
Software Requirements Specification

for

ShiftNumbers Forums

Version 1.0 approved

Prepared by Russell Dare

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version

Introduction

Purpose

This document defines the software requirements for the product ShiftNumbers Forums. It will contain the specifications of the application up to and including its 1.0 release. Its scope covers all aspects of the application.

This particular forum system will center its functionality around a friend system. This system allows users to befriend other registered users. This will allow you to view all threads your “friend” has commented on or posted. When making posts it is also possible for you to make posts available to only your “friends”. This will essentially allow all users to have their own mini- forums within the main forum.

Document Conventions

In this document, bold titles will denote sections while italics will be used to state additional information about the topic being explained. Each image or diagram will be followed by a description with information about what is contained in the image or diagram. Requirements will always be listed from highest to lowest priority.

Intended Audience and Reading Suggestions

The intended audience of this document is for developers or others that wish to host their own version of the forums. The rest of this document contains specifications, hardware requirements, functionality, and design specifications. This document is best read first beginning to end and then each section can be referred back to as needed. This document will begin with an introduction to the project, followed by design information with diagrams, and finally with details about the project's implementation.

Project Scope

This software is a customizable web forum to be used to provide a web based community. Its objective is to provide all the functionality expected of a web forum in a clean, easy to use interface. The system should be as easy to administer as it is to use. The functionality of the forums that is available to the user is controlled by the administrators to allow them to control the delegation of abilities.

References

“GNU General Public License”. *GNU Foundation*. 31 Jan 2006
<<http://www.gnu.org/copyleft/gpl.html>>

Overall Description

Product Perspective

This product is a standalone web based application. The forum doesn't need to be part of a larger system. It is used to provide a web forum community and contains all the necessary functionality to administer, moderate the forum, handle authentication, registration of users, and provides permissions for different levels of users.

Product Features

- User Profiles – Personal information a user enters about him/herself that other users can view.
- User Private Messaging – The ability to leave message for a user and the ability for that user to reply.
- Online Status – The ability to see if a user is currently logged in or not.
- User Customized View – The ability to select themes to customize the look and feel of the forums to your choosing.
- Friends – The ability to ask another user to become a “friend” and the ability for that user to allow or deny your friend request. From a user's friend screen you are able to see who your friends are, what posts your friends replied to, and what new threads your friends started.
- Customizable User Permissions – The Administrator has the ability to decide what level each user is, who the moderators are, and what they are able to moderate.
- Appearance Customization – The styles are modular so the owner of the forum can easily build his/her own themes and put them into the theme selector.
- Post Discussions – The ability to make new threads and post replies to existing threads.
- Topical (Announcement) Discussions – This section is designed to be a list of items with fields at the forum owner's discretion. This will be a list of elements (i.e. Bit torrent tracker, information listings, etc) Each element in this section will have a related post automatically generated so the users can comment and talk about it.
- Searching – The ability to search through the posts, replies, user profiles, and announcements.
- RSS Syndication – XML feeds that are generated on a regular basis. These can be used for users to download and read using any standard RSS Aggregator. The feeds that will be available are: New announcements, and new posts.

User Classes and Characteristics

There are four main user categories for this system. They are standard user, voice, operator, and administrator. An administrator is any user that has a role in customizing or moderating the web forums. A standard user would be any registered user who doesn't have any administrative abilities. There are several levels of permissions:

1. Administrator – Ability to modify
2. Operator – Ability to moderate posts (specific moderation permissions apply)
3. Voice – Ability to create announcements
4. User – Ability to leave comments to posts, create new posts, edit user profile, assign friends

Each level of user is granted the abilities specified to that class of user as well as all the abilities specified to the classes of user below that certain class. For example, an operator will have all the abilities of an operator but also the abilities of a voice class user and a standard user.

Operating Environment

This software is designed to operate cross platform. This being said, the hardware recommendations are:

Server:

- x86 or Power PC based server
- *NIX operating systems
- Apache Web Server
- PHP & mod_php
- mod_ssl
- PERL
- Tripwire (HIGHLY recommended for security of PHP applications)

Client:

- Any PC Hardware (Mac, PC)
- Any Operating System (OSX, Linux, Windows)
- Any W3C Standard supporting browser (Firefox, Mozilla, Safari, Konqueror, IE6)
- Javascript Enabled

Design and Implementation Constraints

The main constraints that need consideration in this project are time constraints. The design and implementation time for this will be approximately 10 weeks. There are also constraints restricting this application to running on a php enabled web server with a mysql backend and the language is English.

User Documentation

Readme File – Delivered in the form of a text document

Assumptions and Dependencies

When hosting the ShiftNumbers forums it is assumed that the person hosting the forums has a full understanding of the Linux operating system, MySQL, and the Apache web server. It is the systems administrator's job to secure the forums by using recommended security tools like SSL and Tripwire. The system administrator is also responsible for protecting the database server from attacks from the outside world.

System Features

User Profiles

3.1.1 Description and Priority

This feature is a set of information about a user that that user can customize. Your profile is made up of information such as: name, location, occupation, interests, and contact information like email or one of the various instant messaging clients. A user can choose to be anonymous and not enter information at all or have the option of filling out some or all of the fields. This feature will allow other users to search for people based on the information they entered.

Priority: High
Benefit 9
Cost 1
Risk 1

3.1.2 Stimulus/Response Sequences

The user has both the ability to view other user's profiles while being able to view and edit their own profile. If a user name is clicked on anywhere within the forums system it will bring up a profile screen with the relevant profile information about the user that was selected. When a user logs into the forums they will have the option to view their own profile. Once viewing their profile they are able to make modifications if desired.

3.1.3 Functional Requirements

- REQ-1: A table in the database in which to hold the user profile information
- REQ-2: The ability to log into the forum system so the user will have private access to edit his/her profile
- REQ-3: An edit function so changes may be made to a user's profile
- REQ-4: A profile display screen so users can view others profiles

User Private Messaging

3.2.1 Description and Priority

This feature gives users the ability to send a private message to another user. This will allow people do direct communications to another user without using a third party communications service such as email.

Priority: Medium
Benefit: 5
Cost: 3
Risk: 2

3.2.2 Stimulus/Response Sequences

A user has the ability to log into the forums section and view any private messages that they received. They can select to delete them or just leave them to be reviewed later. The messages will contain the user who sent it (so a reply can be made), the date they were composed, and the message text itself. To send a message a user will have to be logged in (so a message will be associated with a username) and they will view the profile of the user they want to send a message to and they will click the compose message button.

3.2.3 Functional Requirements

- REQ-1: A table in the database in which to hold the private messages
- REQ-2: The ability to log into the forum system as viewing and composing private messages is only allowed among authenticated users.
- REQ-3: The functionality in the view profile area where a private message can be composed.
- REQ-4: The area in which a user may go to check his/her private messages.

Online Status

3.3.1 Description and Priority

This feature gives users the ability to see what other users are online at the time. This will lead into a site wide ability of listing all users currently logged in or statistics as to how many people are logged in over a period of time.

Priority: Low
Benefit: 3
Cost: 3
Risk: 1

3.3.2 Stimulus/Response Sequences

When a user is viewing the profile of another user he/she can see by way of a small image by the user's name whether or not the user is currently online. This can aid in decisions such as when to make contact with the individual. If a person is online it may be easier to send a private message than, say, send an email.

3.3.3 Functional Requirements

REQ-1: An entity used to track the status of each user, logged in or not.
REQ-2: A notification on the user's profile page to show what the state of the user is.

User Customized View

3.4.1 Description and Priority

This feature is designed to allow the user to have some ability to customize the look and feel of the interface.

Priority: Low
Benefit 2
Cost 4
Risk 1

3.4.2 Stimulus/Response Sequences

This feature will give the addition of a theme selector to the forums. The idea is the user will be able to log into the forums and select a theme from the theme selector. This theme will change the way the application looks to that user. The feature will use a combination of a cookie stored on the user's computer as well as the database to store what theme the user has selected. Each time the user visits the application the theme they selected will be restored.

3.4.3 Functional Requirements

REQ-1: An entity to track what theme the user has selected.
REQ-2: The ability for users to authenticate into the system.
REQ-3: A theme selector utility where users can view themes and select the one they

want.

Friends

3.5.1 Description and Priority

This feature will allow users to become “friends” with other users. This will let a user keep track of all the posts their friends are adding to the forums as well as what posts their friends are replying to.

