

Project Management Software

By

Hugh Beardsworth

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I must also acknowledge the Ohio Air National Guard for the leadership skills that gave me the perseverance to recognize the need for continuing education, and the funding to reach my goals.

Dedication

This manual is dedicated to my parents, whose endless perseverance, drive and self esteem, enabled me to have the strength, dedication, and desire to complete the task of striving towards my bachelor degree in information technology.

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Abstract

Control Works Inc. is a company that manufactures custom control panels for many different aspects of industry. With every project treated as a custom project, each control panel is designed from scratch. This consumes all of the time of the four design engineers that are employed by Control Works Inc. It can take from three to ten days to produce control panel designs for submission to a customer for review. Even though each panel is custom designed for a specific application, the circuitry is constantly reused. This recycling of circuits will help improve the design time, delivery time of submittal, reduce the errors, reduce the cost, and ultimately boost customer confidence.

The project management database software will give the ability to access the orders database. This will allow the user to search for a string of components in completed projects. This search capability will save design time in three distinctly different ways: First, by returning the closest circuit to the one that is required, this way the circuit is practically designed; second, by preventing repetitive research on non-familiar components in project; and the third is in the CAD department, where there will be less drawing time since the drawings are no longer from scratch.

1. Statement of Problem

In today's competitive market, companies must seek out new and improved ways to manufacture their products. These changes should help to drop the cost of the product and increase the over all profits of the company. To aid Control Works Inc. in the change I am proposing a searchable database to organize previous jobs. There are many ways to reduce the cost of a product that a company manufactures. One way to reduce the cost of a product is in purchasing of the needed supplies to create the product (3). Buying in bulk or under contract with suppliers will dramatically decrease the cost of items that are required in manufacturing. But what can be done after purchasing advantages have been realized? The next area of cost reduction to look at is in the manufacturing end of the product. Addressing areas that contain a lot of errors, bottlenecks in the facility, or areas about which customers have complaints. The answer is not always clear. Although no manufacturer wants to simply add more people in order to get their product out the door as this will only increase costs. However if a manufacturer streamlines the present system a dramatic reduction in cost can be achieved.

1.1 Defining the Problem

In streamlining the manufacturing process at Control Works Incorporated, the area I intend to address is the administrative area. Below is the list of steps that were developed from my personal interview (4) (7). These steps will follow projects from orders to production.

- 1) Quote
 - a) The sales department receives a set of specifications outlining a project that is out for bid.

- b) The sales department assembles a list of items, generally in one to three hours, which will meet the job specification.
 - c) The bid is based on components used for the project times a specific multiplier for that particular customer.
 - d) The sales department then sends the bid to the customer for acceptance or rejection.
- 2) Design
 - a) Once the bid is accepted, a folder is created for that job and all items concerning that project are inserted.
 - b) Engineering then sorts through the specs for any missed items.
 - c) The engineer develops a list of items that were bid for the project.
 - d) Then engineering develops hand drawn sketches.
 - e) The Design steps can take from several hours to several weeks depending on the availability of information required.
- 3) Draw
 - a) After engineering has developed a final sketch, it is sent to the CAD department. The CAD department draws the schematic with a program called AutoCAD.
 - b) The finished drawing is reviewed and signed off as complete.
 - c) The drawing stage can take from a couple of hours to a full day.
 - d) There are two people in the CAD department and four designers. This can create a bottleneck of designed jobs waiting to be drawn.
- 4) Submit
 - a) The bill of materials and schematic then enters the submittal process. Each item is matched up with a cut sheet that provides information about the item.
 - b) After all items have been matched up with a cut sheet, the submittal is sent to the customer for approval.
- 5) Build
 - a) If approved, the package then goes into manufacturing.
 - b) After the product is completed it then goes to quality assurance.
 - c) After the product passes quality assurance it is then shipped to customer.

2. Description of Solution

With the time constraints that are placed on projects, there is a need for increased efficiency. To achieve this, procedures that are in place need to be refined or changed.

The changes this proposal will address are to reduce the bid time, design time, and

number of errors. The reduction in these areas may increase the output of the affected departments and ultimately reduce the overall cost of a project. Along with the reduction of the cost of projects, if the bid procedure becomes more accurate, a reduction in losses from improperly bid items would increase overall profit. In addition to the losses on improperly bid projects, overbid items on a project would also be reduced making bids more competitive, increasing business and overall profits. The sales department is often deluged with projects that need to be bid quickly, usually in just a couple of hours. Projects are bid in the fastest manner possible. In this haste, a sales person may error, overbidding or underbidding items. The errors in one department may or may not be caught in the next department. In the long run these errors will also delay the delivery of an acceptable product.

2.1 Development

2.1.1 Quote

A company that builds approximately two thousand custom control panels a year must have an overlap in projects categories. In order to improve the flow of the quotes to design, my proposal is to create a database that will contain all of the customers, components used, vendors and orders (See section 2.1.1.1.) This database will have application pages pertaining to the quote stage of the process. These pages will interact with the database by use of an ADO and ODBC. The ADO control unit will enable you to create database applications (5 p 721), (6 p 648), and the ODBC will provide a standard interface for the database (6 p648). The database will be set up with referential integrity, using a unique order number assigned by Control Works Inc, which will prevent lost or mixed orders (5 p 151). This database will be accessed

through an existing local area network that has less than ten users. The types of fields that will be required for this database are customer information, vendor information, items information and project information. When a sales person selects the items required for the project, a search will be performed on existing projects and list the project that contains the closest match of items required. This search will be performed with queries, the result of which contains selected records and or fields from those records (2 p 14), (6 p 239). The sales person will then get costs from the previous project and a list of items that could not be matched. The sales person will only have to modify the price accordingly with the items that could not be matched. This will improve accuracy of the quotes, increase the speed to produce the quote, and provide an overall better product. This new bid can now be sent out to the customers, with confidence in its accuracy.

