

BTech 450A Project Report: Online Survey Management System

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Abstract

The purpose of this project is to develop a Survey System for the University of Auckland that would let staff, departments and students create, manage and publish surveys online. This project will be developed by AQXI Software in conjunction with students from the University of Auckland doing an internship in this company.

In the long term this project aims to be used widely throughout the University and possibly market research organizations to obtain online survey based data and be able to analyze them. The system will therefore be developed so that it provides a flexible architecture that would be easily integrated with existing packages. The system will also provide extensible statistics and report functionalities on the responses gathered with different surveys.

The system that I present in this document therefore aims to easily design and publish surveys in order to collect large and accurate data from the different respondents. By providing a flexible variety of types as well as template libraries for the different components of a survey, this system could therefore be used for marketing research methodologies.

This document describes the work done for the Online Survey Management System Project in the academic year 2006. It includes details of specification of this system in terms of functionality, design, interface and actual implementation.

The document includes description of features for such a survey system and the research supporting the decisions and analysis done for specifying the system functionality. It also details design aspects of the system including User Interface, System Architecture and Database Design. I will describe the interaction between the roles of users of the system and the policies which govern the process of survey creation, survey moderation, survey response and extraction of relevant data.

1. Introduction

1.1. The Company:

AQXI Creative Software was founded in 2004 with a vision to successfully invent and apply technology to support businesses with a thirst to not just succeed, but excel at what they do. [2].

1.2. Industry Links:

Confirming the viability of AQXI's direction and vision, AQXI has been accepted into the Icehouse, the leading NZ business incubator and key supporter of Spark, the University of Auckland Entrepreneurship Challenge. The Icehouse was developed by The University of Auckland Business School with its partners Bank of New Zealand, Telecom, The Boston Consulting Group, Chapman Tripp, HP, Deloitte and Microsoft.

1.3. The Project:

The purpose of this project is to design and develop an online Survey Management System, currently in phase two of its project plan. The vision for the system demands an online, modular, world-class survey system for accurate, timely and simple collection of data from a large number of survey respondents to simultaneous surveys.

The Survey Management System is expected to be commercialized and developed and supported during and after the completion of this project. At this time the academic and market research markets are targeted, although the flexible design of the system should allow it to be adopted across a wide range of industries.

1.4. The Project Team:

The team at AQXI specializes in software requirement analysis, design, development and project management. They are also experts in creative graphics design, system architecture and networking. The Company currently supports five interns on the Survey System project [2] including a sub team from the Bachelor of Technology Project, and a sub team of Information System

undergraduates. These include Mr. Phil Hu (IS - UOA), Ms. Michelle Wu (IS - UOA), Mr. Sam Johnson (IS - UOA), Mr. Hitesh Patel (BTech - UOA) and Mr. Nischint Java (BTech - UOA). This team is supported by project manager Mr. Sébastien Louis and Company Director Mr. Alex Dunayev.

1.5. Background Information

The Survey System project is an experiment in software product development undertaken by AQXI Limited. The company aims to use several best practices in engineering, development and project management to test the potential of development of a modular, multi layer system that can potentially compete with similar available systems.

The technology chosen for this project is an open-source Web Application Framework built on a Microsoft ASP.NET (VB.NET) platform. The framework is called DotNetNuke (DNN) [3] and is based on Microsoft Corporation's IBuySpy Portal Solution Kit (IBS), and is distributed as open-source software, licensed under a BSD agreement. In general, this license grants the general public permission to obtain the software free-of-charge. It also allows individuals to do whatever they wish with the application framework, both commercially and non-commercially, with the simple requirement of giving credit back to the DotNetNuke project community. The most recently released versions are 3.2 and 4.0.

Version 3.2 of DNN runs on ASP.NET 1.1 with SQL Server 2000. This version, although less current, is selected for extension to develop the online Survey Management System, due to availability of hosting solutions and support for ASP.NET 1.1 and a preference for SQL Server 2000 over SQL Server 2005 which is bundled with ASP.NET 2.0 and used for DNN version 4.0.

1.6. Motivation

This project offers opportunities for the company on several aspects. As a growing entrepreneurial company, it allows experimentation with project management techniques and best practices with relatively low risk, while creating Intellectual Property resources that can potentially be commercialized. The development of the online Survey system also allows the company an opportunity to capture new markets and extend into partnerships with Universities where internship programs can benefit both organizations.

The intern teams stand to benefit from the company's expertise in development of software, and learn the process of taking an idea from concept to commercialization.

1.7. Project Goals

The goal of this project is to develop a system that allows the users to conduct online surveys for accurate, timely and simple collection of data from a large number of respondents.

In order to develop the system, a series of sub goals need to be achieved. These are:

- Understanding the technology and its capabilities.
- Understanding Survey Systems and the process of surveying in general.
- Understanding the end user and their requirements.
- Analyzing what current systems are available, and what they offer.
- Creating a vision for the system and specifying what features are essential to build a good survey system.
- Detailing the features and scoping the requirements.
- Designing the system to accomplish the features.
- Designing a User Interface that makes it easy to use the system.
- Implementing the system to accomplish a first release.
- Testing and evaluating the system with end user feedback.
- Adding features and fine tuning requirements.
- Reiterating design through testing to accomplish a better system.

1.8. Learning Opportunities

This project offers me the prospect to gain experience in technology development in a commercial environment. It also allows for exploring new techniques and applying software engineering skills and use technology standards and best practices, to create a product that is marketable as well as flexible so that it may be further developed.

This semester offered the opportunity to design the system in detail using best practices and creating a well documented specification and design for a system that can be implemented using any development team. It also provides the opportunity to develop the system for a first release or part thereof.

3. Requirements and Specification

3.1. Research

The first goal to developing a survey system, after understanding the technology capabilities, was to collect information and establish an understanding of what a survey is, how it is used, by whom it is used, what it is composed of, and what sort of a workflow support was needed for it.

3.2. Methodology

To facilitate research on surveys, firstly an analysis of available systems was done. Feature sets available in various systems were studied, and discussions on these features were held internal to the BTech Team. Possible approaches, solutions, data structures and system complexities were discussed, although not in depth. The cross tabulated results of 5 most feature rich systems is included in Appendix 1.

To extend understanding and deepen feature granularity of the system, interviews were conducted with several organizations and expert users. These included people from the Department of Statistics, Science and Information Systems at the University of Auckland, as well as people involved in various aspects of surveying and survey conducting in over 40 different market research organizations. These interviews were conducted over the telephone, as well as in person. The feedback and requirements were documented for AQXI Limited. A list of all possible features were compiled and graded in terms of priority, for a distribution between 4 iterations. This is compiled in summary in Appendix 2.

Interviews were also conducted with the company supervisor and project manager Mr. Alex Dunayev and Mr. Sébastien Louis. The requirements and specifications for the system are based on these interviews, as well as the research and interviews collated in the previous iteration.

3.3. Analysis

Based on the research, the survey was identified as the central object that followed a specific workflow (Fig 1). The survey is created by the survey creator. When dealing with online surveys, this survey may be in various formats, and may even be un-digitized. After creation the survey questionnaire, the survey creator may be required to take approval from someone who acts as a moderator to

ensure the survey is of sufficient quality, and is statistically valid.

This moderator may be a single person, or a group of people, or may even be the survey creator himself in cases where the survey creator believes he has sufficient knowledge to be sure that the survey produces statistically meaningful results.

The survey is sent to the moderator for approval, and the moderator may approve it, or provide feedback to the creator. This process may iterate several times, and in some organizations has specified formats and procedures.

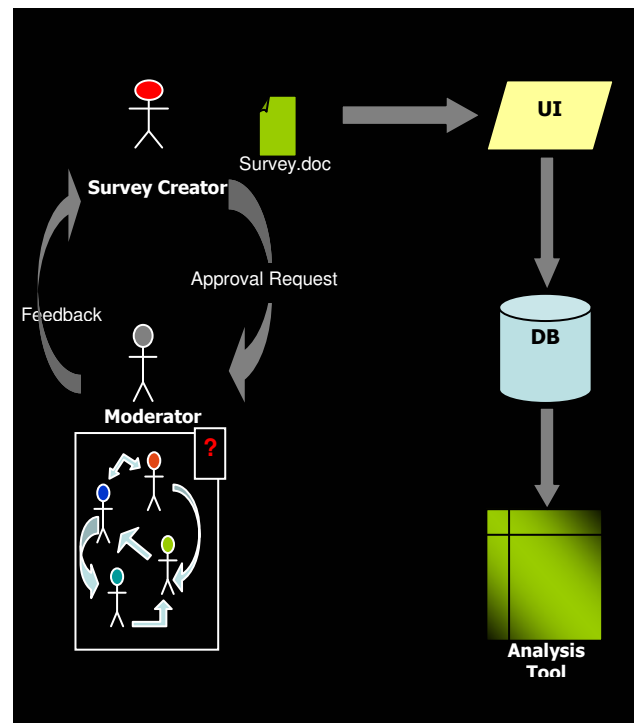


Fig 1. The Online Survey Process

If the moderator is more than one person, i.e. a committee of people, this group may have its own internal workflow. This internal process would vary from organization to organization and supporting the moderators' internal process is outside the scope of the system.

Once the survey is approved, the creator may either, both create and publish an online version of, the survey may have to be digitized programmatically by one or more employees of the organization. In some cases the original survey may be a directly publishable digital format.

The User Interface (UI) is typically a web page accessible through a browser. Respondents are informed by any traditional means, of its existence and access URI¹. Respondents presumably access the website and log their responses, which are recorded into a database (DB). After sufficient responses are collected, the survey analyst (often the survey creator) accesses this raw data. This data is subject to analysis in a variety of ways, most often in statistical analysis and presentation packages like SPSS², SAS³ and MS Excel. Actual statistical analysis is beyond the scope of the system.

3.4. Identified Problems

Problems identified from the current systems, over various organizations are:

- The Survey Creator may make a statistically irrelevant or ethically unsound survey or part thereof.
- The Survey Creator - Moderator communication is slow and may involve multiple formats and transitions.
- The Moderation Process is slow.
- Survey Moderators may “change their mind” or may be uncertain about decisions made by other Moderators, or even decisions made previously by them.
- The Survey Creator may have to edit the survey often.
- The Survey Creator may have to change the format of the survey in order to publish it.
- The Survey Creator may need to edit the survey once it is published.
- The Survey Respondents demand ease of use in order to respond to surveys.
- The collected data must be available in a suitable format for analysis; otherwise the analysis process involves re-entering data into an analysis tool.
- Basic statistics on surveys are required to monitor status.

Based on our understanding of the research material, the basic terminology and solutions were proposed as follows:

3.5. Definitions and Solutions

- **Survey:** a collection of sections and questions on a particular subject.
- **Section:** a collection of questions associated to a particular survey.
- **Question:** a question consists of one or more stems and options.
- **Stem:** a stem is the text preceding the options in a question.
- **Option:** an option is a possible value to answer a question.
- **Response:** actual answer from a respondent to a certain question.
- **Public Surveys:** online surveys available to any unauthenticated users.
- **Private Surveys:** online surveys available only to authenticated users.

The research material and competitive evaluation of various systems showed the need to ensure that the system provides a quality process-centric online system which facilitates the development of creating, editing and publishing surveys. It needed to provide basic moderation capabilities for surveys created in the survey system. The system also should enable the survey administrators and editors to manage the process of producing surveys as well as basic response analysis and extraction of data based on the results of surveys. Distribution of Surveys to respondents is also a valid issue.

Thus required solutions for the system needed to include:

- Facility for moderation of the survey and an online accessible record of feedback provided by such a moderator.
- A single viewable version of the survey in a format that remains consistent between creation, editing, moderation and response.
- An easy to use status indication for defining the current stage of a survey.
- Seamless publishing of the survey to produce forms that look exactly like the created version. (WYSIWYG⁴ editing and publishing)
- Real-time analysis for survey statistics.
- Compatible format exports for data ready to be imported into analysis packages like SPSS, SAS, and MS Excel etc.

¹ URI: Universal Resource Indicator

² SPSS: Statistical Package for the Social Sciences

³ SAS: Statistical Analysis System

⁴ WYSIWYG: What You See Is What You Get paradigm

3.6. System Scope

The system should:

- Present the ability to manage access control for users of the system and basic administration of the survey management system.
- Present the ability to create and edit surveys and survey questions (including selection of types of questions and the viewing and editing of survey and question properties).
- Present basic survey moderation capabilities for surveys created in the survey system.
- Present basic survey respondent management capabilities to manage respondents of surveys published by the system (including invitations and additions to system).
- Present the ability to analyze responses of surveys in basic views, including tables and charts.
- Present basic survey data extraction capabilities in raw data formats for download.
- Present basic survey response capabilities to allow response to surveys.

3.7. Assumptions

This scope is subject certain limits and assumptions including:

- Only online surveys are considered in this system.
- Respondents only answer online.
- Unauthenticated users have access only to public surveys.
- Authenticated users have access to public and private surveys.
- Authenticated users are responsible for keeping their personal details up to date.
- The Survey Administrator is responsible for keeping the details of Respondents up to date.
- Respondents have the required skill to attempt surveys.
- The Survey Administrator will provide and manage the respondents suitable to a survey.
- The survey response data is independent of system data.
- The roles of Survey Administrators, Editors, Analysts, Moderators, and Respondents are assigned by the Survey Administrator, to users associated to his survey system.

Several Roles are also considered in the system. The basic scheme is to separate out users from roles, and have a user role management system for assigning various roles to a

user. The roles considered in the system are detailed below.

3.8. System Roles

The following roles were identified for the system:

Hosts:

This group of users will have access to every part of the system. They are also responsible for maintaining the survey system. This group of people will be able to assign administrators of the system.

Administrators:

This group of users will have maximum authority in the system with regards to managing and maintaining surveys. They can grant access to Editors, Moderators, Analysts and Respondents. Administrators have the rights of Editors, Moderators, Analysts and Respondents.

Editors:

This group of users will have access to edit, retire, analyze and publish surveys. Editors will have rights to add, invite, remove and remind respondent in the system. They are able to invite anonymous respondent and publish anonymous links to the survey as well.

Moderators:

This group of users will be assigned by Administrators; they have access to review surveys. Moderators also have authorities to write, edit and delete comments on surveys which they have reviewed, as well as approve surveys for publishing.

Analysts:

This group of users will have permissions to generate reports, such as survey statistics and online analysis. The report is based on completed surveys. This group of users will also have access to extract raw data containing responses for each question for each respondent in CSV format.

Respondents:

This group of users will be people who have been invited to respond to surveys.

The system features were compiled using evaluated software as benchmarks to define common functionality, as well as user interviews to prioritize and fine tune feature considerations. Features considered for this iteration of the Survey System are summarized in Appendix 3 and discussed below.

3.9. System Features

The Survey System to be built was specified to have the following features. A summary of the features is presented in Fig 2. For detailed requirements of the system, please refer to the BTech End of Semester 1 Report [6]. An updated Software Requirement Specification document is attached in Appendix 5.

Features:

- **Framework (SYS01)**
 - Authentication System
 - Personalized Profile Management
 - User Management
- **Survey Administration (SYS02)**
 - Role Management
- **Survey Creation (SYS03)**
 - Survey Creation
- **Survey Editing (SYS04)**
 - Survey Editing
 - Question Ordering
 - Question Editing
 - Section Management
 - Page Management
 - Template Management
 - Skin Management
- **Commenting System (SYS05)**
 - Comment Management
- **Moderation System (SYS06)**
 - Ready for Approval & Approved for Publishing
- **Publish Survey (SYS07)**
 - Publish Survey
- **Response Engine (SYS08)**
 - Response Collection
- **Analysis Engine (SYS09)**
 - Online Analysis
 - Exporting Data

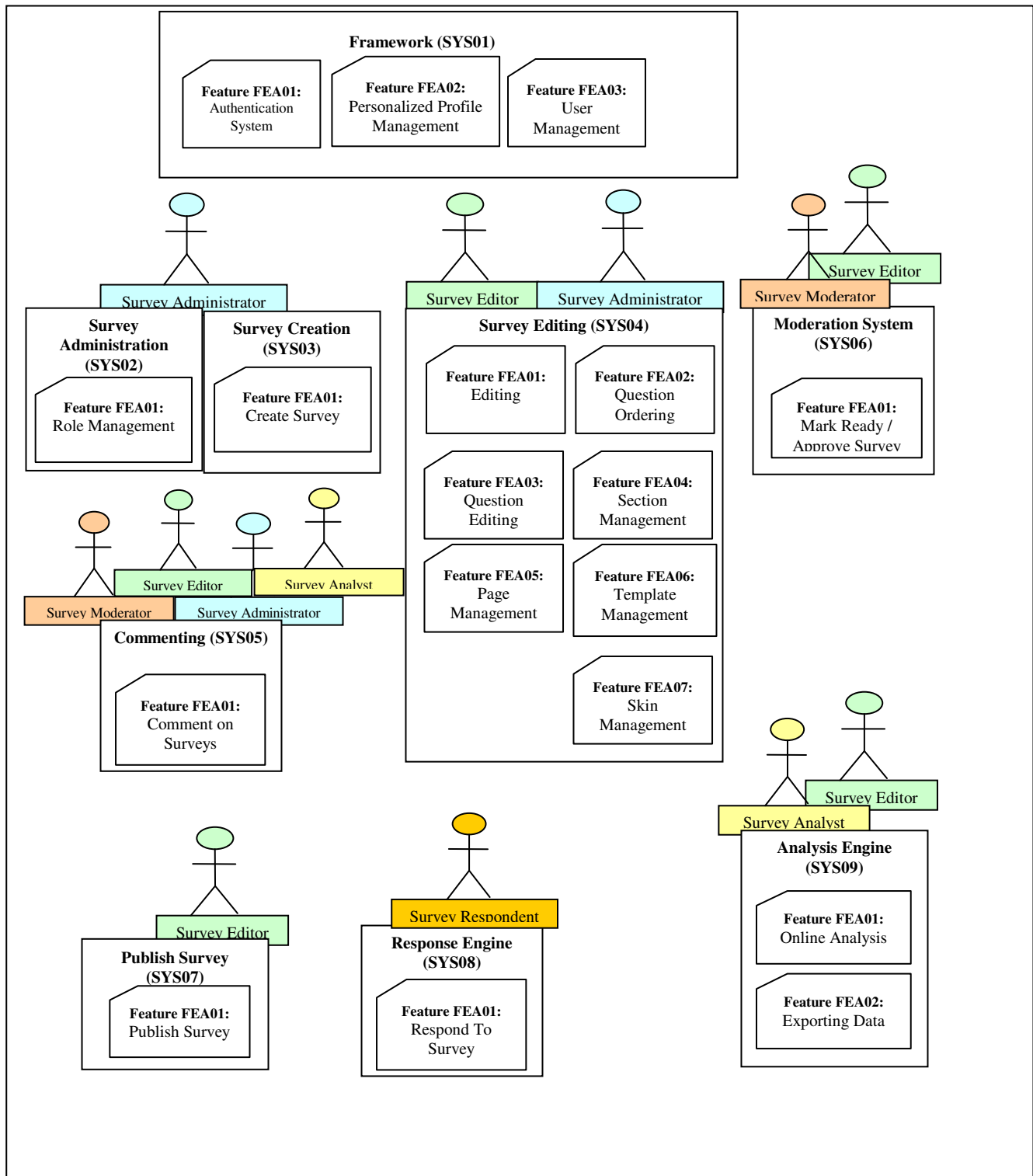


Fig 2: Schematic of the System

4. Design

4.1. Technology

As discussed previously, the technology selected is an ASP.NET 1.1 based Framework called DotNetNuke. This is a 4-tiered architecture consisting of a User Interface, Business Logic Layer (BLL), Data Access Layer (DLL) and Database (DB). A schema of this architecture is shown in Fig 3.