Priority: High
Benefit 8
Cost 5
Risk 3

3.5.2 Stimulus/Response Sequences

Once a user is authenticated with the system, he/she will be able to target other users as friends. This will be done through the view profile interface. When a user is viewing the profile of another there will be an option to “Make Friend”. Selecting this option will put the requester in the “friend queue” of the desired friend. Friends have to be approved before the relationship is active. This will allow users who decide to post for friends only the discretion to limit the people he allows to view his posts. When a user logs in, he/she has the ability to view people requesting friendship and from there he can confirm/deny the relationship. If confirmed, then the relationship stands and in the friends screen the friend's posts and replies will be visible.

3.5.3 Functional Requirements

- REQ-1: The ability for users to log into the system.
- REQ-2: Database table for tracking friend relationships.
- REQ-3: A control on the view profile section to allow requesting friends.
- REQ-4: An administrative section to allow users to log in and view people requesting to become friends.
- REQ-5: The friends section which allows the tracking of your friends posting, and ability to view private friends only requests.

Customizable User Permissions

3.6.1 Description and Priority

This feature is designed to give site administrators control over the users of the system. The administrators are able to view what permissions users have as well as bump up the level or knock it down.

Priority: High
Benefit 9
Cost 4
Risk 5

3.6.2 Stimulus/Response Sequences

There are four levels of permissions that have been defined for this system. They are: User, Voice, Operator, and Administrator. User permissions can only be modified by a site administrator. When the system is first installed there will be an administrator account created and active that will allow the site owner to log in and start assigning permissions to users. This account can be disabled at a later point for security. When an administrator

logs in he/she has the ability to manage user permissions. From the permissions tool an administrator can look at the users of the system and see who has what permissions. They can also assign higher permissions or lower permissions as they desire.

3.6.3 Functional Requirements

- REQ-1: The ability for users to log into the system.
- REQ-2: The appropriate database entities to track user permission levels.
- REQ-3: The administrative functionality for administrators to be able to modify

permissions.

Appearance Customization

3.7.1 Description and Priority

This feature is part of how the code of the application is developed. All of the appearance attributes of this system are contained in CSS files to allow end user customizations. The owner of the forums can have complete control over the look and feel of the system by modifying the CSS. New themes can also be created and inserted by third parties which will allow each forum to have its own unique look and feel.

Priority: Low
Benefit 2
Cost 1
Risk 1

3.7.2 Stimulus/Response Sequences

To create a custom theme for the system the only files that need to be created/modified are the CSS files in the themes directories. Also if any new or changed images are needed then those will need to be in the appropriate place in the themes directory as well. The CSS code all resides in external files which allows themes to be built without digging through the source code of the system.

3.7.3 Functional Requirements

- REQ-1: All styles are to be contained in external CSS files.

Post Discussions

3.8.1 Description and Priority

This function is the ability for registered users to start new threads, or posts and for users who are replying to posts that already exist. The post is the first post on any topic. The poster will title the thread, add their information in the text section, and categorize it.

The thread (and all replies with it) can be moderated by operator class users with moderate privileges. Other users can search through and review posts and reply to any they want. A reply will directly follow the main post in the thread. Replies are also subject to moderation.

Priority: High
Benefit 9
Cost 4
Risk 3

3.8.2 Stimulus/Response Sequences

Users have the ability to start new threads or conversations. The user will click the add post button and will enter the information for the post (Title, Post Text, Category). When submitted the new post will appear under the category that it was submitted under and will be immediately available for reply by other users. The post will be subject to moderation by operator class users who have the moderate ability for that particular post category. Users can browse through posts and reply to them. Replies are similar to posts but are additional comments onto the conversation the main post starts.

3.8.3 Functional Requirements

- REQ-1: Users ability to authenticate with the system.
- REQ-2: The database has the proper tables to hold the posts and categories.
- REQ-3: The controls to add new post.
- REQ-4: The ability to browse through posts (by searching or by category browsing).
- REQ-5: The ability to reply to a post.

Topical (Announcement) Discussions

3.9.1 Description and Priority

This feature is designed to allow the posting of organized information to a separate section of the site. It is designed to be a data driven part of the site similar to a torrent tracker or similar service. Each entry in this section will have a post auto generated so there can be a conversation going on about each entry in the announcement section.

Priority: High
Benefit 9
Cost 6
Risk 3

3.9.2 Stimulus/Response Sequences

This will provide a separate section of the system for users to browse through. This section is of announcements. It will be accessed through the front page similarly to posts but the goal is to provide the user information. The information could be regarding movie listings, events, torrents, download links, or anything pulled from a data table. This section is optional for the forum owner. It can be toggled on or off in the administration control panel. For each entry into the announcement section there will be a post automatically generated and linked to the announcement so there can be a conversation about the announcement.

3.9.3 Functional Requirements

- REQ-1: The ability for a user to log in
- REQ-2: A database table to hold the information for announcements.
- REQ-3: The ability to search and view announcements.
- REQ-4: The auto generation of forum posts to go along with announcement entries.
- REQ-5: The ability for Voice class users to create new and edit existing announcements.

Searching

3.10.1 Description and Priority

This feature gives the user the ability to perform searches in the system. The goal of the search is to allow full searching of users, posts/replies, and announcements.

Priority: Medium/Low
Benefit 6
Cost 7
Risk 6

3.10.2 Stimulus/Response Sequences

The search box will be located towards the north part of the system. It will be able to be accessed from all pages of the system. By default the search box will search through all Posts. There will be an option to open up advanced searching. The advanced search page will allow additional search functionality. From the advanced search page a user could search for other users, posts/replies, or announcements. A search spy feature is also planned. This will be a feature where a user can see in real time what is being searched for. This tool's main goal is to provide insight into the popular topics.

3.10.3 Functional Requirements

REQ-1: A means of searching the database for the requested search terms.
REQ-2: The search box built into the interface.
REQ-3: An advanced search page where users can select additional search parameters.

RSS Syndication

3.11.1 Description and Priority

This feature will provide the user with XML feeds with which they can parse using an RSS Aggregator or another utility. This will allow information from the system to be syndicated at other locations.

Priority: Low
Benefit 6
Cost 3
Risk 2

3.11.2 Stimulus/Response Sequences

The feeds that will be available are: new posts, and new announcements.

3.11.3 Functional Requirements

REQ-1: Links to allow users to reach the XML files.
REQ-2: Scripts to produce new XML files on a regular basis.

External Interface Requirements

User Interfaces

The interface is designed to provide the user with maximum efficiency while remaining simplistic enough to provide a very small learning curve. All the navigation elements will appear on the left side of the application. The navigation can be accessed in the same place on every page so users won't need to re-adjust to new navigation every time they go to a different page. The error messages will always be shown in the application, not as popup alert boxes. This will allow users to go back from the error by clicking the back button instead of having to move the mouse to the popup box and clicking ok. The login box will appear with the navigation on the left side of the page. Upon authentication with the system the login box will be replaced with user specific navigation. This navigation will vary per user based on his/her permissions.

Hardware Interfaces

The software product will be run on a php enabled web server. The recommended hardware system is an X86 based server but any hardware system that can run a php enabled web server will be sufficient. The client hardware can be any that can run a web browser. The protocol used to connect the clients is HTTP.

Software Interfaces

The system is designed to be hosted on the Linux(2.4 or above) operating system. The hosting application will be the Apache 2 web server. PHP 4 or 5 will be required to drive the server side of the application. Perl 5 is required for the functionality of the XML feed generating scripts. The package recommended to protect the application on the web server is Tripwire 2.3 or greater. The back end is a mySQL 4 or greater server. It is the administrator's responsibility to follow the directions provided by the vendors of Apache and mySQL to secure the services and prevent unauthorized access.

Communications Interfaces

All clients of the system are required to have a web browser. The server will be required to use HTTP to communicate with the clients. HTTPS will be used for authentication to provide the necessary security. The forums system is optimized to both medium bandwidth (cable/dsl) and high bandwidth (fttp/gigabit) connections. It is not recommended that a client attempts to use the application over a dialup connection. As all the information is stored on the server, there will be no synchronization mechanisms needed for clients.

Other Nonfunctional Requirements

Performance Requirements

There aren't any specific performance requirements of the system itself. There are performance considerations for the systems that host the system. Careful attention should be paid to the manuals of both the Apache web server and the mySQL database so the desired performance can be achieved.

Safety Requirements

To ensure safe storage of information it is highly recommended that the owner of the forums perform regular data backups. In the event the database becomes corrupted, a new copy should be restored from backup.

Security Requirements

There are three main security issues when dealing with this product. The first is the security of the servers themselves. A web application's security is only as good as the security of the servers they are hosted on. The Apache web server and the MySQL database server should be secured based on the security guides provided by their respective manufacturers. The second is application level security. It is recommended that the use of a defense package such as Tripwire be used whenever using a PHP based application. The defense system will protect the application against most attacks from the outside. The third is the security of the user authentication process. To log into the forum, users go through an authentication process built into the forum. This process uses a Username, Password pair to authenticate. This process needs to be protected by SSL in order to be secure. The forum owner has the responsibility for setting the web server up to protect the authentication process with SSL.