2.1.1.1

In designing the data for this project I will have to implement application pages with visual basic. Suggested ideas are as follows:

1. Bid application pages:
 - a) Insertion of motor data in field will automatically select the proper size of starter and overload based on requirements by U.L. procedure.
 - b) Wire size calculation will automatically be made based on load currents that are input in user fields.
 - c) Selection of part number will be made by requirements of specification, for U.L. condition. This can be done with option buttons for required conditions for the project, eliminating the items that do not meet the requirement.
2. The gathered information at bid time will create pages documenting the design features. These items will meet or exceed the 1999 National Electric Code (NEC) and are listed below.

- a) Total U.L. amps for panel.
- b) Wire amps for motor (1 p)
- c) Motor wire size (1 p 257)
- d) Main feed wire size 1 p 256)
- e) Component amps (1 p 257)
- f) Main disconnects amperage (1 p 481).
- g) Wires bend distance for power block (1 p 377).
- h) Size main fusing if required (1 p 481).
- i) Size of main circuit breaker if required (1 p 481).
- j) Popup windows citing specific NEC regulations

2.1.2 Design

If the bid is accepted it will then go to the design stage. The designer has an advantage, since the project will only need to be modified with the items not included. The designer will pull the drawing from the previous project, and add the items that were listed as not included and pass the drawing to the CAD department. The same modifications will have to be done on the Bill of Material.

2.1.3 CAD

Once in the CAD department, the CAD operator will simply alter the existing drawing and save it as the new drawing. Now the project is ready to send to the customer for approval. The time saving in Design and CAD department will increase efficiency up to eight percent, depending on the complexity of the drawing.

2.2 Savings

The saving in time can be based generally on the circuits required, if in the bid stage it takes you one minute to look up each item needed. This in conjunction with the standard amount of components in a control panel can be worked out:

- Item 1) Standard Duplex panel will have forty items listed. Looking up each item you will have saved 40 minutes.

Item 2) The more complex panels can have up to one hundred different items, yielding a time saving of 100 minutes.

By random sampling over the past three years, we have discovered that the three classes of projects work out to be such as, item1 60%, item 2 20% and 20% that does not fit in any category these will be classed as unaffected by the database retrieval system. Out of the 2000 panels completed each year 1200 item 1 style panels are built, 400 item 2 style panels are built and 400 panels unaffected style panels are built.

The timesaving over the year calculates as follows:

1,200items * 40min = 4,8000min
400items * 100min = 4,000min
8000min + 4000min = 5,2000min
5,2000min / 60 min = 866hours
866hours / 40 hours = 21 weeks
866hours / 52 weeks = 16.65 hours/week

The billing rate of the employees is \$35.00 hr. $35 * 866 = \$30,310.00$ lost per year.

Intended Users

The intended users will vary in computer knowledge, so I have developed three different logon styles. The differentiation of the logon will allow the users only in the area that they are required to perform their task. The three classes of logons are Sales, Data Entry, and Administration. The logon will be verified by a logon access number in the database, enabling and disabling selections on the switch form.

2.3.1 Class One

The first class will be set for the sales department, allowing the sales people only to access the Bill of Material (BOM) page and logon setup. The access to the BOM page will be strictly for entering a quote or search criteria for a previous project. The

logon access will be limited to changing their present password. The level of computer literacy required will be the lowest for this class of individuals.

2.3.1.1 Class Two

The second class will be strictly set up for data entry. Included in this will be addition of new parts, customers, vendors, and changing of password in the logon names. The individuals accessing this class will be responsible for correct data entry information. This level will require a mid level of computer competency.

2.3.1.2 Class Three

The third class of logon will be the administrative class. This class will have the capabilities to do the same as the first two classes, and will be able to edit orders, add log names, and logon code. This class will be accessed by individuals with the knowledge of the database, and what is required for its operation.

2.4 Design Protocols

The areas that will be utilized in this project will consist of database and programming. The main focus for this project will be on the database. Visual Basic will be utilized in the creation of the application pages that will communicate with the Access database.

2.4.1 Application Pages

2.4.1.1 Logon Form

The first page will handle Logon characteristics, comparing user name and password with the database logon entries. Once identified in the database, a logon code number is returned. This code number will be the key to the level of access that

is granted. The fields that will be required are the user name and password. The administrator will select the access code.

2.4.1.2 Switch Form

The Switch Form will give the operator easy navigation through the many forms. This navigation is handled through eight command buttons, each offering access to a different area. The proper buttons will be enabled by the authorization code in the database. The selections on this form are BOM, customer, supplier, quotes, products, projects, orders, and logon.

2.4.1.3 Customer Form

The Customer Form will have the capabilities for the authorized user to add, delete, and edit, existing customers. The fields that will be required are customer name, address, city, state, phone number, and fax number.

2.4.1.4 Orders Form

The Orders Form will have the capabilities for the authorized user to add, delete, and edit, existing orders. The fields that are required for this form are order date, part number, project ID, and quantity.

2.4.1.5 Product Form

The product Form will have the capabilities for the authorized user to add, delete, and edit existing products. The fields that are required on this form are supplier name, part number, part name, price, units in stock, units on order, and product description.

2.4.1.6 Project Form

The Project Form will have the capabilities for the authorized user to add, delete, and edit existing projects. The fields that are required are project name, project description, purchase order (PO) number, date, and company name.

