Software Requirements Specification

for

VODKA

Version 1.1 Approved
April 24, 2007

Prepared by:
Archit Baweja, Drew Hall, Sunny Huynh,
Kevin Lynch, and Kanwarpreet Sethi

Drexel University

Revision History

Name	Date	Reason for Changes	Version
Archit Baweja, Drew Hall, Sunny Huynh, Kevin Lynch, and Kanwarpreet Sethi	24 April 2007	Revised from Reviews	1.1
Archit Baweja, Drew Hall, Sunny Huynh, Kevin Lynch, and Kanwarpreet Sethi	17 Jan 2007	Initial Version	1.0

Contents

1 Introduction

1.1 Purpose

This document specifies all the software requirements for the VODKA financial management system. These requirements directly relate to the functionalities, performances, constraints, attributes, and interfaces of the system.

VODKA is a tool to manage the financial accounts of student organizations within a schoool or university. There are two primary goals of the VODKA system. The first goal is to allow students to manage the financial accounts of their student organizations in a simple and reliable manner. And the second goal is to provide a centralized tool by which the parent school may audit the student organizations. In order to provide these two goals, the system focuses on simplicity, flexibility, security, accessibility, and scalability.

1.2 Scope

This document describes the software requirements for the initial release of VODKA , version 1.0. The intended audience of this document exclusively includes the developers, the testers, and the end-users of the VODKA system.

1.3 Definitions, Acronyms, and Abbreviations

Audit An audit is an assessment of the accuracy by which a student organization's financial statements are presented.

Check Request A check request is a request for the parent school or university to issue a check for a specified amount to a specified recipient.

Communications Protocol A communications protocol defines the rules for sending data in a network. Each protocol may include information such as data representation, error detection, authentication and other information.

Deactivation Deactivation of a user account in the VODKA system may mean one of two scenarios. Deactivation includes deletion and disabling of user accounts. Deleting of a user account is only possible if there is no prior history associated with the account. In the case of a user account having prior history, only disabling is possible.

Finance Manager The Finance Manager is a user whose user account has priveleges to create, to edit, to delete, and to view all comments, financial accounts, transactions, and user accounts of every organization within the VODKA system.

Financial Account Each financial account is an independent collection of transactions and their histories. A financial account is uniquely identified with an associated account number.

HyperText Markup Language (HTML) The HyperText Markup Language is the predominant language used for the creation of web pages.

HyperText Transfer Protocol (HTTP) The HyperText Transfer Protocol is the de facto standard protocol communications protocol for World Wide Web applications.

Internet The Internet is a publicly accessible network of interconnected computer networks.

Internet Protocol (IP) The Internet Protocol is the standard communications protocol to distinguish computers connected over a network and to send data across the Internet.

Network A computer network is the interconnection of multiple computers using a telecommunications system, which allows for the communication and sharing of resources.

Non-Volatile Storage Non-volatile storage is the type of computer memory does not lose its stored information when powered off.

Organization Advisor An Organization Advisor is a special user account provided for each organization with the privileges to create, to edit, to delete, and to view all comments, transactions, and user accounts of the particular organization to which the advisor belongs. Each organization must have at least, but not limited to, one advisor account.

Privilege The VODKA software system limits user accounts from performing certain actions; whether a user account can or cannot perform these actions is called the user's privileges. Priveleges are to create, edit, delete, and view; each action the user can take upon the system must be classified as one of these categories. User privileges are specific to different parts of the software system.

Short Message Service (SMS) Short Message Service is a service available on mobile phones that permits the sending and receiving of short text messages between phones.

Simple Mail Transfer Protocol (SMTP) The Simple Mail Transfer Protocol is the de facto standard communications protocol for email transmission over a network.

Student Organization Officer Training (SOOT) At Drexel University, officers of student organizations must attend annual training sessions, called Student Organization Officer Training, that explain the policies and procedures involved in running student organizations. These policies and procedures include those regarding the management of financial accounts owned by the student organizations.

System Administrator The system administrator is a special user whose user account has all the possible privileges available to any other user account as well as direct access to the underlying VODKA system processes and server(s). This person(s) should be the one(s) permitted to access the physical machines running the VODKA system. The role of the system administrator is to perform system maintenance and configuration.

Transaction A transaction is any entry into a financial account that documents financial accounting practives (e.g. recording a bank account deposit or pending check request).

Transmission Control Protocol (TCP) The Transmission Control Protocol is a very commonly used communications protocol that guarantees transmission integrity over a network.

Transport Layer Security (TLS) The Transport Layer Security is a set of communication encryption protocols that guarantee privacy and data integrity over a network.

User A user is a person who interacts with the VODKA system.

User Account A user account is an independent collection of user information that the VODKA system uses to recognize individual users. Each user account is uniquely identified by a user name and allows the software to track individual user privileges.

Volatile Storage Volatile storage is a type of computer memory that requires power to retain the stored information. When volatile storage is powered off, all the stored information is lost.

Web Browser A web browser is a software that allows users to view and interact with graphical and textual web sites on the World Wide Web.

World Wide Web (WWW) The World Wide Web is network of interconnected documents on the Internet.

1.4   Overview

The rest of this document contains background information regarding the VODKA system and the functional and non-functional requirements of the system. Wherever possible, the IEEE Std 830-1998 format for software requirements specification [1] is followed.

2 Overall Description

2.1 Product Perspective

University student organizations need a way to keep organized records of their financial transactions. As described in section 1.2 of this document, VODKA intends to fill this unique need by providing software that allows simple, reliable, and auditable financial management. Personal financial software - such as Microsoft Money 2007 [4], Quicken 2007 [2] and GnuCash 2.0 [3] - is not easily audited and is only accessible from one computer. And, companies such as SAP [5] provide large scale financial systems for corporations but are both too costly and too complex for most student organizations.

2.1.1 System Interfaces

The VODKA software integrates several internal systems to provide functionality.

Authentication The VODKA software provides the capability to use an external authentication interface for the verification of user login. In the absence of such an external system, VODKA provides a built-in component.

Client The VODKA software has an interface to the user's client that translates user input into data the server will understand and vice versa.

Database The VODKA software has an interface to a database that must translate user interactions into database commands and back again.

Updater The VODKA software has an interface for automated updates to be applied over the entire VODKA system.

2.1.2 User Interface

The VODKA client includes a simple interface resembling common paper-based financial management methods. The client is an intuitive web-based interface that requires no installation of software other than the presence of a web browser that is HTTP 1.1 compliant. Furthermore, data is held only temporarily and does not require storage space on the users' computers. The client remains accessible from any system on the school's network and is fully portable between different computers.

The client interface is used by many people with differing preferences and is configurable to display information in various formats that individual users modify.

As transactions post to the system, all users' displays automatically update to reflect the change. Furthermore, the VODKA client allows for quick access to textual comments included with every transaction.

2.1.3 Hardware Interfaces

The VODKA client runs on any computer hardware meeting the following criteria:

- Capable of connecting to the school's network.

- Capable of running a modern HTTP 1.1 web browser.

- Includes a keyboard and a pointing device.

- Includes writable volatile storage.

The VODKA server runs on any computer hardware meeting the following criteria:

- Capable of connecting to the school's network as a server.

- Capable of interfacing with modern database software.

- Capable of running a modern suite of networking software.

2.1.4   Software Interfaces

The VODKA software integrates some external software to provide functionality.

Authentication The VODKA software authenticates users either against the parent school's or university's authentication interface, or the built-in VODKA authentication component.

Client The VODKA software interfaces with the user's web broswer and expects that it is capable of HTTP 1.1 and HTML 4.0.

Database The VODKA software interfaces with an existing database software.

Server The VODKA server software runs on an operating system that supports serving dynamic web pages using encryption and is capable of communicating with the Internet.

2.1.5   Communications Interfaces

Communication between the client software and the server software is facilitated by common network protocols. This is to ensure the software's full compatibility with a school's network.