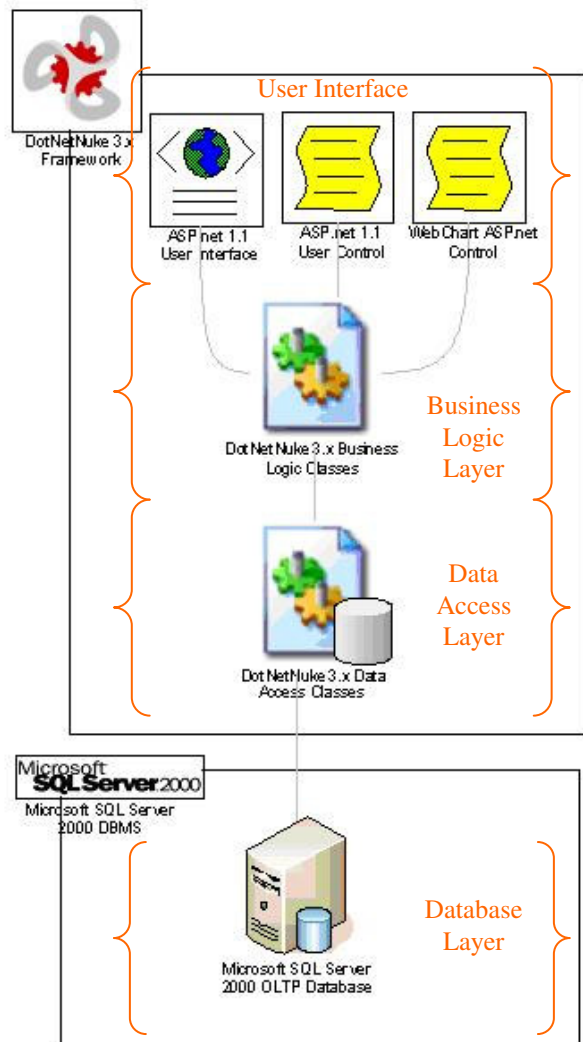


Fig 3. The DNN Framework

For DNN 3.2.2 The UI is designed using ASP.NET 1.1 ascx controls linked to code-behind files. The codes behind files, as well as the BLL are implemented in VB.NET. The Data Access Layer is implemented using SQL Stored Procedures. The Database is implemented in SQL Server 2000. A detailed ERD for this version is

available at website reference [4]. A description of the DAL is provided in website reference [5].

Modularity of components and the multi tier architecture allows for extensibility and modification of the system. One future consideration is to extend the Business Logic of the system and expose its functionality through Web Services. The survey object could then potentially be injected into a website with content through a client side frame, or AJAX control, and respondents could be targeted based on content, interests, external system profiles, or system information external to the survey management system itself. This could potentially target larger, more specific audiences and increase rates of response, or sample representation, although there is currently no research conducted to suggest or discredit this approach.

To implement the current specified system, this framework will be extended on each level to implement functionality. Each module will be associated with its own set of User Control, Code behind File, Data Reader, Stored Procedures and Database Tables.

4.2. State Analysis

Analyzing the states that the survey goes through as the central business object for the system, a state analysis diagram was constructed as shown in Fig 4.

The survey is seen to change state as follows:

- 1. Draft:** After creation, the survey is by default in the Draft state. It can at this stage be edited, or commented on.
- 2. Ready for Approval:** Once the survey has been drafted, the Editor of the survey may mark it as ready for approval. Once it is ready for approval, the Moderator has access to approve the survey for publishing or deny approval.
- 3. Under Approval:** While the survey is waiting for approval, the Analyst, Editor and Moderator roles can continue commenting on the survey.
- 4. Approved for Publishing:** Once a survey is approved by a Moderator for publishing, it may be published publicly or privately, by an Editor.
- 5. Published:** Once the survey is published, it may be responded to by any user who is assigned the Respondent role. It may also be analyzed.
- 6. Retired:** After retirement, the survey can no longer be edited, analyzed, or commented on. Data may still be available for export.

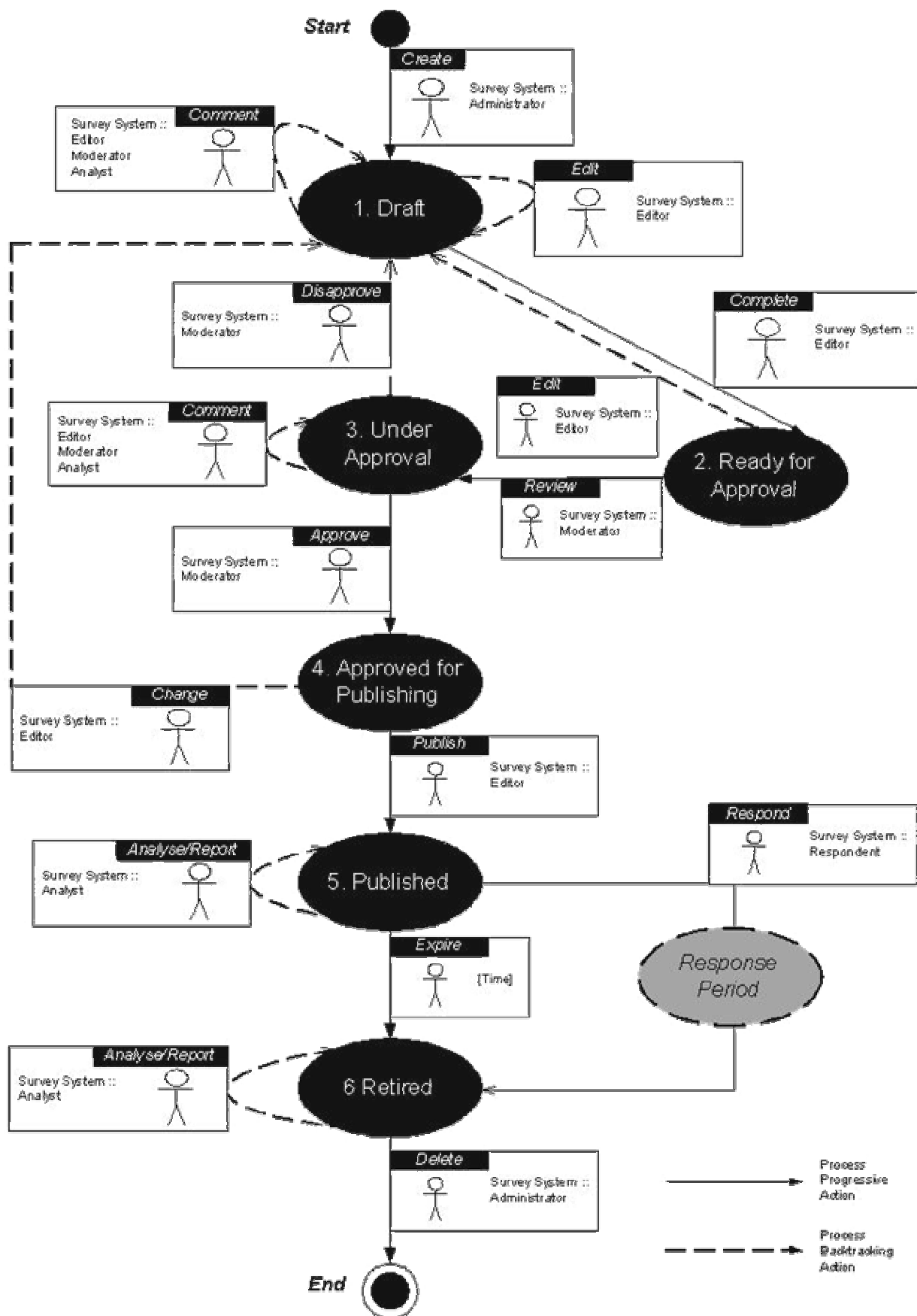


Fig 4. Survey Workflow State Analysis

4.3. User Interface (UI) Design

The User Interface of the system was designed keeping the end user in mind. A general flow of user interaction with the system was defined using a Screen Flow document based on roles and tasks of users.

Each screen of the designed screen flow was then designed with representation of all features for the user screen so as to form a template for implementation of the UI. The implemented modules closely follow the screen designs proposed in the Screen Design Document.

4.3.1. Screen Flow

The generic process flow describes a Survey Lifecycle. The Online Survey Management System uses this lifecycle as a basis for its generic process in creating and executing a survey.

- First a Survey is created and put into editing. After some iterations of editions, where a Moderator may or may not leave comments on the survey with feedback from the Editor, the Editor signals that the survey has been created and that it can begin the process of being moderated.
- During moderation, the survey cannot be modified and as soon as the Editor signals that a survey is ready. The moderator has power over the survey, on whether it can be edited or published anymore.
- Once the Moderator has approved the survey, it can be published.
- Upon publishing, the Editor can add respondents to a Private Survey or if open can distribute a URI locating the Survey. The survey can now be analyzed and data maybe extracted.
- After a Survey has been Expired or retired, a survey can not be edited, it can only be analyzed and data maybe extracted from it.

Based on this process flow, the generic screen flow of the system was described as shown in Fig 5.

Following a login through a login page, the user is takes to the Show All Surveys page. This page lists all surveys the

user is associated with. From this page a user selects a survey to work with and is directed to a page containing the most commonly used functionality for the role. For instance, an Editor may be redirected directly to the editing pane of the survey. This page also provides access to all other functions executable by the roles of the user. Navigation is via a menu that is populated with links relevant to a user role.

As the figure shows all users access their respective screen via a common Show All Surveys Page.

- The Editor is able to access the Analysts section as well as Skin Management for the site, Managing Survey Users and Publishing a survey (which includes managing Respondents.). The Editor also accessed the Creation and Editing functionalities for the system.
- The Analyst can View online charts and Export data.
- The Moderator only has access to the Moderation page allowing for locking a survey form edition and approving a survey so that it can be published thereafter.
- If any Analysts, Moderators or Editors are listed as being Respondents for a survey then the special link to the response page is also available.
- All users can access the Preview Survey Page, to see what the survey looks like from the Respondent point of view.
- The Survey Administrator can access all pages of the System.

A detailed Screen Flow document was prepared to fine tune navigation and identify pages critical to navigation and usability of the system. This Screen Flow Document is attached in Appendix 6. Also detailed Screen Designs were prepared for these pages.

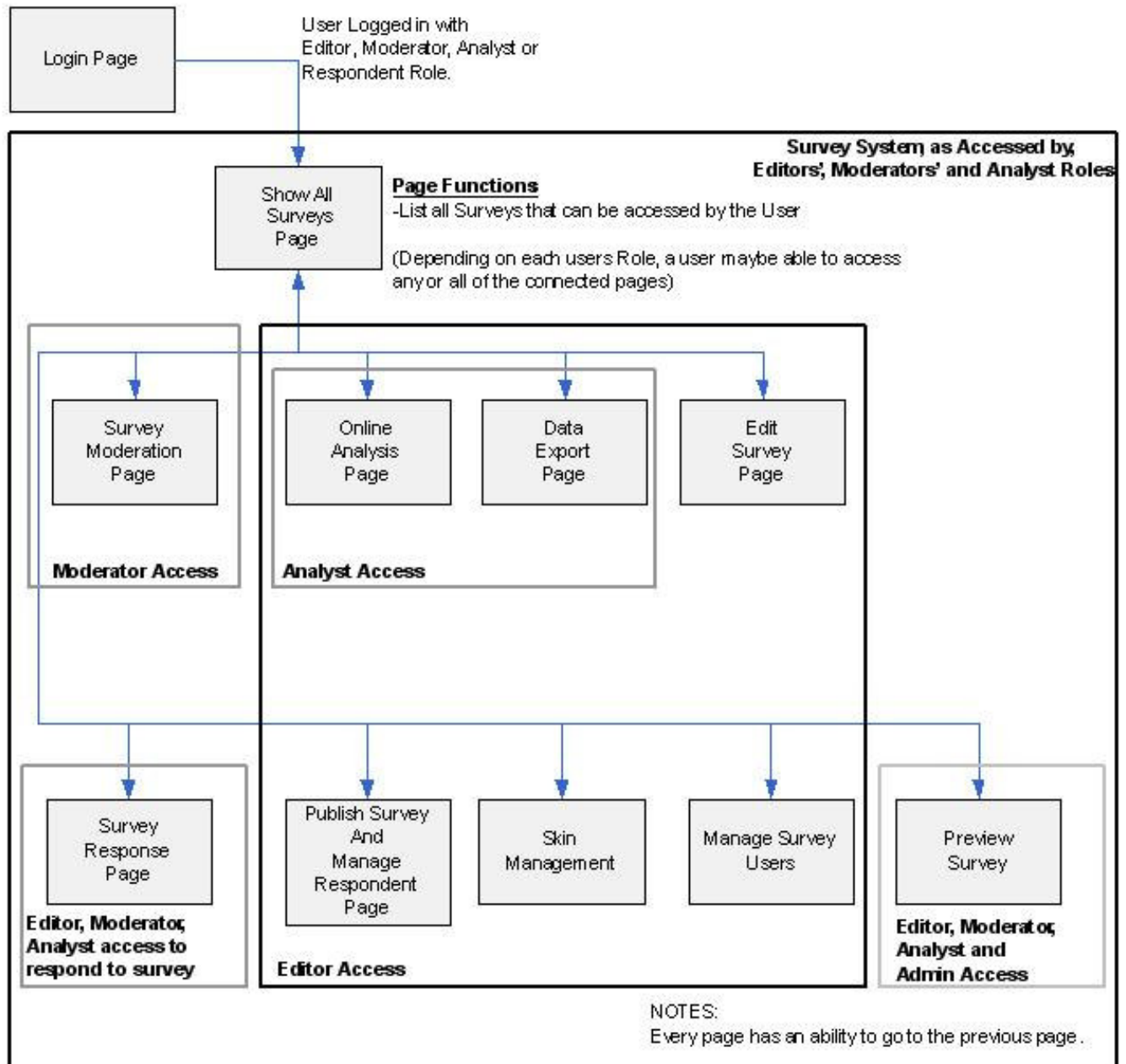


Fig 5: Generic Screen Flow for Editors, Moderators and Analysts.

4.3.2. Screen Design

Metaphor: (“Toolbox & Workbench”)

The Online Survey Management System has a user-interface implemented with the “Toolbox & Workbench” metaphor. To make any changes, a user will select a “tool” on one of the toolboxes to the left of the screen, add or make changes inside that toolbox and have these changes reflected in the “workbench” area or the display panel to the right of the screen. The interaction loosely resembles a Microsoft Visual Studio development environment, with options and commands on a left toolbox, and changes on a main display or workbench. The user cannot directly manipulate the system through the workbench (unless otherwise stated in the section regarding said exceptions).

The user will most commonly interact with the system in the following steps:

1. User selects a domain (represented by tabs across the top of the screen) to perform actions in, e.g., “Edit Survey”.
 - System populates a list of toolboxes (down the left side of the screen) appropriate for that domain. Toolboxes are initially hidden and represented by icons that can be selected to show the desired toolbox.
2. User selects a toolbox by selected an icon along the left side.
 - System populates the toolbox area with commands and options appropriate for the selected toolbox.
3. User makes changes in the toolbox with the supplied

commands and options. User then applies changes.

4. System refreshes the workbench display on the right side of the screen and updates the contents to reflect changes.

This layout is illustrated below (Fig 6).

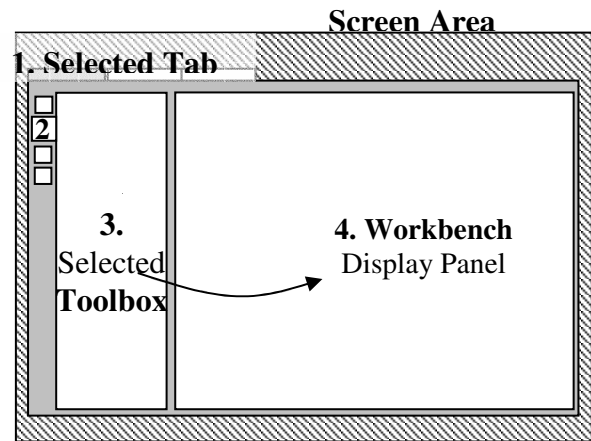


Fig 6: Screen Layout for “Toolbox & Workbench”

Domains & User Roles:

Each user role is associated with certain domains, which dictate the features that they are permitted to access. These domains are represented as tabs across the top of the toolbox and display panel, and are shown or hidden depending on the current user’s role.

Roles vs. Domain	Administrator	Survey Editor	Survey Moderator	Survey Analyst	Survey Respondent
View All Surveys	☒	☒	☒	☒	
Create Survey	☒				
Edit Survey	☒	☒			
Comments & Approval	☒	☒	☒	☒	
Publish	☒	☒			
Analysis	☒	☒		☒	
Data Export	☒	☒		☒	
User Management	☒	☒			
Survey Response	☒	☒	☒	☒	☒

Fig 7: Domain Access Rights vs. User Roles Matrix

There are five roles in the survey system that the screen design is concerned with:

1. Administrator
2. Survey Editor
3. Survey Moderator
4. Survey Analyst
5. Survey Respondent

There are nine domains (tabs) the survey system interface divides into:

1. View All Surveys
2. Create Survey
3. Edit Survey
4. Comments
5. Publish
6. Analysis
7. Data Export
8. User Management
9. Survey Response

The given table (Fig 7) outlines the domains and features that each user role of the system is able to access.

Notes:

1. The Administrator has access rights to all domains, ignoring logical constraints; e.g., an Administrator can access both “Edit Survey” and “Publish” tabs, even if the selected survey has not been approved for publishing. This constraint is enforced on other roles.
2. A Survey Moderator has the additional ability in the “Comments and Approval” tab to lock surveys against editing and/or publishing. These options are contingent on whether the Survey Editor has submitted the survey for approval readiness.
3. The Survey Respondent does not see any tabs. He or she is directed to the survey itself for responding.

Other Considerations:

- The screen design reflects the hardware requirements of 800x600 resolution, 32-bit color. A rough screen ratio of 4:3 is targeted.
- Toolboxes and associated icons can be implemented using JavaScript or AJAX-based technologies to alternate between toolboxes in future iterations.

- Tabs and associated contents are implemented using separate logical pages that will cause a page refresh when tabs are changed.
- It is expected that Internet Explorer 6.0 or above browsers will be used to run the interface of the system. Alternate browsers such as Mozilla Firefox are considered, but not specifically targeted in this iteration.
- This section should be read with the screen flow document in order to fully understand the system and user flow through the screens shown in this section.

Some detailed screen designs are included in Appendix 4.

4.4. Database Design

The database for the system is designed to suit future specification and feature sets for the system. Advanced features such as Dynamic Branching, Randomization, Templates and Tracking are not implemented in this iteration for the Survey System, but are supported by the database.

The ERD shown in Fig 8 shows the Basic Schema of the database.

Being a DotNetNuke based system; there is some dependence of the Survey system tables on the framework information. Example: PortalID, UserID, etc are inherited from the DNN Architecture.

The main entities in the Survey System are:

- tblSurvey
- tblQuestion
- tblPage
- tblStem
- tblOption
- tblStatus
- tblSurveyResponse

The tblSurvey table holds information about the survey. This includes author and creation information, Settings information and some statistical information that can be updated in real-time.

The tblQuestion entity is the primary construct of all components making up a survey. This table holds information to the question identity and its association with a page within a survey. Depending upon the type of

the component, it is rendered at runtime by various engines.