2.4.1.7 Quote Form

The Quote Form will have the capabilities for the authorized user to add, delete, and edit existing quotes. The fields that are required for this form are quote number, part number, and customer ID.

2.4.1.8 Supplier Form

The Supplier Form will have the capabilities for the authorized user to add, delete, and edit existing supplier. This form will require supplier name, address, city, state, phone number, zip code, and fax number.

2.4.1.9 Password Form

The Password Form will have the capabilities for the authorized user to add, delete, and edit existing user logons. The individual user will have the ability to edit only their password.

2.4.1.10 BOM Form

The BOM Form contains the main operating function of this software, gathering all of the information required for proper selection of components. The information that is gathered will consist of; customer, voltage of project, amperage and connections to many forms that will aid in the selection of the proper components. The amperage will be calculated so that it will comply with NEC and U.L. guidelines. The parts that will be sized off the amperage will also fall under these guidelines.

2.4.1.11 Parts form

2.4.1.11.1 NEMA/ IEC

The NEMA/IEC Form will access the BOM Form and utilize the horsepower and amperage that will be required in order to select a proper contactor and over load.

Depending on what type of contactor selected NEMA or IEC, the system will output the proper part numbers back to a list for quoting and comparing to the previous projects.

2.4.1.11.2 Operators

The Operators Form will allow the selection of specific operators, depending on several different criteria, such as manufacturer or size (30mm or 22mm). Once the selections of what circuits are made, the components will be loaded into a list of items required, and those items will be loaded in the list that is used for searching previous projects.

2.4.1.11.3 Power Block

The Power Block Form will take the current calculation from the BOM form and properly size the power block in accordance to U.L. and NEC requirements.

2.4.1.11.4 Lightning Arrestor

The Lightning Arrestor Form will utilize the voltage information from the BOM form and make the proper selection for the working voltage that will be required on the project.

2.4.1.11.5 Power Monitor

The power Monitor Form breaks down the selection to a manufacturer level. After the manufacturer has been selected, lists of items that are available from that

particular manufacturer are show. The form will also compare the voltage limitation of that item selected to the voltage selected on the BOM form.

2.4.1.11.6 Alternator

The Alternator Form is set up for the proper selection of an alternator. This page will have error checking built in so that the proper alternator is selected for the system requirements.

2.4.1.11.7 Transformer

The Transformer Form will display the different transformers available, once the selection has been made the peripheral items required for proper operations are automatically selected. These items will consist of proper fusing or circuit breakers.

2.4.1.11.8 GFI

The GFI Form will offer the selection of a GFI. The information for proper load requirements will also be available for the transformer form to ensure proper load requirements and protection. If there is a transformer a check will be done to ensure proper sizing.

2.4.1.11.9 Alarm

The Alarm Form will offer the different lights available. The selection criteria will be dependant on the NEMA class required to maintain integrity of the enclosure.

2.4.2 Database

The data will be set with referential integrity and utilize the following tables:

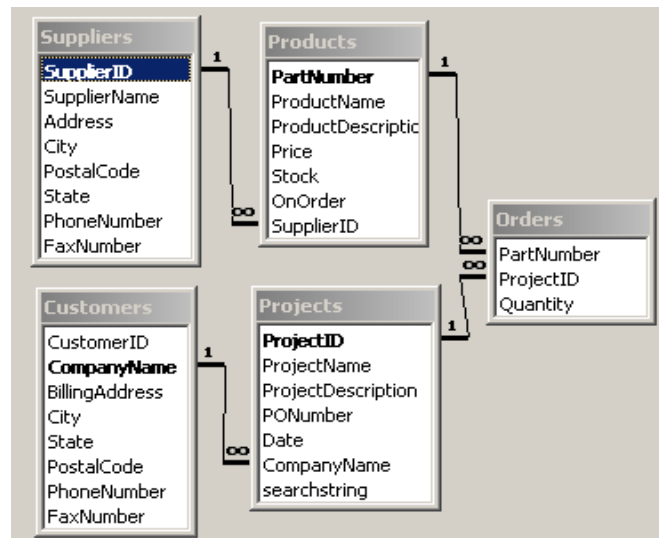


Figure 1. Database relationships

3. Deliverables

- 3.1 The database management system will allow the user to search for a similar project to one they are presently quoting or designing.
- 3.2 The application pages are written in Visual Basic 6.0
- 3.3 Application pages will check for the proper components being selected.
- 3.4 Connection between Microsoft Access 2002 and Visual Basic 6.0 will be with Microsoft Jet, OLEDB 4.0 connection.
- 3.5 Users will have a logon with different levels of access authenticated by the database.
- 3.6 Tasks that may be accomplished:
 - 3.6.1 Operator interface for easy navigation.
 - 3.6.2 Enter or edit customer information.
 - 3.6.3 Enter or edit supplier information.
 - 3.6.4 Enter or edit parts information.

3.6.5 Enter or edit personal log in password and name.

3.6.6 Build a list of items that are required for quote by point and click operation.

3.6.7 Automatically search through existing projects for similar requirements.

4. Design and Development

4.1 Budget

See Appendix A.

4.2 Timeline

See Appendix B.

4.3 Hardware

See Appendix C.

4.4 Software

See appendix C.

