

Recipedia

The Digital Cookbook

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Kevin Quinn, Tim Spens, Koto Norose, Shawn Rhoades

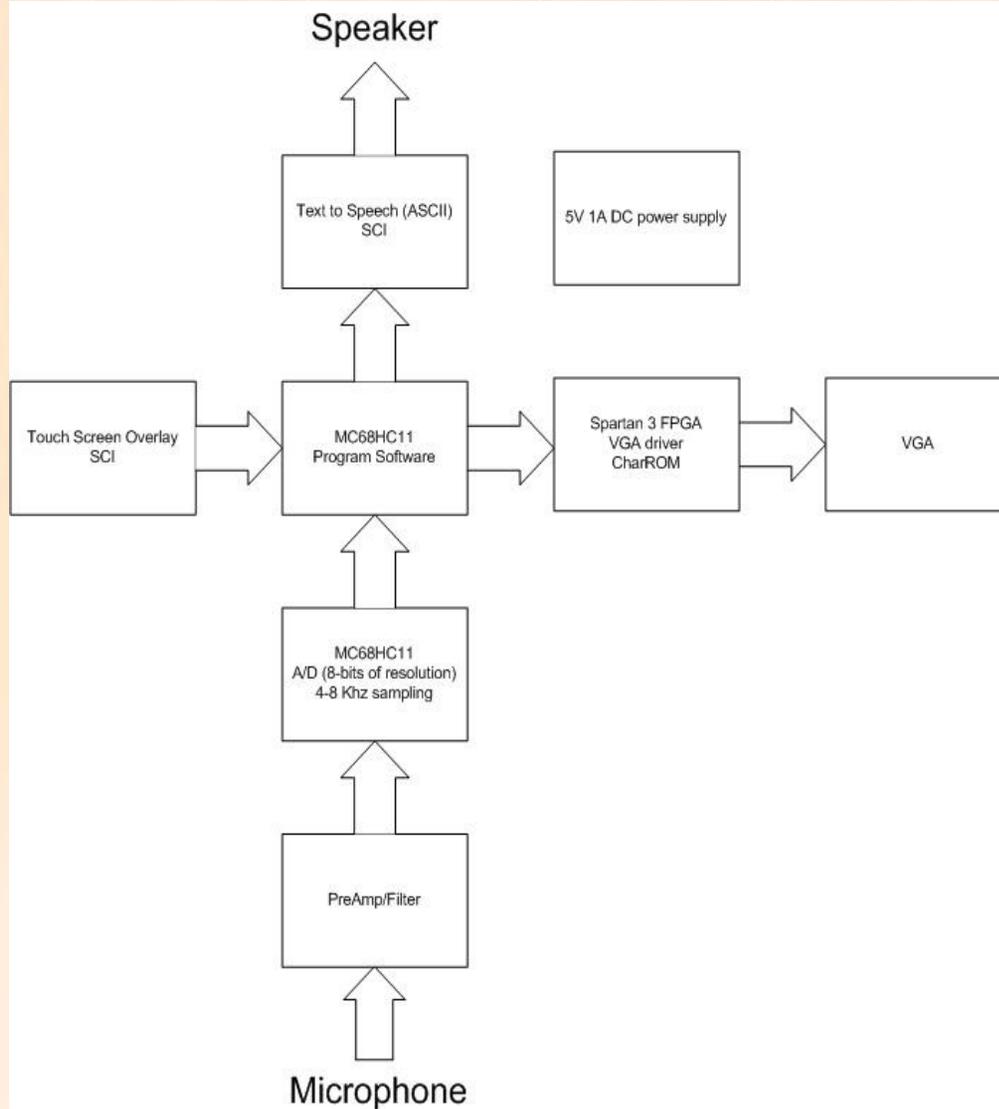
www.cs.utah.edu/~kquinn/recipeia.html

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*

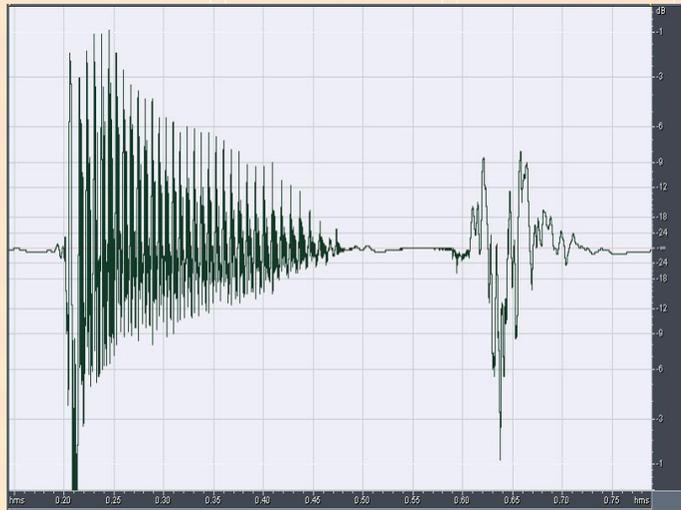
- *Processing & Control*

- *MC68HC11 x 2*
- *Spartan 3 FPGA*

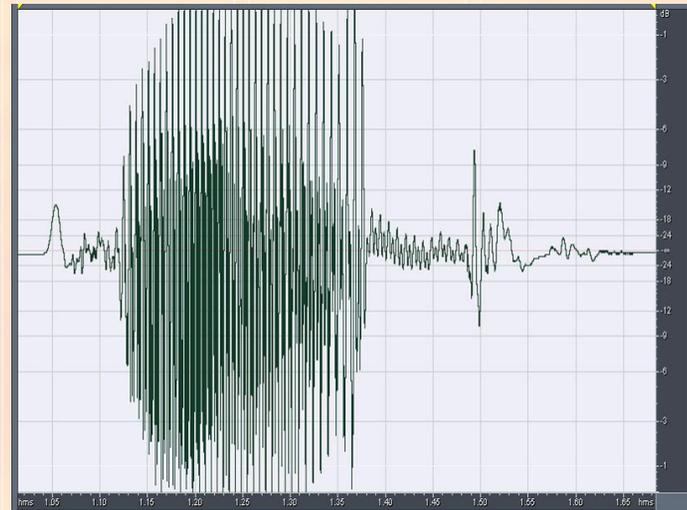
Implementation Strategy cont...

- *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*

FPGA Font IBM default 8x16

CHAR #41: CHAR #42: CHAR #43: CHAR #44: CHAR #45: CHAR #46: CHAR #47:

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• *Character ROM*

Finalized Schedule

| <u>Completion Date</u> | <u>Milestone</u> |
|--|---|
| <i>May 15th, 2006</i> | <ul style="list-style-type: none">• <i>All parts acquired and tested</i> |
| <i>June 15th, 2006</i> | <ul style="list-style-type: none">• <i>Schematics of complete system compiled</i>• <i>Pseudo-code written for software</i> |
| <i>July 15th, 2006</i> | <ul style="list-style-type: none">• <i>5V 2A power supply complete</i>• <i>Software & interface for text-to-speech</i> |
| <i>October 10th, 2006</i> | <ul style="list-style-type: none">• <i>VGA and character ROM implemented via Spartan3 FPGA w/interface to μController</i> |
| <i>October 20th, 2006</i> | <ul style="list-style-type: none">• <i>Analog components complete: amplifier, filter, etc.</i>• <i>System enclosure complete</i> |
| <i>October 30th, 2006</i> | <ul style="list-style-type: none">• <i>Software & interface for touch screen & application software complete</i> |
| <i>November 30th, 2006</i> | <ul style="list-style-type: none">• <i>Extra features complete: command recognition, timer, calendar, USB interface, etc.</i> |
| <i>December 7th, 2006</i> | <ul style="list-style-type: none">• <i>System fully operational</i>• <i>Ready for presentation & demonstration</i> |