Software Quality Attributes

This product will have the ability to scale so the software will accommodate the user's needs as their forum usage grows. It can be customized so the forum software can accommodate the needs of the owner. The features provided by the software are robust but not so much as to become creeping functionality. The forum will be self sustainable so the owner of the forum won't need to perform any maintenance other than the normal post moderation that would be expected of any web forum. The forum will maintain a standard of simplicity. It will be simple to administer as it will be simple to use.

Before the final release of the forum there will be a cycle of Alpha followed by Beta testing. This will ensure all functionality of the forum exists and functioning properly. It will also give time to iron out any unexpected bugs and undocumented features.

Other Requirements

Currently there are no plans for internationalization and the language of the forums is English. The required database is MySQL. All legal requirements are the end user's responsibility to ensure they are in compliance with any local laws or regulations.

Appendix A: Glossary

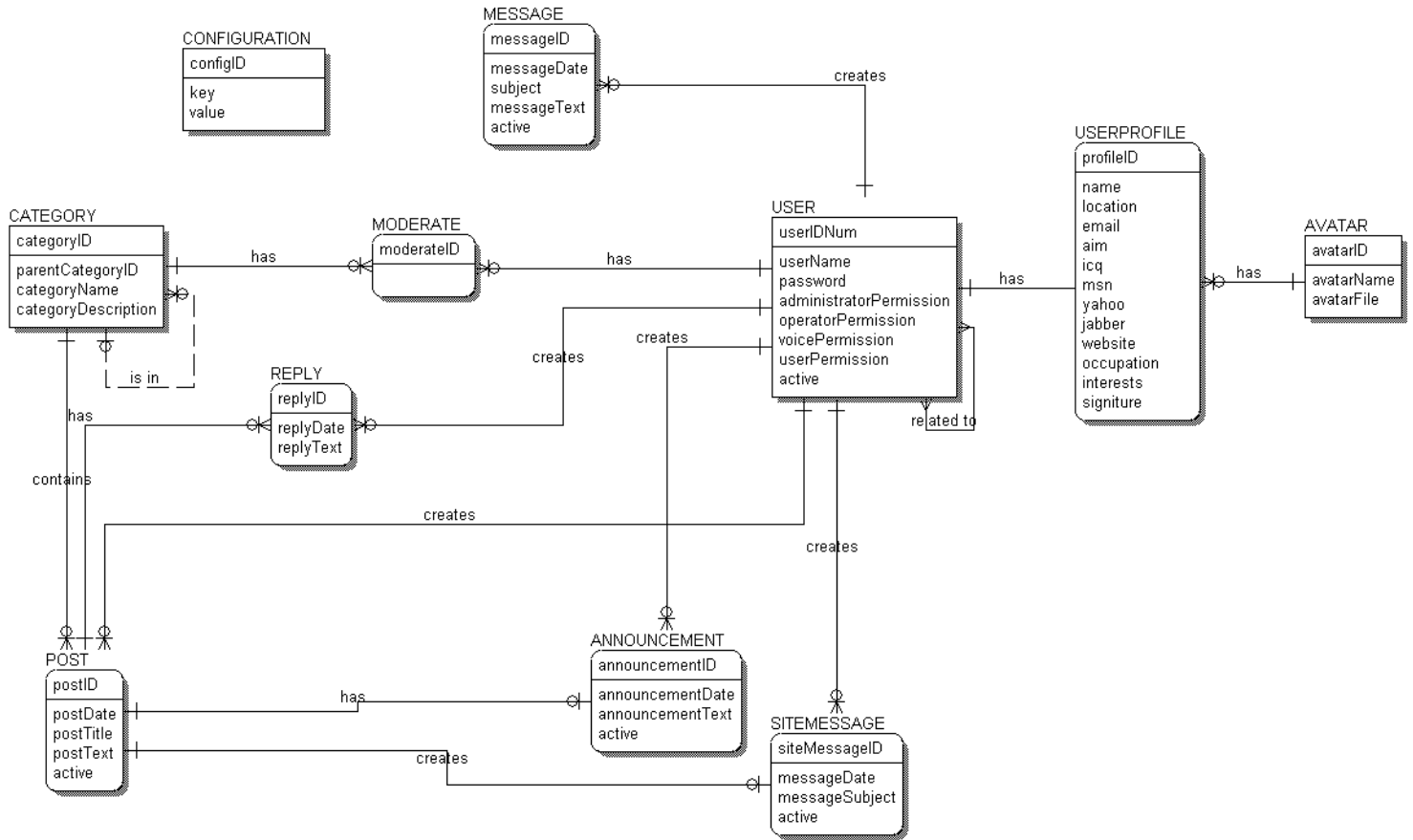
Announcement – An entry that replicates a data table. A post would be automatically generated and linked to the announcement so users can talk about and comment on the announcement.

Friends – A linking between two users in the system. The two users will be able to easily track what posts or replies the other is making.

Friend Queue – The wait list each user has which contains all the people who are waiting for approval to become a friend.

GNU General Public License (GPL) – The software license this system uses. See www.gnu.org.

Appendix B: E/R Diagram and Data Dictionary



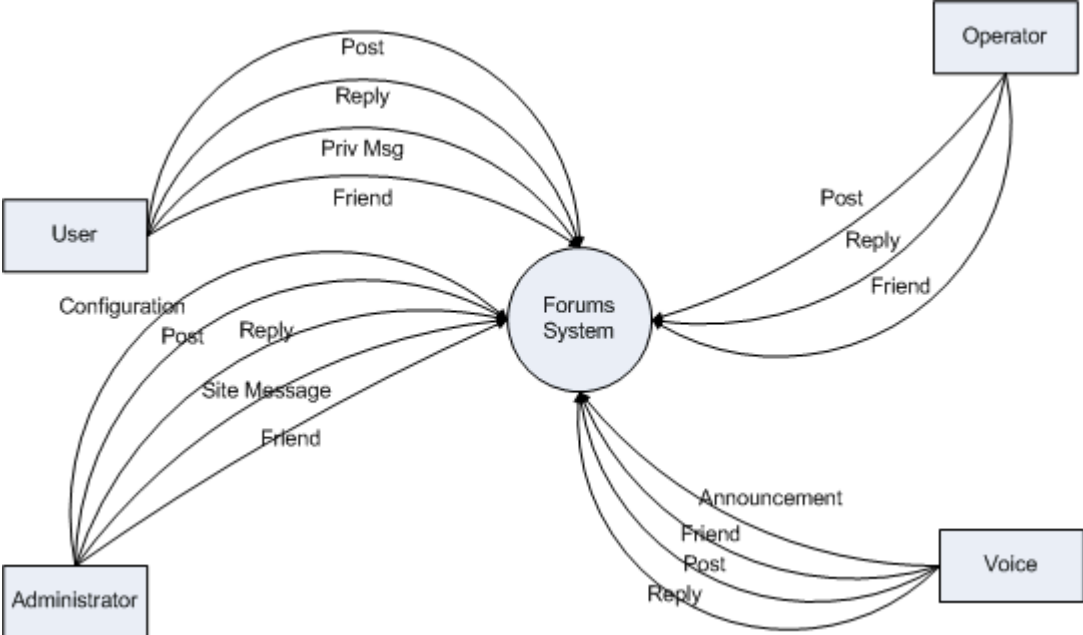
Data Dictionary

Table Name	Attribute Name	Primary Key?	Foreign Key?	Indexed ?	Datatype	Description
user	userIDNum	X			INT	Unique ID for Users
user	userName			X	VARCHAR(30)	The user id entered by the user
user	password				VARCHAR(255)	The encrypted password of the user
user	administratorPermission				INT	Toggle for administrator permission
user	operatorPermission				INT	Toggle for operator permission
user	voicePermission				INT	Toggle for voice permission
user	userPermission				INT	Toggle for user permission
user	active				INT	Toggle for active, Is user active or not
userprofile	profileID	X			INT	Unique ID to identify the profile