Data will be encrypted using TLS and HTTP/1.1. This use of these protocols requires the ability for the systems to communicate using TCP/IP network stacks.

The VODKA system sends emails using SMTP.

2.1.6   Memory Constraints

The server system requires no greater than 1 gigabyte of RAM memory. And the client application requires no more than the minimum memory a modern desktop computer commonly has, approximately 256 megabytes of RAM.

2.1.7   Site Adaptation Requirements

The VODKA software provides customizeable networking configurations for the client site's particular network setup. And includes support for the use of firewalls. For security integrity, a data encryption protocol, such as TLS, is used for all transmission and storage of data.

The VODKA server software is not responsible for the security of the physical server, requiring the physical server to be inaccessible to those who are not the system administrator.

2.2   Product Functions

The VODKA system will provide the following functions:

1. Records of financial accounts and their transactions

2. Records of users accounts and their posting of transactions

3. Restriction/grant of permissions to users per financial account

4. History of transactions posted to each financial account

5. Reports summarizing the financial transactions over specified periods of time

2.3   User Characteristics

The users of VODKA need be familiar with only basic financial transactions and comprehend the financial system setup by their school or university for its student organizations. Typically, this requires that the user attends SOOT training sessions or the equivalent.

2.4   Requirements Apportioning

The priority levels for the requirements are:

Priority	Description
1	This is the highest priority level; all requirements of this level must be fully satisfied and verified in order for the software system to be released.
2	Requirements of this priority are not expected to be verified by the current release of VODKA. The unfulfillment of these requirements must not create hazards for the system. However, these requirements are expected to be fully satisfied and verified by the next minor release of the system. The features satisfying these non-verified requirements must be clearly documented to the end user as such.
3	Requirements of this priority are not expected to be fully satisfied in the current release of VODKA. But, these are expected to be fully satisfied and verified at the next major release of the system.
4	These requirements are of the lowest priority and are not within the current scope of the system design. These requirements are included only to indicate where the software is expected to change in future development.

3 Specific Requirements

3.1 External Interface Requirements

3.1.1 Email System

0100 **Purpose** The external email system is to provide a messaging service from the VODKA system to the VODKA users. **Priority 1**

0110 **Input** The input is generated automatically by the VODKA system using settings configurable by the System Administrator. **Priority 1**

0120 **Output** The output is in the form of an e-mail to an e-mail account, but it does not return any sort of message to the VODKA system. **Priority 1**

0130 **Data Format** The format uses SMTP protocol. The actual messages are provided by the VODKA system. **Priority 1**

3.1.2 External Authenticator

0140 **Purpose** The external authenticator is a third party software interface that validates user accounts through comparing user account names and passwords. It does not keep track of which users are allowed to access VODKA system nor their VODKA permissions. **Priority 1**

0150 **Input** The input is supplied by the user through a login module that formats and forwards the username and password to the external authenticator. **Priority 1**

0160 **Output** The output comes in the form of a positive or negative validation returned to the login manager. **Priority 1**

0170 **Data Format** The format will vary and is configurable by the System Administrator. **Priority 1**

3.2 Functional Requirements

3.2.1 User Accounts

0180 **User Account Types and Privileges** - The system classifies user accounts on the basis of roles and privileges. These are referred to as user account types. **Priority 1**

0190 The following are the user account types that exist in the VODKA system:

0200 System Administrator **Priority 1**

0205 Finance Manager **Priority 1**

0210 Organization Advisor **Priority 1**

0215 Organization Member **Priority 1**

0220 The account type defines the user permissions that are enabled for the account. **Priority 1**

0230 At all times, one user account with full administrative privileges exists in the VODKA server as the System Administrator. **Priority 1**

0233 The system allows for the System Administrator to perform administrative functions through the VODKA web interface. **Priority 4**

0235 The system allows for the creation of any number of labels for user accounts. Only System Administratorand Finance Managercan create labels. **Priority 3**

0240 **User Account Creation** - The system allows for the creation of user accounts. **Priority 1**

0250 The VODKA system allows for any number of user accounts, limited by hardware resources. **Priority 1**

0260 The system allows only the System Administrator or the Finance Manager to create user accounts. **Priority 1**

0270 The VODKA system requires certain information for the creation of a new user account. These fields are mandatory and cannot be left blank. **Priority 1**

0280 The following information is required and necessary for a new user account:

0290 *Username* - The username may only contain alphanumeric and underscore(_), hyphen(-) and period(.) characters. The username can be a maximum of 20 characters. **Priority 1**

0300 *Password* - The system accepts a password of maximum 20 characters. **Priority 1**

0310 *Name* - This field accepts a maximum of 60 characters. **Priority 1**

0320 *Email Address* - This field accepts a maximum of 60 characters and conforms to the format *emailaddress@domain.extension*. **Priority 1**

0325 *Phone Number* - This field accepts a maximum of 20 digits. **Priority 4**

0330 *User Account Type* - This field allows the selection of an account type (Requirement [0180]) which defines the privileges available to the user account. **Priority 1**

0340 *Accessible Financial Accounts* - This field allows the selection of financial accounts to which the user has access. It includes a description field to specify how the user is associated with the financial account.

0350 *Financial Account Privileges* - For each financial account added, privileges can be granted or removed. Refer to Requirement [0580]. **Priority 1**

0360 **User Account Modification** - The system allows for the modification of user accounts. **Priority 1**

0370 The system requires a user to login using the associated username and password before allowing modifications to be made. **Priority 1**

0380 The following user account information is modifiable by all user types:

0390 *Email Address* **Priority 1**

0395 *Password* **Priority 1**

0400 The following information is modifiable by the System Administrator, the Finance Manager and the Organization Advisor:

0410 *Financial Account Privileges* **Priority 1**

0420 The following user account information is modifiable by both the System Administrator and the Finance Manager:

0430 *Accessible Financial Accounts* **Priority 1**

0440 The following user account information is modifiable only by the System Administrator:

0450 *Username* **Priority 1**

0455 *Name* **Priority 1**

0460 *User Account Type* **Priority 1**

0470 **User Account Deactivation** - The system allows for the deactivation of user accounts. **Priority 1**

0480 The system denies deactivated users from logging in to the VODKA system. **Priority 1**

0490 A user account that has associated history can only be disabled, and never fully deleted from the system. **Priority 1**

0500 A user account with no history whatsoever may be fully deleted from the system. **Priority 1**

0505 A disabled user account can be reactivated by the System Administrator. **Priority 1**

0510 The system allows all user accounts to be disabled except for a single remaining System Administrator. **Priority 1**

0520 **Username and Passwords** - The VODKA system allows the System Administrator to configure the format of the username and password. **Priority 1**

0530 The system allows for a password meter which defines the strength of the password. **Priority 4**

0540 The system allows a user's password to be changed by the user. This causes a notification to be emailed to the user's Email Address. **Priority 1**

0550 The System Administrator can reset any and all user's passwords. **Priority 1**

0560 The system does not allow the System Administrator to change any user's password. System Administrator's can only reset passwords. **Priority 1**

0570 The system is configurable to force users to change passwords on a periodic basis configured by the System Administrator. **Priority 3**

3.2.2 Financial Accounts

0580 **Financial Account Privileges** - Each financial account has associated privileges which can be granted or removed. **Priority 1**

0590 For each financial account, the following permissions can be added or removed:

0600 View balance **Priority 1**

0605 View transactions **Priority 1**

0610 Post comments to transactions **Priority 1**

0615 Post transactions **Priority 1**

0620 Delete transactions **Priority 1**

0630 The system allows users to access any number of financial accounts limited by hardware resources. **Priority 1**

0635 The system allows for the creation of any number of labels for financial accounts. Only System Administratorand Finance Managercan create labels. **Priority 2**

0640 Financial account privileges are cumulative such that the privileges of lower levels must be granted before privileges of higher levels are granted. The privileges and their levels (1 is lowest, 5 is highest) are: **Priority 1**