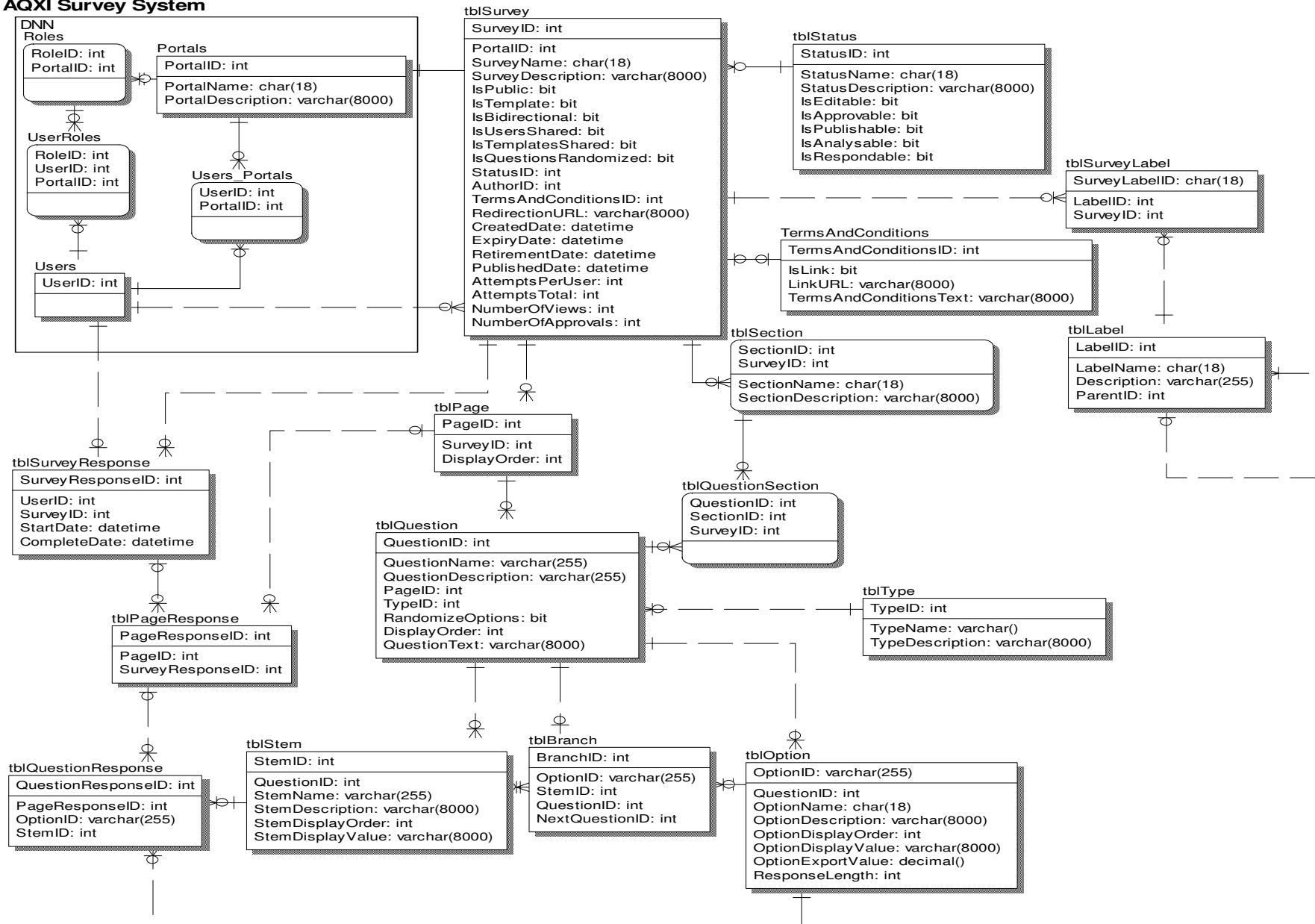
The `tblPage` table stores information about questions appearing on a page of any given survey. It also stores the display order of each component for runtime rendering.

The `tblStem` table associates individual stems with questions. A question may contain more than one stem in the case of a Likert matrix.

The `tblOption` table stores information about various options a user may select in responding to a question. It also stores information not currently used, e.g. Display Order for answer randomization, Option Value for weighted options and Option Export Value for post analysis.

The `tblStatus` table holds information regarding the state of the survey. It is used by every function set to determine if the Survey is in the appropriate state to execute the said functions. Workflow control for the survey is enabled through this table.

The `tblSurveyResponse` table actually stores the responses by a particular user to a survey. It also logs information on the start and end of a response session to enable measurement of length for a survey in terms of time units. These features are considerations for future iterations.

AQXI Survey System**Fig 8: Online Survey Management System ERD**

5. Implementation

In the implementation phase, the database was first implemented as a common factor across all developers. Scoping and estimation was done for each module to be developed, and based on these estimates a plan was scheduled for implementation.

The schedule for implementation was tightly packed as delays in the Design phase meant limited time available for implementation of the System.

5.1. Development in DNN

Development in DNN follows a standard convention. The standard project structure is as follows:

- **Controls**
 - User Control (ascx)
 - Code Behind File (ascx.vb)
- **Components**
 - Controller
 - Info
 - Data Provider
- **Providers**
 - SQL Data Provider

The controls include all user controls (ascx files) created to be displayed in a web browser. They can use any of the ASP Web Control components. Each ascx file has its own Code Behind file that it is referenced to (filename.ascx.vb). This file may be written in either VB or C#. This file uses instances of the Controller and Info classes for all data manipulation and retrieval.

The components of the project include a Controller Class, Info Class, and a Data Provider Interface. The Info class uses an implementation of the Data Provider Interface to populate and encapsulate data in the database, and make it available as an object for use with control code. The Controller class typically contains methods to instantiate and manipulates instances of the Info Class. The Data Provider Interface is a definition of methods required by the Info class to access data from the database.

Providers may include Data, Security, Cryptography or providers of any other type. Most commonly used is the SQL Data Provider which implements the Data Provider Interface. It has all the methods to access the database stored procedures and return data to the calling Info class.

5.2. Create Survey:

I was initially assigned the “Create Survey as a Portal” or simply “Create Survey” Module. This module was essential to the system as it set up the actual environment required for the survey. It was to achieve the following tasks:

- Create a New DotNetNuke Portal with alias, description and default administrator.
- Add content to this new portal based on the survey template.
- Add the roles of the survey system into this DNN Portal so that users may be assigned to the various roles.
- Allow functionality to add users from the base portal to be added into the Editor and Moderator roles of this new Portal.
- Update the Survey table with a new survey instance, with PortalID corresponding to this portal.
- Redirect the user to this new portal

A Screenshot of this Module is shown in Appendix 4.

About DNN Portals:

DotNetNuke has been developed to provide support for multiple portals/sites using a single database. This allows the software to be installed on a web server and support multiple websites through a single hosting account. This is ideal for administrators who wish to provide sub-hosting services to their membership, or for companies who wish to have unique websites created for each department.

Due to DNN's support for multiple portals, the designation between Host and Administrator is important.

Logging in to a DNN site as Host allows the user to manage settings related to site hosting and e-commerce, including; the monthly hosting fee; hosting disk space; and demo period/expiry date. The Host has access to a list of all hosted portals, their individual hosting information, and has the ability to edit, modify, or delete a specific portal.

Logging in to a DNN site as Administrator allows the user to manage settings related to their own individual portal. The Administrator may edit, modify, or delete settings specific to their own portal/site, but has no access to other DNN portals operating under the same host.

Essentially, DNN uses asp net classes to allocate a unique application ID to every Portal created in it. This in essence allows the running of multiple ASP.NET applications under the single framework install. However due to this arrangement, the membership provider too allocates user memberships based on Application ID rather than Portal ID. This means that identical user profiles can exist in multiple portals, on a single DNN install and belong to completely different users. This is advantageous when it comes to using the framework to provide hosting solutions, but can raise serious issues when developing a multi application (Multi Portal) System like the Survey System.

Development:

The implementation of this module used standard DNN Controllers and Info Classes to manipulate values in the DNN Database, as well as the implemented Controller and Info Classes for the Survey System project. Using the Portal Controllers from DNN achieved some functions, but also created some issues. Basically it was not possible to create an instance of a portal (New Survey) without creating a New Application and therefore a new user domain. This caused complications for users already existent in the system like Editors and Moderators, who needed to interact with multiple portals (applications) using the same user profile.

One suggested solution to this problem, was to create duplicate memberships for the in each of the Portals they worked in, and create a custom Profile Management module to ensure consistent updating of the user profile across all applications.

5.3. User Profile Manager

The User Profile Manager was prototyped to compliment the Create Survey as a Portal Module. The purpose of this module is to update the user profile stored in the membership provider tables, across all portals where the user exists. This was to be used only in relation to the Survey System where the requirement for user access across multiple user domains exists.

A screenshot of this module is included in Appendix 4.

This Module achieves the following:

- Allow changing of user details across all Portals where the user exists in a single DNN Install.
- Allow updating password for a user across all Portals where the user exists in a single DNN install.

When the aforementioned Modules were demonstrated to the company, the issue of user domain was taken seriously. According to design principles it was not intuitive to allow multiple profiles to exist for a single user. Ideally a single user record should be provided to exist across the entire system. This seemed impossible to implement using the current framework. Alternative suggestions included changing the framework code; decoupling the membership provider, using an alternate framework (Later version of DNN) or using 3rd party solution packs to replace part of the framework thus making it possible to share users across portals.

The solution decided on finally was a slight change in assumption of the system. Instead of creating a multi portal (hence multi application) system, a single application variant could be produced with a similar feature set, using the same technology, and achieving largely the same goals. Basically instead of having a single survey within a portal, we could now have multiple surveys within a single portal. This decision was established by project management at AQXI and rescaling of the system according to new assumptions and the latest time frame was done by them. In the end, the create survey functionality was reduced to a minimal user control with a simple form to input name description and expiry date of a survey, and this would update only the Survey table within the survey system.

In light of the new requirements, the Create Survey and User Profile manager was not to be included in the final system. The Commenting System and the Approval system were assigned to me for development.

5.4. Comments

The comments module was intended to be a value add feature onto the Survey System. The functionality of the comments subsystem was considered generic enough to bring value to any other system as well. The intent for this sub system was to develop a module that could be plugged into not just the Survey System, but any other system running on a similar framework and architecture. A screenshot of this module is given in Appendix 4.

The comment Module achieves the following:

- View all comments posted on a survey.
- Create a new Comments thread.
- Reply to a particular Comments thread.
- View detail about a particular comment.

The comments module, being potentially independent from the remaining System, implements its own database Table. The Comments table has the following fields:

- Item ID
- Portal ID
- Module ID
- Title
- Created Date
- Body
- Display Order
- Created By User

The Display Order stores information on the thread which the comment belongs to, as well as the depth of the comment. The Module also has its own set of Stored Procedures to GET, SET, UPDATE, GET TOP LEVEL MESSAGES, GET BY PARENT and GET THREAD.

5.5. Approval

The approval module deals with the state changes for the survey. It allows the Moderator to approve a survey for publishing, thus allowing access to the Publishing and Analysis features to the Editor and Analyst. A screenshot of this module is included in Appendix 4.

This Module uses business objects common to the main Survey System Project. It therefore references the dll of the Main Survey System and does not implement its own controller and Info classes. It needs all standard stored procedures for get, update, add, and delete to be implemented for proper functioning. During testing, each of these procedures needed to be implemented to allow functions to run normally.

For all implemented modules, a Settings control was included to allow for alteration of runtime parameters for the module. Some of these include:

- Display Width and Height for the module
- User Roles in the system to be considered as a specific role for the module.
- Virtual Path of Images in the Module.

6. Implementation Issues

Although the project was considered to have a high risk of cancellation by the company when the flaw in initial assumption was identified with the prototyping of the Create Survey Module, the project re-factoring and reduced scope allowed it to continue with development and allowed for the implementation of most functionality of the system from the original specification.

Some design flaws were identified into the implementation phase, where Specification and Design documents were inconsistent, had variations, or had simply insufficient clarity to develop a clear function. These incidents were few in number and resolved as they were encountered by clarifications with the project manager on the actual requirements for System functionality.

7. Post Production

Post production of this developed code involves writing Test cases for each module based on the specification and testing functionality manually, to ensure it matches the original specification. User documentation on How to Use the system or each part thereof is to be developed in an easily readable format with limited technical language so that any user of the system may be able to Install, Use, Modify Settings and Remove the component as required.

Deployment of these modules involves packaging of the compiled code libraries, User controls, images and any other resources (images etc) into a single Zip file with an XML based script with unpacking instructions for deploying the module within an install of DNN. The package, referred to as a Private Assembly, includes SQL Code to set up the tables and stored procedures used by the particular module. This SQL code is run during uploading of the module to a DNN install.

8. Overall Assessment

8.1. Deliverables

In Assessing the project overall, the following deliverables were completed:

- Technology Training
- Market research
- Market Validation
- Requirements Gathering
- Requirements Specification
- State Analysis
- Screen Flow Design
- Screen Layout Design
- Database Design
- Design Validation
- Database Implementation
- Specification of Individual modules & Sub Systems
- Implementation of Specified Modules

8.2. Comparison with Original Goals

Compared to the original goals of the project at least 9 of the original 12 goals have been completed successfully. The process of Surveying and the requirements of such a process were analyzed and identified. The Technology to be used was understood to good granularity by all individuals in the team. The end user was involved in the specification process and we believe the requirements were captured successfully. A competitive evaluation helped assess a clear vision for the product and establish a clear indication of market position and competition. A detailed System Scope was defined and designed. A system prototype was implemented and achieved at code level to demonstrate and resolve issues with the design.

The goals not achieved in this iteration of the system were testing and evaluating the developed system with end user feedback, and reiteration of the project process to fix flaws in the product.

8.3. Future Work

The requirements to be completed, before the system is released for commercial use are thorough testing of the system, Repairs in code, User acceptance testing and Deployment of the developed system onto a Web Server.

9. Conclusion

In conclusion, the project has demonstrated successfully the viability of an Online Survey System as a developable commercial product. Research, Specification, Designs and Implementation were done to Industry standard. The designed system is modular and flexible and can be combined with other systems already deployed or still to be developed.

The project has been completed with minor delays in the specification and design phases and needed to be scoped down slightly in the implementation phases with the interns doing part of the development and the company applying other resources to take the system to completion for all features in the future.

9.1. Learning

I believe this project has greatly assisted my learning and provided valuable work experience. My skills in ASP.NET, VB.NET, SQL Databases as well as best practice Engineering and Business Process Modeling have improved. I now have an increased appreciation for using Software Engineering concepts and tested methodologies. I also gained valuable insight into the working of an Information Technology based organization and improved team work and communication skills.

Projects of such scale also provide several intangible benefits and lessons in terms of organization, time management, team work, coordination, motivation and leadership, which is essential in working with a project team in IT or otherwise.

7. References

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8. Confidentiality Statement

The information supplied in this report is the property of Nischint Java and AQXI Software Limited and may only be used for its intended purpose. It has not been approved by AQXI or Nischint Java for public distribution and remains confidential to Nischint Java, the BTech 450 supervisors and AQXI Software staff.

Appendix 1: Comparison of Available Online Survey Management Systems.

	Prezza Technologies (http://www.prezzatech.com)	Qualtric Labs (http://www.qualtrics.com/)	Web Surveyor (http://www.websurveyor.com)	Perseus SurveySolutions (http://www.perseus.com)	Net Reflector (http://www.instantsurvey.com)
Dynamic branching	✓	✓	✓	✓	✓
Survey completion reward schemes.	✗	✗	✗	✗	✗
Validations	?	?	✓	✓	?
Access control for respondents (Embedded Identifier link)	✓	✓	✓	✓	?
Single survey response per user.	✓	✓	✓	✓	✓
Survey Preview	✓	✓	✓	✓	?
Survey statistics page	✓	✓	✓	✓	?
Question limits (sample limiting)	✓	✓	✓	✗	✗
Quota reached messages	✗	✓	✓	✗	✗
Email Invitations	✓	✓	✓	✓	✓
Survey Response URL	✓	✓	✓	✗	✓
question type	✓	✓	✓	✓	✓
Number of questions per page.	✓	✓ Limited	✓	✓	✓
Branched / Skip patterns for questions.	✓	✓	✓	✓	✓
Directional flow control	✓	✓	✗	✗	?
Email reminders	✓	✓	✓	✓	✗
Email Survey?	✓	✗	✗	✗	✓ Limited
Question and Answer Randomization	✓	✓	✗	✓	✓
Weighted responses	✗	✓	✗	✗	?
Weighted respondents	✗	✗	✗	✗	?
Media (Audio/Video) based questions	✗	✓	✗ ?	✓	✓

Streamline load speed.	?	?	?	?	?
Editable live surveys	✗	✓ Limited	✓	✗	✗
Trigger notification for particulars surveys. (early warning system)	✗	✓	✗	✗	✗
Printable surveys	✗	✗	✗	✓	✗
Manual management of email reminders and messages.	✓	✓	✓	✓	✓
Virtual Address for survey responses.	✓	✗	✓	✗	?
Respondent qualifying.	✗	✓	✗	✓	✗
How-to section	✓	✓	✗	✗	✓
Best practice documents	✗	✗	✗	✗	?
Survey templates	✓	✓	✓	✓	✓
Sample questions; question library	✓	✓	✓	✓	?
Progress Bar	✓	✗	✗	✗	✗
Save and Continue	✓	✓	✓	✓	✗
Wizard based survey creation	?	✓	✓	✓	✗
View and click through tracking.	?	✗	✓	✗	✗
Tracking save and continue.	✗	✗	✓	✗	✗
Personalized costing	✗	✓	✗	✗	✗
Personalized reporting	✓	✓	✓	✓	✓
Authentication	✓	✓	✓	✓	✓
Password protected survey, for respondents.	✓	✓	✓	✓	?
HTTPS	✓	✓	✓	✓	✗

Appendix 2: Identified functionality for Survey System (Long Term).

Process	Iteration 1	Iteration 2	Iteration 3	Iteration 4
Access Control	• Authentication • HTTPS		• Virtual Addresses for Survey Responses • Email Invites	• Question Limits • Personalized costing • Reward Schemes
Survey Creation / Editing/ deleting	• Ease of Use (UI) • Progress Indicator • Defining no of Questions per page • Dynamic Branching Foundation • Foundation for Live Editable surveys • Foundation for Survey Templates • Survey Preview • Simple Question Types ○ Check Box ○ Radio Button ○ Combo Select ○ Text Area • Complex Question Type ○ Likert ○ Matrix	• Directional Flow control • Company Customizable look and feel.	• Wizard Based Survey Creation • Dynamic Branching • Dynamic Branch / Skip Declaration (UI)	• Sample questions(Question Library) • Editable Live Surveys
Moderation		○ Comments on Surveys	○ Survey Approval ○ Survey Disapproval	
Respondent Management	• Survey Response URL • Password protected Surveys • Access Control for respondents		• Manual management of reminders and messages • Email reminders • Respondent Qualifying	• Weighted respondents • OCR • Printable Surveys • Streamlined load speed • Media based questions (Audio / Video)
Response Collection	• Quota Reached Messages • Single Survey response per user	• Save and Continue	• Question Randomization • Answer randomization	• Email Survey? • Weighted Responses
Response Analysis	• Survey statistics	• Online Analysis	• Personalized Reporting	• Tracking Save and Continue • Trigger Notification for particular surveys • View and click through tracking
Data Extraction	• CSV	• SPSS	• Excel	• SAS • Data Transformation • Recoding Ability.

Appendix 3: Identified Features And Roles Required For The Current Iteration Of The Survey System.