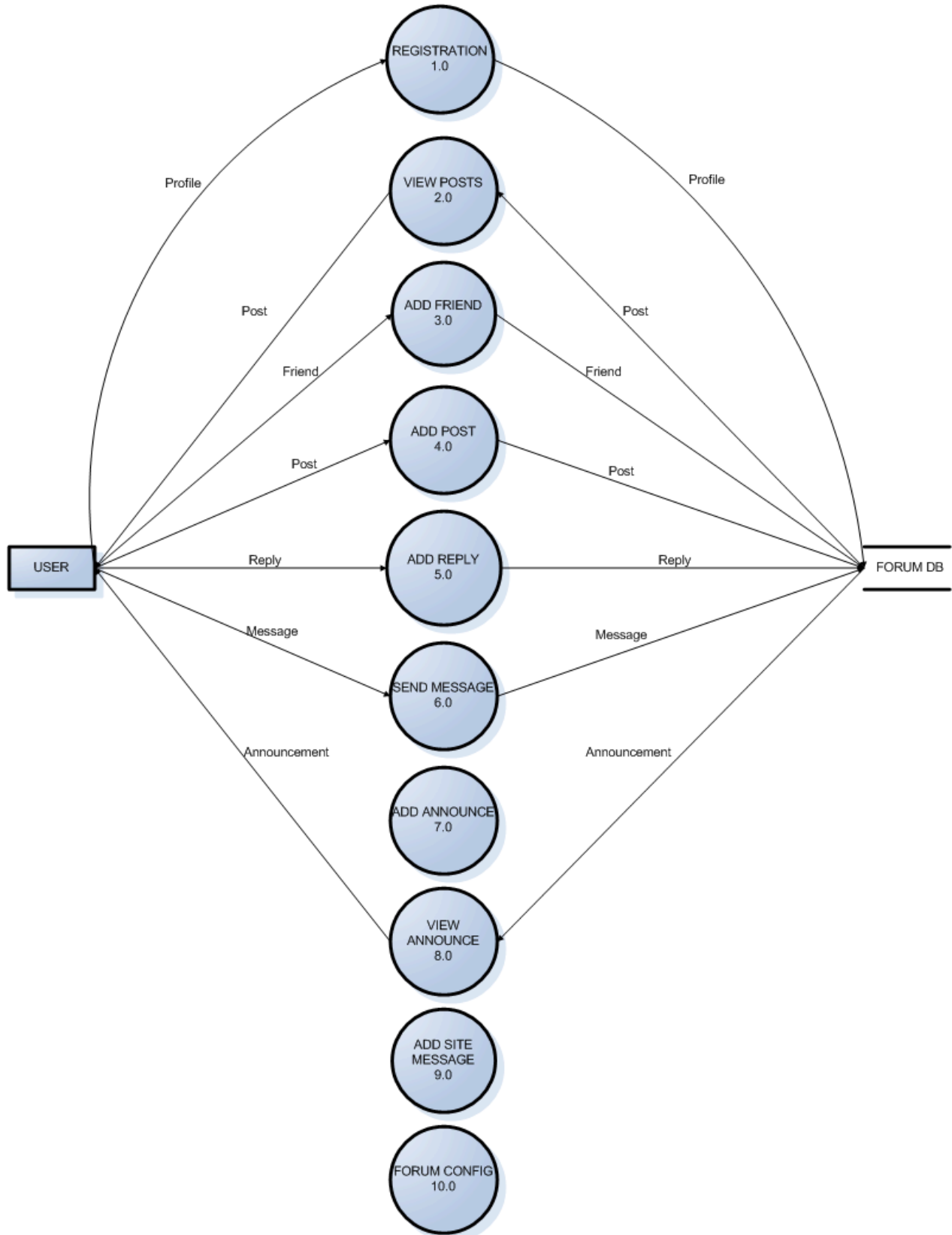
userprofile	fk_userIDNum		X		INT	The ID of the user associated with profile
userprofile	fk_avatarID		X		INT	The ID of the avatar associated with user
userprofile	name			X	VARCHAR(50)	The real name of the user
userprofile	location				VARCHAR(150)	The user's location
userprofile	email				VARCHAR(150)	The user's email address
userprofile	aim				VARCHAR(20)	The user's aim name
userprofile	icq				VARCHAR(20)	The user's icq name
userprofile	msn				VARCHAR(20)	The user's msn name
userprofile	yahoo				VARCHAR(20)	The user's yahoo name
userprofile	jabber				VARCHAR(20)	The user's jabber name
userprofile	website				VARCHAR(150)	The user's website
userprofile	occupation				VARCHAR(150)	The user's occupation
userprofile	interests				VARCHAR(255)	The user's interests
userprofile	signature				TEXT	The user's signature (appears after post)
avatar	avatarID	X			INT	Unique ID to identify the avatar
avatar	avatarName				VARCHAR(50)	The name of the avatar, what the user selects
avatar	avatarFile				VARCHAR(100)	The image file of the avatar
post	postID	X			INT	Unique ID to identify the post entry
post	fk_userIDNum		X		INT	The ID of the user making the post
post	postDate				VARCHAR(15)	The datetime the post was made
post	postTitle				VARCHAR(255)	The title of the post
post	postText				TEXT	The text (body) of the post
post	active				INT	Toggle for active (Will post be visible or not)
category	categoryID	X			INT	Unique ID to identify the category
category	parentCategoryID		X		INT	ID of parent category (root category)
category	categoryName			X	VARCHAR(150)	The name
category	categoryDescription			X	TEXT	The description of the category
reply	replyID	X			INT	Unique identifier of the reply entry
reply	fk_postID		X		INT	The ID of the post this reply is associated with
reply	fk_userIDNum		X		INT	The ID of the user who wrote this reply
reply	replyDate				VARCHAR(15)	The date the reply was made
reply	replyText				TEXT	The text of the reply
reply	active				INT	The active state of the reply
moderate	moderateID	X			INT	Unique identifier for the moderation association
moderate	fk_userIDNum		X		INT	The ID of the user who has moderated
moderate	fk_categoryID		X		INT	The ID of the category of entries that can be moderated
friend	friendID	X			INT	Unique identifier for the friend association

friend	fk_root_userIDNum		X		INT	User ID of the user who has a friend
friend	fk_friend_userIDNum		X		INT	User ID of the user who is the friend of the user
announcement	announcementID	X			INT	Unique identifier for the announcement entry
announcement	fk_postID		X		INT	The ID of the auto generated forum post associated
announcement	fk_userIDNum		X		INT	The ID of the user making the announcement
announcement	announcementDate				VARCHAR(15)	The date the announcement was made
announcement	announcementText				VARCHAR(255)	The text of the announcement
announcement	active				INT	Toggle for the state of the announcement
message	messageID	X			INT	Unique identifier for the message association
message	fk_userIDNum		X		INT	ID of the user the private message is for
message	fk_userIDFrom		X		INT	ID of the user sending the private message
message	messageDate				VARCHAR(15)	The date the message was composed
message	messageSubject				VARCHAR(255)	The subject of the message
message	messageText				TEXT	The text of the message
message	active				INT	The active status of the message
sitemessage	siteMessageID	X			INT	Unique identifier for the site message
sitemessage	fk_postID		X		INT	ID of the auto generated post associated
sitemessage	fk_userIDNum		X		INT	ID of the user posting the site message
sitemessage	messageDate				VARCHAR(15)	The date the site message was composed
sitemessage	messageSubject				VARCHAR(255)	The subject of the site message
sitemessage	active				INT	Toggle for active status of the site message
configuration	configID	X			INT	Unique identifier for the configuration entry
configuration	key				VARCHAR(100)	The key or identifier of the configuration entry
configuration	value				VARCHAR(100)	The value the key refers to