0650 View balance - Level 1 **Priority 1**

0655 View transactions - Level 2 **Priority 1**

0660 Post comments to transactions - Level 3 **Priority 1**

0665 Post transactions - Level 4 **Priority 1**

0670 Delete transactions - Level 5 **Priority 1**

0680 The following privileges are not explicitly granted but are implied by the user account types. The accounts include the System Administrator, Finance Manager, and Organization Advisor account types. **Priority 1**

0690 The privileges are:

0700 Placing a Financial Account on temporary deactivation in case of a violation of school policy or dropping below a minimum balance. **Priority 3**

0710 The System Administrator and Finance Manager are granted all privileges for all financial accounts. **Priority 1**

0715 An Organization Advisoris granted all privileges for the specific financial accounts that it is associated with. **Priority 1**

0720 For the System Administrator and Finance Manager user types, there is no option to add financial accounts to their user account. They automatically have full access to all financial accounts in the VODKA system. **Priority 1**

0730 **Financial Account Creation** - The system allows for the creation of financial accounts. **Priority 1**

0740 The system can support any number of financial accounts limited by hardware resources. **Priority 1**

0750 The creation of a new financial account requires the following information:

0760 *Account Name* - This field accepts up to 60 characters and defaults to blank. This is a mandatory field and cannot be left blank. **Priority 1**

0770 *Account Number* - The account number conforms to a format configurable by the VODKA System Administrator. By default this field accepts up to 20 digits. **Priority 1**

0780 *Comments/Description* This field is blank by default and records the time and username of the person posting the comment. **Priority 1**

0800 Each financial account is unique and is identified by its unique account number **Priority 1**

0820 **Financial Account Deactivation** - The system allows for the deactivation of financial accounts. **Priority 1**

0830 Deactivation of a financial account denies all users from editing it. However, the account may be audited. **Priority 1**

0840 User accounts having access to a deactivated financial account can view the account as normal. **Priority 1**

0845 A disabled finacial account can be reactivated by the System Administrator or the Finance Manager. **Priority 1**

0850 **Financial Account Modification** - The system allows for modification of financial accounts. **Priority 1**

0860 Modification privileges are not granted to Organization Memberand are limited to System Administrator, Finance Manager, and Organization Advisor. **Priority 1**

0870 Organization Advisor are limited to performing modifications to only their associated financial account. **Priority 1**

0880 The following modifications can be made to a financial account:

0890 Account name **Priority 1**

0900 Comments/Description **Priority 1**

3.2.3 Financial Transactions

0910 The system allows users to enter and record financial transactions. **Priority 1**

0920 These are defined by individual schools and universities, and include:

0930 withdrawals **Priority 1**

0935 deposits **Priority 1**

0940 transfers between financial accounts **Priority 1**

0950 The system allows for the recording of the following information regarding each transaction:

    0960 Check number (if applicable) **Priority 1**

    0965 Date **Priority 1**

    0970 Payee **Priority 1**

    0975 Description **Priority 1**

    0985 Amount **Priority 1**

    0995 Source account **Priority 1**

    1000 Destination account (if applicable) **Priority 1**

    1005 Reconciliation status **Priority 1**

1010 The system allows for the following actions to be applied to transactions:

    1020 Delete Transaction **Priority 1**

    1025 Edit Transaction Information (Refer to Requirement [0950]) **Priority 1**

    1030 Post comment to transaction **Priority 1**

1040 The system allows users to apply actions to multiple transactions, all at once, including deletion and change of labels. **Priority 1**

1050 The system allows the remaining actions (Refer to Requirement [1010]) to be applied to only single transactions, one at a time. **Priority 1**

1060 The system allows users to attach any file to a specified transaction. Any number of files may be attached to a transaction limited to hardware resources. **Priority 3**

1070 The system allows each transaction to be tagged with multiple labels. **Priority 1**

1080 The system allows any number of labels to be created for each transactions, limited to hardware resources. **Priority 1**

1090 The system maintains a permanent history of all actions applied to transactions from a user account. **Priority 1**

1100 Deleted transactions are maintained in the permanent history of the financial account. **Priority 1**

1110 The system allows the reverting of transactions to any prior state in its history by any user with the appropriate privilege. **Priority 1**

1120 The system allows for any number of comments to be posted for each transaction. Each comment records the date and user who posted the comment. **Priority 1**

1130 Each posted comment triggers a notification to be sent to all users associated with the specific financial account. **Priority 4**

1140 The system allows for the sorting of transactions based on any number of valid transaction fields. Typical transaction fields include date ranges, modification date ranges, labels and payee. **Priority 2**

1150 The system allows for the searching of transactions based on standard logical search operations (AND, OR, NOT) on any number of valid transaction fields. Typical transaction fields include creation date, modification date ranges, categories and payee. **Priority 2**

3.2.4 Financial Reports

1160 The system provides a summary of all financial accounts associated with a user account upon login. **Priority 1**

1170 The system is able to generate and print reports of transactions. **Priority 1**

1180 The system generates graphs of all or a selected subset of financial transactions represented by label, property (e.g. date, payee, etc.) and net worth. **Priority 1**

1190 The type of graphs the system can generate include pie chart, line graph, and bar graph and is selectable. **Priority 1**

1200 The system is able to analyze trends on spending and net worth for each financial account using the account's history. **Priority 3**

1210 The system is able to analyze previous year's records and intelligently predict an upcoming term's spending trend. **Priority 4**

3.2.5 Communication Facilities

1220 The VODKA system provides communications facilities to allow notifications to be sent to users. **Priority 1**

1230 Communication facilities provided in the VODKA system are:

  1240 Email **Priority 1**

  1245 Short Message Service **Priority 4**

1250 The system is user configurable to automatically notify users of account activity including transaction approvals, modifications, or submission by other users. **Priority 3**

1260 The system is configurable to automatically notify users if an account balance falls below a certain threshold set by the Organization Advisor. **Priority 2**

1270 The system provides an up-to-date news feed about the recent activities of the user's associated financial accounts. **Priority 4**

3.2.6 Abnormal Situations

1280 **Lost Username** The default VODKA authentication system allows for recovery of lost or forgotten usernames. **Priority 2**

  1290 To recover a lost or forgotten username, the user is directed to a VODKA system web page with directions. **Priority 2**

  1300 A user is required to provide their email address which is registered with their user account in the VODKA system to recover their username. **Priority 2**

  1310 In case of an external authentication system, the user is redirected to the web page of the external system with directions on recovering their username. **Priority 2**

1320 **Lost Password** The system allows for recovery of a lost or forgotten password. **Priority 2**

  1330 To recover a lost or forgotten password, the user is directed to a VODKA system web page with directions. **Priority 2**

  1340 A user is required to provide their username and email address associated with their user account in the VODKA system to recover their password. **Priority 2**

  1350 In case of an external authentication system, the user is redirected to the web page of the external system with directions on recovering their password. **Priority 2**

3.3 Security Requirements

1360 The system encrypts data over a direct connection between the client system and the server system. **Priority 1**

1370 The system allows for the backup of the data system to local or remote non-volatile storage systems. Incremental backups should not create outages and full backups do not interfere with user interaction for more than 10 minutes. **Priority 1**

1380 The system is configurable to e-mail warnings about multiple failed login attempts from the same user. These warnings are sent to the System Administrator. Other security risks of this type are the responsibility of the System Administrator. **Priority 1**

1390 **User Account Authentication** The system allows only valid users to log into the system. A valid user is one which has not been disabled or deleted and exists on the system. **Priority 1**

    1400 To log onto the system, a user provides their valid username and password. **Priority 1**

    1410 The system uses the parent university's (external) authentication system where available. The authentication method is configurable by the System Administrator. **Priority 1**

    1420 The system allows for authentication of users using external systems or the default authentication included with the VODKA system. **Priority 1**

    1430 The system provides a method of authenticating users as part of VODKA. This is the default authentication system and uses the VODKA user name and password if present. **Priority 1**

    1440 For external authentication, valid passwords are authenticated by the external system run by the parent university. **Priority 1**

    1450 The system allows the System Administrator to configure a timeout after which a user is automatically logged out of VODKA. **Priority 1**

3.4 Design Constraints

VODKA is not officially recognized by the university as a tool to manage the financial accounts of student organizations within a school or university. However it will follow certain guidelines required by the university, to help gain acceptance. Following these guidelines will put further constraints on the system. This section will discuss some of these design constraints

3.4.1 Financial Auditing

All student organizations are required to keep a history of financial records for the purpose of a future audit.

