

# Distributed Polling System Requirements Specification

Version 1.0

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## 1. Introduction

### 1.1 Purpose of this document

The purpose of this document is to clearly specify the requirements cater by DPS to all parties associated with the project. The document also categorizes the requirements based on priorities in order to differentiate among essential requirements and optional/additional requirements.

### 1.2 Intended Audience

- Score Supervisor and Evaluators: This document will serve as one of the input to evaluate the project for score competition.
- Project team members: This document will be used as a reference by project team during implementation and to ensure that high priority requirements are given more importance than low priority requirements.
- Steering group members: To make sure that project is getting implemented in accordance with the requirements provided by customer.
- Future Users: The future stakeholders that will participate in development of the further versions of the DPS product.

### 1.3 Scope

This document describes all project requirements along with high level use case diagrams. Scope of the document includes priority, source and categorization of requirements.

### 1.4 Definitions and acronyms

#### 1.4.1 Acronyms and abbreviations

Acronym or Abbreviation	Definitions
DPS	Distributed Polling System
DSD	Distributed Software Development
User	Poll Member/Administrator

## 2. Requirements Description

### 2.1 Introduction

DPS project is performed as part of SCORE contest and DSD course. The project is currently entering the requirement analysis phase after completion of project planning phase. DPS is a system through which it is possible to cast votes and obtain results in order to make decisions among a specific set of predefined users. In the following sections, we will discuss requirements catered by DPS.

### 2.2 Functional requirements

The requirement of DPS project is to develop an application which controls polling among predefined set of members in order to make some specific business decision. The application can be hosted on a web server and users of the system, i.e. poll members and system administrator can use the system in order to perform various different functionalities explained in sections discussed below. The poll members can cast votes by sending sms or email based on their current situation, for example, if one or more poll members are traveling then they can use their mobiles to send sms to send their vote. DPS system will be able to send information of polls, receive member's responses and announce result of polls based on the responses received. Later on, these results can be used by management to take important business decisions.

The main actors of DPS project are system administrator and poll member.

### 2.2.1 *SMS Module Interaction Requirements*

Using mobile communication tools for voting on a certain issue in order to make business decision is one of the goals of this system. Sending SMS text messages is a way for communication that makes it possible to vote between predefined options and receive voting results. Sending alert message to members in the correct format through SMS, receiving the acknowledgment after the data is received and sending the analyzed results of each vote are requirements which will be done by SMS module Interaction.

### 2.2.2 *Email Module Interaction Requirements*

Another type of mobile communication is sending and receiving information by email. One of the requirements of DPS project is Email Module Interaction part, which will do all controlling on sending and receiving email. The emails about decisions regarding a certain matter will be sent to all members of the group which is pre defined by administrator and their responses will received by system. Controlling the email interaction is an important part of the system which will be responsible for sending alerts to all specified members and getting their results in a secure communication channel with encrypted data.

## 2.3 **Non Functional Requirements**

### 2.3.1 *Security Requirements*

Security requirements allow members to vote and discuss about important business decisions in a secure manner. The data send over the internet by email or by SMS will be encrypted. Also, the detail information related to business decision will be sent to member's email address in the form of password protected PDF file. While receiving responses, system will check whether the sending person is a legitimate user or not. Authentication is achieved using digital signatures.

### 2.3.2 *User Interface*

The system is a web-based application. User and administrator can have access to the system from anywhere in the world using the web browsers.

### 2.3.3 *Usability*

Clearly show all the options a user or administrator has at any given stage while using the system. We should make the system web page front-end simple and easy to understand and to interact with.

It should be easy and painless for the user to create a poll and thereby facilitate easy decision making. If it's too hard or takes too long the user might leave without using this option for online decision making.

### 2.3.4 *Database Requirements*

Database will store information of members of the system, all information of defined pools, answers of the members and the result of each poll. It must have a good performance with a well designed structure to avoid redundancy. Accessing the database will be possible from data access layer and proper stored procedures will be written for getting data from it.

### 2.3.5 *Extensibility*

Over time the system will be enhanced with small features like including voice mail and multimedia messages, therefore the application is extensible.

## 2.4 **Requirement Engineering**

We first identified all combinations of possible scenarios, after that we specified the requirements using use case diagrams and in the document we present one as an illustration.

