College of Computer
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Engineering Department

جامعة جدة
University of Jeddah

كلية علوم وهندسة الحاسب
قسم هندسة البرمجيات

Software Requirements Engineering – Project

[Section: E2]

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1. Background And Goals

1.1 Background

- Content:

The Municipality Councils E-voting System initiative in Saudi Arabia aims to revolutionize the electoral process by introducing a modern, efficient, and inclusive method for citizens to participate in municipal elections. Despite previous efforts to encourage citizen engagement through traditional voting methods, participation rates have remained low, prompting the exploration of electronic voting as a means to increase involvement. The project involves the development of an online platform accessible through The Unified National Platform GOV.SA, leveraging both governmental and private sector expertise to ensure functionality, security, and user-friendliness.

- Motivation:

The motivation behind this project stems from the need to address the shortcomings of traditional voting systems, particularly low citizen participation rates. By harnessing digital technologies and leveraging the widespread internet usage, the Municipality Councils aim to streamline the voting process, enhance accessibility for all citizens, and ultimately foster greater civic engagement and representation in local governance.

1.2 Goals

- Purpose:

The purpose of this project is to modernize the electoral process in Saudi Arabia's Municipal Councils by implementing an efficient and inclusive E-voting system that increases citizen participation and engagement.

- Advantage:

Successful implementation of the E-voting system will lead to significantly higher voter turnout, thereby enhancing the democratic process and ensuring broader representation of citizen voices in municipal decision-making.

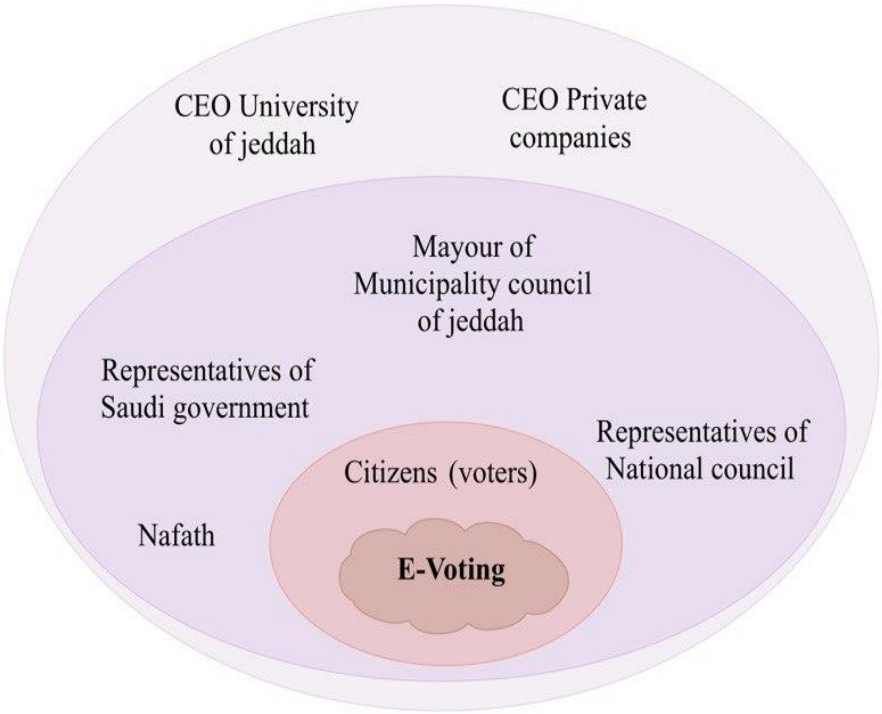
- Measurement:

The success of the project will be measured by tracking the percentage increase in voter turnout compared to previous elections, as well as assessing citizen satisfaction with the new E-voting system through feedback mechanisms and surveys.

2. Stakeholders Identification

Contact Person	Involvement	Influence	Justification Of Interests In The Project
mayor of municipality Council of Jeddah	High involvement	Little influence	Decider of business rule
Citizens(voters)	High involvement	Strong influence	The decision depends on citizens vote
Representatives of Saudi Government	High involvement	Strong influence	owner of the online E-voting application.
Representativse of National Council	High involvement	Strong influence	The National Council is responsible for the voting process
CEO of University of Jeddah	High involvement	Little influence	University of Jeddah will be involved in commissioning the legal and socio studies
CEO of Private Companies	High involvement	Little influence	private companies develop some parts of the application, test its security, try to penetrate the system and analyze it (functions and non functions
Nafath	High involvement	Little influence	An external system that citizens log into