1460 The system keeps records of all actions impacting financial accounts for auditing purposes. This includes tracking changes made to all transactions for all financial accounts (active or deactivated) by all user accounts (active or deactivated). **Priority 1**

1470 The system will keep history of transactions for each financial account for at least 7 years. **Priority 4**

3.5 Software System Attributes

3.5.1 Reliability

The VODKA system is fully robust such that it can handle the following scenarios.

1500 Power failure to the server will not cause corruption of nonvolatile memory. **Priority 3**

3.5.2 Availability

1510 The VODKA system is acceptably robust such that it can remain up and running as long as hardware and network conditions allow. **Priority 1**

3.5.3 Security

1520 A number of factors are used to protect the software from accidental or malicious access, use, modification, destruction, or disclosure. For these items please see section 3.3. **Priority 1**

3.5.4 Maintainability

1530 For long-term maintainability, the software is broken into modules according to the services that the system provides. **Priority 1**

3.5.5 Portability

The following factors relate to the ease of porting the software to other hosts or operating systems.

1540 The client software, that runs in a browser, is written in strict compliance with current HTTP, TCP/IP, and JavaScript versions. **Priority 1**

1550 The database software is limited to any ANSI-SQL compatible relational database management system and the operating systems for which it is programmed. **Priority 1**

1560 The VODKA server, which may or may not also contain the database, is a stand-alone system, and therefore is not limited by porting issues. **Priority 1**

3.5.6 Internationalization

1570 The VODKA system supports multiple languages including 16-bit character codes and all system messages are configurable by the System Administrator. **Priority 3**

3.5.7 Testability

1580 The VODKA system is broken into modules that are easily tested and verified to perform as this document prescribes. Additionally, the code provides interfaces to test groups of modules interacting with other modules. **Priority 1**

3.6 User Interface

Figure 1 is the user login screen for the VODKA system. It has fields for entering a username and password. It also provides links to recover a lost username and password. By using this login page a user is able to login to the system and on a valid login is directed to the summary page as seen in Figure 2.

Figure 2 is the summary page that the user is directed upon a successful login. A list of all financial accounts that the user is associated to is displayed on this screen. Clicking on a financial account takes the user to the Account Details page as seen in Figure 3.

Figure 3 is the Account Details page that is displayed on clicking on a specific financial account from the Account Summary page. All transactions associated with this account are displayed on this page. Clicking on a specific transaction also displays the transaction history. A user is also able to generate expense reports for this financial account using the Expense Reports link.