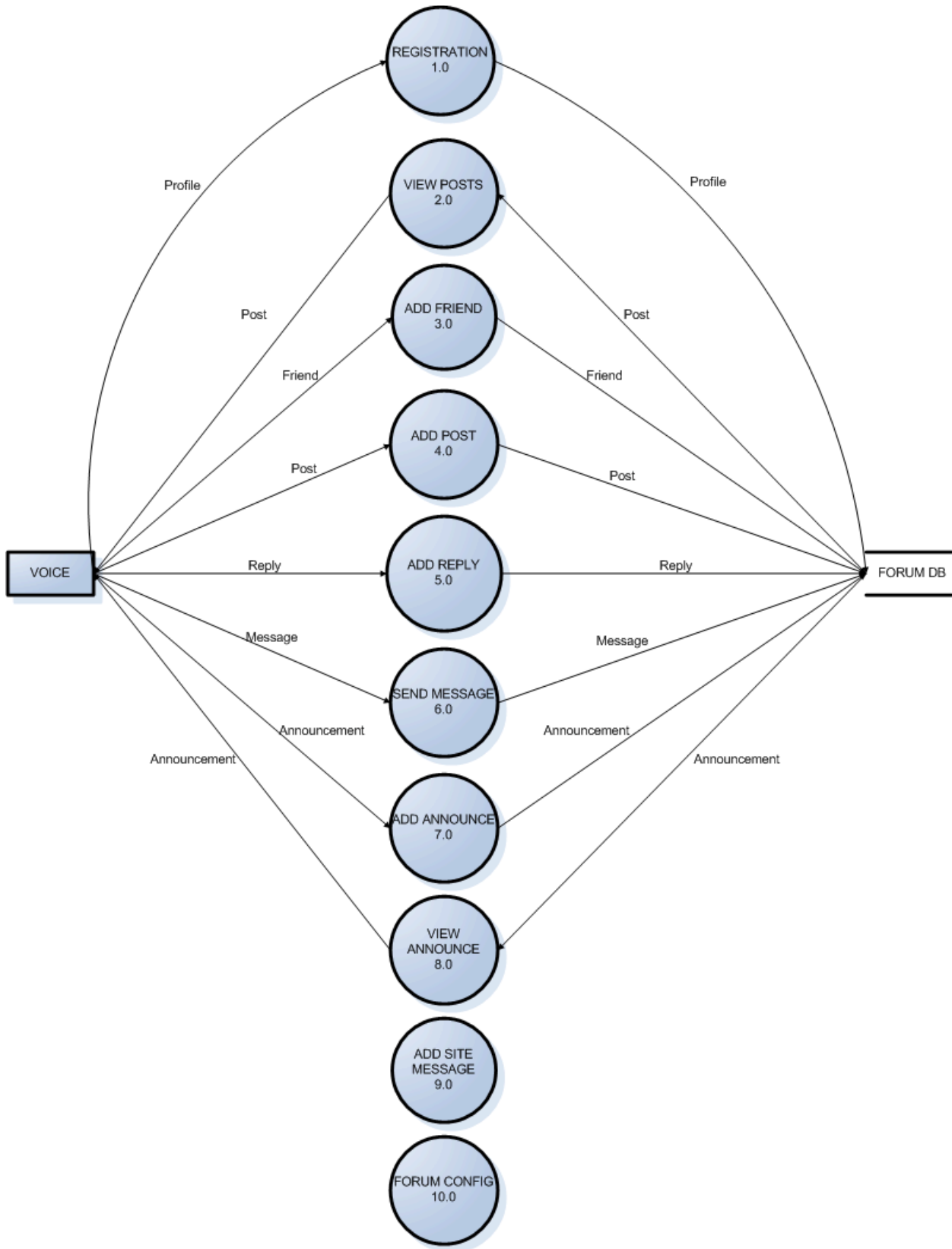
Appendix C: DFD



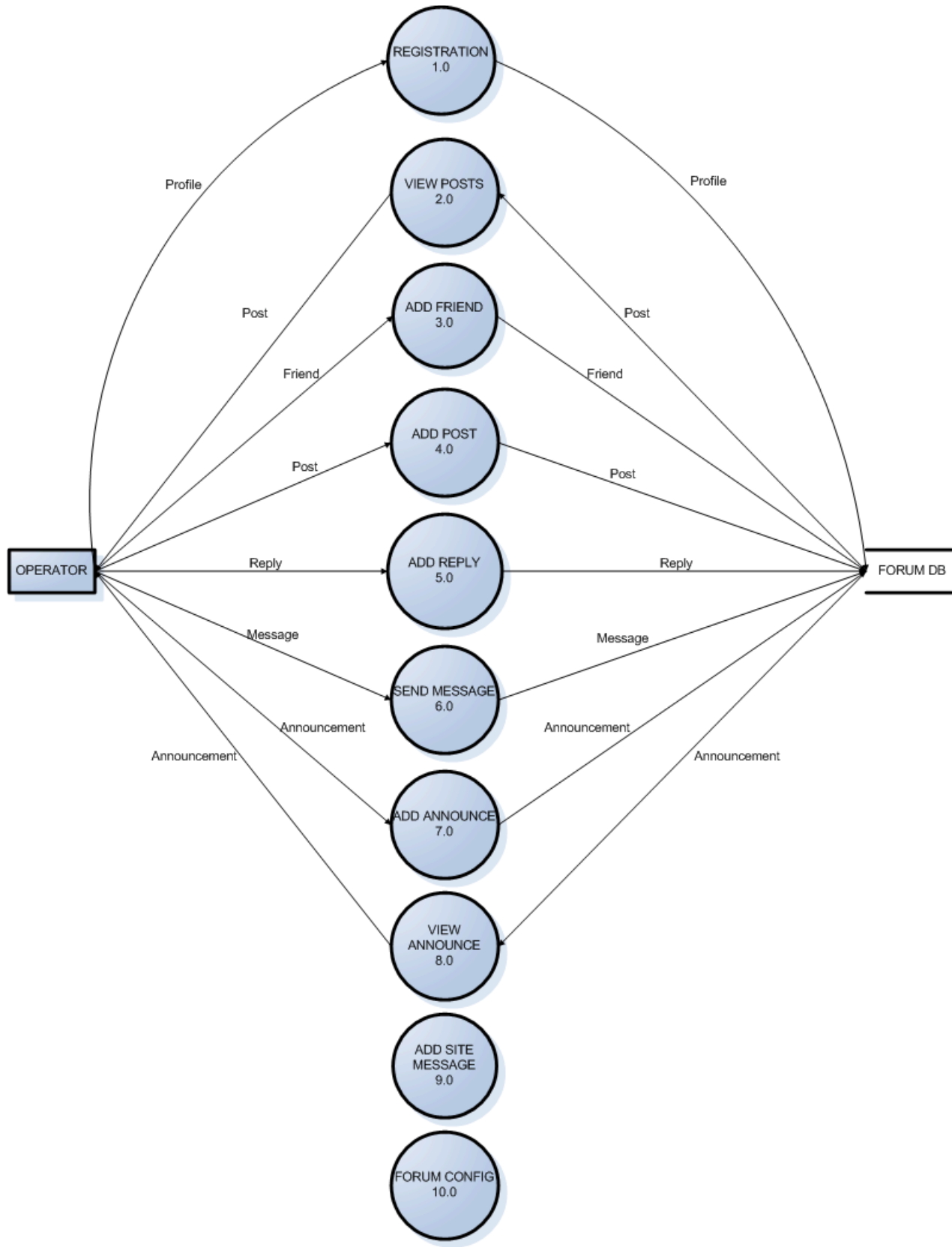
Context



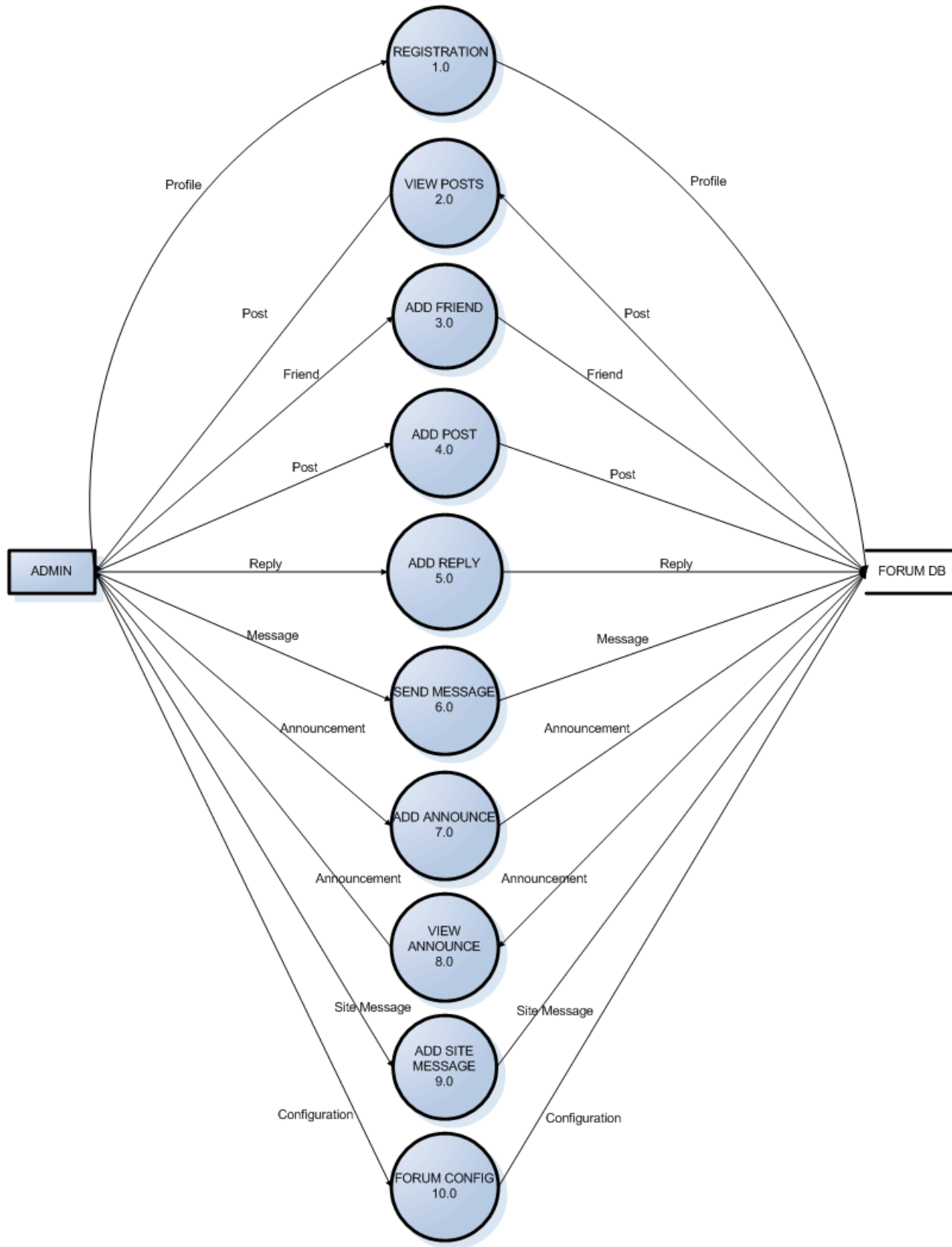
Level 1 – User



Level 1 – Voice