Project Flow

| ID | Task Name | Start | Finish | Duration | Q2 06 | | Q3 06 | | | Q4 06 | |
|----|-------------------------------------|-----------|------------|----------|-------|-----|-------|-----|-----|-------|-----|
| | | | | | May | Jun | Jul | Aug | Sep | Oct | Nov |
| 1 | Acquire All Parts | 5/5/2006 | 5/15/2006 | 7d | █ | | | | | | |
| 2 | Schematics of Complete System | 5/5/2006 | 6/15/2006 | 30d | █ | █ | | | | | |
| 3 | Pseudocode Written | 5/5/2006 | 6/15/2006 | 30d | █ | █ | | | | | |
| 4 | Power Supply | 5/5/2006 | 7/14/2006 | 51d | █ | █ | █ | | | | |
| 5 | Software & Interface Text-to-Speech | 5/5/2006 | 7/14/2006 | 51d | █ | █ | █ | | | | |
| 6 | VGA & Character ROM | 7/17/2006 | 10/10/2006 | 62d | | | █ | █ | █ | | |
| 7 | Analog Components | 7/17/2006 | 10/20/2006 | 70d | | | █ | █ | █ | | |
| 8 | System Enclosure | 7/17/2006 | 10/20/2006 | 70d | | | █ | █ | █ | | |
| 9 | Touch Screen Software & Interface | 7/17/2006 | 10/30/2006 | 76d | | | █ | █ | █ | | |
| 10 | Extra Features | 9/1/2006 | 11/30/2006 | 65d | | | | | █ | █ | |
| 11 | System Testing | 7/14/2006 | 12/7/2006 | 105d | | | █ | █ | █ | █ | █ |

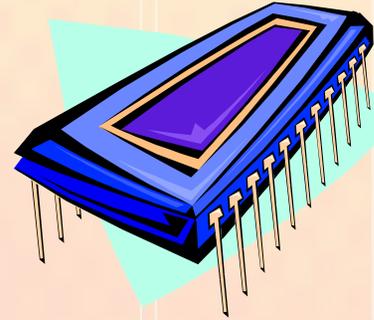
Project Tasking

| <i>Task</i> | <i>Kevin</i> | <i>Koto</i> | <i>Tim</i> | <i>Shawn</i> |
|--|--------------|-------------|------------|--------------|
| <i>Schematics</i> | | | | |
| <i>Pseudocode</i> | | | | |
| <i>Power Supply</i> | | | | |
| <i>Text_to_Speech</i> <i>(software & interface)</i> | | | | |
| <i>VGA & Character ROM</i> <i>(FPGA Spartan 3)</i> | | | | |
| <i>Analog Components</i> | | | | |
| <i>System Enclosure</i> | | | | |
| <i>Touch Screen Software &</i> <i>Interface</i> | | | | |
| <i>Extra Features</i> | | | | |
| <i>System Testing</i> | | | | |

Finalized Bill Of Materials (BOM)