3. Stakeholder map



4. Requirements Elicitation Techniques

Contact Person	Elicitation Techniques	Requirement Type
mayor of municipality Council of Jeddah	Interviews	Business rules/business requirements
Citizens(voters)	Questionnaires	User requirements
Representatives of Saudi Government	Workshops/focus group	Business rules/business requirements
Representativse of National Council	Workshops/focus group	Functional requirements/non-functional requirements
CEO of University of Jeddah	Interview	Functional requirement
CEO of Private Companies	Interview	Constraints, Quality attribute
Nafath	System interface analysis	External interface requirements, Functional requirements

5. Project Constraints

5.1 Solution Constraints

1- The project will produce a new version of the existing voting system
2- The project will be an E-voting system to convince citizens to use it
3- The E-voting system will have an Internet application server that allows the communication with citizens by means of web pages; this machine uses an Apache web server and a Tomcat application server installed in two different partitions
4- The E-voting system will have a database server that stores all the information related to the electoral roll and the e-ballot box; this server uses Oracle version 9

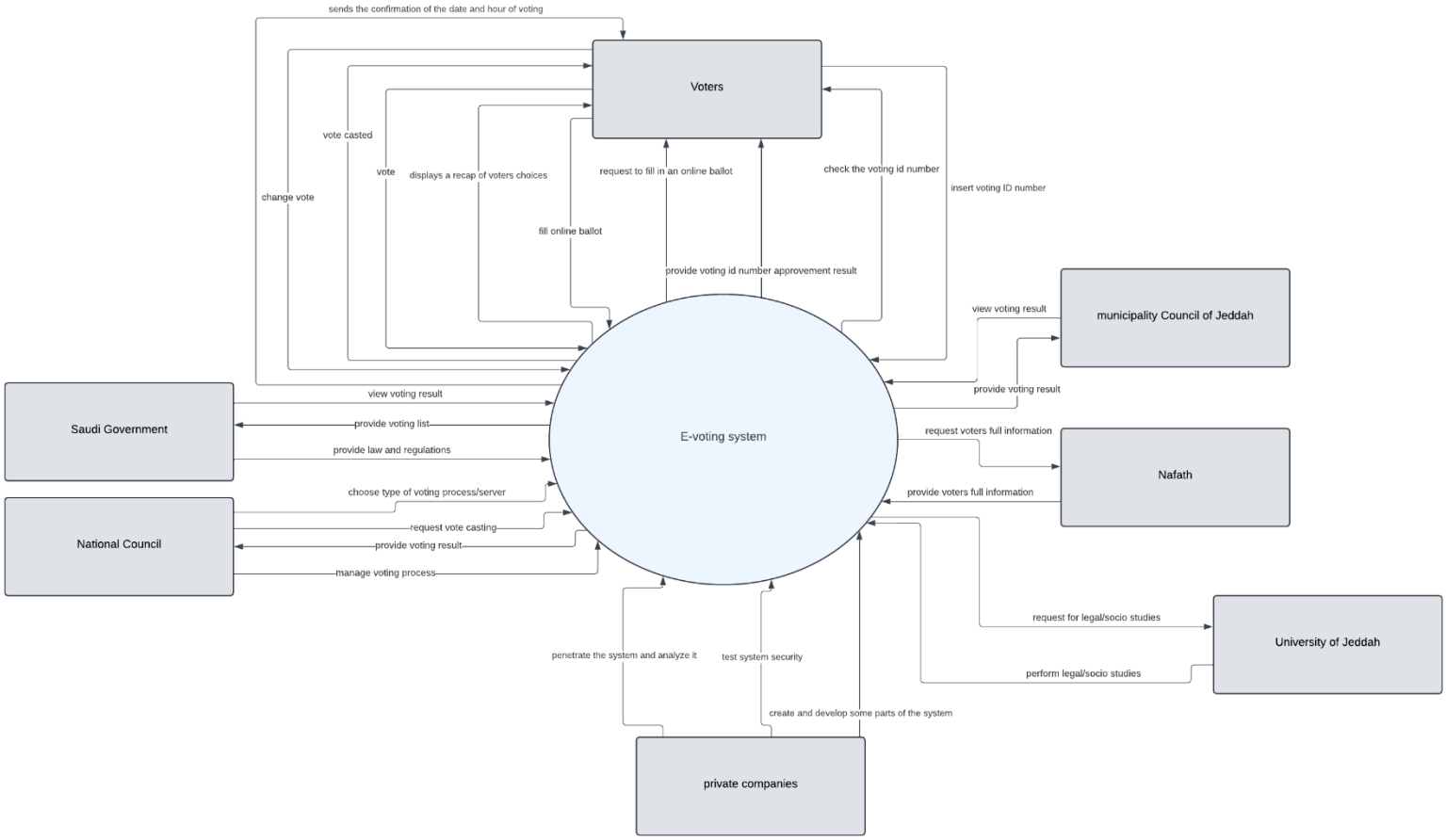
5.2 Schedule Constraints

1- The project planning will be complete by May 9
2- The project is expected to be complete and release by the end of 2024
3- The training for the citizens to master the new version and digital signatures will take 2 weeks after release
4- The new system have the potential to improve voters turnout

