

# Software Requirements Specification

for Kirkland Signature Online Survey Tool

Version 1.2

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## Revision History

Date	Changes	Version
10/21/16	Finished first draft	1.0
11/20/16	Changed up use cases and polished up diagrams	1.1
12/10/16	Finalized some use cases and made them more specific and clear (final version)	1.2

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# 1. Introduction

Authors: Josh Pfeffer, Jeremy Koletar, Patrick Cook, Timothy Wong

## 1.1 Purpose

Team Costco is presenting this document to XYZ Corporation to detail the Online Survey Tool project and lay out the various external interface requirements, system features, and other nonfunctional requirements. Our team's objective is to provide XYZ Corporation with an online survey tool that will allow them to better advise political campaigns via collected data from survey users.

After conducting interviews with multiple employees of the XYZ Corporation, we have compiled the information as laid out in this document. We intend for this document to serve as a basis and guide for future development of the product. Any feedback from XYZ Corporation will be much appreciated. This is version 1.0 of the document.

## 1.2 Document Conventions

Our team has divided this document into five sections and appendices. All major sections will begin on a new page and will follow the format described below. Major sections may also contain smaller subsections that will be used to describe specific details of this project. All main headings will be boldface 23-point font and preceded by the section number. Subheadings will be boldface 17-point font and will include the section number followed by the subsection number. Minor headings will appear in boldface 13-point font. Section content will be written using 11-point font.

# 1. Main Heading

## 1.1 Subheading

### 1.1.1 Minor Subheading

Body Subheading

**Section References**

All section content

The fourth section of this document contains tables and other information about our system's features and will outline user cases to describe the major tasks that our project will accomplish. All use cases will outline the steps that a user must complete to perform a specific action and the response from the system.

## 1.3 Intended Audience and Reading Suggestions

Team Costco has prepared this document for XYZ Corp project managers, marketing staff, developers who will be implementing/using this survey tool, and engineers who will be monitoring and/or modifying the the tool.

The project managers, marketing staff, implementers, and modifiers of this tool should read through the entire document as each part will be important and informational as to how our tool is going to be used, the capabilities, and different implementations of each part of the tool. However, if one would like to quickly view a synopsis, view **Section 2: Overall Description**. This section will give a broad view of the features and implementation of the online survey tool.

Developers who will be using/creating surveys through the tool should focus on **Section 3: External Interface Requirements** and **Section 4: System Features** as these sections detail how the tool will be used and what features the tool will have. These are especially important to understand as they are vital in using the tool effectively and efficiently.

This document will be the primary guideline upon which the whole tool will be based on. It specifies the requirements for our tool which will be followed throughout the process of designing and finalizing this tool.

## 1.4 Product Scope

Team Costco previously prepared a Vision and Scope document for XYZ Corp; please refer to section Scope and Limitations.

## 1.5 References

- Team Costco, 2016. *Vision & Scope Document for XYZ Corporation*.

## 2. Overall Description

Authors: Jeremy Koletar, Patrick Cook, Josh Pfeffer

### 2.1 Product Perspective

XYZ Corp's core business is conducting surveys. Current survey software has proven inadequate for their purposes. Data security is paramount, as survey result data and accompanying analysis are XYZ Corp's end product which it delivers to its customers. For this reason, survey software hosted by a third party is not preferred, eliminating many of the existing offerings. XYZ Corp primarily uses SurveyMonkey, which is not only hosted by a third party, but also lacks important question types and analysis features. The Online Survey Tool will supplement XYZ Corp's existing tools by providing the functionality described in the following section.

### 2.2 Product Functions

This section outlines the functionality that will be included in our survey tool. Please refer to section 4 for specific details on the implementation of our product.

Our vision for this project is to create a survey tool that will have surveys created by, data managed by, and analyzed by XYZ Corp exclusively. We want to make sure that this survey tool is easy to use for users as well as being fully-featured enough to allow XYZ Corp to obtain all the data it needs.

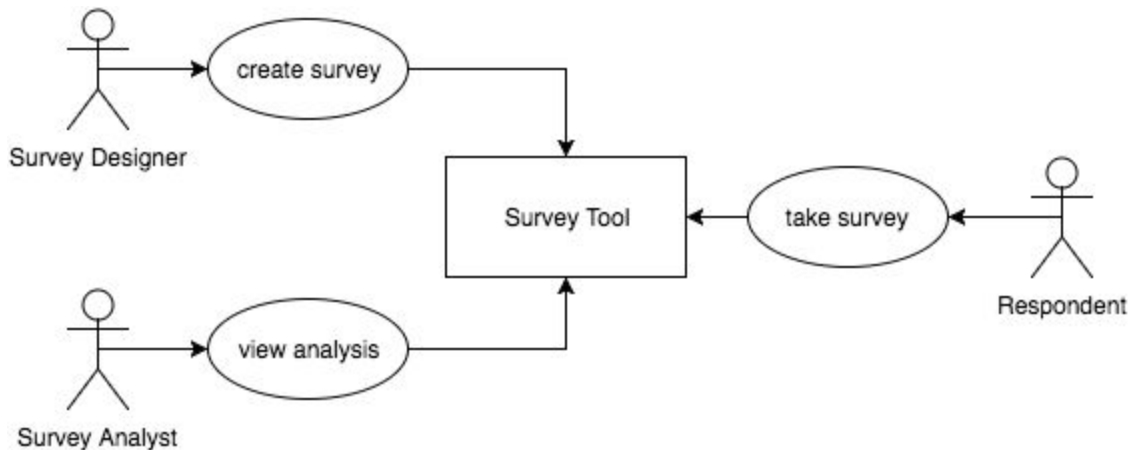
Our major features include:

- Basic survey tool where survey designers can create questions and subsequently collect the data
- The ability to ask and analyze conjoint analysis trade-off questions
- Data and survey results will be stored internally by XYZ Corp

Additional features include:

- The ability to manage email lists and send survey links out to respondents
- Restricting each user to only respond to each survey once
- View data in chart/graph form
- Conjoint trade-off analysis
- View statistical information calculated from data
- Cross tabulation analysis
- Regression analysis

## 2.3 User Classes and Characteristics



We will define the following users classes (each are specific users whom we expect to use our online survey tool):

- Survey maker
- Survey respondent
- Survey analyst

### 2.3.1 Survey Maker

Our survey tool functionality will be centered around the ability for authorized users to create surveys. Given that survey authors are skilled employees of XYZ Corp, it is important for the survey creation interface to be conducive to efficient usage by experts who have become familiar with the interface.

### 2.3.2 Survey Respondent

Survey respondents are the lifeblood of XYZ Corp's business, because without respondents, there is no data with which to sell to XYZ Corp's clients. Survey respondents will be filling out the surveys which have been sent to them by email. After completing the survey, the answers from the respondent will be stored in the database for later analysis by the survey analyst.

### 2.3.3 Survey Analyst

The survey analyst is the role which delivers value to XYZ Corp's clients. This user will be able to view survey results at any time as long as they are logged in to the system. The survey analyst will analyze the results of the surveys, synthesize it in logical conclusions, and deliver these conclusions to the appropriate political campaigns.



## 2.4 Operating Environment

Our goal in developing a survey tool for XYZ Corp is to maximize accessibility by ensuring support of major browsers such as Google Chrome, Safari, Firefox, and Microsoft Edge.