5. Project Management Database Proof of design

5.1 User interface Pages

The user interface pages meet deliverable 3.2 and 3.4, in that they are created with Visual Basic 6.0 and are connected to the database by use of Microsoft Jet, OLEDB connection string.

```
constr = "provider=Microsoft.jet.OLEDB.4.0;Data source=" & App.Path & "_seniordesign.mdb;"  
db.Open constr
```

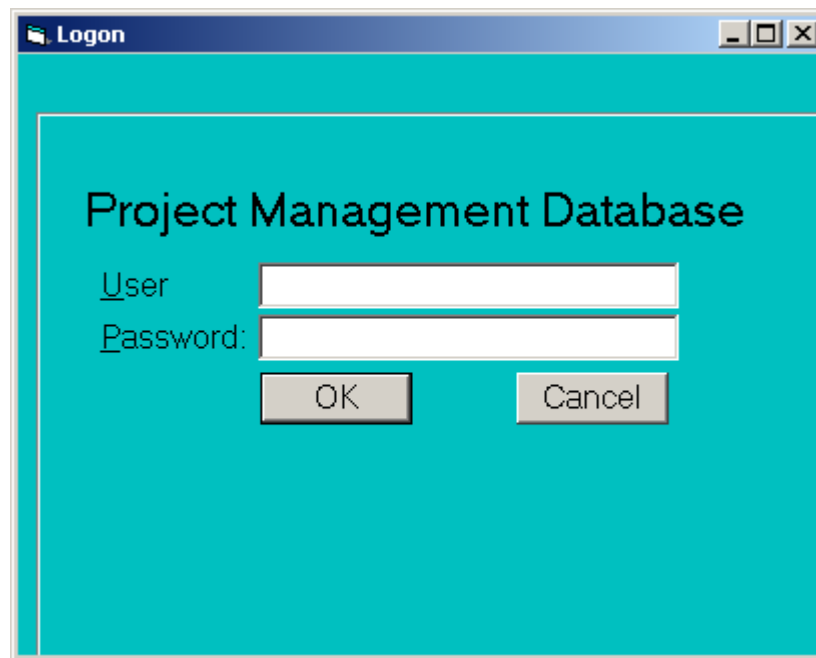
5.2 Login page

The log in page meets the requirements for deliverable 3.5, and is design for implementation of the three different access levels. These levels provide the restriction to unauthorized users, as in an effort to keep inexperienced people from creating problems in the database by inadvertently deleting items.

```

        If txtPassword = rs("Password") Then
            txtauthorizationcode = rs("authorizationcode")
            'Locks out unauthorized changes items
            If txtauthorizationcode < 3 Then
                frmLogOnUtility.txtauthorizationcode.Enabled = False
                frmLogOnUtility.lblauthorizationcode.Enabled = False
                frmLogOnUtility.cmdFirst.Enabled = False
                frmLogOnUtility.cmdLast.Enabled = False
                frmLogOnUtility.cmdNext.Enabled = False
                frmLogOnUtility.cmdPrevious.Enabled = False
                frmLogOnUtility.cmdAddnew.Enabled = False
            End If
        End If
    
```

The log in levels is stored in the database and is only accessible by the administrator. As the user logs in, the database will return a value in a hidden field and this value will determine what pages will be accessible to the user.



The screenshot shows a Windows-style dialog box titled "Logon". The background is a solid teal color. In the center, the text "Project Management Database" is displayed in a large, bold, black font. Below this, there are two input fields. The first is labeled "User" and the second is labeled "Password:". Both labels are in a standard black font. Below the input fields, there are two buttons: "OK" and "Cancel". The buttons are rectangular with a light gray background and a thin black border. The "OK" button is on the left and the "Cancel" button is on the right. The dialog box has a standard Windows title bar at the top with the text "Logon" and three control buttons (minimize, maximize, close) on the right.

Figure 2. Logon Form

5.3 Switch Page

The switch page will meet the deliverable 3.6.1 give the operator the ability to migrate through the software. The selection offered to the user will be dependant on the access code returned from the database. If the user is allowed access all of the

selections will be visible. However if a user has restricted access then the page will be altered to only show the selections that are available to that particular user.

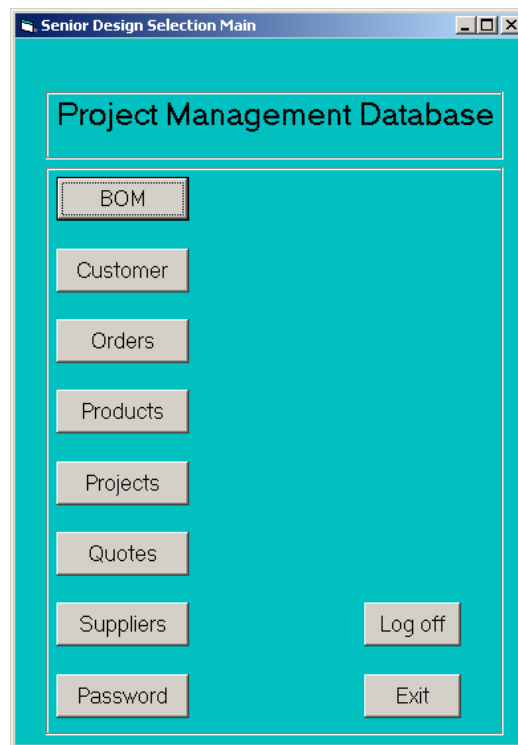


Figure 3. Switch Form Maximum Authorized

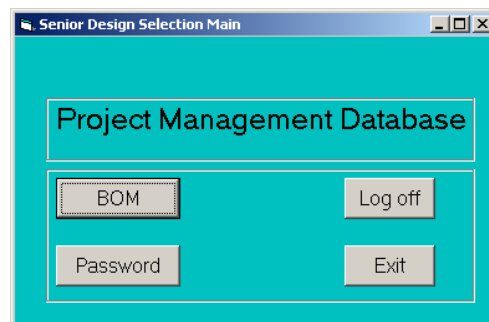


Figure 4. Switch Form Minimum Authorized

5.4 BOM

In selecting the BOM form the deliverable 3.1, 3.6.6 and 3.6.7 will be met. The user has the ability to navigate in a manner that will allow selection of the components that are required for the project. Customer Selection is handled by a drop down menu that will

display the customer in the active database. The search box will accept input by simple selection of the components required or manually if searching for a specific part. The user can select and fill in the appropriate information with simple selections.