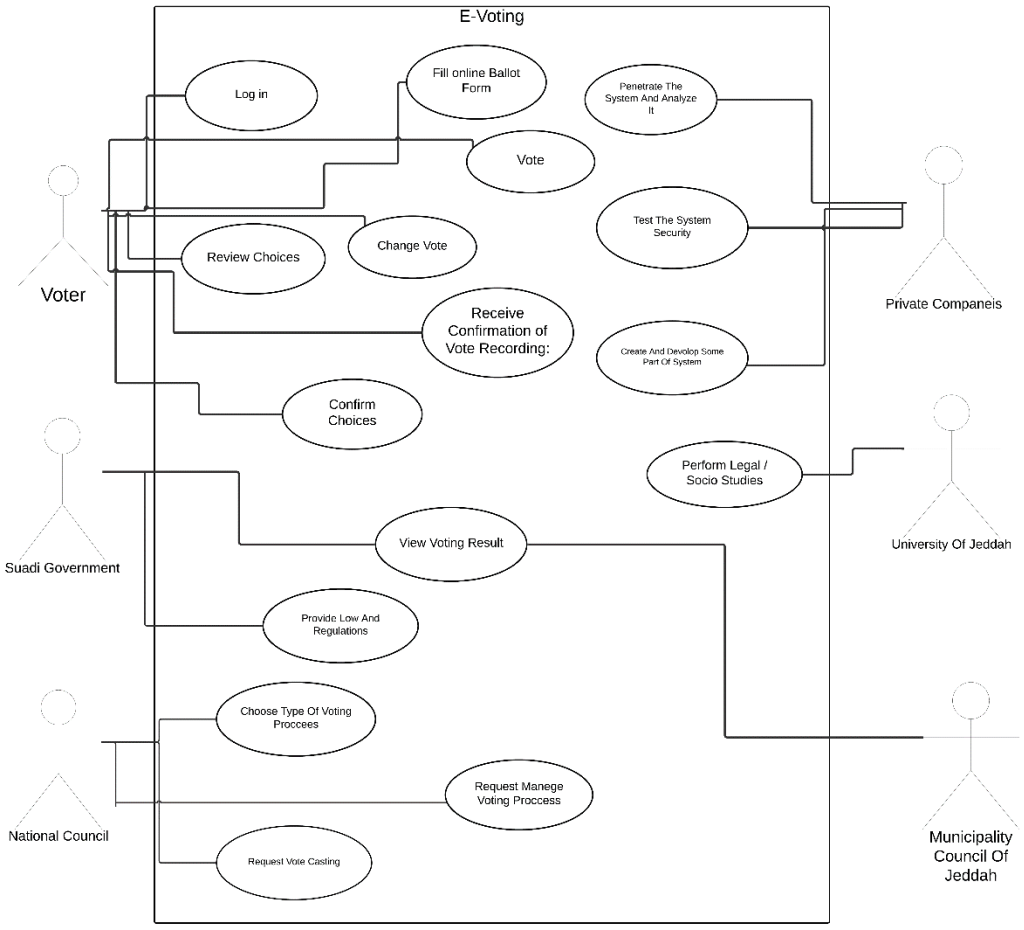
5.3 Budget Constraints

1- The project budget for the human resources (developers, testers, business analysts,manager,…) will cost 100 million SAR
2- The project budget for the technical resources (computers, servers, internet Network Infrastructure,database,…) will cost 300 million SAR
3- The project overall including all aspect will cost 400 to 600 million SAR

6. Context Diagram



7. Product Use Case Diagram



8. Product use case table

PUC	PUC Name	Actors	Output & Input
1	Log in	Voter	Voter full information (in)
2	Fill online ballot form	Voter	Elector & voter information & sign (in)
3	Vote	Voter	Elector name (in)
4	Review choice	Voter	Voter's elector choice (out)
5	Change vote	Voter	Elector name (in)
6	Confirm choice	Voter	Final elector choice (in)
7	Receive a conformation of a vote recording	Voter	Conformation message (out)
8	View voting result	Saudi government & Municipality council of Jeddah	List of number of votes for each elector (out)
9	Provide law and regulation	Saudi government	Law and regulation about voting process (in)
10	Choose type of voting process	National council	Type of voting process (in)
11	Request manage voting process	National council	Voter turnout data & activity logs & tracking records (out)
12	Request vote casting	National council	Casted votes (out)

13	Penetrate the system and analyze it	Private companies	Analyzing report (in)
14	Test the system security	Private companies	Test result “system is save or not save” (in)
15	Create and develop some parts of system	Private companies	System components (in)
16	Perform legal / socio studies	University of Jeddah	Reports (out)