### 2.4.1 Matrix for scenarios

By studying the problem statement and description, we have identified several possible scenarios or cases which we may encounter (more than 100 combinations). All the possible scenarios and examples have been listed out in the form of a matrix as well as text so as to get a more clear idea of what should be exactly developed. A sample matrix is depicted as in the following section.

The priority of the poll decides whether the poll can be send by SMS or email or both(for e.g: a low priority poll is send only as an email, whereas a high priority poll are send by moth means). Anonymous field represents whether user can vote anonymously or not. It is decided by the poll member during the creation of poll. Discussion allowed specifies whether discussion facility is permitted for a given poll. There are different poll types that we have identified. The poll can be a yes/no type or choosing anyone option from then given list or choosing the options based on priority and choosing many options without any priority. Result Calculation represents when the result can be calculated for a particular poll. Some combinations of poll cannot exist (for e.g.: a priority poll cannot be send only as an email). This is what is specified as Does this type of poll exists.

**Table 4-1: Matrix of scenarios**

Priority of poll	Anonymous	Discussion Allowed	Send by SMS	Send by Email	Poll Type				Result Calculation (final Decision)	Does this Type of poll exist?
					Yes/No	Choose anyone option	Choose Many Option	Choose according to priority		
Low		✓		✓	✓				>50% vote	Yes
	✓									
Medium		✓	✓		✓				>50% vote	Yes
	✓									
High		✓	✓	✓	✓				>50% vote	Yes
	✓									

From the table we arrived at several scenarios like:

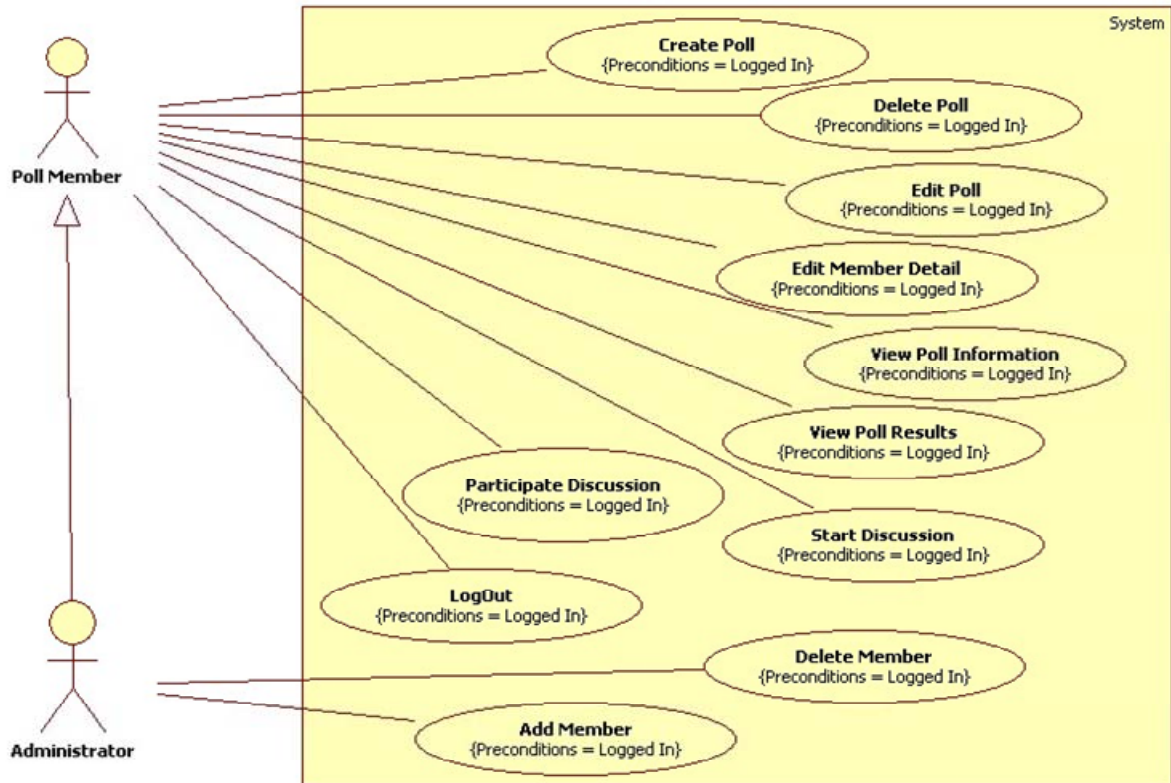
1. In a high priority poll where discussion was allowed, one of the poll members sends his opinion. But later when he discussed with other members of poll, he wanted to change his opinion before the poll was closed.

