What is Recipedia?

- Digital cookbook capable of storing recipes
- Touch screen, VGA monitor and voice command interface provides a user-friendly environment
- Uses text-to-speech capabilities to “read” recipes to the user one line at a time
Implementation Strategy

• Input Devices
  • Touch screen
  • Microphone

• Output Devices
  • VGA monitor
  • Speaker

• Processing & Control
  • MC68HC11 x 2
  • Spartan 3 FPGA
Implementation Strategy cont…

- Application software implemented in main 68HC11 processor
- Main processor interfaces with touch screen, FPGA, text-to-speech, and input from auxiliary processor
- Voice command recognition implemented in auxiliary 68HC11
- Auxiliary 68HC11 interfaces with microphone and main processor via a/d converter and i/o ports
- Analog sound samples will be taken via microphone and compared with hard-coded expected samples
- FPGA - VGA controller and character ROM generator
Examples of Char ROM & Sound Samples

- **NEXT @ 8Khz**
- **HOME @ 8Khz**
- **Character ROM**
## Finalized Schedule

<table>
<thead>
<tr>
<th>Completion Date</th>
<th>Milestone</th>
</tr>
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<tbody>
<tr>
<td><strong>May 15(^{th}), 2006</strong></td>
<td>• All parts acquired and tested</td>
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</tbody>
</table>
| **June 15\(^{th}\), 2006** | • Schematics of complete system compiled  
  • Pseudo-code written for software                                      |
| **July 15\(^{th}\), 2006** | • 5V 2A power supply complete  
  • Software & interface for text-to-speech                                |
| **October 10\(^{th}\), 2006** | • VGA and character ROM implemented via Spartan3 FPGA w/interface to µController |
| **October 20\(^{th}\), 2006** | • Analog components complete: amplifier, filter, etc.  
  • System enclosure complete                                               |
| **October 30\(^{th}\), 2006** | • Software & interface for touch screen & application software complete   |
| **November 30\(^{th}\), 2006** | • Extra features complete: command recognition, timer, calendar, USB interface, etc. |
| **December 7\(^{th}\), 2006** | • System fully operational  
  • Ready for presentation & demonstration                                  |
## Project Flow

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Start</th>
<th>Finish</th>
<th>Duration</th>
<th>Q2 06</th>
<th>Q3 06</th>
<th>Q4 06</th>
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<tr>
<td>1</td>
<td>Acquire All Parts</td>
<td>5/5/2006</td>
<td>5/15/2006</td>
<td>7d</td>
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<td>6/15/2006</td>
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<td>7/14/2006</td>
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<td>5</td>
<td>Software &amp; Interface Text-to-Speech</td>
<td>5/5/2006</td>
<td>7/14/2006</td>
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<td>6</td>
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<td>10/20/2006</td>
<td>70d</td>
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<td>Touch Screen Software &amp; Interface</td>
<td>7/17/2006</td>
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<td>11/30/2006</td>
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## Project Tasking

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<th>Kevin</th>
<th>Koto</th>
<th>Tim</th>
<th>Shawn</th>
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<tr>
<td>Schematics</td>
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<td>Text to Speech (software &amp; interface)</td>
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<td>VGA &amp; Character ROM (FPGA Spartan 3)</td>
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<tr>
<td>System Testing</td>
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Finalized Bill Of Materials (BOM)

• **Embedded Processors**
  - Primary Vendor: University of Utah
  - Model #: 68HC11
  - Part #: MC68HC11E1CP2
  - Unit Cost: $13.50 (Own 2)
  - Quantity: 2
  - Total Cost: $0.00

• **FPGA**
  - Primary Vendor: www.digilentinc.com
  - Model #: Spatan3 starter kit
  - Part #: XCS3S200
  - Unit Cost: $99.00 (own 2)
  - Quantity: 2
  - Total Cost: $99.00 + shipping
Finalized Bill Of Materials (BOM) cont...

- **Text_to_Speech Module**
  - Primary Vendor: www.hobbyengineering.com
  - Model #: SPO3
  - Part #: R184SP03
  - Lead Time: 2 weeks (In-stock)
  - Unit Cost: $99.00
  - Quantity: 1
  - Total Cost: $99.00 + Shipping

  - Model #: SPO3
  - Part #: R184SP03
  - Lead Time: 2 weeks (In-stock)
  - Unit Cost: $102.00, $94.00
  - Quantity: 1
  - Total Cost: $102.00, 94.00 + Shipping
Finalized Bill Of Materials (BOM) cont...

• **Touch Screen**
  - Primary Vendor: eBay inc.
  - Model #: SCN-AT
  - Part #: E274
  - Lead Time: None (Purchased)
  - Unit Cost: $56.00
  - Quantity: 1
  - Total Cost: $70.00 ($56.00 + 14.00 shipping)

• **ViewSonic OptiQuest Q71 CRT Monitor**
  - Primary Vendor: Deseret Industries (DI)
  - Model #: VCDTS21348-2M
  - Lead Time: None (Purchased)
  - Unit Cost: $10.00
  - Quantity: 1
  - Total Cost: $10.00
System Enclosure Details

- Large box composed of aluminum, plexiglass, or Lexan material adequate enough to enclose CRT monitor, circuit boards, etc.
Extra Features

- Voice Command Recognition
- Timer
- Calendar
- Time/Date
- USB expansion capabilities (new recipes, etc.)
Questions??

www.cs.utah.edu/~kquinn/recipedia.html