Inventory Group

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Tony Franckowiac - Sponsor
Introduction

• Venetian Marble and Granite is a local manufacturer of countertops for residential and commercial building projects.

• Each piece is designed and manufactured to custom specifications.

• Their largest division molds synthetic marble countertops.
Venetian wanted:

- a way to mark each piece during production for tracking.

- a computer database which stored info for each piece:
  - dimensions
  - color
  - location
  - notes
  - stage in production
  - work order number

- a way to identify a piece easily on the production floor and during delivery truck loading.
Constraints

Official constraint statement from charter drafted in the fall:

“The solution is constrained by the budget and should be able to withstand any conditions encountered in the manufacturing process.”
Constraints – Project Objectives

- Provide a maintainable electronic database for all inventory

- According to the capabilities of the chosen database, it will contain information in the problem description
Constraints – Project Objectives

- Supply a means to track all pieces through manufacturing, storage, and delivery.

- Each piece will have a unique identifier linking it to the electronic database which is installed as early as possible in manufacturing.
Final Design

- 4 design elements
  - New work order numbering scheme
  - Adhesive Labels
  - Clipboard check in/out stations
  - Access database
Final Design – New Numbering Scheme

• New numbering scheme
  ◦ _ _ - _ _ _ _
  ◦ First two digits correspond to year
  ◦ Last four correspond to the number of work orders that year
  ◦ Ex: “10-0148” year 2010, 148<sup>th</sup> order
Final Design - Labels

- Paper work order → Stickers on each piece
- The same basic information from the old work orders will be on the new labels.
Final Design - Labels

Work Order: _________ Piece: _____ / _____ Color: _______

Bowl Type: _______ # of Bowls: _____ Faucet Spread: _______

Work Order: ___________________ Piece: _____ / _____

Color: _____________ Type: ___________ Trim: ___________

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Checklist

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Color</th>
<th># of Bowls</th>
<th>Bowl Type</th>
<th>Faucet Spread</th>
<th>Splashes</th>
<th>Location</th>
<th>Finished By</th>
</tr>
</thead>
</table>

Type of Top: __Angle__Banjo__Regular
Back Splash: __Coved__Detached
End Splash: __Left__Right
Size: __Standard 4”__Other
Edge: __Standard__Single O.G.__Double O.G.

Overflow: __Yes__No
Faucet Holes On Deck: __Yes__No
Whirlpool: __Yes__No
Pneumatic Switch: __Yes__No
In-line Heater: __Yes__No
Nailers: __VM__Others
Skirt Framing: __VM__Others
Pump: __3/4hp__1.0hp
No. of Jets: __6__8__10__12
### Final Design – Clipboard Stations

- Clipboard stations will now be used as check in/check out points
- Sheets will be collected at the end of the day to update the database.

<table>
<thead>
<tr>
<th>Work Order #</th>
<th>Piece #/Total</th>
<th>Date In</th>
<th>Initials</th>
<th>Date Out</th>
<th>Initials</th>
<th>Mixed by/Poured by</th>
<th>Finished by</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The database consists of several parts:

- Tables, which store the raw data.
- Forms, which present the information in an easy-to-read fashion.
- Reports, which show only relevant information for a specific task and are based on a query.
## Final Design – Access Database Form

### Inventory

<table>
<thead>
<tr>
<th>Work Order #</th>
<th>Pieces</th>
<th>Date Authorized</th>
<th>Date Poured</th>
<th>Scheduled Install Date</th>
<th>Location</th>
<th>Storage Rack-Slot</th>
<th>Color</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0017</td>
<td></td>
<td>30-Jan-10</td>
<td>03-Feb-10</td>
<td></td>
<td>Finishing</td>
<td></td>
<td>White/Rose</td>
<td>45</td>
<td>$145.00</td>
</tr>
<tr>
<td>10.0016</td>
<td>1</td>
<td>30-Jan-10</td>
<td>03-Feb-10</td>
<td></td>
<td>Finishing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0001</td>
<td>2</td>
<td>01-Jan-10</td>
<td>10-Jan-10</td>
<td></td>
<td>Storage</td>
<td>B-47</td>
<td>Green</td>
<td>3</td>
<td>$7.75</td>
</tr>
<tr>
<td>10.0003</td>
<td>2</td>
<td>05-Jan-10</td>
<td>10-Jan-10</td>
<td>26-Jan-10</td>
<td>Storage</td>
<td>2-13</td>
<td>Red</td>
<td>4</td>
<td>$10.00</td>
</tr>
<tr>
<td>10.0002</td>
<td>1</td>
<td>05-Jan-10</td>
<td>17-Jan-10</td>
<td>28-Jan-10</td>
<td>Storage</td>
<td>W-33</td>
<td>Blue</td>
<td>76</td>
<td>$12.00</td>
</tr>
<tr>
<td>10.0004</td>
<td>1</td>
<td>05-Jan-10</td>
<td>17-Jan-10</td>
<td>28-Jan-10</td>
<td>Storage</td>
<td>W-33</td>
<td>Green</td>
<td>76</td>
<td>$12.00</td>
</tr>
<tr>
<td>10.0009</td>
<td>1</td>
<td>12-Jan-10</td>
<td>17-Jan-10</td>
<td>29-Jan-10</td>
<td>Molding</td>
<td></td>
<td>Green</td>
<td>2</td>
<td>$15.46</td>
</tr>
</tbody>
</table>
Final Design – Access Database Reports

**Average Weight**

<table>
<thead>
<tr>
<th>Work Order #</th>
<th>Date Poured</th>
<th>Pieces</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0015</td>
<td>03-Feb-10</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>10.0016</td>
<td>03-Feb-10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10.0017</td>
<td>03-Feb-10</td>
<td></td>
<td>45</td>
</tr>
</tbody>
</table>

**Work Order Summary**

<table>
<thead>
<tr>
<th>Work Order #</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0013</td>
<td>5</td>
<td>$34.72</td>
</tr>
</tbody>
</table>

- Average Weight Report for a given date range.
- Work Order Summary for a given work order.
Testing

- Prototypes were brought to Venetian
  - Database system
  - Stickers
  - User Manual
  - Clipboard

- Feedback was collected

- Revisions were made

- Final product reached
Evaluation

• Looking back at the criteria for the project:

  ✓ The database stores all necessary information and then some.
  
  ✓ It is capable of tracking multiple work orders and multi-piece work orders.
  
  ✓ Feedback from David suggests the system is much simpler to use than the current Q&A software.
  
  ✓ The new work order numbering scheme provides a unique and logical identifier linking a piece to the database.
  
  ✓ Access is much more maintainable than the outdated software Venetian currently uses.
Conclusion

- Main objectives have been accomplished.
- Only small adjustments in the workers’ routines.
- Effective and efficient for Venetian’s needs.
- Under budget.
- We recommend Venetian expand the database.
- With production expansion, integrate barcodes.
Questions?

Source: http://www.flickr.com/photos/doberagi/1404539812/
We would like to thank:

Faculty Advisor: Dr. Giolma

Senior Design Professor: Dr. Nickels

Contacts at Venetian: Tony Franckowiac, David Allen