9. Use Case Scenarios

Use case Name	Vote
Participating Actors	Voters
Flow of events	1- After log in the voter starts request by clicking on request online ballot 2- The system display screen of voters' choices 3- After that, the voter can click on who he wants to vote for 4- The system display message say that the vote is casted.
Entry condition	The voter clicks on request to fill in online ballot
Exit conditions	When receive message or display screen of vote casted
Quality requirements	• The answer of request of fill in online ballot doesn't take more than 3 min

Use case Name	Choose type of voting process
Participating Actors	National council
Flow of events	1- request of vote casting 2- Provide type of voting 3- the process of voting 4- Provide voting result
Entry condition	make request to vote casting
Exit conditions	Send voting result
Quality requirements	• The system verifies the voting result within 24 hours after each operation

10. Functional Requirements

- **The system** shall display an online ballot.
- **The voter** shall be able to see the recap of his/her choices.
- **The national council** shall be able to monitor and access the votes and be able to view voting result.

11. Non-Functional Requirements

- **The system** shall ensure that the time taken to display the screen of voters' choices and process the vote selection does not exceed 10 seconds, ensuring a seamless and responsive user experience.

- **Following the selection**, the system must provide confirmation that the vote has been successfully cast

- **The system** must be capable of handling and processing voting requests without errors or system failures, ensuring continuous availability and reliability throughout the voting period.

12. Volere Snow Card

Requirement #: 1 **Requirement Type**: FR **Event/BUC/PUC** #: 3 (vote)

Description: The system shall display an online ballot

Rationale: To cast the voters' votes

Originator: Voter

Fit Criterion: The online ballot display must be working on distinct web browsers (such as Chrome, Safari) and different devices (such as desktop, tablet, and smartphone) To guarantee consistent rendering and operation across platforms

Customer Satisfaction: 5

Customer Dissatisfaction: 5

Priority: Release 1 (high)

Conflicts: None

Supporting Materials: Use case diagram

History: Created may 5,2024

Requirement #:2 **Requirement Type**: FR **Event/BUC/PUC** #: 3 (vote)

Description: The voter shall be able to see the recap of his/her choices

Rationale: To change or delete or confirm their vote

Originator: Voter

Fit Criterion: The recap of voter choices should agree and match with the electors that the voter actually chose

Customer Satisfaction: 4

Customer Dissatisfaction: 3

Priority: Release 2 (high)

Conflicts:None

Supporting Materials: Use case diagram, context diagram

History:Created may 8, 2024

Requirement #: 3 **Requirement Type:** FR **Event/BUC/PUC #:** 10 (Choose type of voting process)

Description: The national council shall be able to monitor and access the votes and be able to view voting result

Rationale: To ensure the integrity of the system and to ensure that the result accurately reflect the will of voters and electors

Originator: National council

Fit Criterion: The national council shall be able to see the real-time updates of votes and the result they see must be the actual correct result

Customer Satisfaction: 5

Customer Dissatisfaction: 5

Priority: Release 1 (high)

Conflicts: None

Supporting Materials: Context diagram

History: created may 1,2024

Requirement #: 4 **Requirement Type:** NFR **Event/BUC/PUC #:** 4 (vote)

Description: The system shall ensure that the time taken to display the screen of voters' choices and process the vote selection does not exceed 10 seconds, ensuring a seamless and responsive user experience.

Rationale: specifying a time limit for displaying the screen of voters' choices

Originator: voter

Fit Criterion: prioritizing user experience

Customer Satisfaction: 4

Customer Dissatisfaction: 3

Priority: release 3 (medium)

Conflicts: none

Supporting Materials: use case

History: created in May 8, 2024

Requirement #: 5 **Requirement Type:** NFR **Event/BUC/PUC #:** 7

Description: Following the selection, the system must provide confirmation that the vote has been successfully cast

Rationale: Confirming successful vote cast instills trust and transparency in the process.

Originator: voter

Fit Criterion: Confirmation of successful vote cast.

Customer Satisfaction: 5 **Customer Dissatisfaction:** 3

Priority: release 5 (medium) **Conflicts:** none

Supporting Materials: product use case

History: created May 9, 2024

Requirement #: 6 **Requirement Type:** NFR **Event/BUC/PUC #:** 11

Description: The system must be capable of handling and processing voting requests without errors or system failures, ensuring continuous availability and reliability throughout the voting period.

Rationale: To maintain uninterrupted voting processes, the system must operate reliably and without errors, ensuring continuous availability throughout the voting period.

Originator: National council

Fit Criterion: Error-free processing of voting requests with continuous system availability and reliability.

Customer Satisfaction: 5 **Customer Dissatisfaction:** 5

Priority: release 7 (high) **Conflicts:** none

Supporting Materials: use case, context diagram

History: created May 7, 2024