Given that survey respondents will respond to the survey according to their own schedule, the survey tool will be required to be available at all hours of the day. To achieve this, the survey tool must be hosted on a server with a stable internet connection and a secure connection to XYZ Corp's internal MySQL database. The MySQL database will contain the specifications for each survey created, the question bank, and user responses to the survey. This information will be available for survey analysts in order to perform data analytics on the information collected.

## 2.5 Design and Implementation Constraints

The following constraints will affect the implementation of the system:

- The survey can only be accessed by email.
- Respondent's minimum browser version must be:
  - Chrome 53.0
  - Safari 10.0
  - Firefox 49.0
  - Microsoft Edge 38.14393.0.0

## 2.6 User Documentation

Our online survey platform will contain a variety of documentation components: an FAQ, in-line help, an introductory tutorial, and a set of brief example surveys,

## 2.7 Assumptions and Dependencies

Team Costco has made specific assumptions based on our conversations with XYZ Corp in order to provide a reliable product that satisfies all requirements outlined within this Software Requirements Specification. We have outlined them below in order of importance:

### Assumptions:

- Our software will eventually replace the existing survey tool used by XYZ Corp.
- We will have consistent access to specific members of the XYZ Corp in order to confirm design decisions and obtain specific details.

- Our survey tool will be hosted internally by XYZ Corp to ensure maximum speed, security, reliability, and internal data storage.

Dependencies:

- The quality of our product is largely dependent on the hardware specifications (e.g. server quality, storage capacity, processing speeds, etc.) that XYZ Corp decides to implement for this project.
- A secure infrastructure to ensure that sensitive, private information does not get leaked.

## 3. External Interface Requirements

Authors: Timothy Wong, Josh Pfeffer, Jeremy Koletar

### 3.1 User Interfaces

The user interface will be web-based. Each survey page will contain a question and a clickable box for each answer option which indicates the user's answer. If there is a question that allows free responses, boxes will be provided for user input. Under each question in smaller font will be a description of how to answer the question (e.g. it might say "pick one of the two options in this conjoint analysis question"). There will be a button at the bottom of each page that allows a user to advance to the next question. If a response is not found for each question on the page, the button will send the user back to the same question that highlights the question the user did not answer.

### 3.2 Hardware Interfaces

Our survey tool will require the following hardware to ensure the reliability and usability of our product:

- A web server that can handle multiple HTTP client connections simultaneously
- The server must be hosted in immediate proximity to its database (which may reside on the same machine)
- The server must be capable of running the CentOS 7 Linux distribution
- A stable internet connection and backup power supply to decrease website downtime

### 3.3 Software Interfaces

The Online Survey Tool is primarily self-contained. The primary system it will be interacting with is the XYZ Corp outbound email server.

The outbound email server must support Simple Mail Transfer Protocol (SMTP) connections from the web server.

We will be using a MySQL database.

### 3.4 Communications Interfaces

The primary communication interface our system will be utilizing is a web-browser. This will allow all user types to interact with the system. They will be presented with specific

interfaces depending on their user-role and the actions they are allowed to perform. We will be using the HTTP and SSL as the communication standard for the web-browser.

A secondary communication interface we will be using is e-mail. Our system will use a backend e-mail system in order to distribute the survey link to intended respondents. We will be using SMTP as the communication standard for sending e-mail.

Our system will require three main user types, each with specific access rules and communication interfaces:

- The first user role, Survey Creator will be responsible for creating and distributing a survey using an internet connection, e-mail, and a web-browser.
- The second user role, Survey Respondent, will fill out and submit surveys using an interface displayed by a web-browser which will require a stable internet connection. This will also require a connection to an internal database which will store all survey responses and other data.
- The third role, Survey Analyst, will require access to the internal database, a web-browser and an internet connection. This role will require fast data transfer rates between the internal database and the web-server in order to present data analytics on the web interface for the Survey Analyst.

## 4. System Features

Authors: Patrick Cook, Timothy Wong

The following section lists out the system features and functions that will be implemented into the survey tool. The features and functions are described through use cases. Diagrams may reference specific use cases which are indicated using the following format: UC - #. Each use case will be organized in the following format:

### Use Case (UC) number and name

**Actors:** The users of the use case

**Goals:** Why the actors is trying to achieve

**Preconditions:** What is required before using this use case

**Summary:** What is happening in this use case

**Related Use Cases:** Which use cases are related to this use case

User Action	System Response
Specific actions that the user will perform	What the system will do in response to the action

**Postconditions:** What is supposed to happen after the use case

If there is a sub use case (e.g. UC 3.1), then the sub use case will have all of the parent's actors, goals, preconditions, summary, and related use cases unless explicitly redefined.

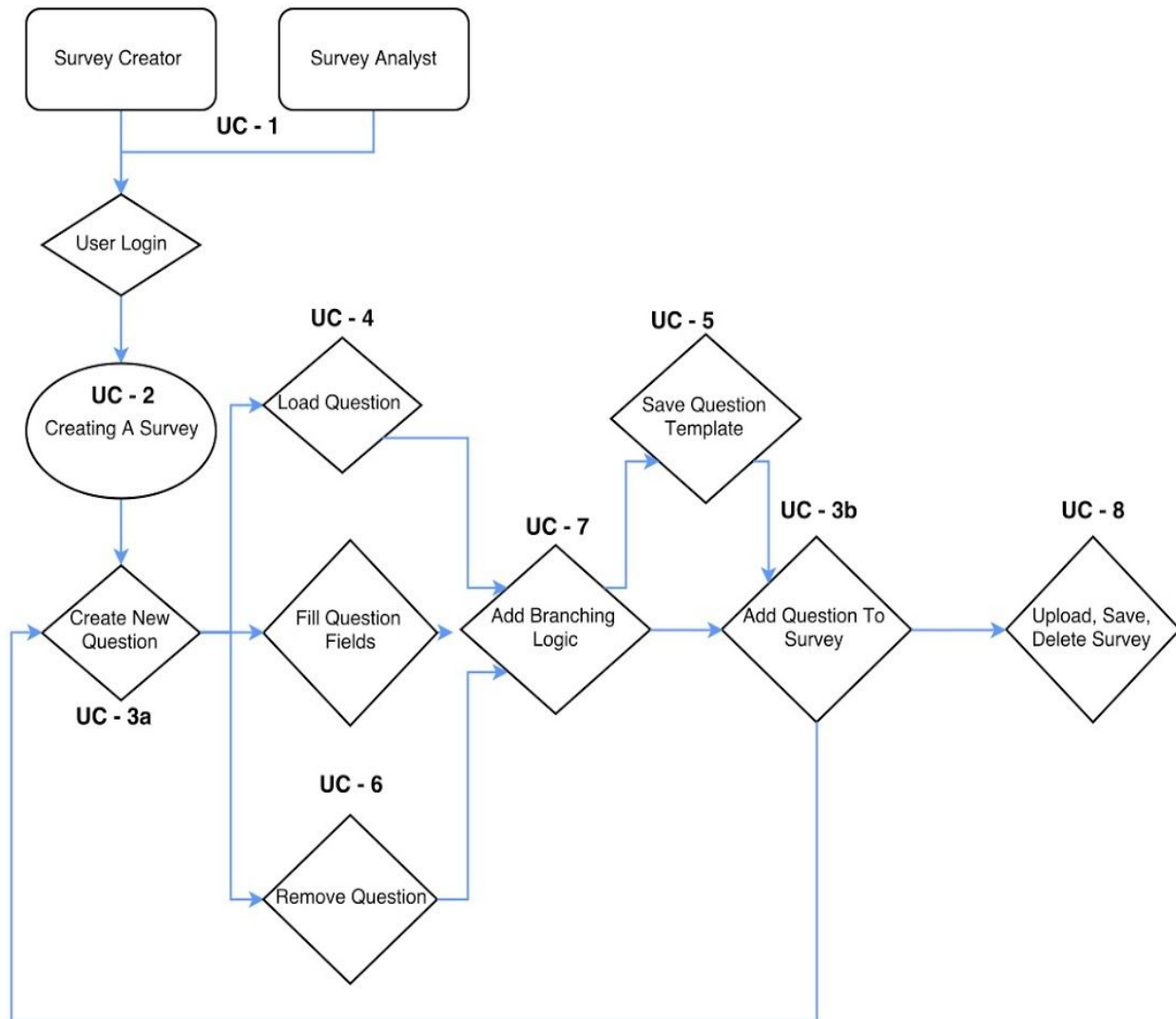
The use cases are separated into three sections. They are in the categories of use cases pertaining to:

1. Creating a survey
2. Taking a survey
3. Analyzing survey responses

## 4.1 Creating a survey

Authors: Patrick Cook, Josh Pfeffer

The following flowchart details the various users, processes, and use cases (indicated by UC-#) that are involved in creating a survey within the Kirkland Signature Online Survey Tool:



## UC-1: Logging in

**Actors:** Survey Analyst, Survey Creator

**Goals:** Authenticate users and limit access to business data

**Preconditions:** Not Logged In

**Summary:** The survey analyst or creator will log into the system by entering their credentials. If the users do not remember their login information, they can be redirected to a forgotten password section where they can receive their password with email confirmation.

**Related Use Cases:** None

User Action	System Response
Navigates to site	Prompt for credentials
Enters correct credentials	Display logged in view
Enters incorrect credentials	Prompt for correct credentials
<b>Branch if user does not know password</b>	
User clicks "Forgot password"	Prompt user for email address to send password reset link to

**Postconditions:** Logged In

## UC-2: Create new, blank survey

**Actors:** Survey Creator

**Goals:** The Survey Creator wants to create a new survey.

**Preconditions:** User is authenticated and is permitted to create surveys.

**Summary:** The user will navigate through the survey tool in order to create a blank survey that can have questions and answers added to them.

**Related use cases:**

- UC-3: Add a question to survey
- UC-4: Load a question from the question bank

User Action	System Response
User clicks "Create Survey"	"Create Survey" dialog opens
User sets opening date and time and closing date in time for survey	System adds the time constraints to the survey

User provides survey name and submits form	System creates a new blank survey and navigates user to the “Edit Survey” page for the newly created survey
--	---

**Postconditions:** A new blank survey has been initialized.

## UC-3: Add a question to survey

**Actors:** Survey Creator

**Goals:** The Survey Creator wants to create a new question to add to the survey and optionally save it to the question bank for later use.

**Preconditions:** User is authenticated and is permitted to edit the given survey. User has navigated to the “Edit Survey” page.

**Summary:** The user will create click the “Add Question” button and create the question from an editor provided. The user then can also reorder the questions to put the new question into the correct place. The system will support the following question types: free response, multiple choice, rating, constant sum, ranking, and conjoint analysis.

**Related Use Cases:**

- UC-4: Load a question from the question bank
- UC-5: Save question template into question bank
- UC-6: Remove a question from a draft survey

User Action	System Response
User clicks “Add Question”	“Add Question” dialog opens, listing available types of questions
User selects question type	Format for respective question becomes available to be filled out
User fills out the question prompt and possible responses	The question is appended to the survey
Drags respective question tab in the top bar to another position	Question order changes

**Postconditions:** Created question is added to survey.

### UC-3.1: Add a multiple choice question to survey

**Goals:** The Survey Creator wants to add a multiple choice question to the survey.

**Summary:** To add a multiple choice question to the survey, the survey creator can press the “Add Question” button and select from the drop down menu the “multiple choice” option. The survey creator can then create the question and create any number of options for the respondent to pick.



User Action	System Response
User clicks "Add Question"	"Add Question" dialog opens, listing available types of questions
User selects "Multiple choice"	Format for multiple choice question becomes available to be filled out
User selects "Single Answer"	The question can only have one answer from the respondent.
User selects "Multiple Answers"	The question can have many answers from the respondent.
User fills out the question prompt	The question is saved
User clicks "Add set option" and fills out option	New option is made and saved to the question
User clicks "Add free response"	New option is made that can be a free response from the respondent.

### UC-3.2: Add a free response question to survey

**Goals:** The Survey Creator wants to add a free response question to the survey.

**Summary:** To add a free response question to the survey the survey creator can press the "Add Question" button and select from the drop down menu the specific type of question they would like to add. The survey creator then inputs the question title.

User Action	System Response
User clicks "Add Question"	"Add Question" dialog opens, listing available types of questions
User selects "free response"	Format for free response question becomes available to be filled out
User fills out the question prompt	The question is appended to the survey

### UC-3.3: Add a rating question to survey

**Goals:** The Survey Creator wants to add a rating question to the survey.

**Summary:** To add a rating question to the survey the survey creator can press the “Add Question” button and select from the drop down menu the specific type of question they would like to add. The survey creator then inputs the question and specifies the scale for rating..

User Action	System Response
User clicks “Add Question”	“Add Question” dialog opens, listing available types of questions
User selects “rating”	Format for rating question becomes available to be filled out
User fills out the question prompt	The question is saved.
User picks number for rating	Creates radio buttons equal to the number chosen in ascending order.

#### UC-3.4: Add a constant sum question to survey

**Goals:** The Survey Creator wants to add a constant sum question to the survey.

**Summary:** To add a free response question to the survey the survey creator can press the “Add Question” button and select from the drop down menu the specific type of question they would like to add. The survey creator then inputs the question and picks the sum of values the respondent can distribute among options.

User Action	System Response
User clicks “Add Question”	“Add Question” dialog opens, listing available types of questions
User selects “constant sum”	Format for constant sum question becomes available to be filled out
User fills out the question prompt	The question is saved.
User picks number for sum	Allows respondent to only distribute values up to the sum.

#### UC-3.5: Add a ranking question to survey

**Goals:** The Survey Creator wants to add a ranking question to the survey.

**Summary:** To add a ranking question to the survey the survey creator can press the “Add Question” button and select from the drop down menu the specific type of question they would like to add. The survey creator then inputs the question and creates as many different options as desired.

User Action	System Response
User clicks “Add Question”	“Add Question” dialog opens, listing available types of questions
User selects “ranking”	Format for ranking question becomes available to be filled out
User fills out the question prompt	The question is saved.
User clicks “add option” and fills out option	Creates a new option, saves the option, and increases the ranking counter by one

### **UC-3.6: Add a system generated conjoint trade off question to survey**

**Goals:** The Survey Creator wants to add a conjoint trade off question to the survey.

**Summary:** To add a conjoint trade off question to the survey the survey creator can press the “Add Question” button and select from the drop down menu the specific type of question they would like to add. The survey creator then inputs the question title, attributes, attribute levels to be used for the generation of conjoint trade off questions. The system will use the attribute levels set by the user to create numerous varying questions.