Figure 4 is the Expense Reports page where a user is able to generate reports based on transactions for a financial account. This page allows a user to specify a time span for which transactions are used for report generation.
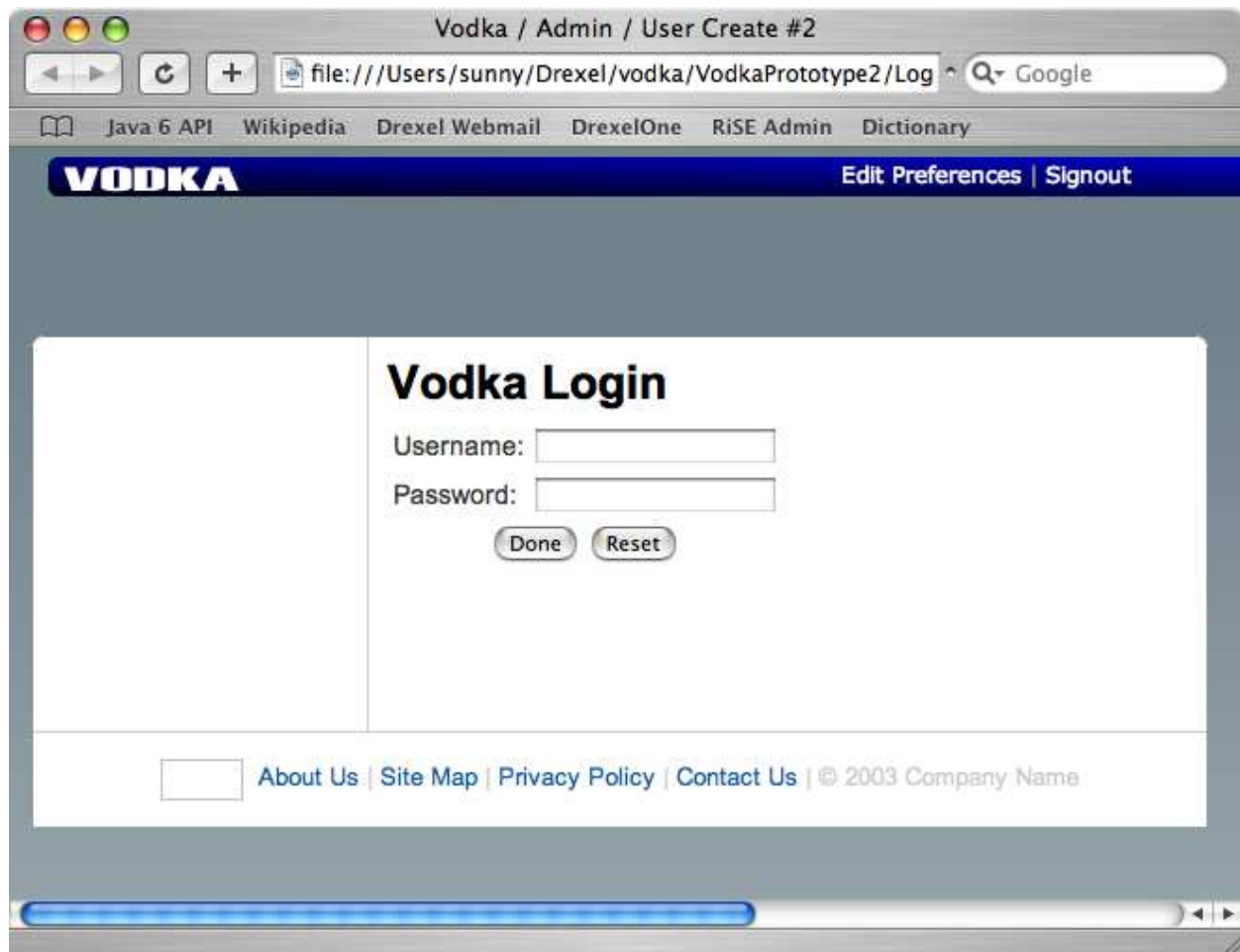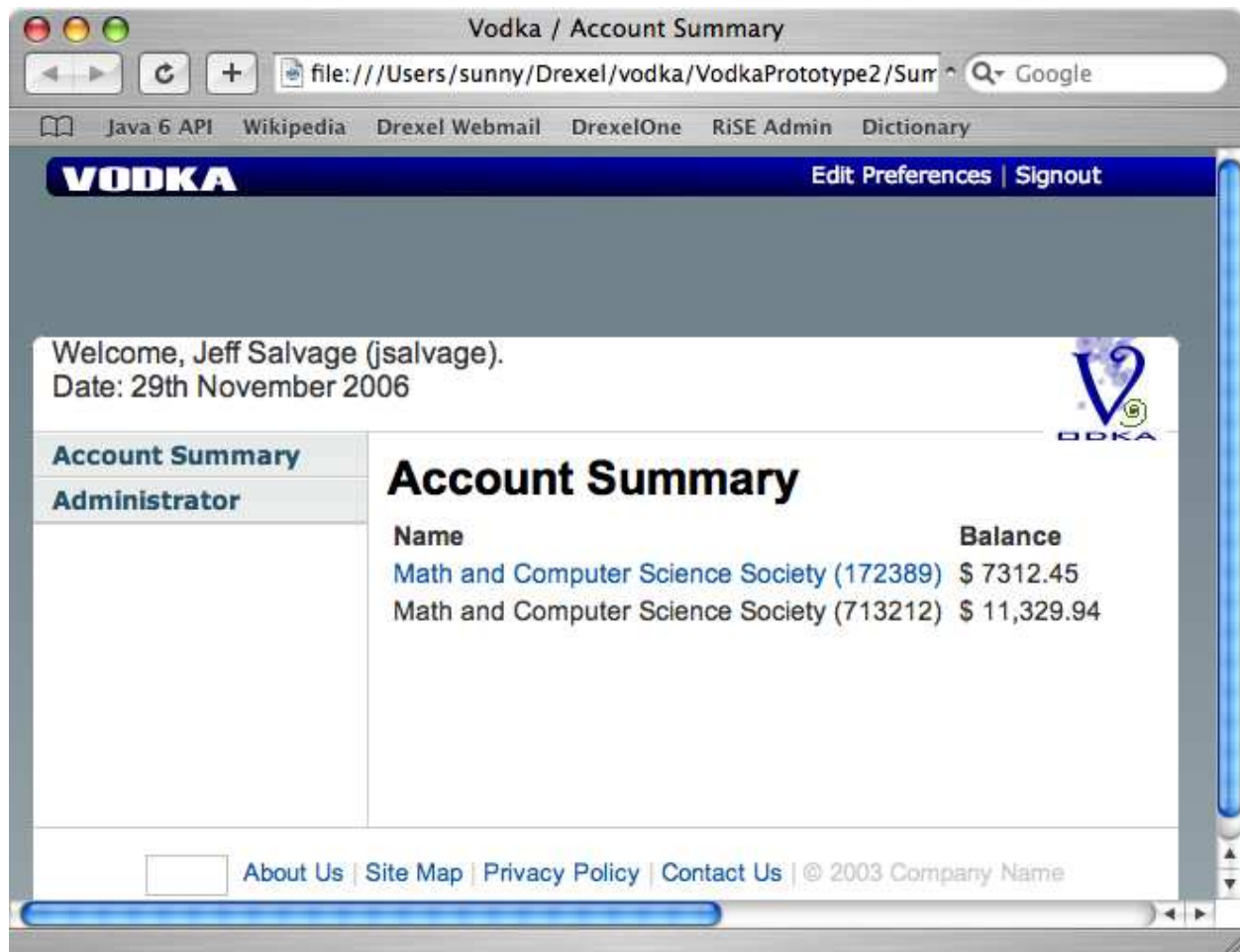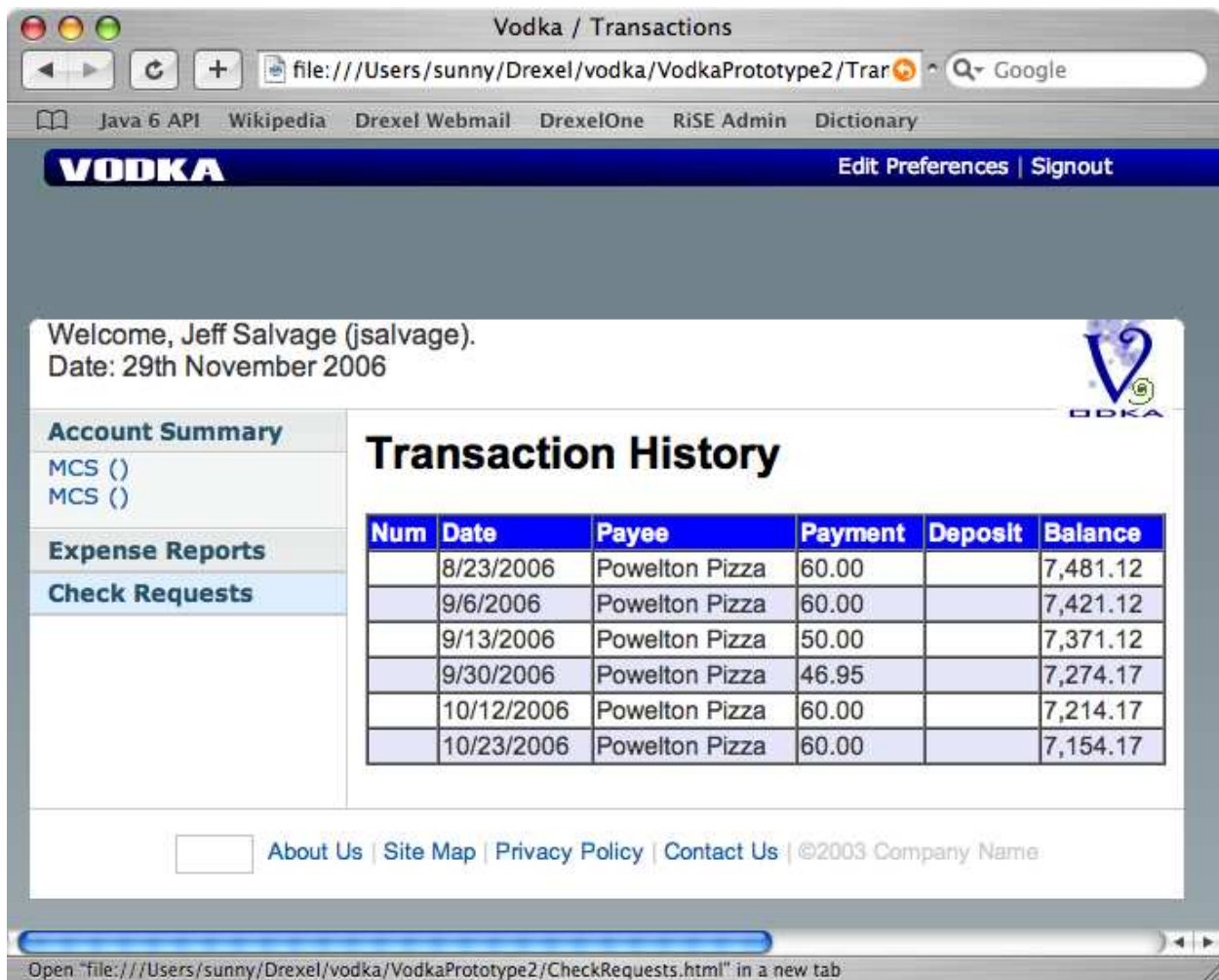
Figure 1: Login Screen

