Financial Management System

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System Model

• Focus on making this work for a business.
  – We’ve been talking with some accounting firms, and regular businesses.
  – Sponsor offered to loan expensive parts.
    • Check Scanner
    • Ingres Database
    • OCR Software
Last Time
BIE (Bank Information Extraction)

- Internet Computer
  - Responsible for any contact to the world outside our system.
  - Not used to store any sensitive data.
  - It will hold the program we write, that navigates and collects information from the banks.
    - This program will also have additional features such as emailing users when accounts are overdrawn.
    - We will deploy our program with Apache’s Tomcat server using CSS, AJAX, Java Servlets, JSPs, etc…
  - It will hold our firewall to the Internet.
  - The program that decrypts our sensitive data from our external drive will also rest on here.
BIE (Bank information Extraction)

- **External Drive**
  - Responsible for holding any secure data.
    - Will hold the program responsible for storing and transferring secure data to the internet computer.
    - We are planning on having this data encrypted.
    - External Drive will be an Iron key
      - World’s safest flash drive
      - Prevent any worry of drive getting lost or stolen.
Bank extraction from last time

• We were stuck with the issue of deciding whether to scrape our information directly or being given our information through an API
• We met with different companies that are doing what we are trying to do, but not to the full extent.
  – They lack the ability to compare with scanned documents so they are limited to whatever the bank provides or manual entering.
  – The goal of our system is to automate everything. We have not seen any system that does everything we are trying to accomplish.
Bank Extraction Method

- We have met with various banks and will start with Chase. As time permits then we may try expanding our project to other banks.
- Chase’s IT department is willing to provide us with an API.
- We will be meeting with their software team in the next couple of weeks on how we will operate.
- We imagine it will be a similar protocol to what various accounting products such as quickbooks use. (quickbooks has a protocol to grab the bank data called direct connect that is local to only quickbooks)
Software Security

• Anything that deals with money is a big issue if security is compromised.
  – We will be using our own accounts
  – We want to protect against hackers/spoofers.

• Security Measures
  – Iron Key
    • Data will be encrypted on the drive
    • Acid feature ensures security
  – We will have a firewall between internet computer and the internet.
  – Any data sent to or received from the bank will be encrypted.
  – We are discussing encrypting data between internet computer and the database
  – Database will be a one-way write database
### Simple User Interface

#### QuickBooks Pro 2004

**Navigators**
- Company
- Customers
- Vendors
- Employees
- Banking
- Business Services
- Reports
- Help & Support

**Open Windows**
- Checking

**Checking**

<table>
<thead>
<tr>
<th>Date</th>
<th>Number</th>
<th>Account</th>
<th>Payee</th>
<th>Memo</th>
<th>Payment</th>
<th>Deposit</th>
<th>Balance</th>
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<td>1,725.00</td>
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<tr>
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<td>36,257.80</td>
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<tr>
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<td>33,422.80</td>
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<tr>
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<td>Mike Scoopette</td>
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<td>1,099-12305</td>
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<td>32,622.00</td>
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<tr>
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<td>Funds Transfer</td>
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<td></td>
<td>31,847.60</td>
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</tbody>
</table>

**Ending balance**: 31,947.80

**Record**  **Restore**

**Sort by**: Date, Type, Number/Ref
VPN Setup

• All communication sent to other members of the VPN is encrypted when sent over the internet.

Figure provided by esecuritytogo.com
OCR Software

• Optical Character Recognition (OCR) is hard.
  – Explains the price range: $300-$120,000

• Cost factors:
  – Handwritten text: harder to translate.
  – Volume/Usage: server class OCR software is the most expensive.
  – Program-Friendly vs. User-Friendly
OCR Software That We’ll Use

• Sponser uses FlexiCapture 8.0 Professional from Abbyy™.

• OCR Features:
  – Can interpret handwritten text…
  – Works with dynamic document layout.
  – Allows user to work with unlimited documents (as opposed to 5,000 pages per month).
  – Program-Friendly.

• User Licensing Issue
  – Limited to 1 user at a time.
Dongle

• Definition: an electronic device that must be attached to a computer (usually through USB) in order for it to use protected software.

• Multiple computers can use OCR Software, but only concurrently.

• Sponsor has one setup already.
  – They need it daily until about 2pm.
  – They don’t need it on weekends.

• We can work with this.
Check Scanner

- Canon™ CR-180 Check Scanner
  – one that’s been offered to us
CR-180 Check Scanner

• Specs
  – Scans about 180 checks a minute
    • depends on grayscale vs. black and white, and resolution.
  – Can read the Magnetic Ink on checks.
  – Claims to be able to work with all paper weights (NCR, receipt paper, cardstock, etc.)
    • Have to adjust rollers if you change paper weight.
  – Can scan documents of different sizes at the same time.
PDE Component

Diagram showing a computer with OCR, connected to a microcontroller, a check scanner, and a touch screen.
Goal of the PDE Component

- Provide feedback of the status of the scanner
- Provide user interface the scanner
- Allow user to control data being sent
XLCD

• We want the microcontroller to control the content of the screens not the OCR Computer
EZLCD kit
EZLCD specs

- Programmable microcontroller
- Interface through serial, parallel, or USB
- 64Kb Flash ROM for fonts.
- 1 Meg Flash ROM
Integration

BIE Component

Bank Information

Fire Wall

Internet Connection

Internet Computer

VPN Connection

Database

External Drive

USB Connection
Integration
# Bill of Materials

<table>
<thead>
<tr>
<th>Name</th>
<th>Price</th>
<th>Vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Computer</td>
<td>$0.00</td>
<td>One of Us</td>
</tr>
<tr>
<td>Database Computer</td>
<td>$0.00</td>
<td>One of Us</td>
</tr>
<tr>
<td>OCR Computer</td>
<td>$0.00</td>
<td>One of Us</td>
</tr>
<tr>
<td>Ingres Database Software</td>
<td>$0.00</td>
<td>Ingres (open source)</td>
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<tr>
<td>OCR Software</td>
<td>$0.00</td>
<td>Fidelity Funding</td>
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<tr>
<td>Microcontroller/LCD Kit</td>
<td>$350.00</td>
<td>LCD Earth</td>
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<tr>
<td>Canon CR-180 Check Scanner</td>
<td>$0.00</td>
<td>Fidelity Funding</td>
</tr>
</tbody>
</table>
Risks

• Integration
  – One of the largest and most important portions of this project.
  – Lots of commercial products that aren’t made specifically to work with each other.

• OCR Software (Resolved)
  – Could cost too much to get the software we want for this project.

• Extracting bank information through the web
  – Could be too difficult or impractical (websites change).

• Security
  – We’ll be using our bank accounts.

• Others will come up.
Projected Milestones

• **First Day of Fall Semester (Monday, August 24, 2009):**
  – Have all of our commercial hardware and software available.

• **Wednesday, September 30, 2009:**
  – Project can successfully access bank information through the bank’s API.

• **Friday, October 16, 2009:**
  – Microcontroller/Touch-Screen completed (as a stand alone).
Projected Milestones (cont.)

- **Friday, October 30, 2009:**
  - PDE component works (may have small bugs/issues).
  - BIE component works (may have small bugs/issues).
  - Begin full integration and testing with PDE and BIE components.

- **Monday, November 30, 2009:**
  - Database Application is functional.

- **Wednesday, December 16, 2009:**
  - Project Completion.
Questions?