User Action	System Response
User clicks “Add Question”	“Add Question” dialog opens, listing available types of questions
User selects question type	Format for respective question becomes available to be filled out
User adds attribute and defines attribute level	The system generates conjoint trade off questions with varying attribute values which are calculated based on the attribute level entered by the user upon question creation.

### UC-3.7: Add a manual conjoint trade off question to survey

**Goals:** The Survey Creator wants to add a manual conjoint trade off question to the survey.

**Summary:** To add a conjoint trade off question to the survey the survey creator can press the “Add Question” button and select from the drop down menu the specific type of question they would like to add. The survey creator then inputs the question title, number of options offered (2-3), attributes, and attribute levels for each option to be used for the generation of conjoint trade off questions.

User Action	System Response
User clicks “Add Question”	“Add Question” dialog opens, listing available types of questions
User selects question type	Format for respective question becomes available to be filled out
User selects number of options (2-3) offered to survey taker	The system renders 2-3 panels which contain input boxes where attributes and attribute levels can be defined by the survey creator
User adds attribute and defines attribute level	The system generates conjoint trade off questions with varying attribute values which are calculated based on the attribute level entered by the user upon question creation.

### UC-4: Load a question from the question bank

**Actors:** Survey creator

**Goals:** Allow the survey creator to load a question of their choice from the question bank.

**Preconditions:** User is on the survey creation page.

**Summary:** While the user is creating a survey, he/she will have the ability to load a specific question from the question bank into the current survey. This will take place on the survey creation page.

**Related use cases:**

- UC-3: Create a question and add to draft survey
- UC-5: Save question template into question bank
- UC-6: Remove a question from a draft survey

User Action	System Response
Selects a question from question bank	Copy of question is loaded
Clicks "branch" option	Prompts the user for the different questions and variables that the question should branch to and from
Presses delete button	Loaded question disappears
Drags respective question tab in the top bar to another position	Question order changes

**Postconditions:** Question has been loaded from the question bank.

## UC-5: Save question template into question bank

**Actors:** Survey creator

**Goals:** Allow the survey creator to save a question template into the question bank.

**Preconditions:** User is on survey creation page.

**Summary:** While the user is creating a survey, he/she will have the ability to save a specific question template into the question bank. This will take place on the survey creation page.

**Related use cases:**

- UC-3: Create a question and add to draft survey
- UC-4: Load a question from the question bank
- UC-6: Remove a question from a draft survey

User Action	System Response
User clicks "Add Question"	"Add Question" dialog opens, listing available types of questions
User selects question type	Format for respective question becomes available to be filled out
Clicks "Save Question" button	Question template is loaded into question bank
Clicks "Discard"	Question template draft is deleted

**Postconditions:** Question template has been saved into question bank.

## UC-6: Remove a question from a draft survey

**Actors:** Survey Creator

**Goals:** The Survey Creator has made a grave mistake, and no longer wants a particular question to appear on the survey.

**Preconditions:** User is authenticated and permitted to edit the given survey. User has navigated to the “Edit Survey” page.

**Summary:** User will click the “Delete” button next to a question which will remove the question from the draft survey.

**Related Use Cases:**

- UC-3: Create a question and add to draft survey
- UC-4: Load a question from the question bank
- UC-5: Save question template into question bank

User Action	System Response
User clicks the “Delete” button next to a question	A confirmation dialog appears, asking if the user is sure they want to delete the question
User clicks “Confirm”	The question is removed from the survey

**Postconditions:** Question has been deleted

## UC-7: Set up branching questions

**Actors:** Survey Creator

**Goals:** Allow a survey creator to add branching logic to a question

**Preconditions:** A question must be created. In order to select the destination question of the branch, the survey creator will be able to select from a drop down menu of current questions already created by the survey creator. User is in the “Edit Question” dialog.

**Summary:** The survey creator will tick a checkbox on the current “Edit Question” dialog. This will reveal the necessary fields for the implementation of branch logic. The creator will then have the option to input a conditional expression (greater than, less than, equivalence, or nonequivalence), the value to test against, and the question to skip to.

**Related Use Cases:**

- UC-3: Create a question and add to draft survey
- UC-4: Load a question from the question bank

User Action	System Response
Survey Creator adds branching logic to a particular pivot question (the location from where the respondent	View is updated with parameter fields that will be filled and used for branching logic

will branch) by ticking a checkbox  Pivot questions cannot be located during the conjoint segment.	
Survey Creator adds a conditional expression row to the table	A new empty row is created
Survey Creator can reorder Conditional Expressions, and can chain expressions to require multiple conditional expressions to be satisfied before branching to a new question.	

**Postconditions:** A new question has been created. The question has been updated to include branching logic which includes one or more conditional expressions, branching question, and the value to test the user's response against.

Example: If **test value** (==, !=, <, >) **user value** ----> jump to question #

*(bold items are parameters specified by actor)*

## UC-8: Distribute survey

**Actors:** Survey creator

**Goals:** Allow the survey creator to send out email links to potential respondents.

**Preconditions:** User has completed creating survey and is prepared to send out link to potential respondents.

**Summary:** From the survey creation page, the user will be able to upload their survey and subsequently send out the link in emails to potential respondents. They can also delete the survey in its entirety if desired.

**Related use cases:**

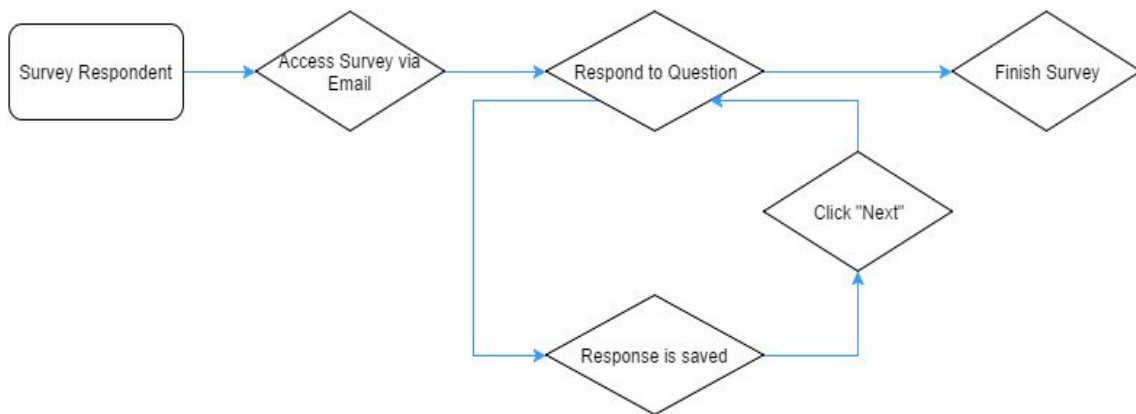
- UC-2: Create new, blank survey
- UC-3: Create a question and add to draft survey
- UC-4: Load a question from the question bank
- UC-6: Remove a question from a draft survey
- UC-7: Set up branching questions

User Action	System Response
Selects option to email survey to all respondents	Database loads up email list and prepares email with link
Clicks "Send Emails"	Email with link is sent to all on the email list

**Postconditions:** Survey has been saved/uploaded and respondents have received the link via email.

## 4.2 Taking a survey

Authors: Timothy Wong



### UC-9: Complete a survey

**Actors:** Survey Respondent

**Goals:** Allow the respondent to log an answer, move to the next question if there is another question, and finish the survey

**Preconditions:** Respondent has the link to the survey and can access the survey

**Summary:** The respondent is answering the survey questions by clicking one of the answers and/or writing their own response in a provided free response box. The respondent can save a partially answered survey and return to it later.