Page:	Roles Affected:	Features of Role:
Access Control Page.	- Survey Owner. - Survey Admin.	- Survey Admin: - Assign Survey Creators. - Assign Survey Moderators. - Assign Survey Respondent Managers. - Assign Survey Response Analysts. - Assign Survey Reporting Analysts. - Assign Survey Respondents. “Unassign” all of the above. - Survey Owner: - Assign Survey Admins. - Assign Survey Creators. - Assign Survey Moderators. - Assign Survey Respondent Managers. - Assign Survey Response Analysts. - Assign Survey Reporting Analysts. - Assign Survey Respondents. “Unassign” all of the above.
Survey Creation/ Editing.	Survey Editor.	- Survey Creator: - Create Category. - Create Survey. - Create Question - Choose question type. - Choose answer type (related to question type). - Edit Survey. - Delete Survey.
Survey Moderation.	Survey Moderator.	- Survey Moderator: - Create Comment. - Edit Comment. - Delete Comment. - Assign comment to Survey. - Assign comment to Question.
Respondent Management.	Survey Admin.	- Respondent Manager: - Add Respondent (new). - Invite Respondent (existing). - Remove Respondent. - Remind Respondent. - Invite Anonymous Respondent.

		○ Publish Anonymous Link.
		• Respondent Types: ○ In-System: ▪ Known (has Uname and Upassword, and we can say who filled out what) ▪ Anonymous (has Uname and Upassword, but cannot track who filled what) ○ Out-System: ▪ Known (Like from a mailing list.) ▪ Anonymous (All the rest of Respondents from the net.)
Response Analysis	• Survey Admin.	• Response Analyst ○ View basic tables. ○ View basic graphs: ▪ Bar (useful for Volume) ▪ Pie (useful for proportions) ▪ Line (useful for trends) ○ All of the above Views are formulated on a per question basis.
Extraction	• Survey Admin.	• Reporting Analyst ○ Extract raw data in formats: ▪ C.S.V. ▪ Microsoft Excel ○ Assumes end user has access to Office applications.
Response	• Survey Respondent	• Survey respondent: • Answer (View access) Surveys. • Save and Continue (if applicable). • Log In/Out of Survey. • Reset Password to access Survey.

Appendix 4: AQXI Online Survey Management System Screen Designs

View All Surveys

The screenshot shows the 'View All Surveys' page of the AQXI Online Survey Management System. The page is displayed in Microsoft Internet Explorer. The header features the AQXI logo and the text 'survey system'. The main heading is 'View All Surveys'. Below the heading, there is a pagination bar showing 'Showing: 41 to 50' and a set of navigation links: '< < 1 2 3 4 5 6 7 8 > >|'. To the right of the pagination bar, there is a 'Sort by' dropdown menu with options: 'name', 'status', 'date of creation', and 'creator'. The page lists three surveys:

Date	Survey Name	Description	Status	Created by	Views	Responses	Response Rate
31/06/05	HR SURVEY	A survey of all staff in our Auckland office for the purposes of planning parking facilities and the correct provision of public transport facilities in the area in and around the office. Access to water coolers in the area will also be surveyed for the purposes of surveying such information.	Ready	John Jones	10	5	50%
05/08/04	PIE SURVEY	A survey of the general public on Queen St, Auckland City about people's favourite pies.	Approved	Harold Pinter	26	23	90%
23/05/05	ZOO SURVEY	A survey about AQXI Ltd, favourite zoo animals.		Bob Doran	10	5	50%

A tooltip 'Click to enter survey options' is visible over the 'HR SURVEY' entry.

Create Survey

Microsoft Internet Explorer

AQXI survey system

Create Survey

Survey Name: Survey Alias:

Expiry Date:

Keywords (comma separated):

Portal Description:

Survey Description:

Assign Editor(s) (Required):

Unassigned Users		Assigned Users:
Joe Jones	>>	Smythe
Stacey Smith	>	ry Marks
Matthew Marks	<	e Johnston
Rebecca Mary	<<	

Assign Moderator(s) (Optional):

Unassigned Users		Assigned Users:
Joe Jones	>>	Smythe
Stacey Smith	>	ry Marks
Matthew Marks	<	e Johnston
Rebecca Mary	<<	

Create New Survey

Personalized Profile Manager

 survey system

Home

Register

***Note:** All fields marked with an asterisk (*) are required.

 First Name:	Administrator	*	 Street:		☐
 Last Name:	Account	*	 Unit #:		
 User Name:	admin		 City:		☐
 Email Address:	admin@localhost	*	 Country:	<Not Specified>	☐
 Website:			 Region:		☐
 Instant Messenger ID:			 Postal Code:		☐
			 Telephone:		☐
			 Cell:		☐
			 Fax:		☐

Preferences

 Preferred Language:	English (United States)
 Time Zone:	(UTC -08:00) Pacific Time (US & Canada); Tijuana

Change Password

 Old Password:		*
 New Password:		*
 Confirm New Password:		*

[Update Password](#)

Membership Services

[Update](#) [Cancel](#) [Unregister](#)

Copyright 2005-2006 © AQXI Creative Software

Main Edit Interface

Microsoft Internet Explorer

AQXI survey system

Show All Surveys > Create New Surveys > Edit Survey Back

John Paynter (Editor, Analyst)

Edit Survey | Comments | Publish | Analysis | Data Export | User Management

Multiple Select Question

Question: 2 of 52

Insert After: Question 1

Add Multiple Select Question

Bob Loblaw loves his law blog. Where would one care that this decision is here? Tick the relevant options.

abc

Options:

Nod your head.

1,2,3

In my decision making committee
When discussing his schedule wit
In his personal transportation me
When learning about relevant opt
When the sound of the decision

Add Option Remove Option

Apply Changes

Cancel Delete

Click to Apply Changes

HR Survey (Draft)

[Terms & Conditions](#)

1. If in perpetuity one must come to a decision about pending matters one would?

☒ Contact the local decision making body. ☐ Decide to decide later.
☐ Form a committee to make the decision. ☐ Make the motion to postpone the decision.

2. Bob Loblaw loves his law blog. Where would one care that this decision is here? Tick the relevant options.

☒ In my decision making committee.
☒ When discussing his schedule with his decision making committee
☒ In his personal transportation mechanism.
☒ When learning about relevant options for the appropriate decision making flow scheme.
☒ When the sound of the decision making process is heard by one who is interested in such matters.

3. Rank the importance of checking the carpet every hour

☐ Not important ☐ Important

4. Discuss the procedures in your department of forming the committee responsible for carpet and surface condition monitoring.

1. Contact a governing body.
2. Stigmatize the governing committee's opportunities to critically evaluate alternatives and provide selections of moneys in part or full for from a selection of money sources.

[Edit](#) [Edit Properties](#) [Edit](#) [Edit](#)

Page: < 1 2 3 4 5 6 7 8 9 10 11 12 > Preview Go To 1 of 12

Changes Applied

Some Toolboxes

Multiple Select Question

☒ Question: 2 of 52

Insert After: Question 1

Stem:

Bob Loblaw loves his law blog.
Where would one care that this decision is here? Tick the relevant options.

abc

Options:

Nod your head.

In my decision making committee
When discussing his schedule wit
In his personal transportation me
When learning about relevant opt
When the sound of the decision

1,2,3

x

[Add Option](#) [Remove Option](#)

☐ Enable Free Text Option

Label: Other:

Max. Chars: 32

[Apply Changes](#)

Cancel Delete

Single Select Question

☒ Question: 1 of 52

Insert After: Beginning

Stem:

If in perpetuity one must come to a decision about pending matters one would?

abc

Options:

Nod your head again.

Contact the local decision making
Decide to decide later.
Form a committee to make the d
Make the motion to postpone the

1,2,3

x

[Add Option](#) [Remove Option](#)

☐ Enable Free Text Option

Label: Other:

Max. Chars: 32

[Apply Changes](#)

Cancel Delete

Some Settings Toolboxes













Section Management

Section List

- Intro (Q1-Q6)
- Basic Info (Q7-Q12)
- Eating Habits (Q13)
- Drinking Habits (Q14-Q23)

Start:

End:

Display Text

Conclusion: Congratulations! You have reached the final questions of our survey. The last three questions will ask you about your preferred

[Add Section](#) Change

[Remove Section](#)

[Apply Changes](#)

[Cancel](#)

Page Management

Page List:

- 1. Q1-Q2
- 2. Q3-Q20
- 3. Q21-Q22

Start: Question 23

End: Question 51

[Add Page](#) Change

[Remove Page](#)

Apply Changes

Cancel

Terms & Conditions

Terms & Conditions Text:

Terms and Condtions

One must read the following passage to fully understand the full consequences of the actions contained within and in perpetuity. Those residing within the immediate and distant area commonly known as Auckland shall furnish the surveyor with information including but not limited to their name as contained within formal legal documents such as a certification of birth. We wll, in our area of responsibility will not furnish other parties, not including our own with information including but not limited to personal details provided in confidence

abc

1,2,3

X

HTML

☐ Text
☒ HTML
☐ Raw

☒ Display link on survey

Apply Changes

Cancel

Comments Overview Toolbox

Microsoft Internet Explorer

AQXI survey system

Back | Home

Tom Jones (Moderator)

Comments

Comments Overview

- Survey, from Administrator Account, posted 7/6/2006 12:29 PM
- Re: Survey, from Administrator Account, posted 7/6/2006 12:30 PM
- Re: Survey, from Administrator Account, posted 7/6/2006 12:51 PM
- Question 5 & 6, from Administrator Account, Survey, from Administrator Account, posted 7/6/2006 12:29 PM

New Thread

HR Survey (Ready)

[Terms & Conditions](#)

1. If in perpetuity one must come to a decision about pending matters one would?

☐ Contact the local decision making body. ☐ Decide to decide later.

☐ Form a committee to make the decision. ☐ Make the motion to postpone the decision.

2. Bob Loblaw loves his law blog. Where would one care that this decision is here? Tick the relevant options.

☒ In my decision making committee.

☒ When discussing his schedule with his decision making committee

☒ In his personal transportation mechanism.

☒ When learning about relevant options for the appropriate decision making flow scheme.

☒ When the sound of the decision making process is heard by one who is interested in such matters.

3. Rank the importance of checking the carpet every hour

☐ ☐ ☐ ☐ ☐ ☐

Not important Important

4. Discuss the procedures in your department of forming the committee responsible for carpet and surface condition monitoring.

1. Contact a governing body.

2. Stigmatize the governing committee's opportunities to critically evaluate alternatives and provide selections of moneys in part or full for from a selection of money sources.

Comment Posted

Lock Survey Toolbox

**Lock Survey**

Current Survey:
Auckland HR Survey

Survey Editor:
Sam Johnson

Creation Date:
10/08/2004

Portal Description:
Survey of employees in the Auckland area for purposes of planning parking and office spaces...

Survey Description:
This survey should only target HR departments for shipping factories across Auckland from Albany to Howick.

☒ Ready For Approval
☐ Approved For Publishing

Apply Changes
Cancel

HR Survey (Ready)

[Terms & Conditions](#)

1. If in perpetuity one must come to a decision about pending matters one would?

☒ Contact the local decision making body. ☒ Decide to decide later.
☒ Form a committee to make the decision. ☒ Make the motion to postpone the decision.

2. Bob Loblaw loves his law blog. Where would one care that this decision is here? Tick the relevant options.

☒ In my decision making committee.
☒ When discussing his schedule with his decision making committee
☒ In his personal transportation mechanism.
☒ When learning about relevant options for the appropriate decision making flow scheme.
☒ When the sound of the decision making process is heard by one who is interested in such matters.

3. Rank the importance of checking the carpet every hour

☒ ☒ ☒ ☒ ☒ ☒

Not important Important

4. Discuss the procedures in your department of forming the committee responsible for carpet and surface condition monitoring.

1. Contact a governing body.
2. Stigmatize the governing committee's opportunities to critically evaluate alternatives and provide selections of moneys in part or full for from a selection of money sources.

Survey Response

Microsoft Internet Explorer

HR Survey

[Terms and Coniditions](#)

Welcome to the XYZ Inc Human Resources Survey! If you have any questions please contact Sue on x4342

1. If in perpetuity one must come to a decision about pending matters one would?

☐ Contact the local decision making body.

☐ Form a committee to make the decision.

☐ Make the motion to postpone the decision.

2. Bob Loblaw loves his law blog. Where would one care that this decision is here? Tick the relevant options.

☒ In my decision making committee.

☒ When discussing his schedule with his decision making committe

☒ In his personal transportation mechanism.

☒ When learning about relevant options for the appropriate decision making flow scheme.

☒ When the sound of the decision making process is heard by one who is interested in such matters.

3. Rank the importance of checking the carpet every hour

☐ ☐ ☐ ☐ ☐ ☐

Not important Important

4. Discuss the procedures in your department of forming the committee responsible for carpet and surface condition monitoring.

1. Contact a governing body.

2. Stigmatize the governing committee's opportunities to critically evaluate alternatives and provide selections of moneys in part or full for from a selection of money sources.

Consider the following

	Not important					Important
Importance of Parking	☐	☐	☐	☐	☐	☐
Importance of Public Transport	☐	☐	☐	☐	☐	☐

Back

Page 1 of 3

Next

Publish Survey

Microsoft Internet Explorer

AQXI survey system

Back | Home

Sam Johnson (Editor)

Edit Survey | Comments | **Publish** | Analysis | Data Export | User Management

Publish Survey

Survey Name:
Auckland HR Survey

Expiry Date:
10/08/2004

Editor:
Sam Johnson

Portal Description:
Survey of employees in the Auckland area for purposes of planning parking and office spaces...

Survey Description:
This survey should only target HR departments for shipping factories across Auckland from Albany to Howick.

Publish As Public Survey
Publish As Private Survey

1. Select "Publish Survey" button to generate a public URI link for survey respondents.

Publish Survey Cancel

2. Your survey has been published and can be accessed from the following link:
<http://server/xyz/abc/1234> *Publish As Public Survey*

1. Add the desired respondents from the "Unassigned Users" to the "Assigned Users" list and select "Publish Survey" button to generate private URI links for survey respondents. *Publish As Private Survey*

Respondent Management for: Survey System Respondents

Unassigned Users:

Joe Jones
Stacey Smith
Matthew Marks
Rebecca Mary

Assigned Users:

Jo Smythe
Mary Marks
Jane Johnston

Add To Assigned Users

Publish Survey Cancel

2. Your survey has been published and can be accessed from the following links:

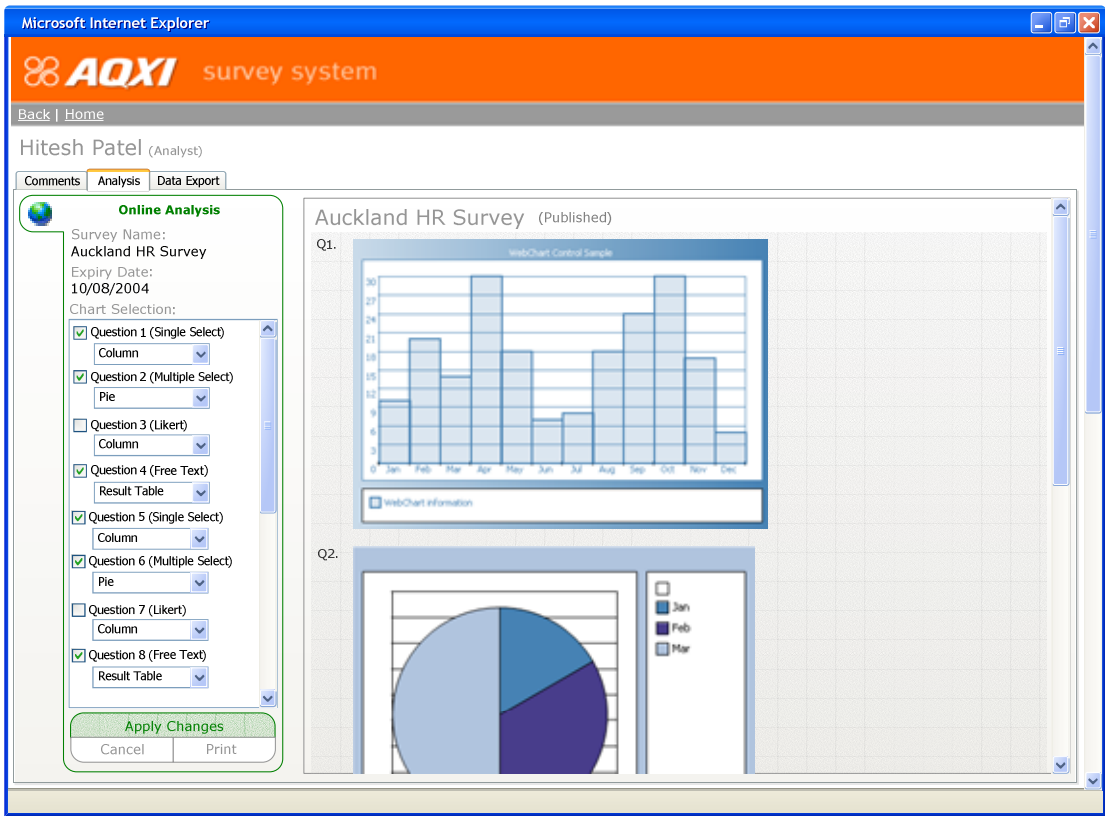
User	URL
jrbd	http://www/a/b/c
rewardsf	http://www/b/c/d

< 1 2 3 4 5 >

Export To CSV

Survey Published

Online Analysis



Data Export

Microsoft Internet Explorer

 survey system

Back | Home

Hitesh Patel (Analyst)

Comments

Analysis

Data Export



Data Export

Survey Name:
Auckland HR Survey

Expiry Date:
10/08/2004

Export Questions:

☒ Question 1 (Single Select)

☒ Question 2 (Multiple Select)

☐ Question 3 (Likert)

☒ Question 4 (Free Text)

☒ Question 5 (Single Select)

☒ Question 6 (Multiple Select)

☐ Question 7 (Likert)

☒ Question 8 (Free Text)

Export As:

Raw

Raw

Totals

Export Format:

CSV - SPSS

CSV - Excel

CSV - SPSS

Apply Changes

Cancel

Auckland HR Survey (Retired)

Exporting Questions:

1, 2, 4, 5, 6, 8

Exporting As:

Raw

Exporting In Format:

CSV - SPSS

Export Data

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Appendix 5: AQXI Online Survey Management System Software Requirement Specification



Online Survey Management System

Software Requirements Specification Document

Iteration 2.0

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1. Introduction

Welcome to the second iteration of the Survey System project. The purpose of this project is to develop an Online Survey Management System that would support the generic workflow of publishing surveys online. This project will be developed by AQXI Limited in conjunction with students from the University of Auckland doing an internship in this company.

In the long term this project aims to produce a system to be used widely throughout the University to collect survey based data online and be able to analyse them. This system will be developed so that it provides a flexible architecture that would be easily integrated with existing packages. It will also provide extensible statistics and report functionalities on the responses gathered with different surveys.

The system that we are presenting in this document therefore aims to easily design and publish surveys in order to collect large and accurate data from the different respondents. By providing a flexible variety of types as well as template libraries for the different components of a survey, this system could also be used for marketing research methodologies.

This Software Requirements Specification document describes the functional and non-functional requirements for such a Survey System. We will describe the interaction between the roles of users of the system and the policies which govern the process of survey creation, survey moderation, survey response and extraction of relevant data.

2. Document Description

2.1. Purpose of this document

- To specify the requirements for the Online Survey Management System.
- To specify and describe the various features and functions of this system.
- To outline and confirm the scope and objectives proposed for this system.
- To obtain feedback from AQXI Limited to avoid misunderstandings.
- To obtain approval from AQXI Limited to start development of the system.