Figure 2: Summary Screen
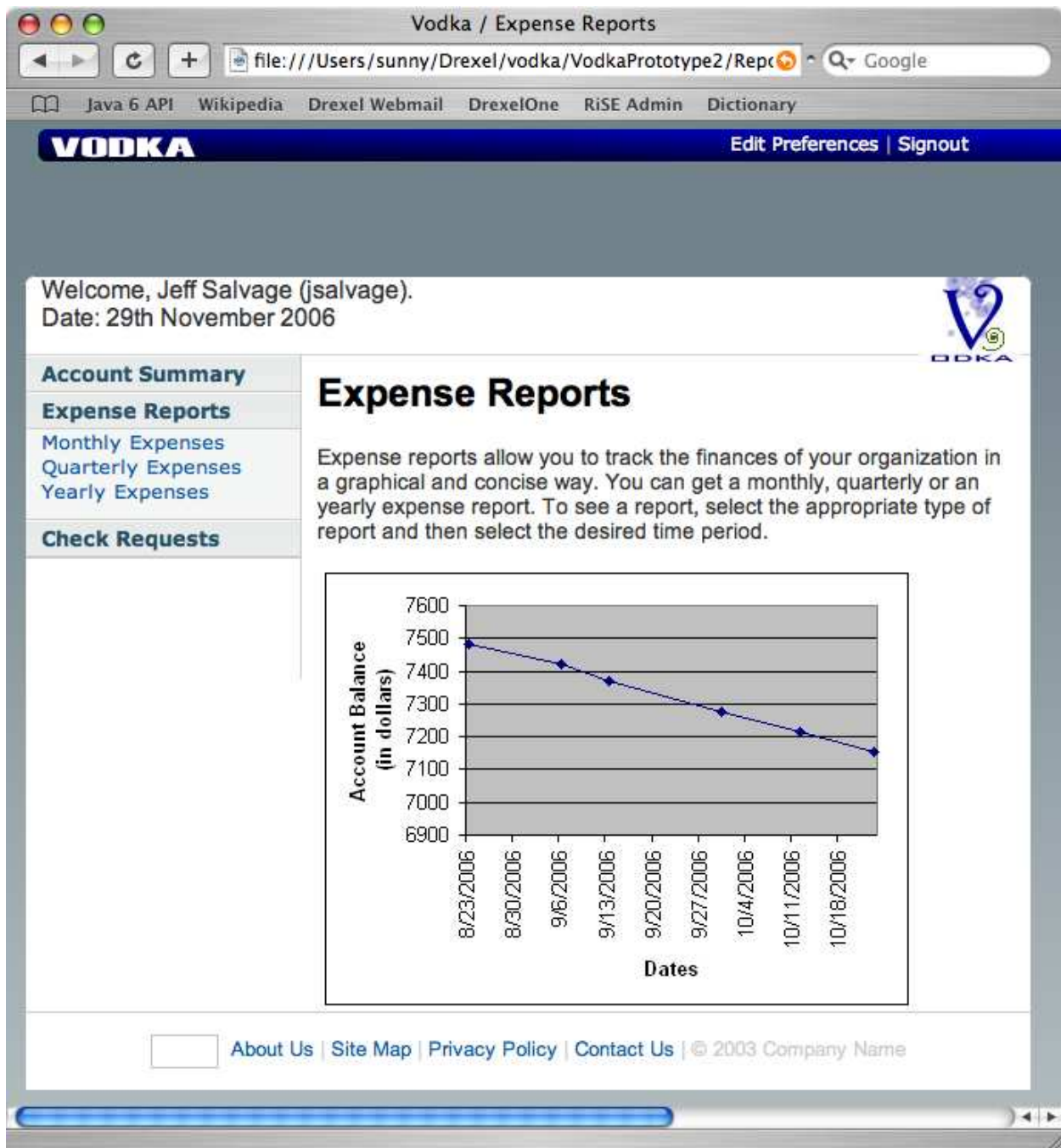
Figure 3: Account Details Screen

Figure 4: Report Screen

4 Preliminary Analysis

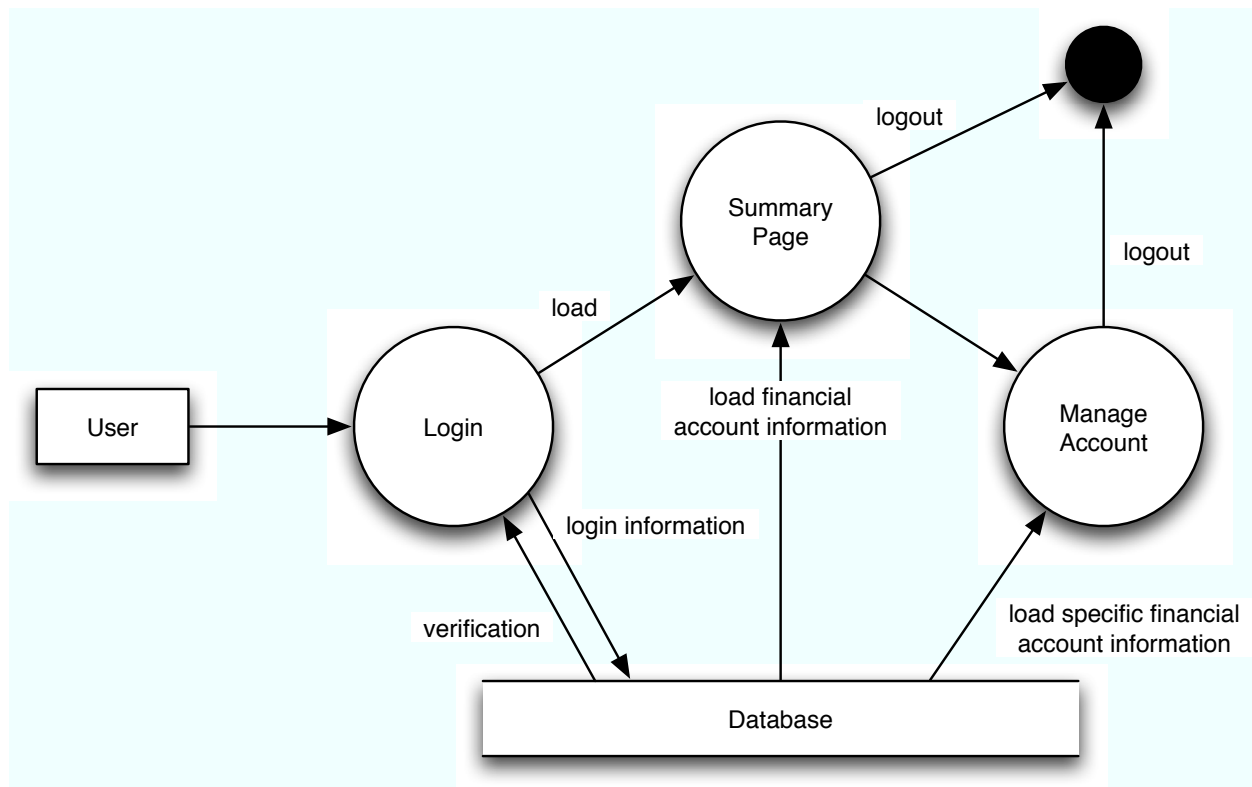The following Data Flow Diagram is a level 1 description of the VODKA system.

Figure 5: Data Flow Diagram - Level 1

Figure 5 provides a top level view of the data flow and user actions taking place in various aspects of the system. The user logs in to the system using a username and password. The login information is sent to the database for verification. If this login is successful the user is then directed to the Account Summary Page. The Account Summary page loads up all the financial account information associated with this user account. From the Summary page a user can Manage Accounts by clicking on a specific financial account. The specific account details are loaded from the database. Any changes a user makes to a specific financial account are saved to the database.

5 Use Cases

5.1 Logging In

The user points the web browser at the correct address and is greeted by the Homepage. The Homepage displays a Login Screen. The Login Screen consists of

- A field to enter a username, labeled Username

- A field to enter a password, labeled Password

- A option to submit the information to the server for authentication, labeled Submit

After the user enters his username and password he/she selects the Submit option. If the username and password are valid, the user is logged in to the system and is presented with the Accounts Summary page. If the the username and password pair is not valid, the user is informed about invalid authentication and presented with the Homepage.

5.2 Accounts Information

After logging in, the user is presented the Accounts Summary page. Here the user can see a list of all the Accounts the user is authorized to see. Each account listed by here provides a link to the Transactions Summary page for that Account.

5.3 Account Transactions Summary

Once the user has selected a specific account, the Account Transactions Summary page is presented to the user. On the Account Transactions Summary page a list of recent transactions are shown.
For each transaction the following information is shown

- The transaction description

- The amount debited/credited to that account for that transaction

- Options for the modifying and deleting the particular transaction

The user can select any transaction, and is provided with a detailed view of the transaction and an option to see the history of changes made to that specific transaction. The user can also select the Modify and Delete options to take the appropriate action.
The following options are shown

- Create Transaction (user requires reading and modifying privileges)

- Financial Report (user requires only reading privileges)

The Create Transaction option provides a link to the Create Transaction page. The Financial Reports option provides a link to the Financial Reports page. The Preferences option provides a link to the Preferences page where the user can manage his personalised settings for the website.