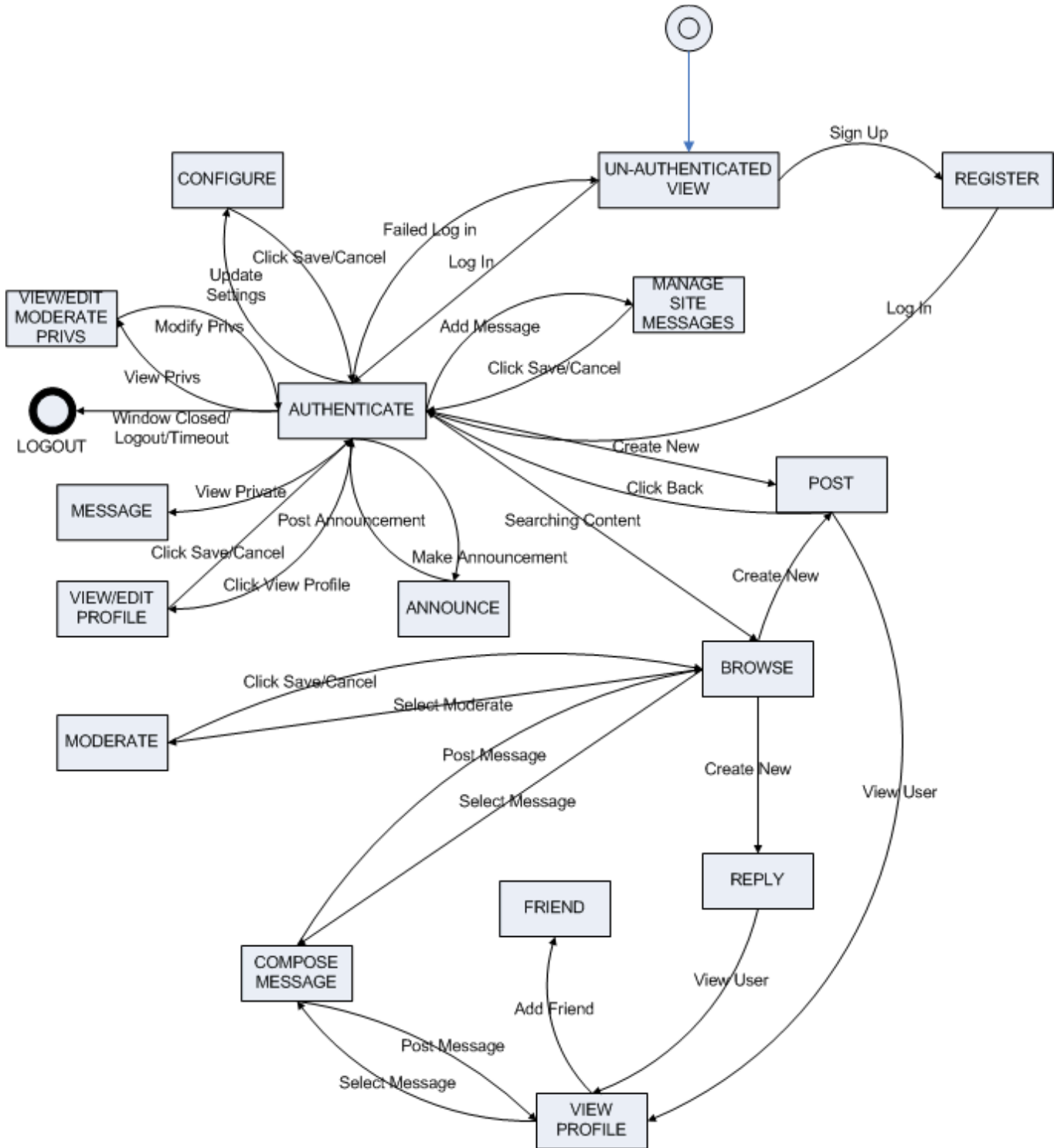


Level 1 – Operator



Level 1 – Administrator

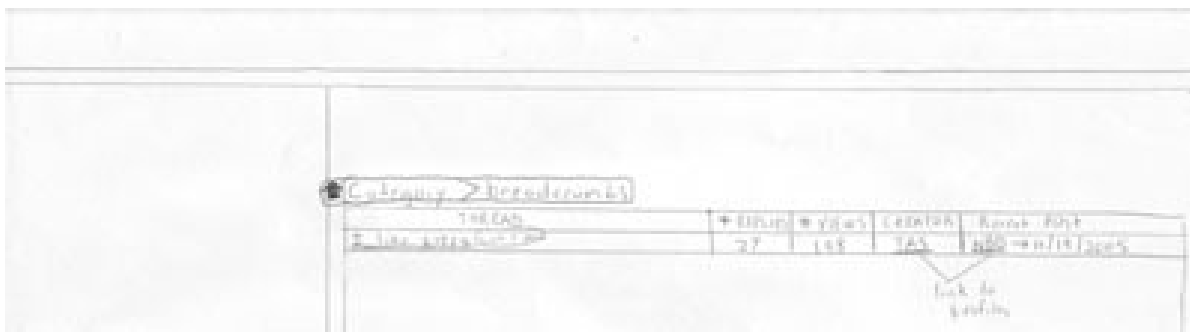
Appendix D: Web Page STD