2.2. Definitions, acronyms and abbreviations

- Survey: a collection of sections and questions on a particular subject.
- Section: a collection of questions associated to a particular survey.
- Question: a question consists of one or more stems and options.
- Stem: a stem is the text preceding the options in a question.
- Option: an option is a possible value to answer a question.
- Response: actual answer from a respondent to a certain question.
- Public Surveys: online surveys available to any unauthenticated users.
- Private Surveys: online surveys available only to authenticated users.

2.3. References

- IEEE Standard 830-1993: Software Requirements Specification Standard.
- AQXI Standard SRS-2006: Software Requirements Specification Standard.

2.4. Document History

Date	Author	Change
17 May 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	First Draft of the Document.
20 May 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	Second Draft of the Document
23 May 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	Third Draft of the Document
25 May 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	First Submission of Document
11 June 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	Second Submission of Document
22 June 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	First Version of Document
28 June 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	First Revision of Document
30 June 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	Second Revision of Document

03 July 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	Third Revision of Document
05 July 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	Fourth Revision of Document
10 July 2006	Nischint Java	Second Version of Document
11 July 2006	Michelle Wu, Phil Hu, Sam Johnson, Hitesh Patel, Nischint Java	Third Version of Document
12 July 2006	Alex Dunayev	Changes to formatting and review
12 July 2006	Nischint Java	Updates according to review.
13 July 2006	Phil Hu, Hitesh Patel, Nischint Java	Changes to Question management, Moderation, and new Commenting system.
14 July 2006	Nischint Java	Changes to System Schematic Diagram, Constraints, and Product Road map.

2.5. Overview

This Software Requirements and Specification document describes the requirements for the Online Survey Management System to be developed by AQXI Limited.

Functional and non-functional requirement specifications, scope and objectives for this system are discussed in more detail later on in the document according to the agreements with AQXI Limited.

3. Product Description

3.1. Scope of this product

- Present the ability to manage and control access for the users of the system.
- Present the ability to administrate the general features of the system.
- Present the ability to create and manage multiple surveys online.
- Present basic survey moderation capabilities for surveys created in the system.
- Present extensive respondent management capabilities for published surveys.
- Present extensive responding capabilities to allow response to published surveys.
- Present the ability to analyse responses of surveys in basic views, including tables and charts.
- Present basic survey data extraction capabilities in raw data formats for download.

3.2. Product Perspectives

Ensure that the system provides a quality Online Survey Management System which facilitates the development of creating, editing and publishing surveys. It provides basic moderation capabilities for surveys created in the system, using a Moderator assigned to a survey, who must approve the survey for publishing or comment and provide feedback to the Editor. The system also enables the survey Editors to manage producing surveys as well as basic response analysis and extraction of data based on the results of surveys. The Editor may choose to view online reports of the survey statistics, or export them to analyse data with statistical or presentation software. The Editor may also assign other Editors or Analysts to their survey to assist with aspects of the survey.

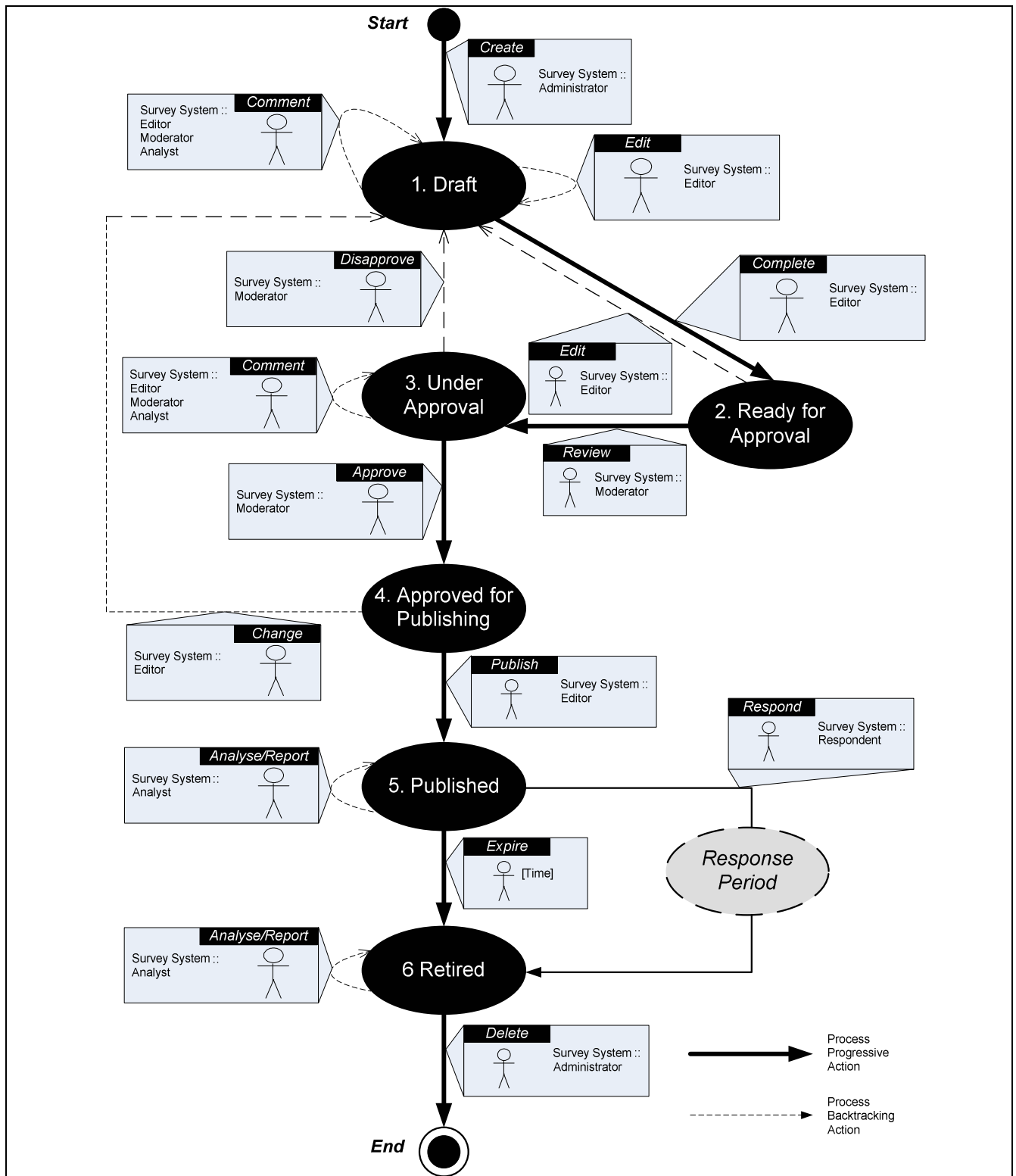


Figure 1: Lifecycle of a Survey

3.3. Product Limits

- Only online surveys systems are considered in this system.
- The survey response data is independent of system data.

3.4. Assumptions and Dependencies

- Unauthenticated users have access only to public surveys.
- Authenticated users have access to public and private surveys.
- Authenticated users are responsible for keeping their personal details up to date.
- Respondents have the required skill to attempt surveys.
- The Survey Administrator or Editor will provide and manage the respondents suitable to a survey.
- The access of Administrators, Editors, Analysts, Moderators, and Respondents is assigned by the Administrators, to users associated with a survey.
- The access of additional Editors or Analysts, as well as respondents may also be managed by the survey Editor.

3.5. User Characteristics

Hosts:

This group of users will have access to every part of the system. They are also responsible for maintaining the survey system. This group of people will be able to assign administrators of the system.

Administrators:

This group of users will have maximum authority in the system with regards to managing and maintaining surveys. They can grant access to Editors, Moderators, Analysts and Respondents. Administrators have the rights of Editors, Moderators, Analysts and Respondents.

Editors:

This group of users will have access to edit, retire, analyse and publish surveys. Editors will have rights to add, invite, remove and remind respondent in the system. They are able to invite anonymous respondent and publish anonymous links to the survey as well.

Moderators:

This group of users will be assigned by Administrators; they have access to review surveys. Moderators also have authorities to write, edit and delete comments on surveys which they have reviewed, as well as approve surveys for publishing.

Analysts:

This group of users will have permissions to generate reports, such as survey statistics and online analysis. The report is based on completed surveys. This group of users

will also have access to extract raw data containing responses for each question for each respondent in CSV format.

Respondents:

This group of users will be people who have been invited to respond to surveys.

3.6. List of Features

Section 4 of this document describes all the features of this Survey System group by sub-systems based on the different users that can access these features. Generally each user has one or more user characteristics, or roles, and can therefore access to one or more sub-systems.

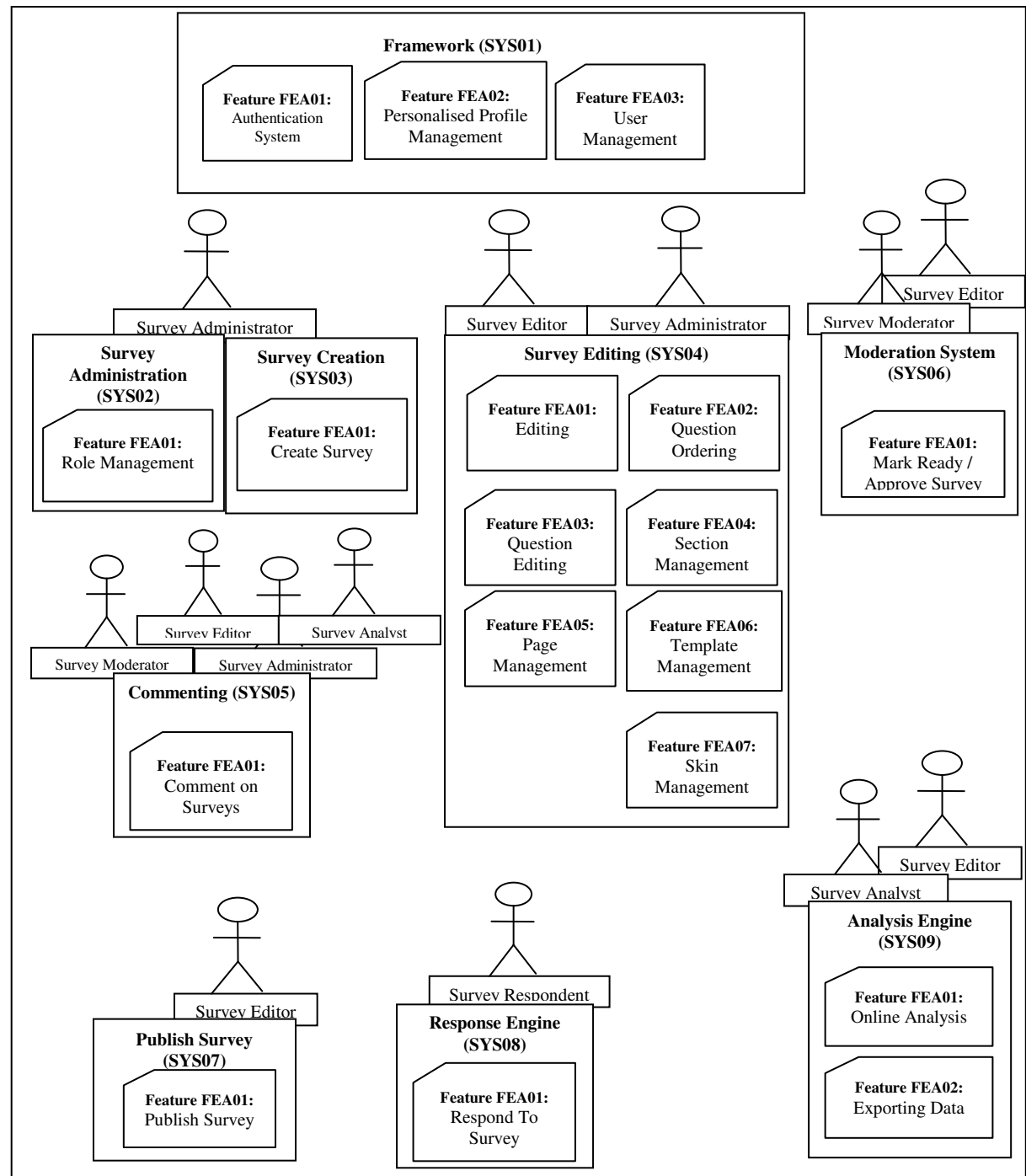


Figure 2: Schematic of the System

3.7. Product Road Map

- Iteration 1: January to February 2006.
- First Release: 17th of February 2006.
- Iteration 2: March to August 2006.
- Second Release: 1st of September 2006 (planned).
- Iteration 3: September to October 2006.
- Third Release: 2nd of October 2006 (planned).

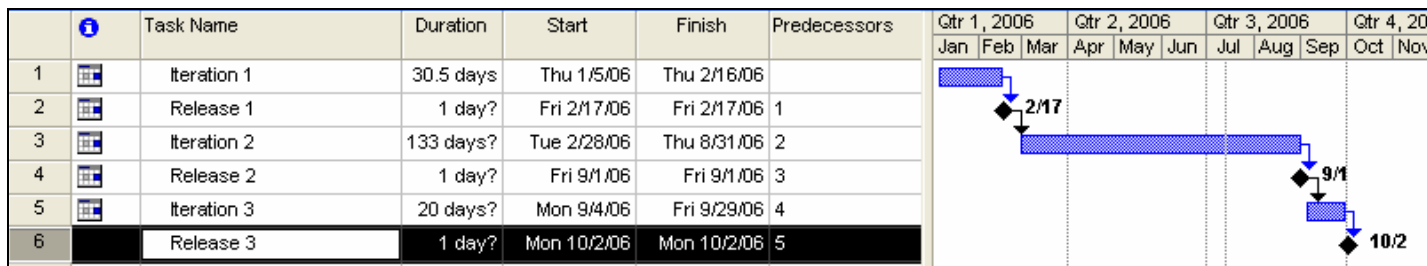


Figure 3: Product Road Map

4. Product Features and Requirements

4.1 Framework (SYS01)

4.1.1. Authentication System

Purpose of Feature: The purpose of this feature is to provide authentication to track users interacting with the survey system.

Stimulus/Response Sequence: User arrives using a URL entered to the web browser or by clicking on an encoded link. A username and password combination is supplied by the user on the login page or by encoded link. The system will verify the credentials supplied to authenticate a user.

ID	Description
SYS01-FEA01-REQ01	Process username and password of users on login page.
SYS01-FEA01-REQ02	Log into system through encoded URI.
SYS01-FEA01-REQ03	Password reminder can be sent via email.

Table 1: Associated Functional Requirements

ID	Description
SYS01-FEA01-REQ04	Public access is tracked via a cookie.
SYS01-FEA01-REQ05	Username and password can be parsed from encoded URI.

Table 2: Associated Non-Functional Requirements

4.1.2. Personalised Profile Management

Purpose of Feature: The User Profile Management allows an authenticated user to maintain their personal details.

Stimulus/Response Sequence: After logging in, the user chooses a User Profile Management option to view or modify existing details.

ID	Description
SYS01-FEA02-REQ01	Show current user personal details, including first name, last name, contact information.
SYS01-FEA02-REQ02	Edit current user personal details.

Table 3: Associated Functional Requirements

ID	Description
SYS01-FEA02-REQ03	Authenticated users can change their own details
SYS01-FEA02-REQ04	User personal details include a minimum of First name, Last name and Email Address, .

Table 4: Associated Non-Functional Requirements

4.1.3. User Management

Purpose of Feature: This feature allows administrators and editors to create, delete and manage users in the system.

Stimulus/Response Sequence: After logging in, the user selects the User Management control which will provide an option to add a user, modify a user, delete a user, import a user, export a user or reset a user password.

ID	Description
SYS01-FEA03-REQ01	Add a new user into the system by inputting new user details, including first name, last name, contact information.
SYS01-FEA03-REQ02	Modify a user's details by selecting a user to edit.
SYS01-FEA03-REQ03	Delete a user by selecting the user to delete.
SYS01-FEA03-REQ04	Import users by uploading a CSV file as defined in Table 7.
SYS01-FEA03-REQ05	Export users by downloading a CSV file as defined in Table 7.
SYS01-FEA03-REQ06	Reset or modify user password by selecting a user with which to do so.
SYS01-FEA03-REQ07	Create encoded automatic login URI to allow logins without keystrokes.

Table 5: Associated Functional Requirements

ID	Description
SYS01-FEA03-REQ8	A user name must be unique when the user selects a user name for their account.
SYS01-FEA03-REQ09	Users must supply an email address.

Table 6: Associated Non-Functional Requirements

Importing and exporting will be available in a CSV-based format such as specified below:

FirstName, LastName, EmailAddress, AddressLine1, AddressLine2, City, State, Zip, Country Joe, Smith, js@test.com, 1 Test St, Testville, Auckland, AKL, 1200, New Zealand

Table 7: CSV Format For User Import/Export

First row of CSV file will contain describing headers. Each consecutive row will contain the values for the headers. The headers will include:

- FirstName
- LastName
- EmailAddress
- AddressLine1

- AddressLine2
- City
- State
- Zip
- Country

4.2. Survey Administration (SYS02)

4.2.1. Role Management

Purpose of Feature: This feature allows Survey Administrators to assign users to a survey with a particular role.

The following roles can be assigned by the Survey Administrator:
Administrator, Moderator, Editor, Analyst and Respondent.

The Editor may also assign roles to Editors, Analysts and Respondents for a particular survey to which they have Editor access.

Stimulus/Response Sequence: After logging in, the user selects the Role Management control which will provide an option to assign a user to a role or un-assign them from a role for a particular survey.

ID	Description
SYS02-FEA01-REQ01	Add, modify and remove users from a role by selecting the user and a role.
SYS02-FEA01-REQ02	Administrators can add, modify and remove users for Administrator, Editor, Moderator, Analyst and Respondent roles.
SYS02-FEA01-REQ03	Editors can add, modify and remove users for Editor, Analyst and Respondent roles.

Table 8: Associated Functional Requirements

ID	Description
SYS02-FEA01-REQ04	The number of users assigned to a role is unlimited.
SYS02-FEA01-REQ05	The number of roles to which a user can be assigned is limited to the number of roles that exist within the system.
SYS02-FEA01-REQ06	The Editor must be able to assign additional Editors, Analysts or Respondents to their Surveys.
SYS02-FEA01-REQ07	A user need not be assigned to a role to exist in the system.

Table 9: Associated Non-Functional Requirements

4.3. Survey Creation (SYS03)

4.3.1. Survey Creation

Purpose of Feature: The Survey Administrator is able to create a blank survey with a default editor. The administrator may assign a moderator to the survey when the survey is created.

Stimulus/Response Sequence: Each Survey Administrator creates a blank survey.

ID	Description
SYS03-FEA01-REQ01	Create the new blank survey with set properties.
SYS03-FEA01-REQ02	Set survey properties: name, survey alias, expiry date, portal description, survey description for internal use, keywords.
SYS03-FEA01-REQ03	Assign Editor(s) to new survey.
SYS03-FEA01-REQ04	Assign Moderator(s) to new Survey.

Table 10: Associated Functional Requirements

ID	Description
SYS03-FEA01-REQ05	The Administrator has the administrator access to the survey which he creates.
SYS03-FEA01-REQ06	The survey name and date properties must be filled before a new survey can be created.
SYS03-FEA01-REQ07	The survey must have: a name and alias.
SYS03-FEA01-REQ08	At least one Editor must be assigned to a new survey.
SYS03-FEA01-REQ09	A moderator need not be assigned to a new survey at this point.