The image shows a software window titled "BOM" with a "Project Management Database" form. The form is divided into several sections:

- Customer:** A dropdown menu.
- Motor Data:**
 - Voltage:** A dropdown menu.
 - NEMA Code Letter:** A dropdown menu.
 - Simplex, Duplex, Triplex:** Three radio buttons.
 - Total Amps:** A label.
- Station Requirements:** A collection of checkboxes including Operators, Lightning Arrestor, Alternator, Main Power Block, Power/Voltage Monitor, Transformer, and GFI.
- Search Criteria:** A large text input field, a Project Number dropdown, and Reset/Exit buttons.

Figure 5. BOM Form

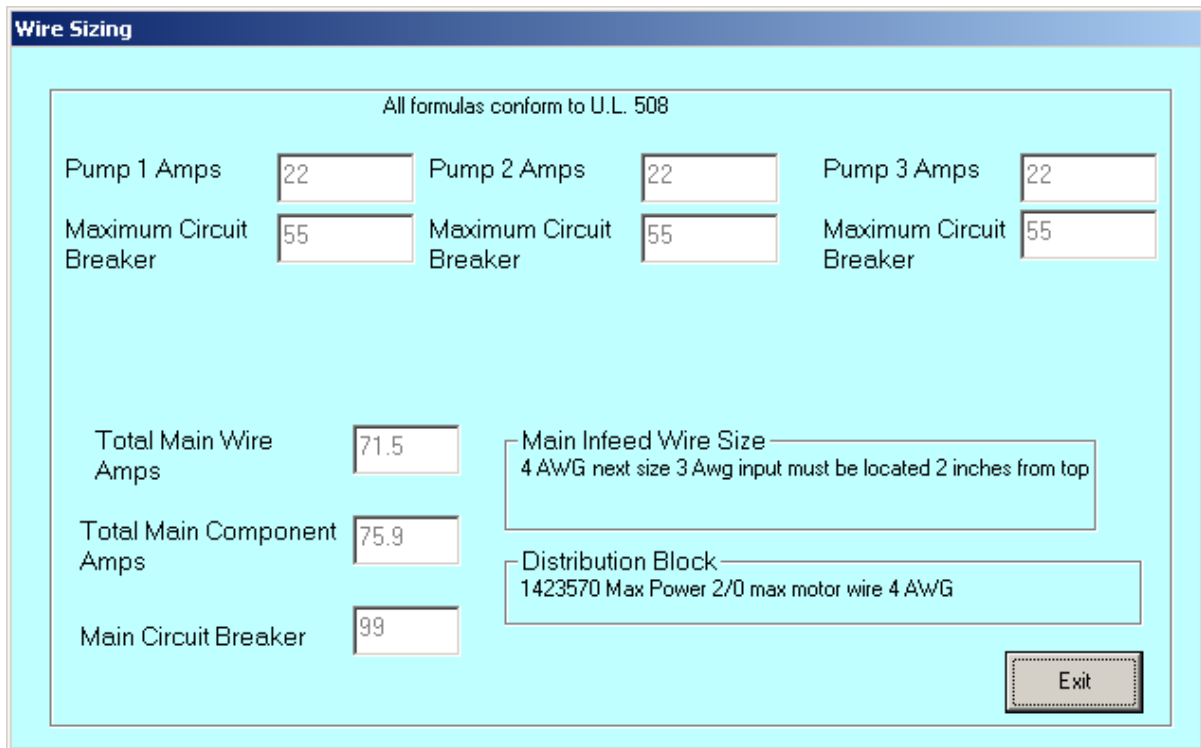
5.5 Required calculation

Many of the forms that are accessed by the BOM page will fill the requirement of deliverable 3.3 below are a list and their function.

5.5.1 Wire Size Form

Wire size form will perform calculations that will conform to U.L. and NEC. The calculations include maximum branch circuit protection, total main wire amperage,

total main component amperage, main circuit breaker size, and main in feed wire size with location for bending space.



The 'Wire Sizing' form has a title bar and a header stating 'All formulas conform to U.L. 508'. It contains input fields for 'Pump 1 Amps', 'Pump 2 Amps', and 'Pump 3 Amps', each with a value of 22. Below these are 'Maximum Circuit Breaker' fields, each with a value of 55. On the left, there are three more input fields: 'Total Main Wire Amps' (71.5), 'Total Main Component Amps' (75.9), and 'Main Circuit Breaker' (99). On the right, there are two text boxes: 'Main Infeed Wire Size' with the text '4 AWG next size 3 Awg input must be located 2 inches from top' and 'Distribution Block' with the text '1423570 Max Power 2/0 max motor wire 4 AWG'. An 'Exit' button is located at the bottom right.

Input	Value
Pump 1 Amps	22
Pump 2 Amps	22
Pump 3 Amps	22
Maximum Circuit Breaker	55
Maximum Circuit Breaker	55
Maximum Circuit Breaker	55
Total Main Wire Amps	71.5
Total Main Component Amps	75.9
Main Circuit Breaker	99

Main Infeed Wire Size: 4 AWG next size 3 Awg input must be located 2 inches from top

Distribution Block: 1423570 Max Power 2/0 max motor wire 4 AWG

Exit

Figure 6. Wire Size Form

5.5.2 Power Monitor Form

Power monitors form will check the voltages of the panel and compare it to the power monitor selected to make sure they match.