**Related Use Cases:**

- UC-8: Distribute survey

User Action	System Response
Pick an answer from given options	Indicate to the respondent the answer they picked
Create own response if allowed	Have empty text box user can type in
Click "next question" button	Log answer into database and move to next question

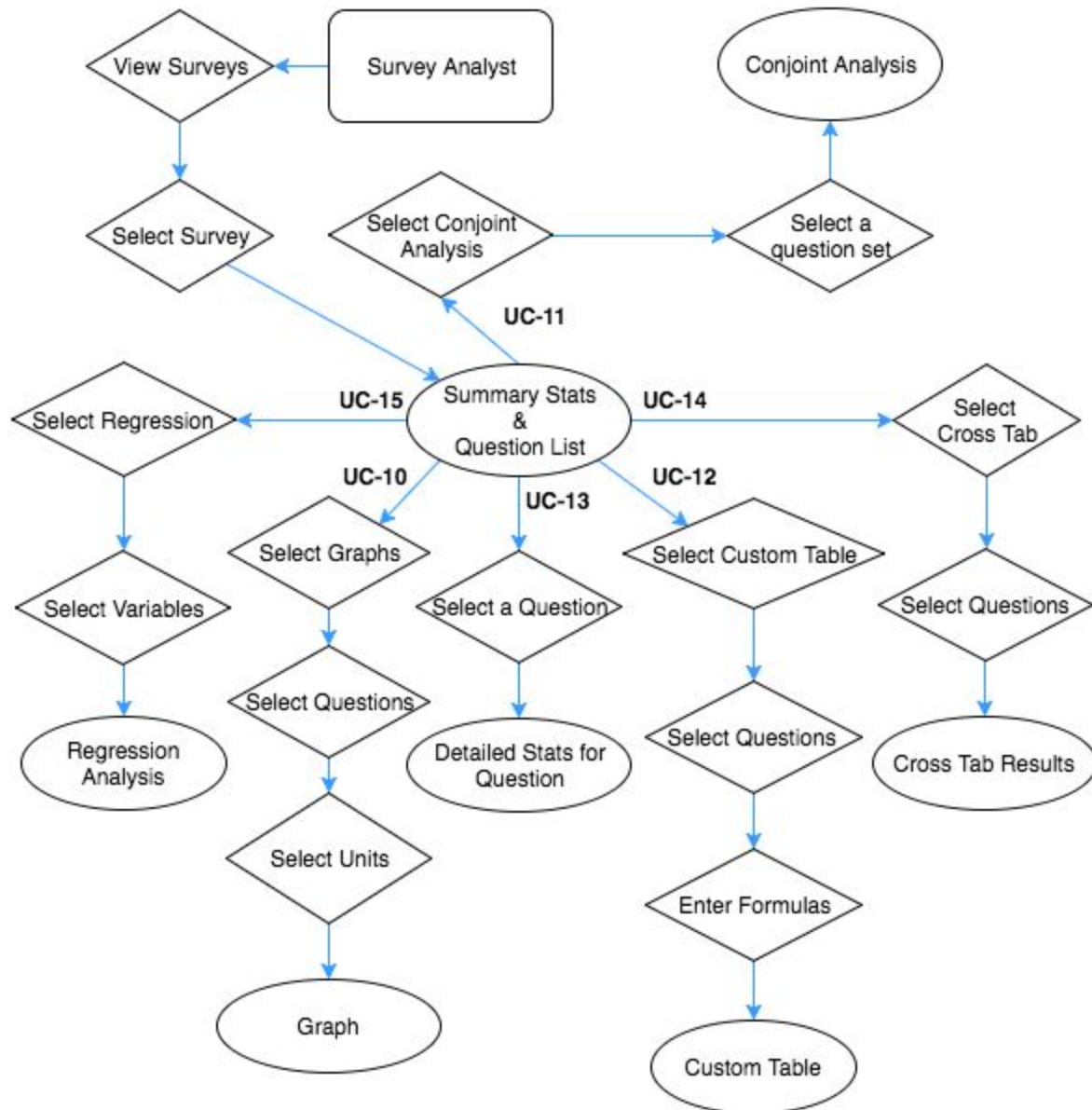






## 4.3 Analyzing survey responses

Authors: Joe Thomas (Diagram), Patrick Cook (UC-14), Timothy Wong



## UC-10: View data in chart/graph form

**Actors:** Survey Analyst

**Goals:** Allow analyst to view data in charts or graphs

**Preconditions:** Respondents have filled out survey and data has been submitted to the server. Survey Analyst has selected a published survey.

**Summary:** Analysts will navigate through the survey tool to get the data shown in a chart or graph. The analysts will be given options as to what question responses they want to analyze as well as what the graphs will look like (what units used, pie chart, bar chart, line graph, etc.)

**Related Use Cases:**

- UC-11: Trade-off analysis
- UC-12: View statistical information calculated from data
- UC-13: View analysis of particular question

User Action	System Response
Select a specific question to display analysis for	Display the "Analysis Settings" dialog
User specifies respondent attributes to filter on (mailing list, previous responses to questions), if any, then clicks next	Display the "Graph Settings" dialog
User selects from the applicable types of visualizations for the question (bar chart, histogram, pie chart, scatterplot)	Show the data for the specified subset of respondents in the requested visualization.

**Postcondition:** Graph is shown to the analyst.

## UC-11: Trade-off analysis

**Actors:** Survey Analyst

**Goals:** View analysis of conjoint trade-off questions

**Preconditions:** Logged In

**Summary:** Analyst will be able to look specifically at the trade-off analysis for any of the conjoint trade-off questions put into the survey

**Related Use Cases:**

- UC-10: View data in chart/graph form
- UC-12: View statistical information calculated from data
- UC-13: View analysis of particular question

User Action	System Response
Clicks 'Survey Data'	Display list of surveys
Clicks a survey	Display summary statistics and list of questions
Clicks "Trade Off Analysis" button	Prompt user for manual or engine created questions
Selects "manual" and specifies question	Create table showing the total responses of preferences for each manually created option.
Selects "engine created"	Create table with all the different attributes and the different average preferences for each level
User specifies respondent attributes to filter on (mailing list, previous responses to questions), if any, then clicks next	Display the "Graph Settings" dialog

**Postconditions:** Trade-off analysis is shown

## UC-12: View statistical information calculated from data

**Actors:** Survey Analyst

**Goals:** View survey response analytics

**Preconditions:** Logged In

**Summary:** The analyst will be able to look at the information calculated from the data received from the surveys in the form of numbers and formulas that can be customized.