5.4 Use Cases for all users
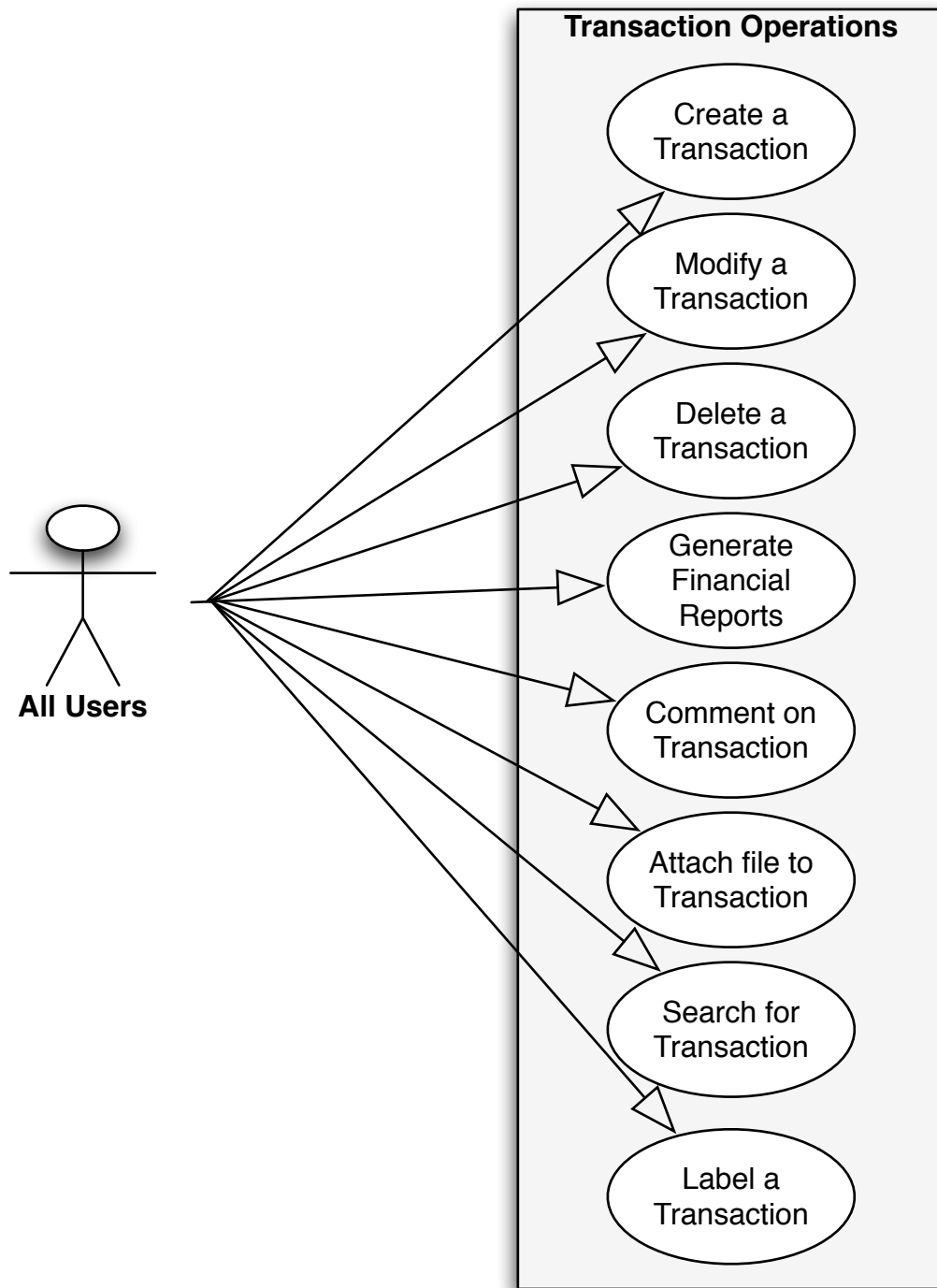
The following use cases are for options available to all users of the systems.

5.4.1 Transaction Creation

In the Account Transactions Summary page, if the user selects the Create Transaction option, the Create Transaction page is shown. The Create Transaction page provides a form to the user, allowing the user to

fill in all the details for a given transaction. At the end of the form there are two options to save or cancel creation of the new transaction. If the user selects the save option, the transaction is saved for that account. If the user forgot to fill in the required fields, an error is shown to the user prompting him to provide values for the required fields of a transaction. If the user selects the cancel option, the transaction is not saved for that account. In both cases, the user is shown the Account Transactions Summary page again.

5.4.2 Transaction Modification

In the Account Transactions Summary page, if the user selects the Modify option, the user is presented with a form for editing all the details for the transaction. At the end of the form there is a Save option to save the modifications made and a Cancel option to cancel modifications (if any) and go back to the Transaction Details page. If the user selects the Save option, the modifications made are saved and the Transaction Details page is shown again. If the user selects the Cancel option, the modifications are discarded and the Transaction Details page is shown.

5.4.3 Transaction Deletion

In the Account Transactions Summary page, if the user selects the Deactivate option the user is presented with a confirmation dialog, confirming the act of deleting the given transaction. The confirmation dialog provides two options, Delete It and Don't Delete. If the user selects the Delete It option, the transaction is deleted. If the user selects the Don't Delete option, the transaction is not deleted.

5.4.4 Attaching a file

In the Account Transactions Summary page, if the user selects the attach file option the user is asked to select a file to upload a file from the local file system. The user can select one or more files and select the upload files option. The files are then uploaded and associated with the initially selected transaction. If the user selects the cancel upload option, the upload operation is cancelled.

5.4.5 Searching for transactions

In the Account Transactions Summary page, if user enters search criterion to filter the displayed transaction the transactions list is filtered as per the search criterion.

5.4.6 Labeling a transaction

In the Account Transactions Summary page, the user selects a transaction and then selects a label to add the transaction in the category for that label.

5.4.7 Commenting on a transaction

In the Account Transactions Summary page, the user selects a transaction and selects the add comment option. The user is presented an option to enter a comment for the selected transaction. If the user selects the save comment option, the comment is saved for the transaction. If the user selects the cancel comment option, the comment is not saved for the transaction.

5.4.8 Financial Reports

In the Account Transactions Summary page, if the user selects the Financial Reports option, the Financial Reports page is shown. The Financial Report page provides a form for the user to specify a time period and a specific type of report to show for that time period. The various options are described in detail in the section on Financial Reports in Section 3.

5.5 Use Cases for Organization Advisor and Finance Managers

The following use cases are for the software features that are only available to Organization Advisors and Finance Managers.
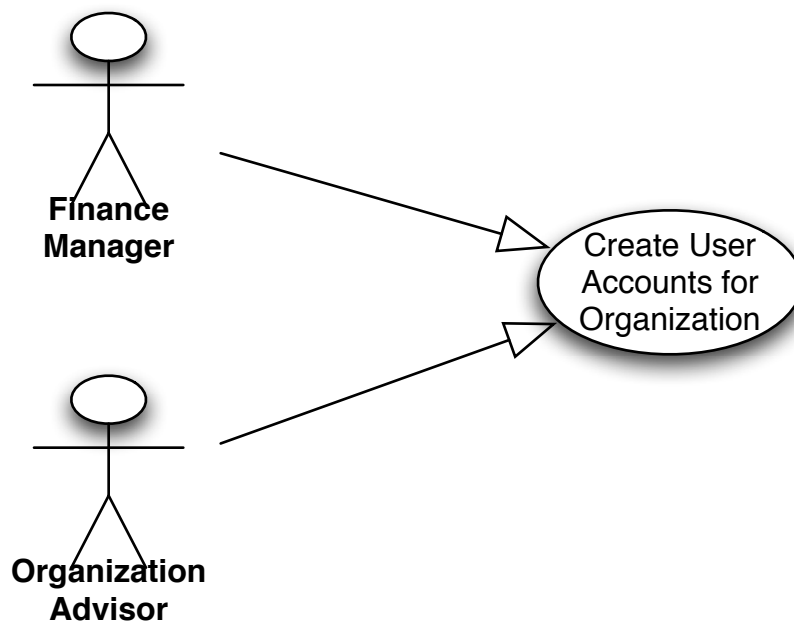
5.5.1 Administrator Page

In the Account Summary page, there is an option to go to the Administrator page if the user has logged in with Organization Advisor or Finance Manager privileges. This option is not shown for Organization Members. In the Administrator page has further options depending on user account privileges.