Figure 7. Improper Voltage Response

5.5.3 Distribution Block Form

Distribution block form will check the total amperage for the panel and then select the properly sized distribution block to ensure that it is not under sized.

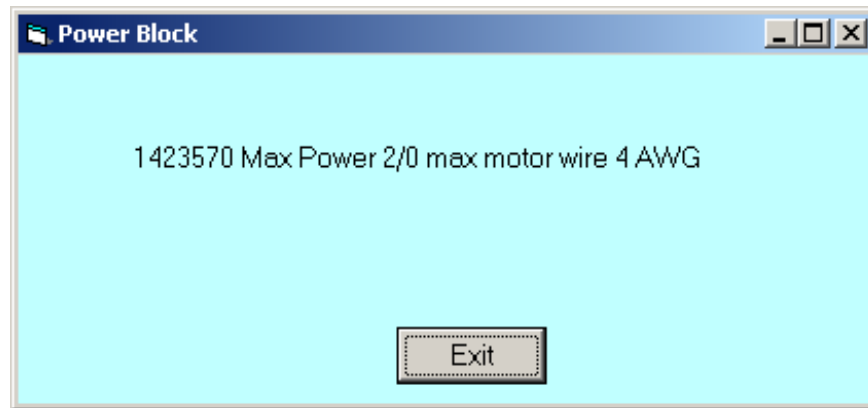


Figure 8. Distribution Block Form

5.5.4 Alternator Form

Alternator form will check the BOM input for the proper style of station. If a simplex is chosen, a selection will not be permitted.

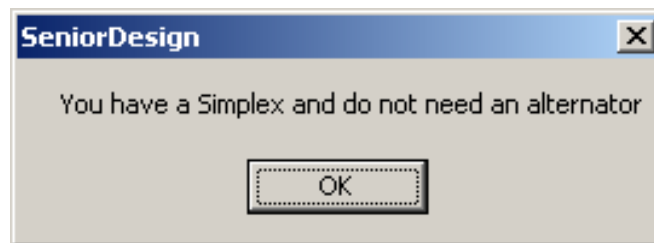
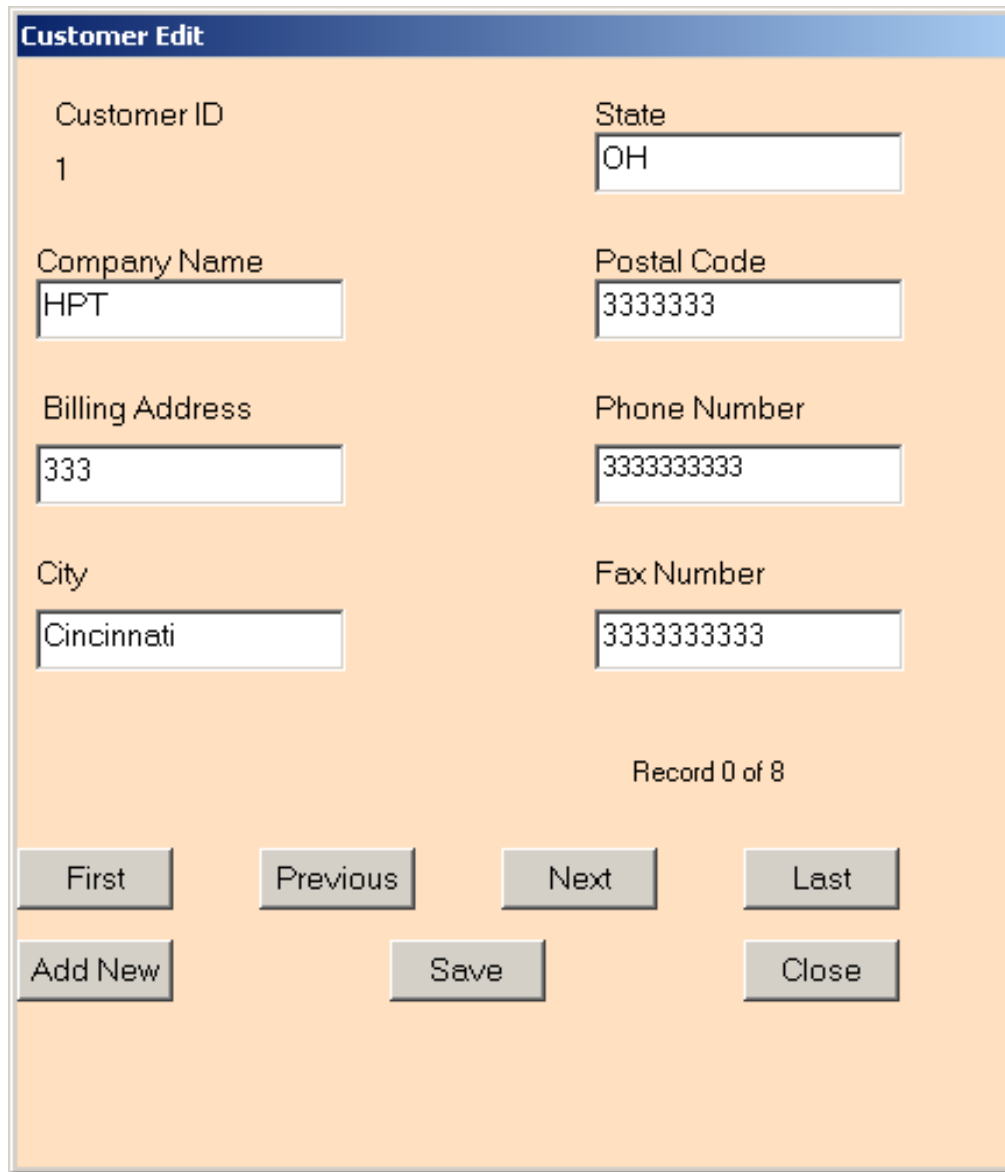


Figure 9. Improper Alternator Responses

5.6 Customer

The customer form will meet deliverable 3.6.2, in that it will provide the authorized user access to the customer form. With the form connected to the data base the user will have the ability to add or edit new and existing customer information.