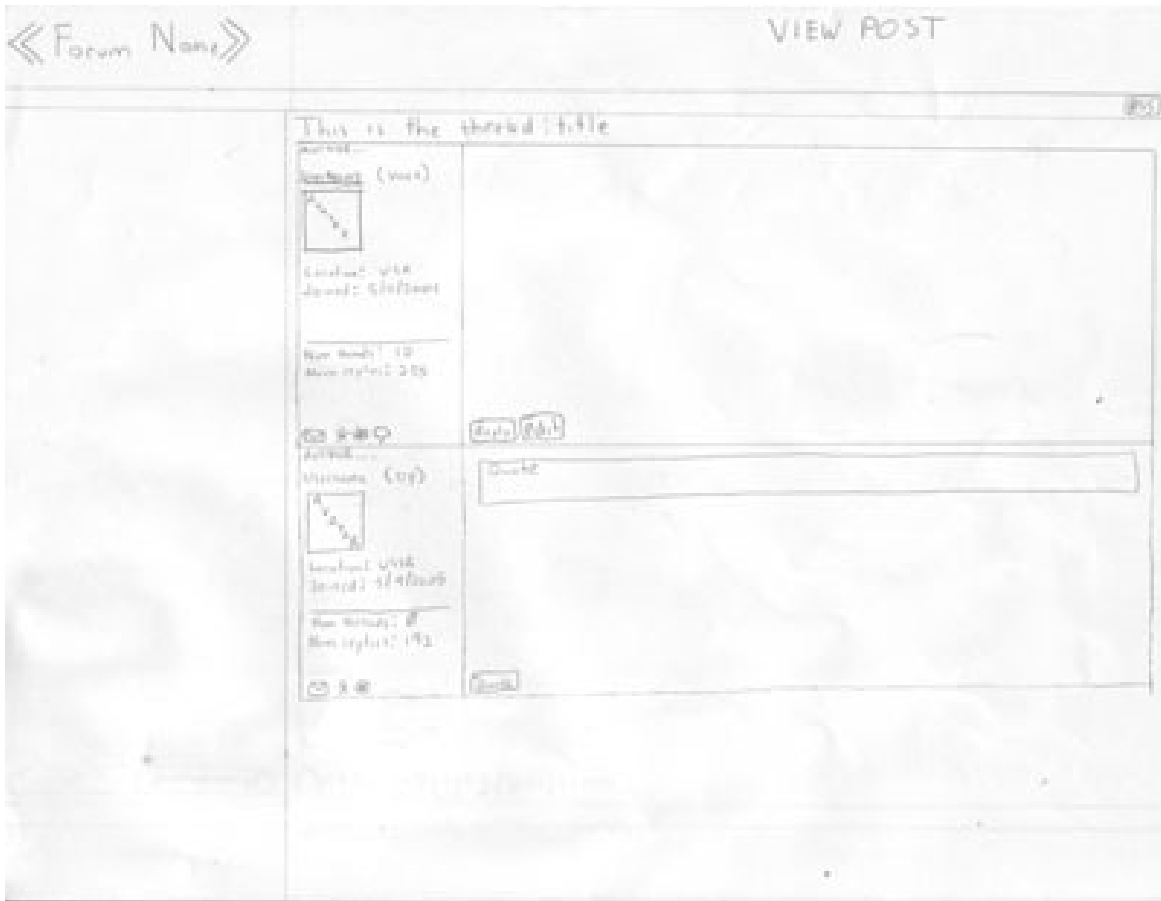
Appendix E: Web Interface Mockups



Main Screen



View All Posts

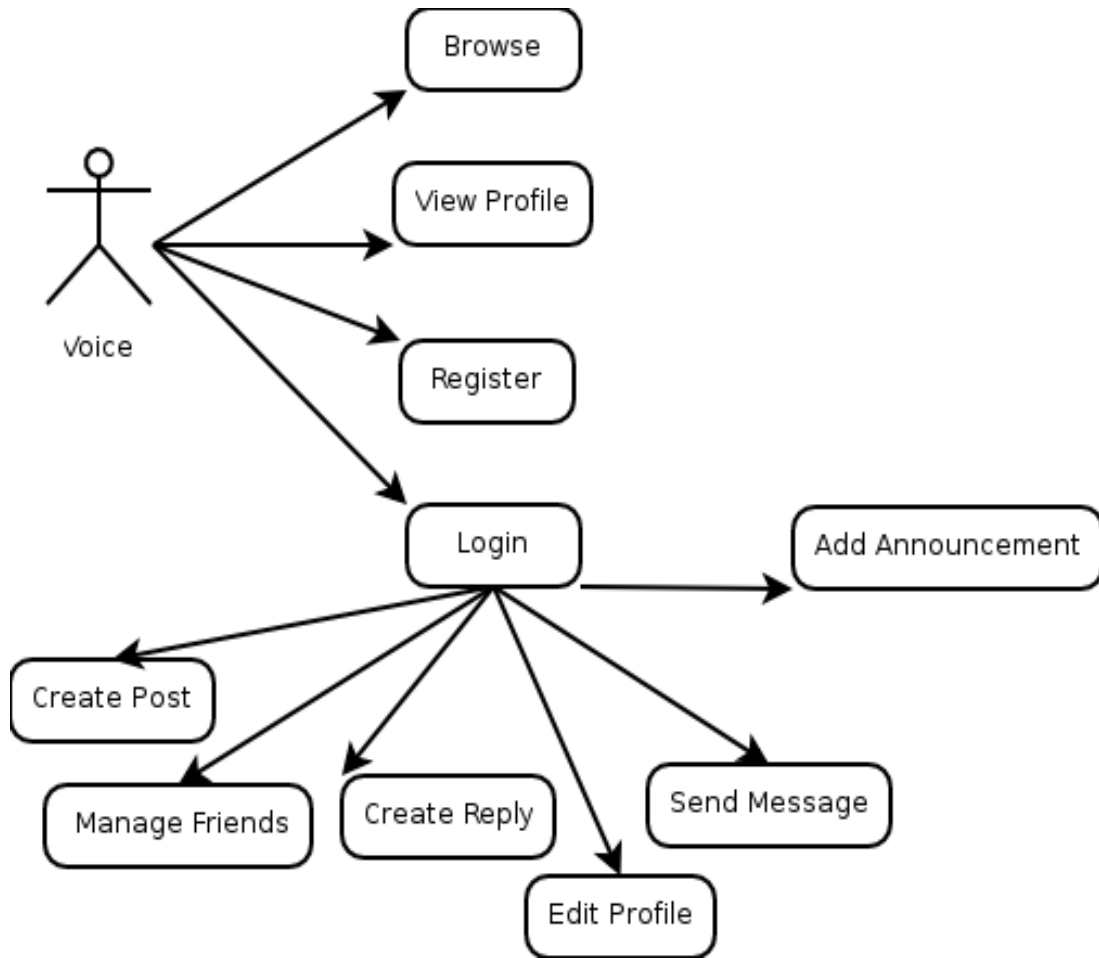
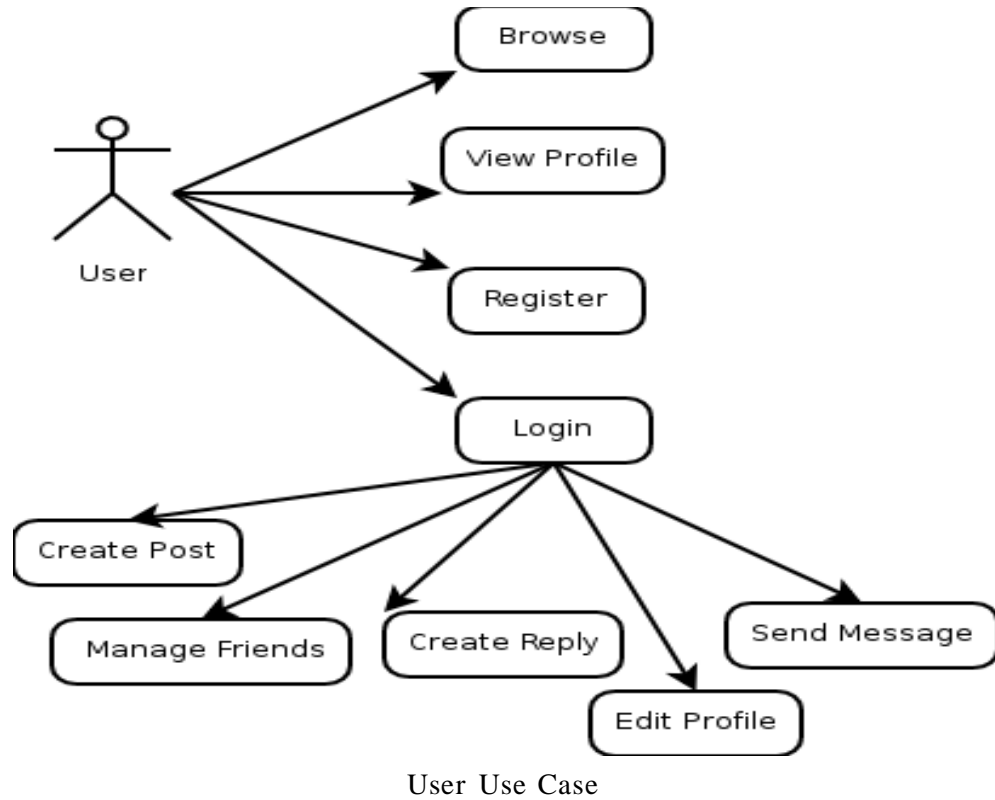