Table 11: Associated Non-Functional Requirements

4.4. Survey Editing (SYS04)

4.4.1. Survey Editing

Purpose of Feature: When the survey is in draft state the Survey Editor is able to edit surveys using this module. The survey editor is able to edit the properties of the survey.

Stimulus/Response Sequence: The Survey Editor selects a survey for editing. The Editor can change the basic properties outlined above and proceed to add questions (stems and options) to the survey. The Survey Editor can also change the name, expiry date, survey description, and portal descriptions associated with each survey. The Survey Editor can also set the redirect URLs, navigation directions and whether it is a template or not. The Survey Editor cannot change the creation date of the survey.

ID	Description
SYS04-FEA01-REQ01	Edit survey properties: name, expiry date, portal description, survey description for internal use, redirection URI, terms & conditions text and pop-up link display.
SYS04-FEA01-REQ02	Preview survey by selecting an option on the page.
SYS04-FEA01-REQ03	Set survey as template.
SYS04-FEA01-REQ04	Current user is shown above editing panels with all assigned roles (Editor, Moderator, etc).
SYS04-FEA01-REQ05	Current edited survey is shown in the editing panel with current state (Draft, Approved, Ready for Approval, etc).
SYS04-FEA01-REQ06	Tag survey as ready for approval.

Table 12: Associated Functional Requirements

ID	Description
SYS04-FEA01-REQ07	The preview button displays the survey in preview mode.
SYS04-FEA01-REQ08	The survey can be set as a template for future use.
SYS04-FEA01-REQ09	The survey must have a terms and conditions property.
SYS04-FEA01-REQ10	Survey must have an approval readiness property that can be enabled to lock editing and allow moderator approval.
SYS04-FEA01-REQ11	Survey cannot be edited while in approved for publishing state, published state or retired state.

Table 13: Associated Non-Functional Requirements

4.4.2. Question Ordering

Purpose of Feature: When the survey is in draft state the Survey Editor uses this feature to reorder the questions of a selected survey.

Stimulus/Response Sequence: After selecting a survey the Survey Editor can enter the Order Management module. The user can then select a page to reorder questions in. Pages can be selected from a selection and its associated questions from a list. When the questions to reorder have been selected, they can be moved upward or downward. Questions can be moved between adjacent pages.

ID	Description
SYS04-FEA02-REQ01	Change the order of questions in the current survey.
SYS04-FEA02-REQ02	Select a page to reorder questions in.
SYS04-FEA02-REQ03	Select question(s) to reorder.
SYS04-FEA02-REQ04	A question can be moved in the upward and downward direction from the toolbox.
SYS04-FEA02-REQ05	Stems and options cannot be reordered within a question.

Table 14: Associated Functional Requirements

ID	Description
SYS04-FEA02-REQ06	Questions are selected from a list.
SYS04-FEA02-REQ07	Questions can be moved within a page, beyond the top of the list to the bottom of the previous page or beyond the bottom of the list to the top of the next page.

Table 15: Associated Non-Functional Requirements

4.4.3. Question Editing

Purpose of Feature: When the survey is in draft state the Survey Editor uses these features to create, edit or delete the questions of a selected survey.

Stimulus/Response Sequence: After selecting a survey the Survey Editor is then taken to the Edit Survey module. A selection of question types is displayed in the question properties toolbox for question addition and manipulation. A list of questions already added to the survey is represented in the main display panel. The user can click a question type and set associated properties, stems and options to be added to the survey. To edit, a user selects a question from the main display panel and the properties toolbox will update to reflect its properties. Questions can be reordered after creation.

ID	Description
SYS04-FEA03-REQ01	Add and edit questions from a toolbox: single select, multiple select, free text, single Likert, Likert matrix, rich text component.
SYS04-FEA03-REQ02	A display panel will show a page layout representation of questions added to the current survey.
SYS04-FEA03-REQ03	A properties toolbox is displayed on question creation or when a question is selected from the survey.
SYS04-FEA03-REQ04	A Terms & Conditions toolbox is displayed for setting and changing the text of survey terms and conditions.
SYS04-FEA03-REQ06	Set default option text for free-text questions from question properties toolbox.
SYS04-FEA03-REQ07	Delete an option from a question from question properties toolbox.
SYS04-FEA03-REQ08	Enable free text option for single select and multiple select questions.
SYS04-FEA03-REQ09	Edit free text option text for single select and multiple select questions.
SYS04-FEA03-REQ10	Edit the text of the option for selection-based questions (single select, multiple select, Likert, Likert matrix) from question properties toolbox.
SYS04-FEA03-REQ11	Edit the properties of a question from question properties toolbox: single select, multiple select, free text, single Likert, Likert matrix, rich text component.
SYS04-FEA03-REQ12	Delete question (and any associated options) from the question properties toolbox.

Table 16: Associated Functional Requirements

ID	Description
SYS04-FEA03-REQ13	The system uses a toolbox for all addition and manipulation of questions.
SYS04-FEA03-REQ14	The system uses a display panel to graphically represent questions and other components.

SYS04-FEA03-REQ15	System must support single select, multiple select, free text, single Likert, Likert matrix questions and rich text components.
SYS04-FEA03-REQ16	A Likert matrix consists of a group of stems and options.
SYS04-FEA03-REQ17	A background save and resume capability is implemented to save the current survey in case of unexpected browser errors.
SYS04-FEA03-REQ18	Properties of the questions depend on the question type. The toolbox interface will reflect this accordingly.
SYS04-FEA03-REQ19	An option is deleted from within the question properties panel.
SYS04-FEA03-REQ20	The text of an option is edited within the question properties panel.
SYS04-FEA03-REQ21	A free text option must be available for single select and multiple select questions.
SYS04-FEA03-REQ22	The properties of a question are edited within the question properties panel.
SYS04-FEA03-REQ23	Questions may be selected from a template to import to the current survey.
SYS04-FEA03-REQ24	When the properties of a question, stem or an option are edited within the properties panel and changes are applied, the changes are reflected within the display panel.

Table 17: Associated Non-Functional Requirements

4.4.4. Section Management

Purpose of Feature: When the survey is in draft state the Survey Editor uses these features to manage the sections of questions and their associated stems and options contained within a survey.

Stimulus/Response Sequence: A section control is available for addition to the survey. After clicking this, section properties can be set and the section is added to the survey.

ID	Description
SYS04-FEA04-REQ01	Add Section from the toolbox.
SYS04-FEA04-REQ02	Edit Section properties (name, start and end questions spanned, display text) from the toolbox.
SYS04-FEA04-REQ03	Sections can be deleted from the Sections toolbox.
SYS04-FEA04-REQ04	A Section can be moved by changing the range of questions it encompasses.
SYS04-FEA04-REQ05	A question can be added to a section.

Table 18: Associated Functional Requirements

ID	Description
SYS04-FEA04-REQ06	Sections of questions must be supported in the system.
SYS04-FEA04-REQ07	Questions can be associated with only one section. Each section can be associated with more than one question.
SYS04-FEA04-REQ08	A Section demarcates a range of questions. Ranges cannot overlap. Ending range choices are populated depending on start range selections.
SYS04-FEA04-REQ09	When a section is deleted, the questions it demarcated are no longer associated with the section. The questions are not removed from the current survey.
SYS04-FEA04-REQ10	A section must be a single span. It cannot be divided across several spans of questions.

Table 19: Associated Non-Functional Requirements

4.4.5. Page Management

Purpose of Feature: When the survey is in draft state the Survey Editor uses these features to manage the pages of the questionnaire and their associated sections, questions, stems and options contained within the page.

Stimulus/Response Sequence: In the toolbox of question types, a page control is available for addition to the survey. After clicking this, a new page is added to the end of the survey.

ID	Description
SYS04-FEA05-REQ01	Add page from the selection toolbox.
SYS04-FEA05-REQ02	Edit page properties (range of questions spanned) from the page properties toolbox.
SYS04-FEA05-REQ03	Delete a page.
SYS04-FEA05-REQ04	Add a question to a page by moving it into the page on the page order management toolbox.

Table 20: Associated Functional Requirements

ID	Description
SYS04-FEA05-REQ05	Multiple pages must be supported by the system.
SYS04-FEA05-REQ06	Questions must be associated with one page. Each page can be associated with more than one question.
SYS04-FEA05-REQ07	A page consists of a group of questions.
SYS04-FEA05-REQ08	When a page is deleted, questions are not removed from the current survey. Questions are appended to the previous page.

Table 21: Associated Non-Functional Requirements

4.4.6. Template Management

Purpose of Feature: When the survey is in draft state the Survey Editor uses these features to manage the addition and usage of templates for surveys, and importing questions from templates into the current survey.

Stimulus/Response Sequence: A user can convert an existing survey to a template or import template questions into a currently edited survey.

ID	Description
SYS04-FEA06-REQ01	Save a survey as a template.
SYS04-FEA06-REQ02	List available survey templates.
SYS04-FEA06-REQ03	Filter template load list by survey name, creation date, editor.
SYS04-FEA06-REQ04	Questions and sections in a survey template can be imported into the current survey from the templates toolbox.
SYS04-FEA06-REQ05	Load survey template by choosing from a list of templates in the Templates toolbox.
SYS04-FEA06-REQ06	A loaded survey template will have its questions and/or sections populated in a list for selection.
SYS04-FEA06-REQ07	Import selected questions into current survey.
SYS04-FEA06-REQ08	Preview template in pop-up window.

Table 22: Associated Functional Requirements

ID	Description
SYS04-FEA06-REQ09	Survey template status must be a property; a template is a survey with this property enabled.
SYS04-FEA06-REQ10	Selected questions will be appended in ascending question number order to the end of the current survey in the main display panel.
SYS04-FEA06-REQ11	Template questions and sections must be selectable for import from a list.
SYS04-FEA06-REQ12	A checkbox appears next to each question within the Loaded Survey Template display panel for selecting questions or sections for importing.

Table 23: Associated Non-Functional Requirements

4.4.7. Skin Management

Purpose of Feature: When the survey is in draft state the Survey Administrator or Editor uses these features to manage the look and feel of a survey.

Stimulus/Response Sequence: As an authenticated survey administrator or editor, one can click on the Skin Management module and set the appropriate properties.

ID	Description
SYS04-FEA07-REQ01	A CSS file, or supported skins can be specified and used for skinning a survey.

Table 24: Associated Functional Requirements

ID	Description
SYS04-FEA07-REQ02	All user interface elements follow a consistent CSS design.

Table 25: Associated Non-Functional Requirements

4.5. Commenting System (SYS05)

4.5.1. Comment Management

Purpose of Feature: Surveys need to be reviewed when created by Survey Administrators. Comments on surveys allow moderators to write comments on the survey. This feature enables survey Administrators, Editors, Analysts and Moderators to have an online discussion to refine surveys accordingly.

Stimulus/Response Sequence: Each moderator will be assigned by Survey Administrators to a particular survey. After logging into the system, Moderators review the survey and write comments for it. The comments can be responded to by Editors, Analysts, other Moderators or Administrators.

ID	Description
SYS05-FEA01-REQ01	Add a comment to a survey.
SYS05-FEA01-REQ02	View survey comments.
SYS05-FEA01-REQ03	A history of comments will be displayed.

Table 26: Associated Functional Requirements

ID	Description
SYS05-FEA01-REQ04	Multiple comments may be added to the survey.
SYS05-FEA01-REQ05	Comments will be displayed in the Comments toolbox of the survey.
SYS05-FEA01-REQ06	The survey display panel must be visible at all times to aid comment references.

Table 27: Associated Non-Functional Requirements

4.6. Moderation System (SYS06)

4.6.1. Ready for Approval & Approved for Publishing

Purpose of Feature: Surveys need to be reviewed after being edited by Survey Editors. Edit locks (Marking a survey “Ready for Approval”) allow Editors to stop modification of the survey while it is being reviewed. This feature enables survey Editors to refine surveys only after the reviewing process. Moderators can approve a survey for publishing.

Stimulus/Response Sequence: Each moderator will be assigned by Survey Administrators to a particular survey. After logging into the system, Moderators preview the survey on the survey moderation page. The moderator may approve or disapprove a survey after the Editor marks it “Ready for approval”.

ID	Description
SYS06-FEA01-REQ01	Lock/Unlock editing of the survey
SYS06-FEA01-REQ02	Approve/ disapprove the survey for publishing.

Table 28: Associated Functional Requirements

ID	Description
SYS06-FEA01-REQ03	Surveys can be locked and unlocked against editing by a Editor.
SYS06-FEA01-REQ04	Surveys can be approved or unapproved for publishing by a Moderator.
SYS06-FEA01-REQ05	Survey must have an approval for publishing, that can be enabled to allow publishing features.
SYS06-FEA01-REQ06	Surveys cannot be approved without the survey being in a ready for approval state.
SYS06-FEA01-REQ05	Survey Moderators only have preview access to surveys.
SYS06-FEA01-REQ06	Once a Survey is approved for publishing, it may not be edited. If it is edited, it must be re-Approved by a Moderator.

Table 29: Associated Non-Functional Requirements

4.7. Publish Survey (SYS07)

4.7.1. Publish Survey

Purpose of Feature: When the survey is in approved state this feature allows publication of the survey for distribution to respondents.

Stimulus/Response Sequence: As an authenticated Survey Editor, the user selects the surveys to publish and selects the publish survey option. A survey publishing page is then displayed. Publishing is contingent upon approval from the survey moderator. Public surveys are tracked using cookies. Private surveys are tracked using the identified user profile.

ID	Description
SYS07-FEA01-REQ01	Generate URI's for public survey publishing.
SYS07-FEA01-REQ02	Generate unique URI's for private survey publishing (for each respondent).
SYS07-FEA01-REQ03	Publish Survey from the Publish tab.
SYS07-FEA01-REQ04	When publishing a survey a new page is created with the survey formatted in preview mode.
SYS07-FEA01-REQ05	Assign respondents to private survey publications.
SYS07-FEA01-REQ06	Export assigned respondents in CSV format.

Table 30: Associated Functional Requirements

ID	Description
SYS07-FEA01-REQ07	Survey Editors and Survey Administrators can publish surveys by choosing to publish a public or private survey.
SYS07-FEA01-REQ08	All respondents have view permission for the published survey.
SYS07-FEA01-REQ09	A survey must be in an approved for publishing state to be published.
SYS07-FEA01-REQ10	CSV export format will include user names, first names, last names and survey assigned for responding.

Table 31: Associated Non-Functional Requirements

4.8. Response Engine (SYS08)

4.8.1. Response Collection

Purpose of Feature: Once the survey has been published this feature allows the system to collect survey responses so that analysis can be performed.

Stimulus/Response Sequence: The respondent will reach the survey by a URI. All stems will be displayed and the respondent will choose their responses. The respondent continues until all pages are complete. The survey is then submitted and will be shown a thank you notification.

ID	Description
SYS08-FEA01-REQ01	Retrieve and display questions in a page.
SYS08-FEA01-REQ02	Redirect respondent (thank you page specified by the creator) after survey completion.
SYS08-FEA01-REQ03	Direct respondent to survey after authentication.
SYS08-FEA01-REQ04	Display progress indicator.
SYS08-FEA01-REQ05	Display terms and conditions in pop-up window from a link on request.
SYS08-FEA01-REQ06	Save the survey progress to return and continue later.

Table 32: Associated Functional Requirements

ID	Description
SYS08-FEA01-REQ07	Terms and Conditions can be displayed via a link at the beginning of the survey should the Survey Editor opt to include it when editing the survey.
SYS08-FEA01-REQ08	A progress indicator must be displayed to the respondent for each survey page.

Table 33: Associated Non-Functional Requirements

4.9. Analysis Engine (SYS09)

4.9.1. Online Analysis

Purpose of Feature: Once the survey has been published the Survey Editor and analyst are able to view basic statistics gleaned from the Survey Results.

Stimulus/Response Sequence: The user is given a choice of available Stems from a Survey to choose from. The user then chooses from a selection of charts.

ID	Description
SYS09-FEA01-REQ01	Online viewing of charts within a web browser.

Table 34: Associated Functional Requirements

ID	Description
SYS09-FEA01-REQ02	Reports are to be generated dynamically upon request.
SYS09-FEA01-REQ03	Graphing will be provided using a third party charting component
SYS09-FEA01-REQ04	A range of graph types is to be provided (to include Bar, Line and Pie graphs).
SYS09-FEA01-REQ06	Free text fields and free text options (single, multiple select questions) are reported using HTML-based tables.

Table 35: Associated Non-Functional Requirements

4.9.2. Exporting Data

Purpose of Feature: Once the survey has been published the Survey Editor and analyst are able to export raw data from the Survey Results.

Stimulus/Response Sequence: The user chooses to export the raw data of a survey in a supported format. The raw data is available to download and save locally.

ID	Description
SYS09-FEA02-REQ01	Data may be exported in CSV format: specified in Table 36.

Table 35: Associated Functional Requirements

CSV Format for Export of Survey Data:

```
Email,DateOfSurvey,SurveyID,SurveyName,SurveyStem1,SurveyOption1,SurveyStem2,SurveyOption2
phil@AQXI.com,23/05/2006 18:02,1,Curry,Do you like curry?,TRUE,Is curry cool?,TRUE
bob@AQXI.com,23/05/2006 18:02,1,Curry,Do you like curry?,FALSE,Is curry cool?,TRUE
sam@AQXI.com,23/05/2006 18:02,2,Peaches,Have you tried peaches?,FALSE,How many peaches do you eat?,4
```

Table 36: CSV Format For Survey Data Export

First row of CSV file will contain describing headers. Each consecutive row will contain the values for the headers. The headers will include:

- Email (of respondent)
- DateOfSurvey (taken by respondent)
- SurveyID
- SurveyName (describing the survey)
- SurveyStemx (where x is greater than one and an integer)
- SurveyOptiony (where x is greater than one and an integer)

5. Other Specific Requirements

5.1. External Interface Requirements

5.1.1. User Interfaces

The User Interface will be based on the standards and guidelines for web-based applications and would be intuitive for users familiar with the web. The user interface will make it easy for users to interact with the system.

5.1.2. Communication Interfaces

No communication interface would be presented by the system but it would be designed so that interacting can be done for Data Extraction using a CSV file, which can be opened in Microsoft Excel and other tools with generic CSV importing facilities. The CSV will be in a format suitable for importing into the SPSS analysis package.

5.2. Performance Requirements

5.2.1. Static numerical requirements

- The database can store up to 1000 surveys at any given time.
- The database can store up to 20000 users at any given time.

5.2.2. Dynamic numerical requirements

- 100 simultaneous users can access the system at any one time.

5.3. Constraints

The system will be using DotNetNuke 3.2.2. The system will be using a minimum resolution of 1024x768, to ensure that what users create, is seen in the preview or by respondent to be the same. To avoid potential conflicts with data, each customer will have a separate DotNetNuke installation.

The survey response data is independent of system data.

5.4. Other Requirements

The Survey System will be designed to run on a Windows-based operating system running Microsoft SQL Server 2000, Internet Information Services 5.0 or above, ASP.NET and DotNetNuke 3.2.2. The supported clients browsers will be Internet Explorer 5 and Mozilla Firefox 1.x compliant and above.

Appendix 6: AQXI Online Survey Management System Screen Flow



Online Survey Management System

Screen Flow

Iteration 2.0

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1. Introduction

The purpose of this project is to develop an Online Survey Management System that would support the generic workflow of publishing surveys online. This project will be developed by AQXI Limited in conjunction with students from the University of Auckland doing an internship in this company.

In the long term this project aims to produce a system to be used widely throughout the University to collect survey based data online and be able to analyse them. This system will be developed so that it provides a flexible architecture that would be easily integrated with existing packages. It will also provide extensible statistics and report functionalities on the responses gathered with different surveys.