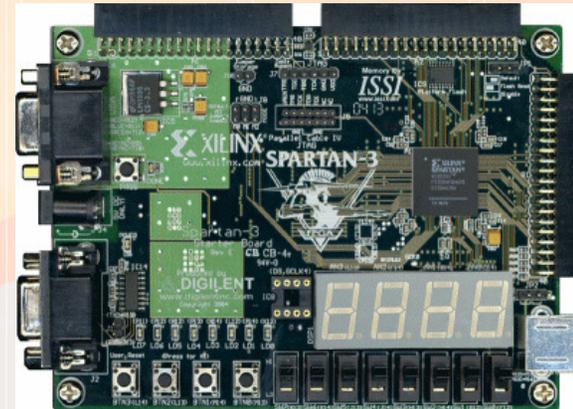
- *Embedded Processors*

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



- *FPGA*

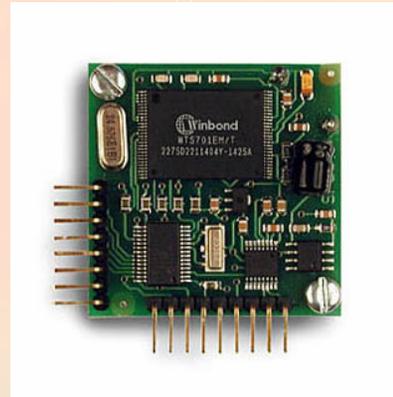
- Primary Vendor: www.digilentinc.com
- Model #: Spartan3 starter kit
- Part #: XCS3S200
- Unit Cost: \$99.00 (own 2)
- Quantity: 2
- Total Cost: \$99.00 + shipping



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



- Secondary Vendors: www.acroname.com , www.junun.org/MarkIII
- 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)



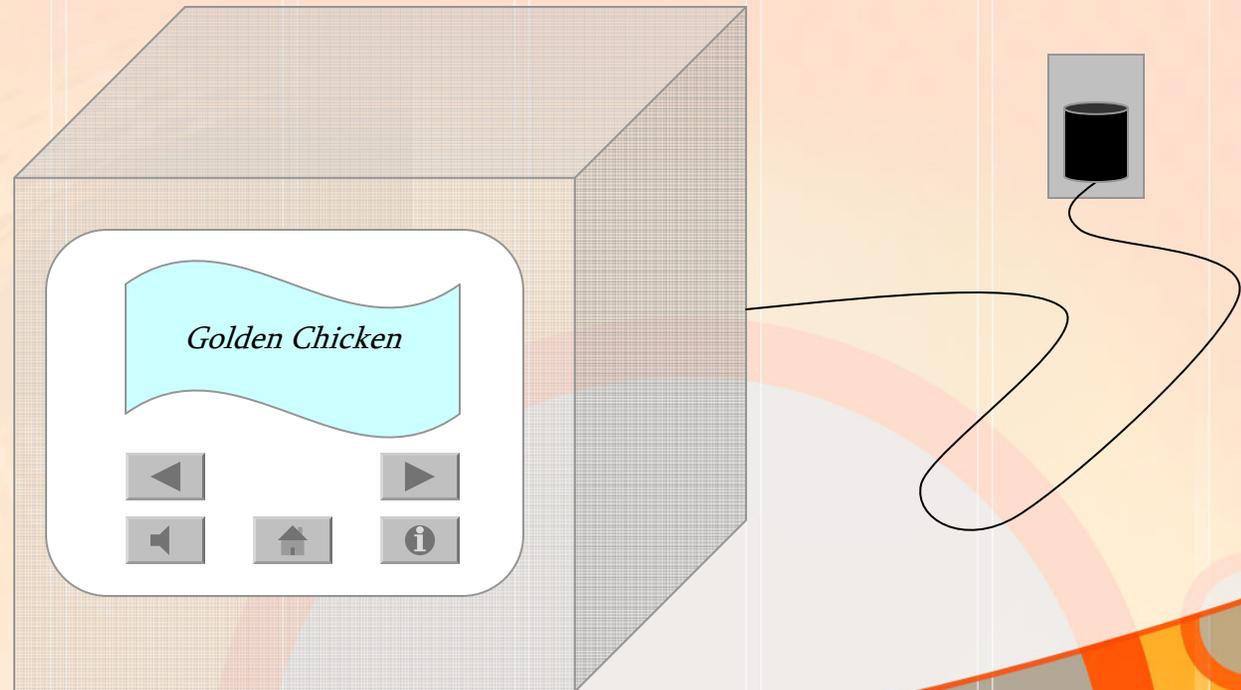
- *ViewSonic OptiQuest Q71 CRT Monitor*

- 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.)*