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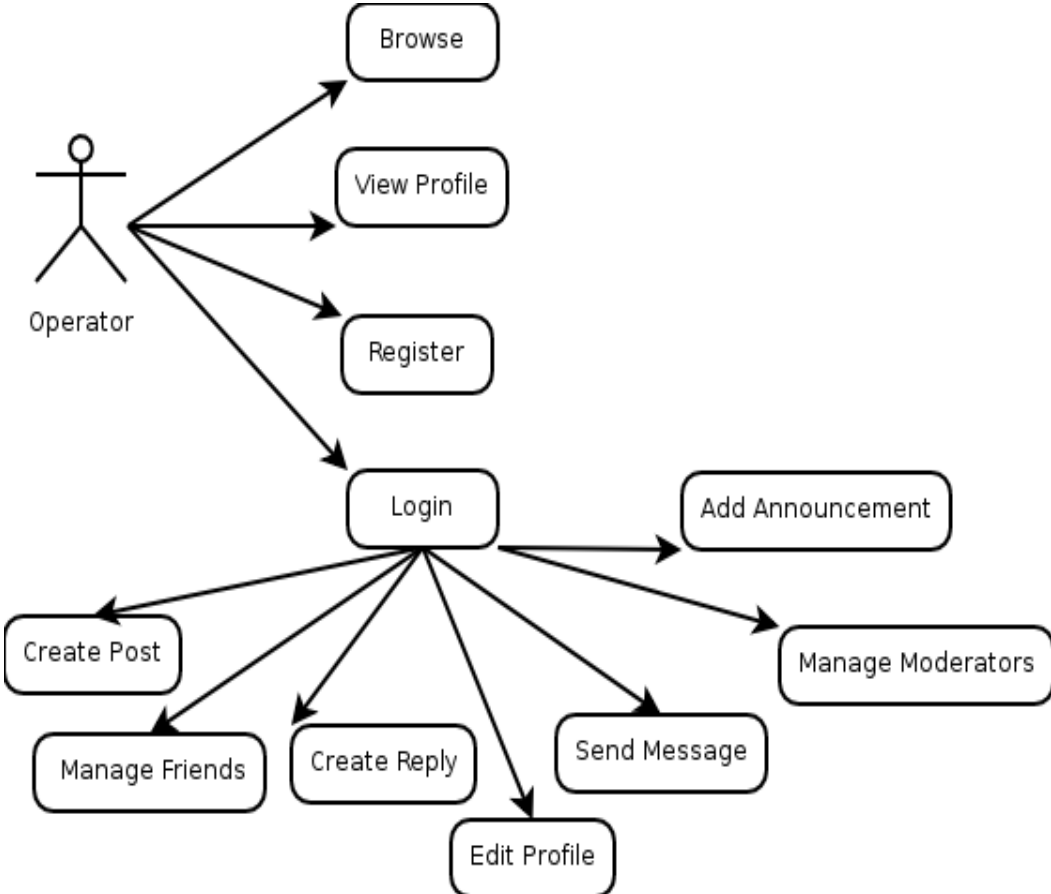


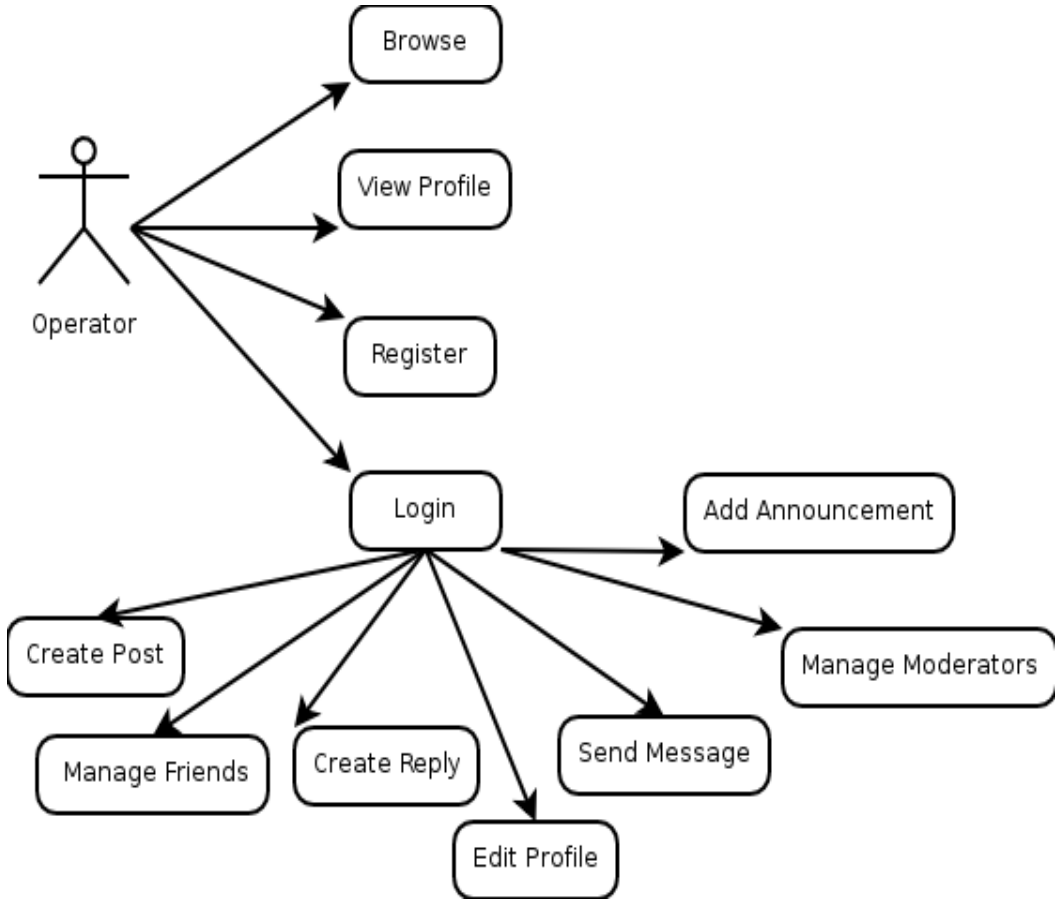
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Appendix F: Use Cases

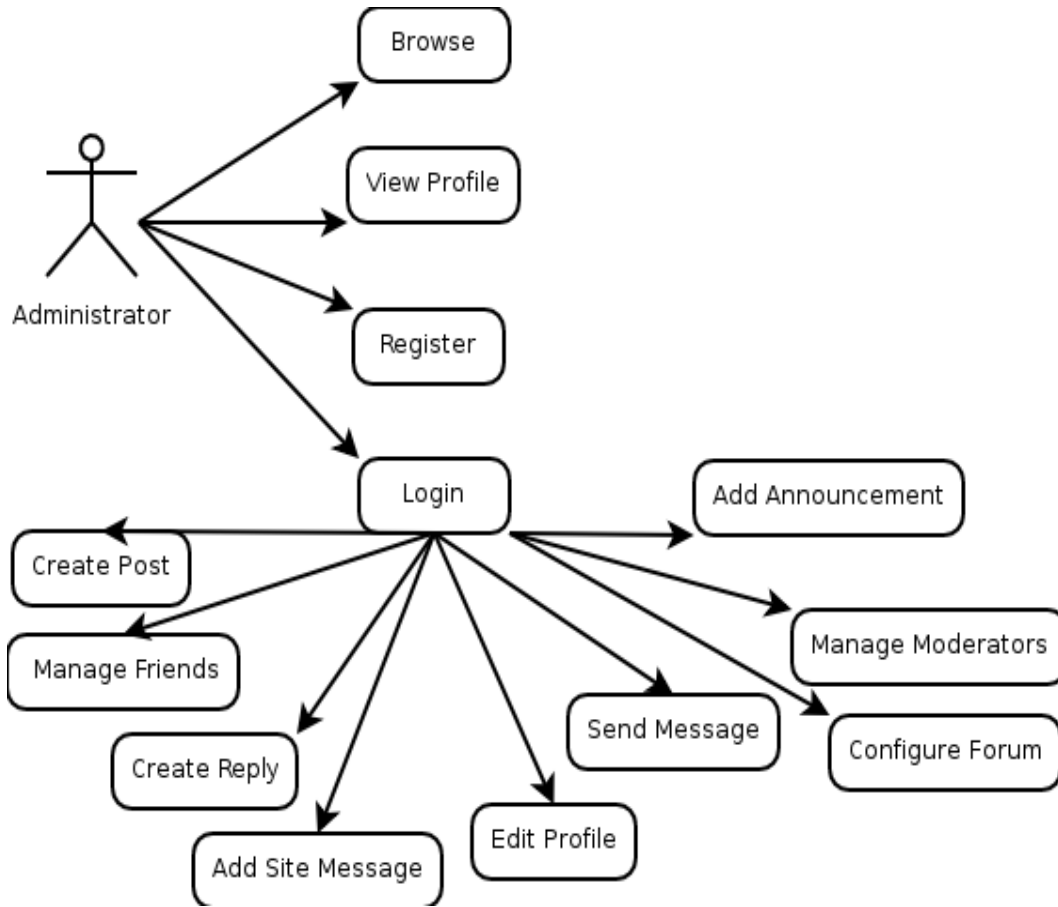


Voice Use Case





Operator Use Case



Administrator Use Case

Appendix G: Issues List

< This is a dynamic list of the open requirements issues that remain to be resolved, including TBDs, pending decisions, information that is needed, conflicts awaiting resolution, and the like.>