- Create a Organization Member (Organization Advisor and Finance Manager)

- Deactivate a Organization Member (Organization Advisor and Finance Manager)

- Create a Financial Account (Finance Manager)

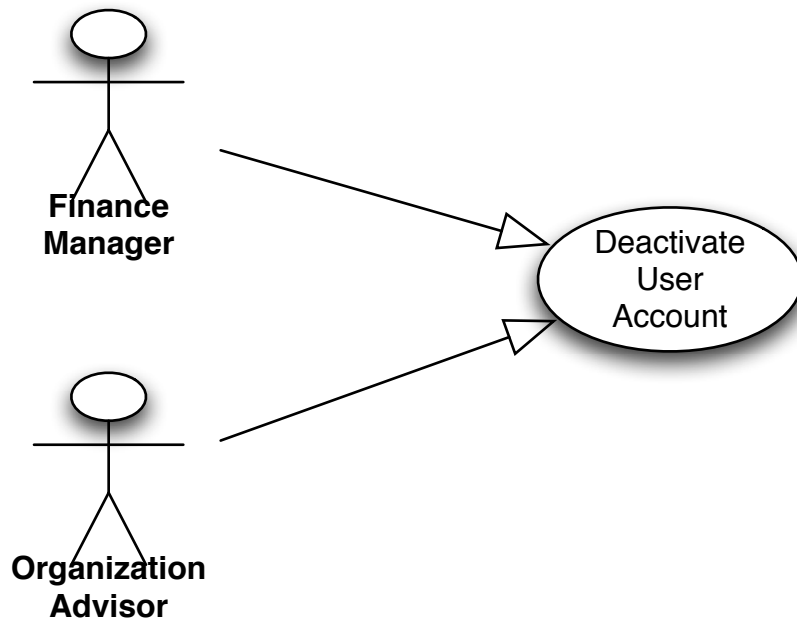- Audit a Financial Account (Finance Manager)

If the user selects the Create Organization Member option, the user is presented the Create a Organization Member page. If the user selects the Deactivate Organization Member option, the user is presented the Deactivate a Organization Member page. If the user selects the Create a Financial Account option, the user is presented the Create Financial Account page. If the user selects the Audit a Financial Account, the user is presented the Audit Financial Account page.

5.5.2 Create a Organization Member

In the Administrator page if the user selects the Create Organization Member option, the Create Organization Member page is shown. Here the user is presented with a form to add a new Organization Member to the system. The user must provide basic information for the new user, and setup the appropriate privileges for various Financial Accounts associated with the new Organization Member account.

5.5.3 Deactivate a Organization Member

In the Administrator page if the user selects the Deactivate Organization Member option, the Deactivate Organization Member page is show. Here the user is presented with form to deactivate an Organization Member's account. After selecting a Organization Member's account, the user must confirm his action by using the Deactivate Now and Cancel Deactivation options. If the user selects the Deactivate Now option, the user is presented with a confirmation dialog to deactivate the specified Organization Member Account. Here the user is asked to confirm the deactivation. If the user presses Cancel Deactivation, the user is presented the Administrator page again.

5.6 Use Cases for Finance Managers only
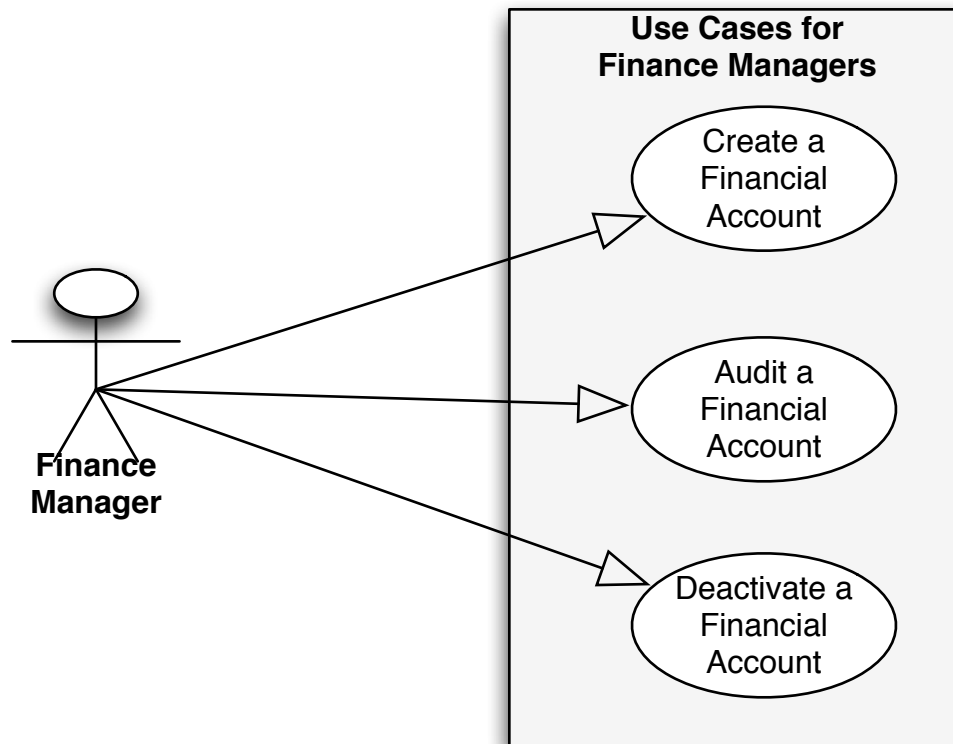
The following use cases are only for options presented to a user logged in with Finance Manager privileges. In the Administrator page, three further options are provided

- Create a Financial Account

- Audit a Financial Account

- Deactivate a Financial Account

If the user selects the Create a Financial Account option, the user is presented with the Create Financial Account page. If the user selects the Audit a Financial Account option, the user is presented with the Audit Financial Account page. If the user selects the Deactivate a Financial Account option, the user presented with the Deactivate Financial Account page.

5.6.1 Create a Financial Account

On the Create Financial Account page a form is shown which allows a Finance Manager to create a new financial account for a Student Organization. The Finance Manager must fill out a form with various options for creating a Financial Account.

5.6.2 Audit a Financial Account

On the Audit Financial Account page, the Finance Manager is first given a list of Financial Accounts associated with him/her. The Finance Manager must first select a Financial Account to audit. The Finance Manager is then given a summary of all transactions for that specific Financial Account for any time period, upto 7 years.

5.6.3   Deactivate a Financial Account

On the Deactivate Financial Account page, the Finance Manager is given a list of Financial Accounts associated with him/her. The Finance Manager must first select a Financial Account to deactivate. The page also has two options labelled Deactivate Now and Cancel Deactivation to confirm the action. If the user presses Deactivate Now option, the selected Financial Account is deactivated. If the user selects the Cancel Deactivation option, the action is cancelled and the user is presented the Administrator page.

References

[1] Software Engineering Standards Committee. Recommended practice for software requirements specifications. Standard 830, IEEE, 1998.

[2] http://quicken.intuit.com/. Quicken 2007, 2007.

[3] http://www.gnucash.org/. Gnucash, 2006.

[4] http://www.microsoft.com/money/default.mspx. Microsoft Money 2007, 2007.

[5] http://www.sap.com/index.epx. SAP, 2007.