The system that we are presenting in this document therefore aims to easily design and publish surveys in order to collect large and accurate data from the different respondents. By providing a flexible variety of types as well as template libraries for the different components of a survey, this system could also be used for marketing research methodologies.

This Screen Flow document describes the interactions between screens for the Survey System. We will describe the interaction between the roles of users of the system and the policies which govern the process of survey creation, moderation, response and extraction of relevant data.

2. Document Description

2.1. Purpose of this document

- To clarify the process the Online Survey Management System will use, to accomplish tasks.
- Define the general flow of User interaction in terms of screens.
- To illustrate screen flow based upon roles of uses and tasks of users.

2.2. Definitions, acronyms and abbreviations

- AQXI: AQXI Limited, trading as AQXI Creative Software.
- Survey: a collection of sections and questions on a particular subject.
- Section: a collection of questions associated to a particular survey.
- Question: a question consists of one or more stems and options.
- Stem: a stem is the text preceding the options in a question.
- Option: an option is a possible value to answer a question.
- Response: actual answer from a respondent to a certain question.
- Public Surveys: online surveys available to any unauthenticated users.
- Private Surveys: online surveys available only to authenticated users.

2.3. User Characteristics

Host:

This group of users will have access to every part of the system. They are also responsible for maintaining the survey system. This group of people will be able to assign administrators of the system.

Administrator:

This group of users will have maximum authority in the system with regards to managing and maintaining surveys. They can grant access to Editors, Moderators, Analysts and Respondents. Administrators will have rights to add, invite, remove and remind respondent in the system. They are able to invite anonymous respondent and publish anonymous link as well. Administrators have the rights of Editors, Moderators, Analysts and Respondents.

Editor:

This group of users will have access to edit, retire, analyze and publish surveys.

Moderator:

This group of users will be assigned by Administrators or Editors; they have access to review surveys. Moderators also have authorities to write, edit and delete comments on surveys which they have been reviewed, as well as assign comment to surveys.

Analyst:

This group of users will have permissions to generate reports, such as survey statistics and online analysis. The report is based on completed surveys. This group of users

will also have access to extract raw data containing responses for each stem for each respondent in CSV format.

Respondent:

This group of users will be people who have been invited to complete surveys.

2.4. Assumptions and Dependencies

- Unauthenticated users have access only to public surveys.
- Authenticated users have access to public and private surveys.
- Authenticated users are responsible for keeping their personal details up to date.
- Respondents have the required skill to attempt surveys.
- The Survey Administrator or editor will provide and manage the respondents suitable to a survey.
- The survey response data is independent of system data.
- The access of Administrators, Editors, Analysts, Moderators, and Respondents is assigned by the Administrators, to users associated with a survey.
- The Respondent, who is not also an Admin, Editor, Moderator or Analyst is logged into the system implicitly via encoded URI and does not see a login screen or a survey selection screen. The survey to be displayed is implicitly specified in the URI.
- For Respondent, who is an Admin, Editor, Moderator or Analyst, survey response is collected via a given link from their navigation menu.

2.5. References

- AQXI Standard SF-2006: Screen Flow Standard.
- AQXI-2006jul12-SurveySystem-ScreenDesign

2.6. Versions

- 29 June 2006: First Draft of the Document.
- 30 June 2006: Second Draft of the Document.
- 05 July 2006: Third Draft of the Document.
- 06 July 2006: Fourth Draft of the Document.
- 10 July 2006: Fifth Draft of the Document.
- 11 July 2006: Sixth Draft of the Document.
- 12 July 2006: Seventh Draft of the Document.
- 13 July 2006: Eight Draft of the Document.

2.7. Overview

This Screen Flow document describes the process by which a user would interact with the Online Survey Management System to be developed by AQXI Limited. It will detail a general flow that Editors, Moderators and Analyst will follow. This document

will also diagram how a Respondent accesses the Survey and also details what screens an Administrator can access.

For more detailed information on screen designs and layouts refer to the AQXI-2006jul12-SurveySystem-ScreenDesign document, which detail the screens with their functions in detail.

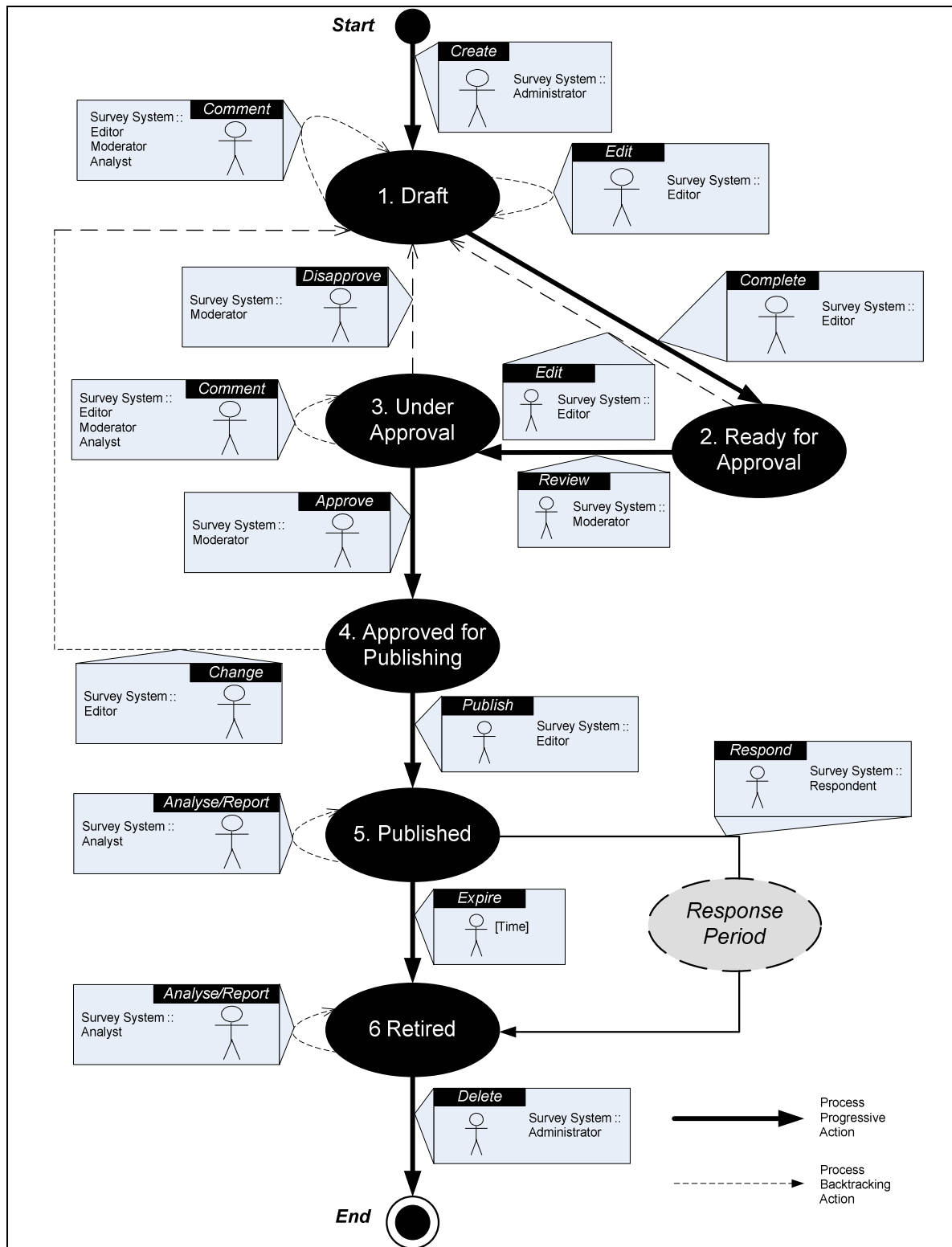
3. Process and Screen Flow

3.1. Survey Life Cycle

The generic process flow described by Figure 1, shown on the next page, describes a Survey Lifecycle. The Online Survey Management System uses this lifecycle as a basis for its generic process in creating and executing a survey.

- First a Survey is created and put into editing. After some iterations of editions, where a Moderator may or not leave comments on the survey with feedback from the Editor, the Editor signals that the survey has been created and that it can begin the process of being moderated.
- During moderation, the survey cannot be modified and as soon as the Editor signals that a survey is ready. The moderator has power over the survey, on whether it can be edited or published anymore.
- Once the Moderator has approved the survey, it can be published.
- Upon publishing, the Editor can add respondents to a Private Survey or if open can distribute a URI locating the Survey. The survey can now be analyzed and data maybe extracted.
- After a Survey has been Expired or retired, a survey can not be edited, it can only be analyzed and data maybe extracted from it.

This describes the Survey Systems general process flow that will be used:



3.2. General Screen Flow

The Generic Screen Flow as described by Figure 2 below shows all the possible screens that each Editor, Moderator and Analyst can access. As the figure shows all users access their respective screen via a common Show All Surveys Page.

- The Editor is able to access the Analysts section as well as Skin Management for the site, Managing Survey Users and Publishing a survey (which includes managing Respondents.).
- The Analyst can View online charts and export data.
- The Moderator only has access to the Moderation page allowing for locking a survey form edition and approving a survey so that it can be published thereafter.
- If any Analysts, Moderators or Editors are listed as being Respondents for a survey then the special link to the response page is also available.
- All users can access the Preview Survey Page, to see what the survey looks like from the Respondent point of view.

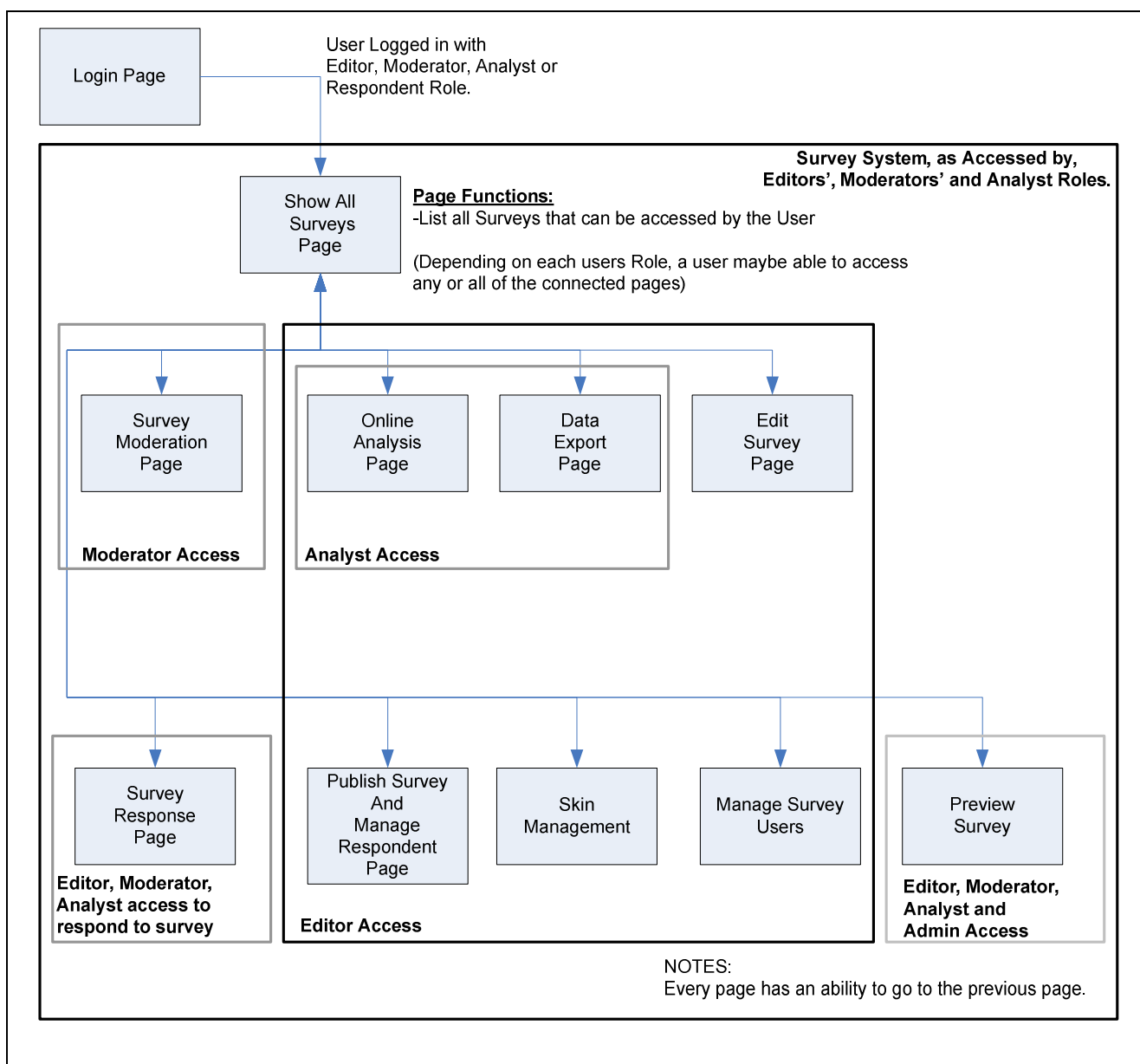


Figure 2: Generic Screen Flow for Editors, Moderators and Analysts.

4. Detailed Screen Flow

4.1. Administration Screen Flow

The Administrator has access to all screens of all users except for responding to a survey where the Administrator must be added as a Respondent to that survey to be able to respond.

The figure below shows all the pages and Administrator has access to from the Survey System. As the diagram shows, in addition to the screens from all the other users, the Administrator also handles User management from the overall Survey System, these users would be mainly the Moderators and Editors as well as any shared respondents.

Only the Administrator is able to create a survey, in this method the Administrator assigns an Editor to the Survey and is also the only user who is able to add any moderators to the survey.

The Administrator also manages the roles of users with respect to surveys. The editor also manages users but does not access this function from the same screen.

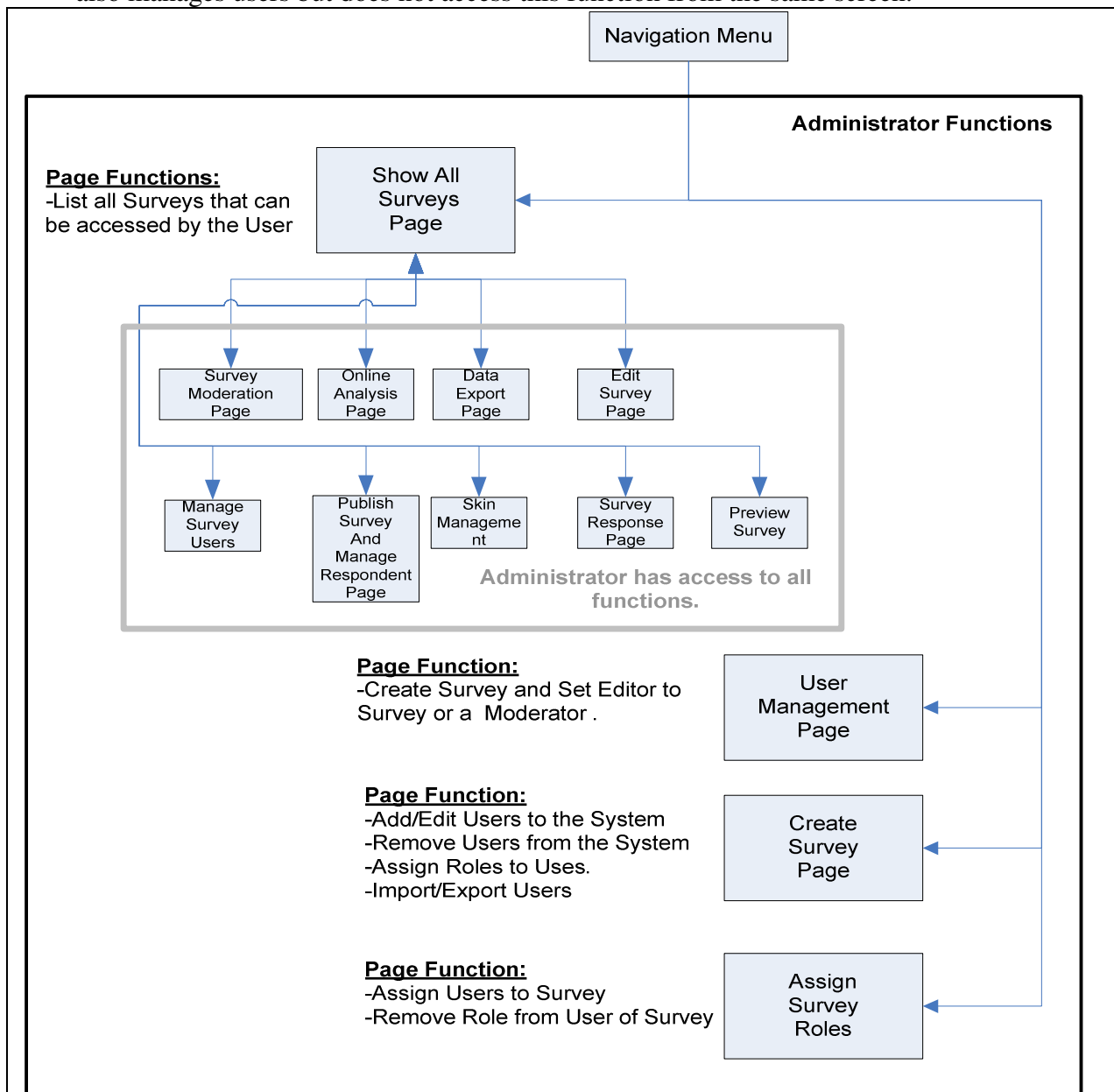


Figure 3: Administrators Screens

4.2. Editing Screen Flow

These sets of screens described in the diagram shown on the next page, details the core function of the Editor, this includes the actual edition of a survey and the commenting feedback with Moderator.

The Comments Page is the same screen seen by the Moderator to add and Moderate a Survey. When the Editor sees the Comments Page he does not see the extra Moderator only functions, the Editor can only View. Add and Edit comments.

From the Current Survey Page, the Editor is able to add/remove edit components that can be added to a survey. These components include Questions, Rich Text, Sections, Pages and Terms & Conditions. This screen also show the Survey properties that can be modified, this is also the screen where an Editor can signal to a Moderator that the survey is ready to be Approved. Once the Editor informs the moderator via the Current Survey screen, the power to edit a survey is taken form the Editors and the Moderator now controls whether the Survey needs to edited more or it is approved and can be modified.

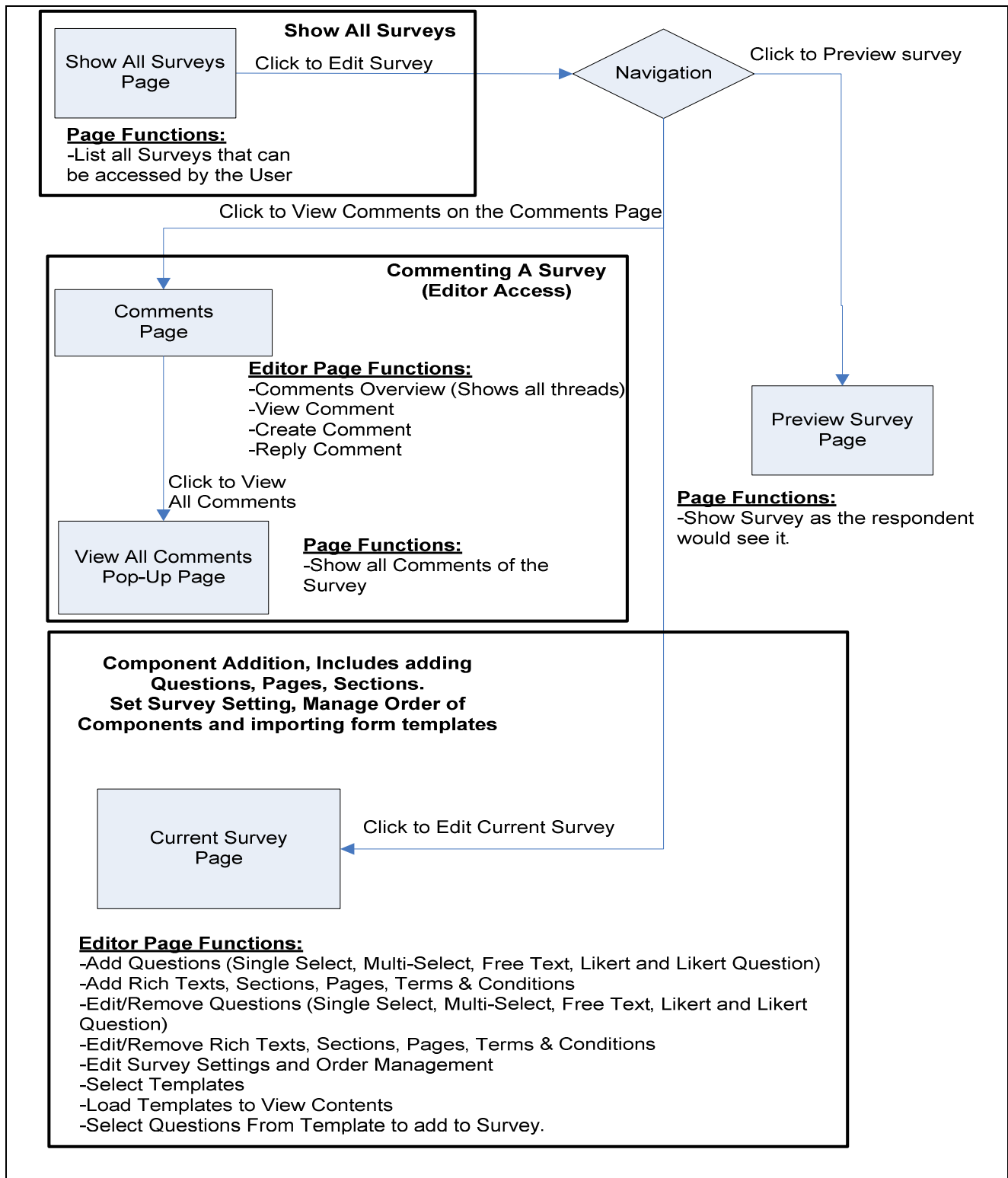


Figure 4: Editors Screens

4.3. Moderation Screen Flow

The Moderation screen, called the Comments page is able to be access by many roles but when a user with Moderator Role accesses the page the user can see some Moderator only options. These options can only be activated once an Editor has signalled via his/her Current Survey Page that the Survey is Ready to be Approved. At all times the Moderator is able to send comments about the survey to the Editor so that it can be improved and the chances of it passing Approval increases during its first Approval.

For the Moderator only functions, he/she can lock a survey from being able to be Edited or Published or allow these actions. In this way a Moderator can allows for changes or approve a survey to be published. The figure below shows the screen involved in moderating a survey.

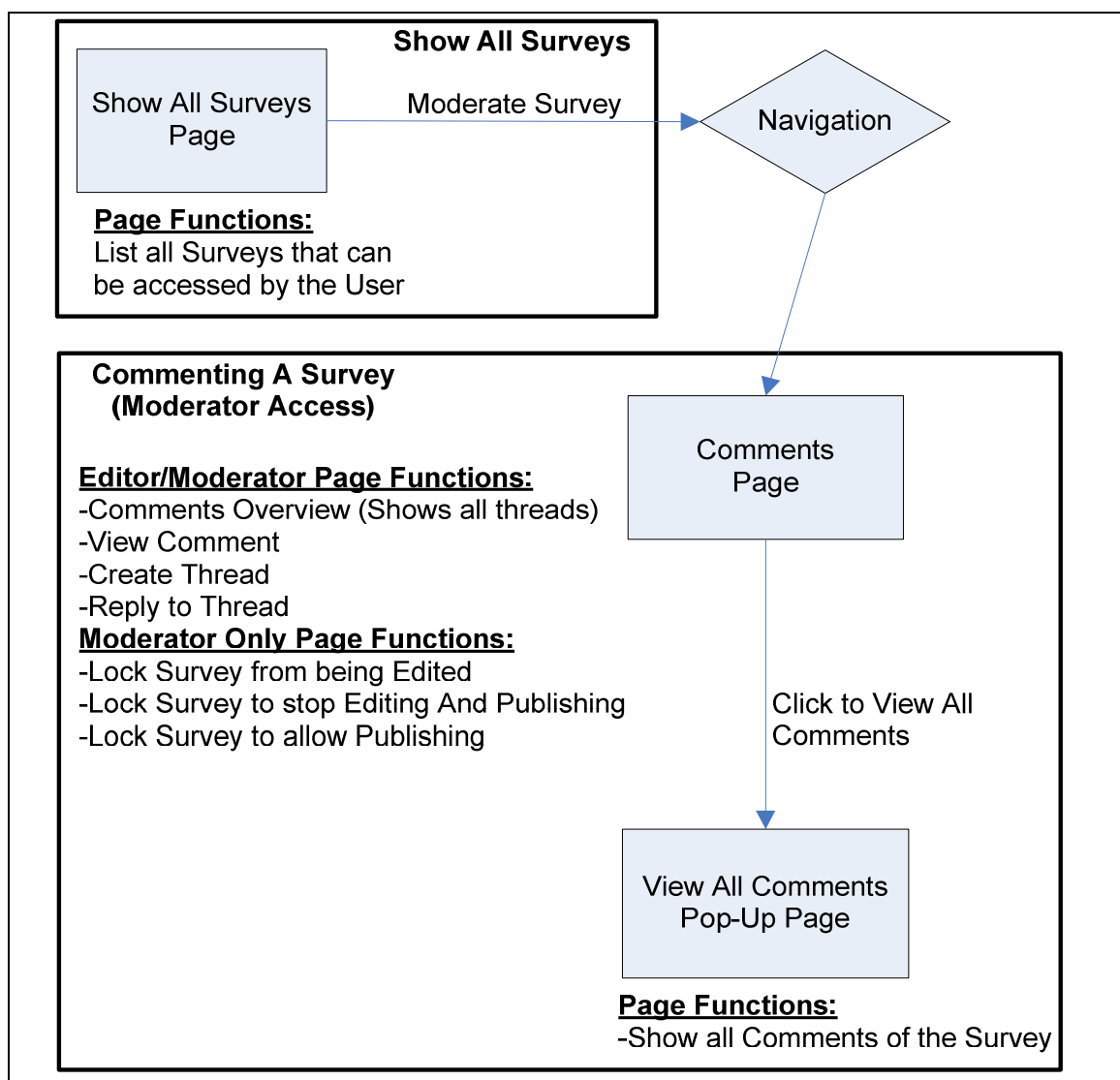


Figure 5: Moderators Screens.

4.4. Publish Survey

This screen is only accessed by the Administrator and the Editor. They can only access this page if the Moderator has given the right to publish for the is survey. A survey can be published as Public or Private.

A public Survey allows any user or non user to access and respond to a Survey. This means that only an access Uri is created by the system.

A Private survey allows only authenticated users to access and respond to the survey. For User with only a Respondent role, this is done through an encoded Uri containing log-in information processed by the system upon entry. For Users who have other roles in the Survey System, an easier method is provided as described in the Respondent flow later in this document.

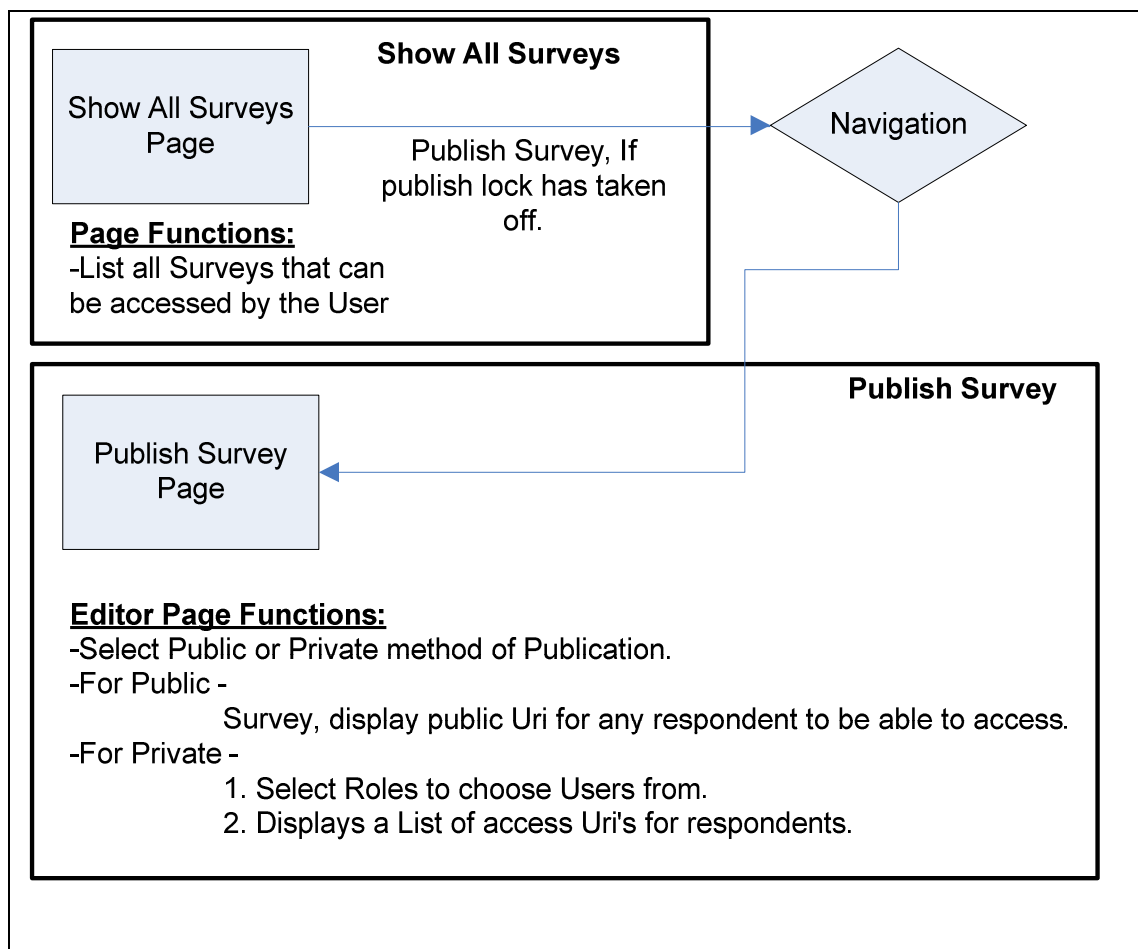


Figure 6: Editors Publish Survey Screen.

4.5. Response Screen Flow

This screen flow describes how Respondents are able to respond to a Survey, and as the figure below shows, there are two ways users may enter a survey.

But first fro public

For Public Surveys a general Link is provided that simply shows any “user”, that is any one who navigates the Uri, the Survey Questionnaire Page.

For Private Surveys an Encoded Uri is provided for each Respondent, this Uri contain their Login information in the Uri so that the user may be directed to the Survey immediately.

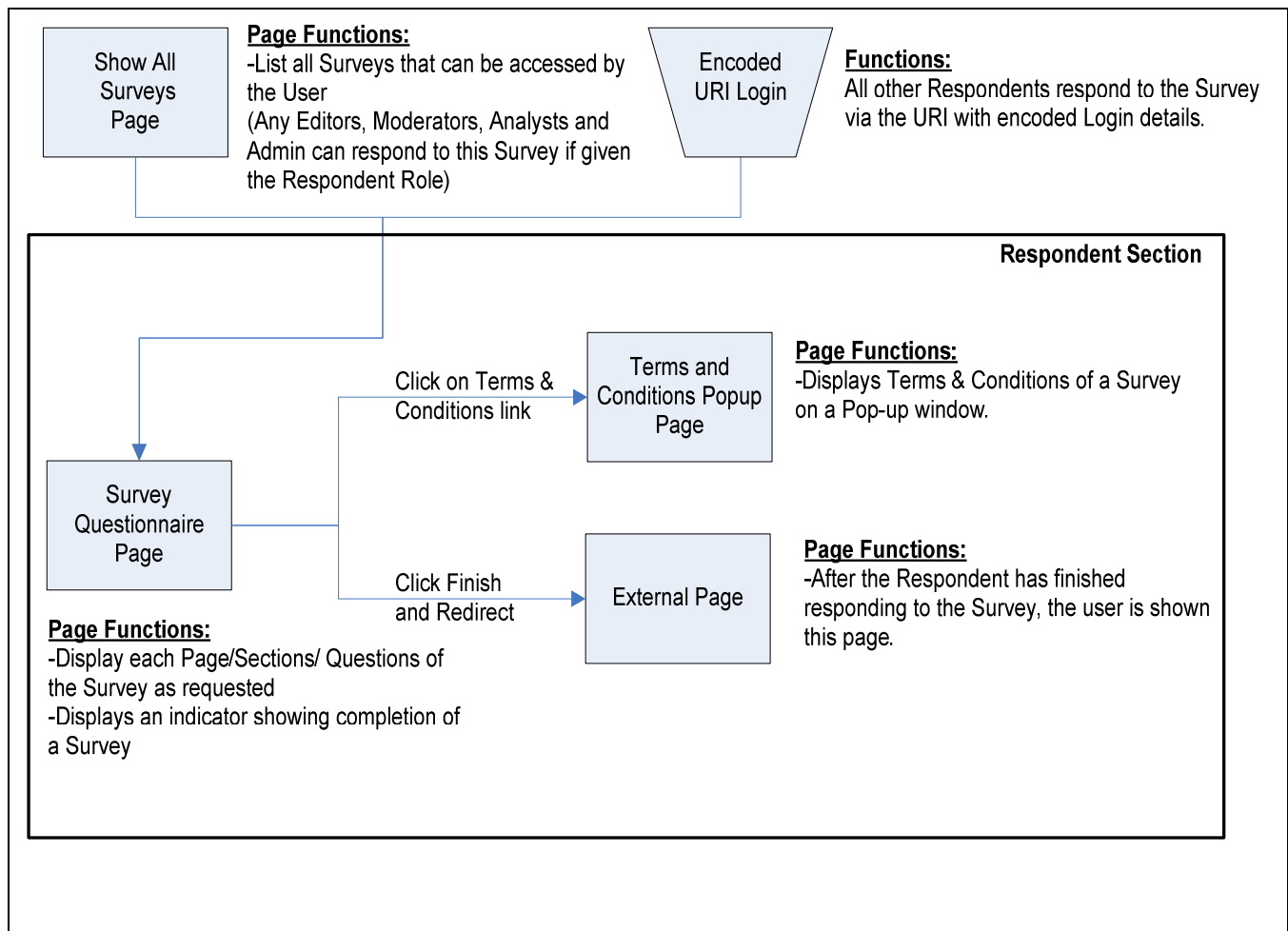


Figure 7: Respondents Screens.

4.6. Analysis Screen Flow

The figure below describes screens viewed by the Administrator, Editor and Analyst Roles. Once a survey has been published data can be begun to be extracted and analysed using external applications or simple charts may be created via the Online Survey System.

The Data Export Page allows for the type of data to be chosen for example totals or Raw and the format the data should be extracted as in CSV, either Excel or SPSS.

The Survey Analysis page allows users to view charts over questions and display them.

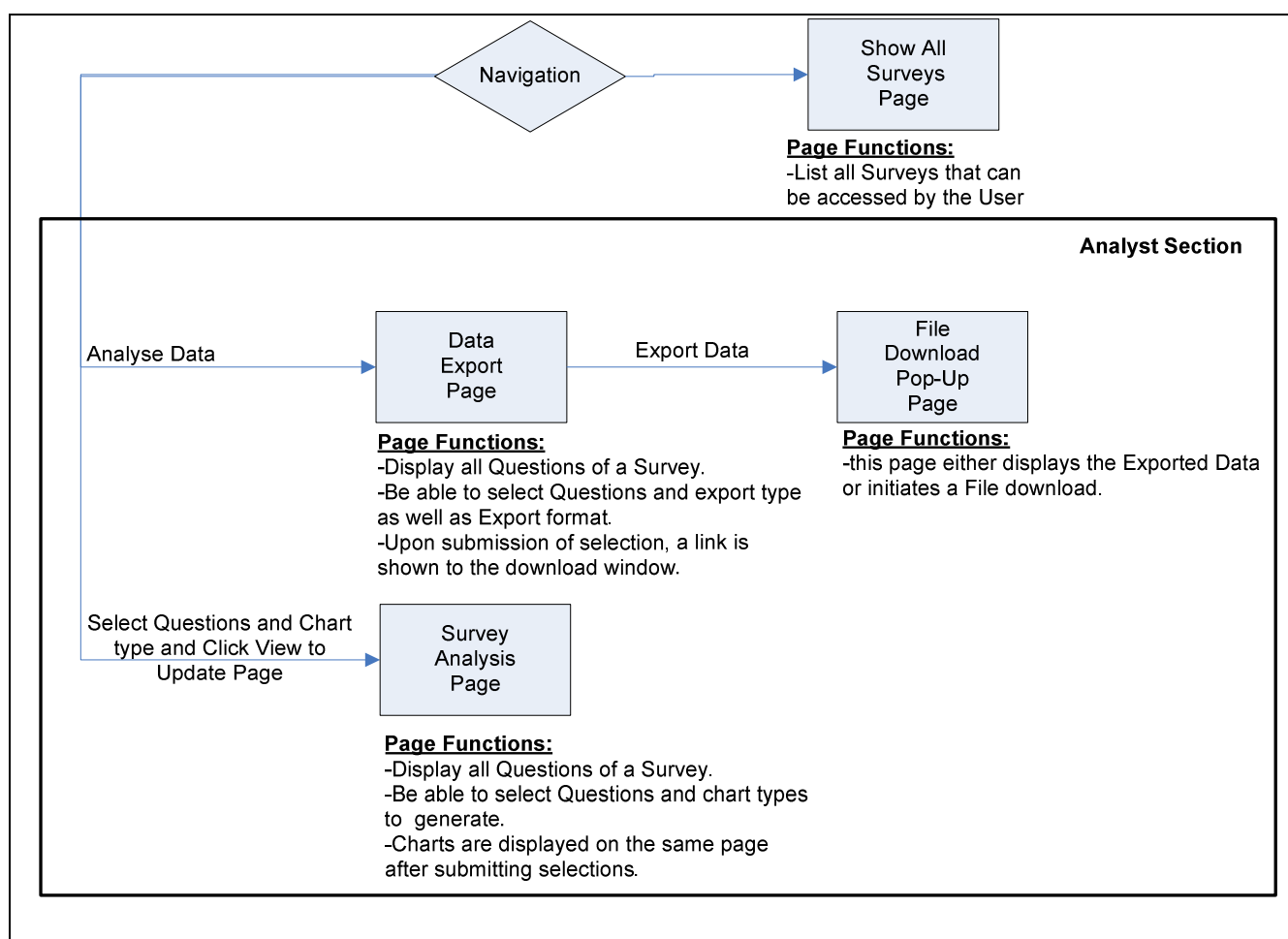


Figure 8: Analysts Screens.