

# Title

## Distributed Decision in a Mobile Context

### Abstract

This is a system through which it is possible to cast votes and obtain voting results in order for decisions to be made among a predefined group of people or systems (through particular interfaces). This is done applying different asynchronous mechanisms and technologies such as SMS for mobile phones, e-mails sent through WiFi, 3g, etc, taking into account the necessary security measures (i.e., a validation and digital signature will be required, etc.). The project should focus on interfaces and algorithms (not on technologies).

### Introduction

A functional prototype of a system is to be designed and developed. It will allow votes to be casted and voting results to be obtained for decision making among a predefined group of people or systems. Voters should interact to call for voting on a certain issue, this may be done using different asynchronous mechanisms and technologies such as SMS for mobile phones, e-mails sent through WiFi, 3g, etc.

The system is to be used by a predefined group of people or systems (voters) and will not be available to those who are not members of the group (i.e., it is not for open or public elections). In that sense, aspects such as security should be considered (i.e., a validation and digital signature will be required, etc.).

The project should focus on interfaces and algorithms (not on technologies). The development methodology chosen and the design architecture proposed will be the main points of the evaluation.

The following section describes the expected functional scenarios of use, an example and more detailed requirements. The development team is expected to elicit the requirements for the project. Such requirements specifications should be part of the project deliverables. Lastly, requirements regarding the deliverables of the project are listed.

### Application domain and scenarios

- **Context:** companies with a very horizontal structure (little hierarchy), with an important number of employees, traveling and working around the world, etc..
- **Motivation:** to take some kind of specific group decisions, there is no reason to wait for plenary meetings, but they should rather take such group decisions remotely from wherever they are, using available technological infrastructure.
- **Need:** a system to enable:
  1. Inform that a decision should be taken for a given business reason
  2. Broadcast each point of view to others
  3. Choose or vote between given options
  4. Compute, present and communicate the results of the vote

### **An Example:**

The Board of Directors of a company with a horizontal structure and a considerable number of members (e.g. an attorneys Law and Investment firm) that has worldwide accounts and therefore implies traveling very often, may make some decisions without the need to schedule meetings, but from different places through technological infrastructure. They may acquire or develop a system that: calls for voting on a certain issue in order to make a business decision, exchanges the voters' opinions on the matter, allows voters to vote between predefined options and, lastly, shows the voting results.

## **Project goals (functional requirements)**

The system should:

- A. Allow for different means of mobile communication (e-mails, voice messages, "SMS" text messages etc). A limited list of available mechanisms can be agreed.
- B. Send an alert message informing that a decision regarding a certain matter is required from all members of the group. This may be a group of people or systems.
- C. Send the alert message to the members, wherever they may be, in the correct format depending on the way the member is connected at that moment (e-mail, voice message, "SMS" text message, pop-box, etc.). Design Alternatives:
  - a. One option is to send the alert message and search for new channels, which should be stored, if an ACK is not received. This implies knowing the location of the members and some kind of tracking.
  - b. A login and reception protocol should be proposed.
- D. Provide additional information in various formats (e.g. a PDF file for those connected through WiFi or internet, and a summary or abstract for those with mobile phones and no other kind of connection).
- E. It would be ideal if the system could adapt the information according to the device; there should be a list of possible devices.
- F. After the call for voting, sending the information and receiving the ACKs, the voting process should begin. In general, two or three voting schemes may be proposed (e.g. Simple "Yes/No" vote; vote between  $n$  options with or without a suggested favorite; vote according to priority, etc.). Otherwise, the most complex may be used (e.g. order of priority). This may be dynamic; the one who proposes the topic to be voted on may also propose a scheme; or there may only be one method but in this case, there must be a design for other voting methods to be included in the future.
- G. Enable to configure dynamically if the vote is anonymous or not. However the system should initially propose a single default mechanism. In such case, the proposed design should consider extending the system to other mechanisms in the future.
- H. Allow discussions in some cases but not in others, or just allow each voter to send one opinion.
- I. Allow each member to vote using the preferred means of communication, with the necessary security/privacy measures to avoid duplicates
- J. Deal with lost messages, falsifications, etc. and count the votes, informing the decision. The voting procedure may come to its closure after a certain time has elapsed and/or when all members have voted or reached the majority. The process may end when one of the options has more than 50% of the votes.

## **Intended output of the process (process focus)**

Teams are encouraged to proactively select a methodology to achieve a consistent implementation of the application (a functional prototype or a partial implementation using a short list of technologies).

The team could select a traditional development process (cascade or incremental prototyping) or an agile approach. This decision is an important issue of the project and hence it should be clearly explained.

In any case, teams are required to document the development accordingly with the chosen methodology (e.g., Project Plan; Requirements Model or Functional Prototype; Design Specification or Architectural Prototype; Test Plan and/or executed test cases; Code; and Release Notes)

## **Tools and standards (optional)**

- It is strongly recommended to use a versioning system, preferably open-source (for instance some CVS).
- UML should be used for design diagrams, unless some specific needs require some additional kinds of diagrams not supported in UML

## **Interaction between stakeholders and developing teams**

Due to several requests the number of teams allowed to do this project has been increased to six (from an initial number of three) and a new stakeholder has been assigned to the project, namely Prof. Xiaoping Jia. Upon registration, teams will be assigned one of the two stakeholders. Having teams from different continents would be ideal. The selection process will be carried out on the basis of email exchanges with teams interested in developing this project; having teams from different continents will be a priority.

The only mechanism for interaction is through e-mail: in English, Italian or Spanish to Miguel Felder ([mfelder@pragmaconsultores.com](mailto:mfelder@pragmaconsultores.com)); in English to Xiaoping Jia ([xjia@cdm.depaul.edu](mailto:xjia@cdm.depaul.edu)). The subject of the messages should begin with [SCORE-PROJECT-#] where # is the team number provided by the organizers upon registration.

The duration of the project is that of the University Course. Expectations will be adjusted to the duration. A duration of not less than 5 months and not more than 8 months is suggested.

Miguel Felder will not be available in February.