The image shows a software window titled "Customer Edit" with a blue header bar. The main area has a light orange background and contains several text input fields arranged in two columns. The left column includes fields for "Customer ID" (containing "1"), "Company Name" (containing "HPT"), "Billing Address" (containing "333"), and "City" (containing "Cincinnati"). The right column includes fields for "State" (containing "OH"), "Postal Code" (containing "3333333"), "Phone Number" (containing "3333333333"), and "Fax Number" (containing "3333333333"). Below these fields, the text "Record 0 of 8" is centered. At the bottom of the window, there are two rows of buttons: the first row contains "First", "Previous", "Next", and "Last"; the second row contains "Add New", "Save", and "Close".

Field	Value
Customer ID	1
State	OH
Company Name	HPT
Postal Code	3333333
Billing Address	333
Phone Number	3333333333
City	Cincinnati
Fax Number	3333333333

Record 0 of 8

First Previous Next Last

Add New Save Close

Figure 10. Customer Edit Form

5.7 Parts

The Parts form will meet deliverable 3.6.4, in that it will provide the authorized user access to the parts form. With the form connected to the data base the user will have the ability to add or edit new or existing part information.

The screenshot shows a software window titled "Products Edit" with a blue header bar. The main area has a light orange background and contains several input fields and buttons. The fields are arranged in two columns: "Supplier ID" (value: 2) and "Units In Stock" (value: 0) in the top row; "Part Number" (value: ALM4) and "Units on Order" (value: 2) in the second row; "Product Name" (value: ALARM) and "Product Description" (value: CWI ALARM) in the third row; and "Price" (value: 22) in the bottom left. A status indicator "Record 0 of 9" is located in the bottom right of the form area. At the very bottom, there are two rows of buttons: the first row contains "First", "Previous", "Next", and "Last"; the second row contains "Add New", "Save", and "Close".

Field	Value
Supplier ID	2
Units In Stock	0
Part Number	ALM4
Units on Order	2
Product Name	ALARM
Product Description	CWI ALARM
Price	22