**Related Use Cases:**

- UC-10: View data in chart/graph form
- UC-11: Trade-off analysis
- UC-13: View analysis of particular question

User Action	System Response
Clicks "Survey Data"	Display list of surveys

Clicks a survey	Display the number of total responses to the survey, the number of surveys sent, the percent responded, and the scale of responses since the survey was sent out.
-----------------	---

**Postconditions:** Data is shown in the form of numbers and statistics.

## UC-13: View analysis of a particular question

**Actors:** Survey Analyst

**Goals:** See in depth statistical information for a particular question

**Preconditions:** Logged in

**Summary:** The analyst will be able to look at the information specifically for a question as well as the details regarding that question (e.g. ethnicity of majority who answered one way)

**Related Use Cases:**

- UC-10: View data in chart/graph form
- UC-11: Trade-off analysis
- UC-12: View statistical information calculated from data

User Action	System Response
Clicks 'Survey Data'	Display list of surveys
Clicks a survey	Display summary statistics and list of questions
Clicks a question	Display detailed statistics for question (e.g. mean, standard deviation, variance)
User specifies respondent attributes to filter on (mailing list, previous responses to questions), if any, then clicks next	Display the "Graph Settings" dialog

**Postconditions:** Analyst sees the specifics for a question's responses.

## UC-14: Cross Tabulation Analysis

**Actors:** Survey Analyst

**Goals:** See in depth statistical information for a specific survey using cross tabulation analysis techniques

**Preconditions:** Logged in. Survey Analyst has selected a published survey.

**Summary:** The analyst will be able to view specific analytics that were calculated using cross tabulation analysis methods. Analytics will be displayed in a table format and will

allow the Survey Analyst to view the relationship between user responses to specific questions.

**Related Use Cases:**

- UC-10: View data in chart/graph form
- UC-11: Trade-off analysis
- UC-12: View statistical information calculated from data
- UC-13: View analysis of a particular question

User Action	System Response
Clicks 'Cross Tabulation Analysis'	Prompt user for question to be used for row and column
Inputs which question is represented on the row and column	Displays table with row and column question responses against each other
User specifies respondent attributes to filter on (mailing list, previous responses to questions), if any, then clicks next	Display the "Graph Settings" dialog

**Postconditions:** Analyst can view in depth cross tabulation analysis information that follows the following format:

<u>Race</u>		
<u>Age</u>	white	hispanic
18-25	<b>25% of respondents</b>	<b>25% of respondents</b>
25-35	<b>25% of respondents</b>	<b>25% of respondents</b>

## UC-15: Regression Analysis

**Actors:** Survey Analyst

**Goals:** See in depth statistical information for a particular question using cross regression analysis techniques

**Preconditions:** Logged in

**Summary:** The analyst will be able to look analyze relationships between different types of variables (i.e. dependent and independent).

**Related Use Cases:**

- UC-10: View data in chart/graph form
- UC-11: Trade-off analysis
- UC-12: View statistical information calculated from data
- UC-13: View analysis of a particular question
- UC-14: Cross Tabulation Analysis

User Action	System Response
Clicks 'Survey Data'	Display list of surveys
Clicks a survey	Display summary statistics and list of questions
Clicks 'Regression Analysis'	Prompts user for dependent and independent variables
Enters dependent and independent variables	Displays chart/graph of the independent variables vs the dependent variables
User specifies respondent attributes to filter on (mailing list, previous responses to questions), if any, then clicks next	Display the "Graph Settings" dialog

**Postconditions:** Analyst sees regression analysis data for specified survey.



## 5. Other Nonfunctional Requirements

Authors: Joseph Thomas, Jeremy Koletar

### 5.1 Performance Requirements

XYZ Corp performs surveys inside the United States on a national scale. An individual survey may have several thousand respondents, and up to 10 surveys will be open to respondents simultaneously. Respondents do not necessarily begin a survey at the same time, but the number of respondents actively engaged with a survey tends to peak within the first 2 hours of solicitation. The number of users within XYZ Corp who will be creating and analyzing surveys is less than 100. These users do not contribute significantly to the total for the purposes of performance.

Based on these parameters, the system must be performant under a peak load of 10,000 simultaneous users. For most uses cases, at or below this user count, system response times **should** remain below the threshold at which users perceive it to be “reacting instantaneously”, which is 100 milliseconds (see reference), and **must** remain below twice that threshold, 200 milliseconds. For computationally expensive actions such as loading large mailing lists or analyzing large data sets, response times will inherently vary.

Reference: “Response Times: The 3 Important Limits”  
(<https://www.nngroup.com/articles/response-times-3-important-limits/>)

### 5.2 Safety Requirements

Our online survey tool will be primarily used to create, distribute and analyze user responses. Therefore, with proper use of our product, no safety requirements will be needed.

### 5.3 Security Requirements

As discussed in Section 2 of this document, improved data security is one of the driving business needs for this project. A breach would compromise the goals of XYZ Corp’s clients, and potentially expose personally identifiable data of survey respondents. For these reasons, the product will undergo thorough testing to ensure it is free of security vulnerabilities.

### 5.4 Software Quality Attributes

The product will play a core role in XYZ Corp's business. As such it must be highly reliable. Extensive testing will be performed using the unit testing methodology to ensure the reliability of features and correctness of code. Automated stress testing will be performed to verify that the product performs under heavy loads (as described in section 5.1). The product will also be well documented and designed so that it can be maintained and extended in the future.

## **5.5 Business Rules**

Sensitive internal information should be kept securely within XYZ Corp. Adequate access control shall maintain this policy.

# Appendix A: Data Dictionary

Authors: Josh Pfeffer, Timothy Wong

## User

User account information, XYZ Corp. employees

### **Username**

User identifier for logging in  
String  
4-16 alphanumeric characters

### **Password**

User secret for logging in  
String  
102 characters (number of hashing rounds, salt, and PBKDF2 digest)

### **Email**

User email for site communiques, password resets, etc.  
String  
Email address, up to 254 characters, RFC 3696 + Errata

## Survey

Individual survey design

### **Name**

Title of the survey  
String

### **Description**

Additional description  
String

### **First Question**

Initial question presented to respondent  
Question

## Question

Individual survey question, belongs to one survey

### **Type**

Type of question  
QuestionType enum

## **Question Types**

### **Multiple Choice**

- Pick best answer (One option question):
  - User will be prompted with options and can only pick one
  - Use of radio button
  - Survey creator may allow an option for a user input answer
    - If no option is picked, user responses will not be logged and question will be repeated
- Pick best answers (Multiple option question):
  - User will be prompted with options and must choose but is not limited to one answer.
  - Use of check boxes
  - Survey creator may allow an option for one or multiple user input answers
    - If no options are selected, user responses will not be logged and question will be repeated

### **Rating Scale**

- Rate each option based on user preference:
  - Survey creator fixes the range for ranking
  - User will be prompted with a question, options, and user input boxes that allows for input of an integer
    - If not within range, user responses will not be logged and question will be repeated

### **Constant Sum**

- Rate each option based on user preference with the limitation that the ratings must equal a set sum
  - Survey creator fixes the constant sum allowed for the question
  - User will be prompted with a question, options, and user input boxes that allows for input of an integer
    - If the total sum of user input answers is not equal to the constant sum specified, user responses will not be logged and question will be repeated

### **Ranking**

- Rank each option from lowest preferred to highest preferred
  - Survey creator creates any number of options
  - User will be prompted with question, options, and drop down boxes for each option with answers ranging between the number of options provided