Is this allowed? How is it going to be implemented?

2. There is a case where at the time of calculating results of a poll, there is 50%-50% vote between two options. Is the poll reopened again for voting/discussions? How the system will implement this?

### 3. Use Case Models

This use case explains all activities which can be performed in DPS system.



**Figure 3-1: Use Case diagram**

Description of each part in detail is as follows:

**Table 3-1: System Login**

Use Case Element	Description
Use Case ID	1
Use Case Name	System Login
Use Case Description	A system user can login into the system to perform associated actions
Primary Actor	Poll member and Administrator
Precondition	None
Basic Flow	User will login into the system
Alternate flow	An error message should be thrown if username/password is incorrect and user

**Table 3-2: System Logout**

Use Case Element	Description
Use Case ID	2
Use Case Name	System Logout
Use Case Description	A user session should end with a logout
Primary Actor	Poll member and Administrator

Precondition	The poll member/admin should have prior log in
Basic Flow	The session should end with a logout message
Alternate flow	No Alternate Flow

**Table 3-3: Vote**

Use Case Element	Description
Use Case ID	3
Use Case Name	Vote
Use Case Description	A Poll member should be able to vote for a particular pole through SMS/Email
Primary Actor	Poll member
Precondition	None
Basic Flow	
Alternate flow	

**Table 3-4: Edit personal details**

Use Case Element	Description
Use Case ID	4
Use Case Name	Edit Personal Details
Use Case Description	A Poll member/Administrator should be able to change his profile details
Primary Actor	Poll member and Administrator
Precondition	The poll member/admin should be logged in
Basic Flow	A successful updation of profile should be shown
Alternate flow	No Alternate Flow

**Table 3-5: Create Discussion**

Use Case Element	Description
Use Case ID	5
Use Case Name	Create Discussion
Use Case Description	A Poll member should be able to create a discussion for a particular Poll
Primary Actor	Poll member
Precondition	The poll member should be logged in
Basic Flow	A successful creation of discussion should be shown
Alternate flow	No Alternate Flow

**Table 3-6: Participate Discussion**

Use Case Element	Description
Use Case ID	6
Use Case Name	Participate Discussion
Use Case Description	A Poll member should be able to participate in a already created discussion for a particular Poll
Primary Actor	Poll member
Precondition	The poll member should be logged in
Basic Flow	New participant should be visible to other members
Alternate flow	No Alternate Flow

**Table 3-7: Add poll member**

Use Case Element	Description
Use Case ID	7
Use Case Name	Add poll member
Use Case Description	Administrator should be able to add a new member to participate in a particular Poll
Primary Actor	Administrator
Precondition	Admin should be logged in
Basic Flow	A successful member addition should be shown
Alternate flow	No Alternate Flow

**Table 3-8: Delete poll member**

Use Case Element	Description
Use Case ID	8
Use Case Name	Delete poll member
Use Case Description	Administrator should be able to delete a member to from an existing Poll
Primary Actor	Administrator
Precondition	Admin should be logged in
Basic Flow	A successful member deletion should be shown
Alternate flow	No Alternate Flow

**Table 3-9: Create poll**

Use Case Element	Description
Use Case ID	9
Use Case Name	Create Poll
Use Case Description	Administrator should be able to create a new Poll



Primary Actor	Administrator
Precondition	Admin should be logged in
Basic Flow	A successful creation of poll should be shown and all members should be notified about the poll
Alternate flow	No Alternate Flow

**Table 3-10: Edit poll**

Use Case Element	Description
Use Case ID	10
Use Case Name	Edit Poll
Use Case Description	Administrator should be able to edit an existing Poll
Primary Actor	Administrator
Precondition	Admin should be logged in
Basic Flow	A successful updation of poll should be shown and all members should be notified about the poll
Alternate flow	If one option of the poll has already got 50% votes, then an error message should be thrown and system should not allow editing the pole.