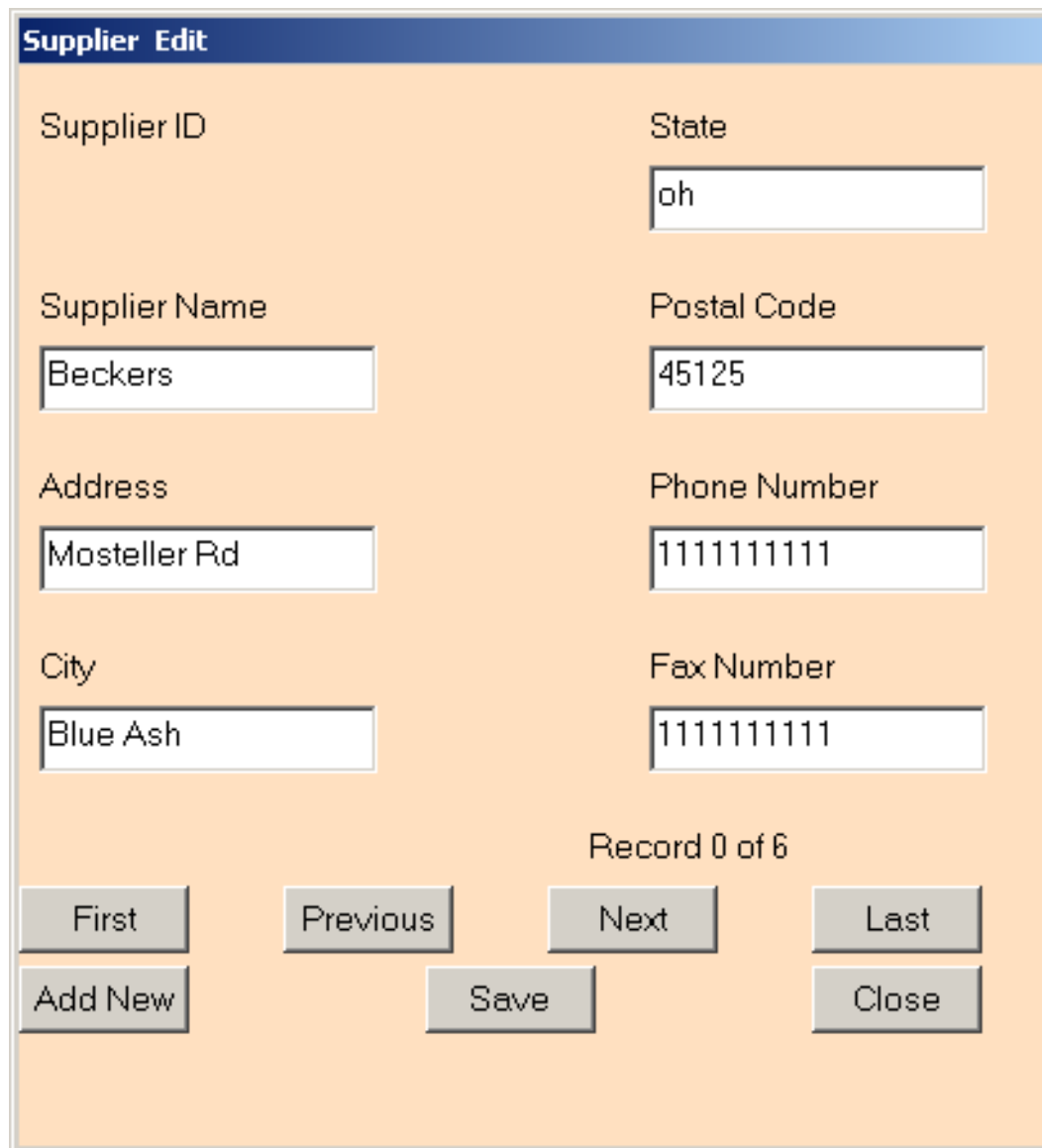
Record 0 of 9

Buttons: First, Previous, Next, Last, Add New, Save, Close

Figure 11. Parts Edit Form

5.8 Supplier

The supplier form will meet deliverable 3.6.2, in that it will provide the authorized user access to the supplier form. With the form connected to the data base the user will have the ability to add or edit the supplier information.



The image shows a software form titled "Supplier Edit". It contains several input fields for supplier information, arranged in two columns. The fields are: Supplier ID, State (with value "oh"), Supplier Name (with value "Beckers"), Postal Code (with value "45125"), Address (with value "Mosteller Rd"), Phone Number (with value "1111111111"), City (with value "Blue Ash"), and Fax Number (with value "1111111111"). At the bottom, there is a status bar showing "Record 0 of 6" and a set of navigation buttons: First, Previous, Next, Last, Add New, Save, and Close.

Supplier Edit	
Supplier ID	State oh
Supplier Name Beckers	Postal Code 45125
Address Mosteller Rd	Phone Number 1111111111
City Blue Ash	Fax Number 1111111111
Record 0 of 6	
First	Previous
Next	Last
Add New	Save
Close	

Figure 12. Supplier Edit Form

5.9 Password

The password form will meet deliverable 3.6.2, in that it will provide the authorized user access to the password form. With the form connected to the data base the user will have the ability to edit their password information. The advance users will have the ability to add or edit the log on authorization code.

The image shows a software window titled "Log On Edit" with a blue header bar. The main area has a light orange background. It contains three text input fields, each with a label above it: "Password" (containing "hugh"), "User Name" (containing "hugh"), and "Authorization code" (containing "3"). At the bottom, there are two rows of gray buttons. The first row contains "First", "Previous", "Next", and "Last". The second row contains "Add New", "Save", and "Close".

Figure 13. Password Edit Form

6. Conclusion and Recommendation

In order to stay competitive in today's manufacturing market it is imperative that managers work to reduce the manufacturing time required for their product. Using the features that are offered in the Project Management Database Software will allow Control Works Inc. to develop their product in less time. With the search function in the Project Management Database Software there will be an immediate cost and time savings in both the quoting and designing stage of their product. This savings will also be reflected in the ability to produce more accurate and competitive quotes. As customers are able to receive information they require in a timelier manner, and the cost of the projects are driven down by removing the fluff, customer satisfaction will increase resulting in a larger number of repeat orders.

Appendix A.

Budget.

Total budgeted for fiscal year 2002 will be:

Microsoft Office XP	\$430.00
Visual Basic 6.0 Enterprise edition	\$660.00
Windows NT 4.0 server 25 license	\$1,457.00
Dell Power Edge 4400	\$2,400.00
Total	\$4,947.00
Total Budgeted for fiscal year 2002	\$7,500.00

Appendix B.

Time Line

Fall 2001

October Thursday 18	Progress Report Due
October Thursday 25	Independent council
November Thursday 1	First draft due
November Thursday 8	Progress report 2 due
November Thursday 15	Independent council
November Thursday 29	Final Draft Proposal due
November Thursday 29	Oral presentation group1
December Thursday 6	Oral presentation group 2

Winter 2002

January Thursday 3	Start Development of Database
January Thursday 10	Development of Database
January Thursday 17	Develop application pages for bidding
January Thursday 24	Develop application pages for bidding
January Thursday 24	Progress Report 1 due
January Thursday 31	Develop application pages for bidding
February Thursday 7	Develop application pages for Design
February Thursday 14	Develop application pages for Assignment Due
February Thursday 14	Draft of Final Report
February Thursday 21	Develop search profile required
February Thursday 21	Progress Report 2 Due
February Thursday 28	Work on report
February Thursday 28	Edit pages
March Thursday 7	Assignment Due Oral Presentation
March Thursday 14	Assignment Due Oral Presentation

Spring 2002

March Thursday 28	Develop
April Thursday 4	Develop
April Thursday 11	Develop & Improve
April Thursday 18	Develop & Improve
April Thursday 25	Develop & Improve
May Thursday 2	Develop & Improve
May Thursday 9	Improve report
May Thursday 16	Improve report
May Thursday 23	Finalize prototype
May Thursday 30	Project Complete
May Thursday 30	Final report

Appendix C.

Components Required

Hardware.
Application server Dell Power Edge 4400

Software.
Database software.
Microsoft Office XP.
Visual Basic 6.0 enterprise edition.
Windows NT 4.0 Server 25 licenses.

References

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