### **Conjoint trade-off**

- Pick a number between 1-9 with 1 showing preference towards one answer and 9 showing preference towards the other (Two choice question):
  - Survey creator creates two options
  - User will be prompted with question, options, and 9 radio buttons that show numbers 1 through 9
- Pick one of the options that is most preferred (Full profile question):
  - Survey creator creates multiple options that each have multiple attributes
  - User will be prompted with question, options, and a radio button for each option

### **Branching Questions**

- Conditional expression
  - The condition to check for while setting a branching question
    - e.g. if **test value** (==, !=, <, <=, >, >=)
- Test value
  - The value to include in the conditional expression
- Destination question
  - The question to jump to if a conditional expression evaluates to true

## **Answer**

Survey answer, belongs to one question

Set answers created by survey creator

Some answers can be filled in by survey respondent if allowed by survey creator

## **Question Bank**

Set of saved questions for easy compositing of common questions into a survey

Saved by survey creator when they are creating questions

## **Question Template**

Each question type will have a template that will be filled in

## **Respondent List**

Set of survey respondents, essentially a mailing list

## **Survey Analyst**

User who will be analyzing the data from the survey

Has access to creation and analysis features of survey tool

## **Survey Creator**

User who will be creating the survey  
Has access to creation feature of survey tool  
Sends out survey by means of the respondent list