**Table 3-11: Delete poll**

Use Case Element	Description
Use Case ID	11
Use Case Name	Delete Poll
Use Case Description	Administrator should be able to delete an existing Poll
Primary Actor	Administrator
Precondition	Admin should be logged in
Basic Flow	A successful deletion of poll should be shown and all members should be notified about the deletion.
Alternate flow	No Alternate Flow

**Table 3-12: Edit other members details**

Use Case Element	Description
Use Case ID	12
Use Case Name	Edit Other Member Details
Use Case Description	Administrator should be able to edit other members details
Primary Actor	Administrator
Precondition	Admin should be logged in
Basic Flow	A successful updation of profile should be shown
Alternate flow	No Alternate Flow

## 4. Requirements Definition

### 4.1 Requirement Group Definitions

Identification	Requirement Group	Rem.
MAC	Main Application Core	
SA	Security Aspects	
PY	Persistency	
SMI	SMS Module Interaction	
EMI	Email Module Interaction	
DB	Database	
WA	Web Application	

### 4.2 Requirement Sources

Source	Description	Rem.
Ctm	Customer	
Sys	Required as a consequence of system	

### 4.3 Requirements definitions

Identity	Status	Priority	Description	Source
Main Application Core				
MAC-1	I	1	Call for voting on a certain issue	Ctm
MAC-2	I	1	Inform all members to vote for a business decision	Ctm
MAC-2	I	1	Broadcast newly created poll info to all poll members	Ctm
MAC-3	I	1	Check user authenticity for the received vote	Ctm
MAC-4	I	1	Anonymous voting	Ctm
MAC-5	I	1	Calculate result based on responses received	Ctm
MAC-6	I	1	Broadcast the result back to all poll members	Ctm
MAC-7	I	1	Close/Publish the result of vote whenever the result of a poll can be decided. According to the number of votes, percentages of answers or time	Ctm
Web Application				
WA-1	I	1	User can log in to the Web page	Sys
WA-2	I	1	User can manage his/her personal information	Sys
WA-3	I	1	User can view all open/close polls information	Ctm
WA-4	I	1	User can create a poll	Ctm
WA-5	I	1	User can delete the poll which he/she has created	Ctm
WA-6	I	1	User can select members of each poll while is creating a poll	Ctm
WA-7	I	1	User can specify all attributes of a poll	Sys
WA-9	I	1	User is allowed to select voting scheme (ex: Yes/No votes)	Ctm
WA-10	I	1	User can create Anonymous or non Anonymous voting	Ctm
WA-11	I	1	User can extend the deadline of the poll that is created by himself/herself	Ctm
SMS Module Interaction				
SMI-1	I	1	Send poll information by SMS to specified members	Ctm
SMI-2	I	1	Collect Acknowledgement for sent SMS	Ctm
SMI-3	I	1	Receive SMS responses and Update database	Sys
SMI-4	I	1	Extract answer from the received SMS	Sys
SMI-5	I	1	Do not store duplicate votes and inform the user by SMS	Ctm

SMI-6	I	1	Check validity of received answer and inform the user for invalid vote	Ctm
SMI-7	I	1	Log sent and received SMS information	Sys
Email Module Interaction				
EMI-1	I	1	Send poll information by Email to specified members	Ctm
EMI-2	I	1	Provide security (Send password protected PDF attachment files) with Emails	Ctm
EMI-3	I	1	Collect Acknowledgement for sent Emails	Ctm
EMI-4	I	1	Receive emailed responses and Update database	Sys
EMI-5	I	1	Extract answer from the received SMS	Sys
EMI-6	I	1	Do not store duplicate votes and inform the user by Email	Ctm
EMI-7	I	1	Check validity of received answer and inform the user for invalid vote	Ctm
EMI-8	I	1	Log send and received email information	Sys

Requirement status:

*I = implemented* (this requirement has been already implemented),

## 5. Future Development

DPS project has a good future in commercial market. This application can be enhanced for more features in order to meet specific customer requirements. We have planned to implement only sms and email as voting method, but if future other means of communication such as voice mail can be implemented to support different user needs. Even more secured measures can be undertaken like digital signatures and so on for further enhancement.