Accessible Blood Glucose Monitor Interface

Team 2
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Rehabilitation Engineering Research Center

- RERC sponsors the design competition
- Funded by National Institute for Disabilities and Rehabilitation Research
- Open to:
  - Biomedical engineers
  - Mechanical engineers
  - Industrial engineers
Introduction

- Lower cost alternative to commercially available meters.
- All-in-one package
  - For the visually impaired
  - For patients with motor control disabilities
Patient Need

- 18.2 million American diabetics
- 5th leading cause of death in U.S.
- No cure
- Rise in obesity driving market growth
- Leading cause in new blindness in adults 20-74 years old
- Annually 12,000-24,000 diabetics loose sight
Economic Costs

- 1 out of every 10 health care dollars spent
- Annual per capita health care expenditure $13,243
- Diabetes market $132 billion/year industry
Available Products

- Accu-Chek Advantage
  - Portable
  - 26 second results
  - 4 uL blood sample
  - No alternative site testing
  - Snap-in code key calibration
  - Large legible display
  - Cost: $65
Available Products

- OneTouch Ultra by Lifescan
  - Portable
  - 5 second results
  - 1 uL blood sample
  - Multiple site testing
  - Large legible display
  - Cost: $75
Available Products

- Voicemate by Accu-Chek
  - Portable
  - 26 second results
  - 4 uL blood sample
  - Snap-in code key calibration
  - Step-by-step voice instructions
  - Modular
  - Cost: $570
Product Description

- Single compact unit
- Battery powered
- Clear voice instructions and results
- Snap-in code key calibration
Product Description

- Features for the visually impaired:
  - Braille enhanced buttons
  - High color contrast buttons
  - Large display
  - Clear voice output
Product Description

Features for patients with motor control disabilities:
- Large buttons
- Rubber side grips
- Fits in the palm of your hand
- Accommodate:
  - Parkinson’s patients
  - MS patients
  - Arthritic patients
Product Description

Other Features:
- 14 and 30 day averaging
- Stores up to 150 test results with date and time stamp
- Testing conditions label
- Download results to PC tracking software
## Estimated Costs

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gumstix mini-computer</td>
<td>$120.00</td>
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<tr>
<td>Gumstix accessories</td>
<td>$60.00</td>
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<tr>
<td>Printed circuit board</td>
<td>$60.00</td>
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<tr>
<td>Other components</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$300.00</strong></td>
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# Timeline

<table>
<thead>
<tr>
<th>Task</th>
<th>Date</th>
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<tbody>
<tr>
<td>Preliminary Design</td>
<td>Mid October 2005</td>
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<tr>
<td>Secondary Design</td>
<td>End October 2005</td>
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<tr>
<td>Third Design</td>
<td>Early November 2005</td>
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<tr>
<td>Optimal Design Analysis</td>
<td>Mid November 2005</td>
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<tr>
<td>Final Parts Order</td>
<td>Mid November 2005</td>
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<tr>
<td>Prototyping</td>
<td>December-February 2005-2006</td>
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<tr>
<td>Final Testing</td>
<td>February-April 2006</td>
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</table>
Conclusion

- Portable size
- Lower cost
- User-friendly interface
- Easy to read display
- Audible output