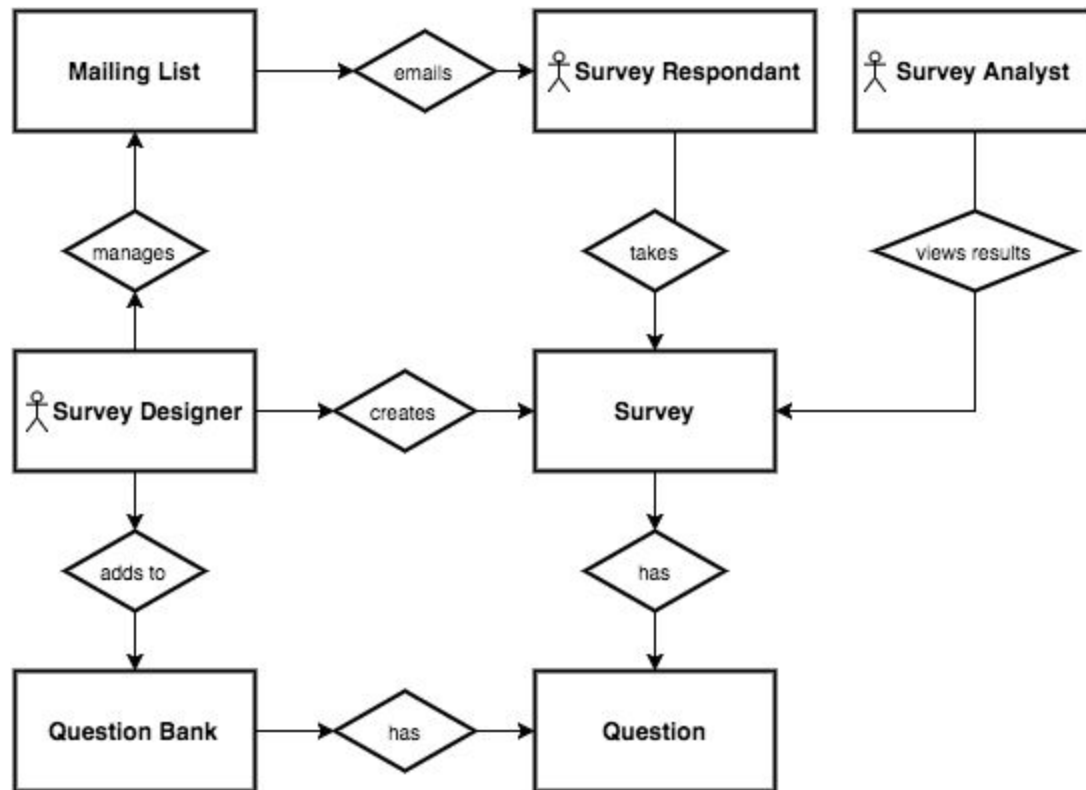
## **Survey Respondent**

Person who will be answering the survey  
Receives access to survey via an email

# Appendix B: Analysis Models

Authors: Patrick Cook, Josh Pfeffer, Joe Thomas

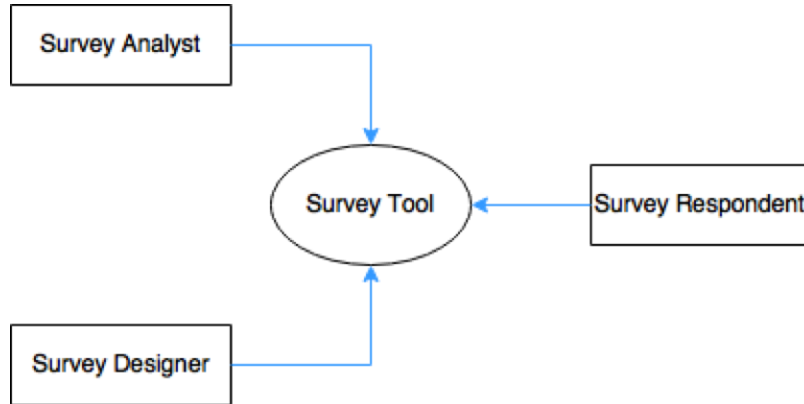
## B.1 Entity Relationship Diagram



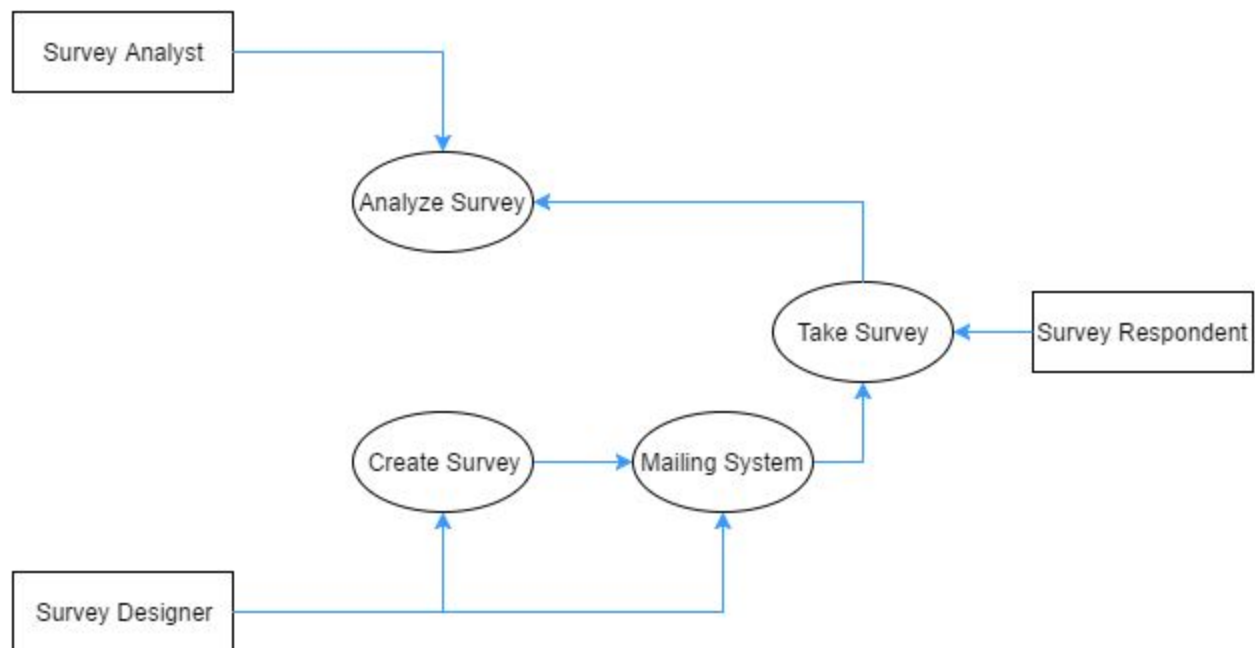
Level 0 ERD

## B.2 Data Flow Diagrams

### Level 0 DFD (Context Diagram):



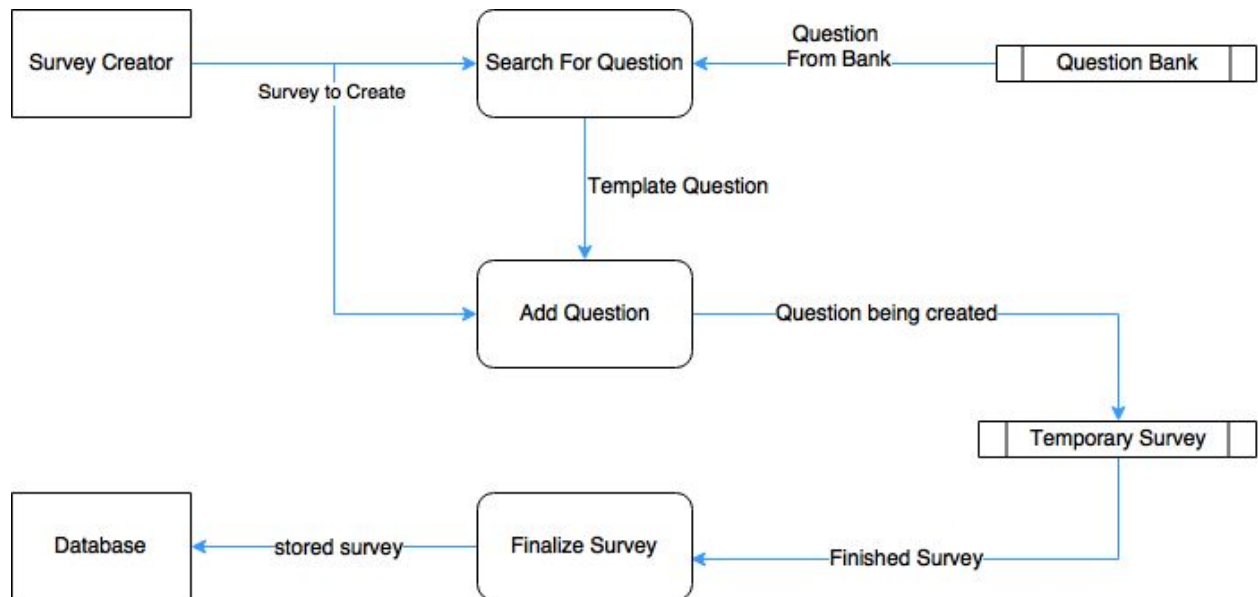
### Level 1 DFD:



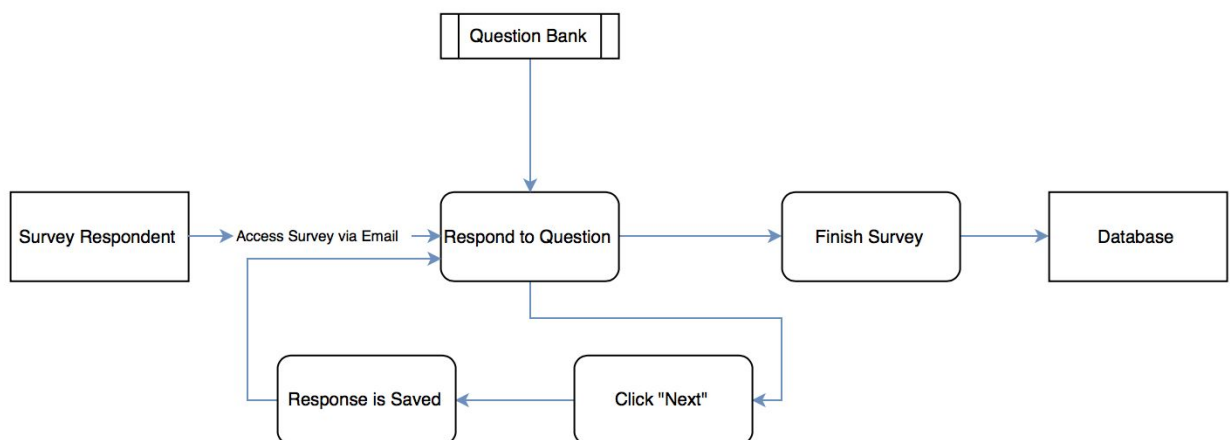


## Level 2 DFDs:

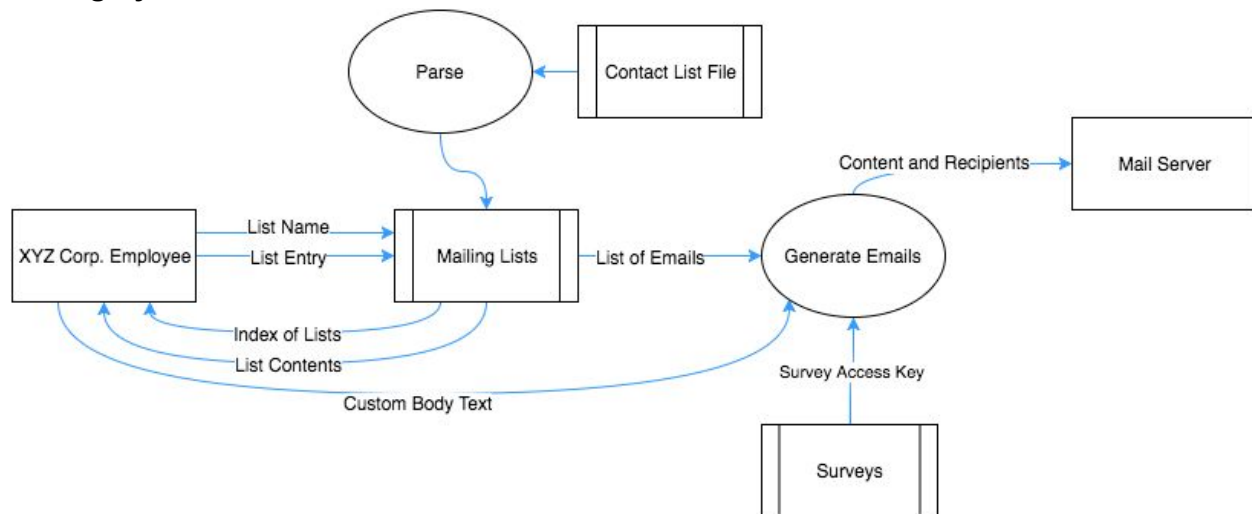
### Creating a Survey:



### Taking a Survey:



## Mailing System:



## Analyzing Survey:

