PollEx

Content

Context of the problem

Within the Universidad Autónoma de Occidente, teachers use different types of tools that allow them to dynamize the way classes are taught during the semester. It is common that, during these class sessions, teachers require the opinion of their students to make decisions about the management of the subject or proposals to raise within it. However, some teachers do not have knowledge about free tools that allow them to develop such activities or do not implement them due to the process of creating an account and entering through this to the platform both the teacher and students, using the manual process of counting votes that may become late, prone to interruptions or that the information is not stored anywhere for possible analysis later.

In order to take advantage of technological advances and the accessibility of students to smart devices, a student of Multimedia Engineering has been asked to take the Multimedia Experience Development courses for the web, Human-computer interaction and multimedia databases make a web application that allows teachers to conduct surveys in real time from any device that has an internet connection to manage their classes.

The app should allow teachers to create surveys that are updated in real time with a maximum of six possible user choices. Data collected through these surveys must be stored in a cloud database to be accessible from any computer. The possible solution proposed should guarantee the speed at the time of creating such a survey and accessing it, mainly through cell phones or tablets.

Project planning

Main objective

Develop a prototype web application model that allows the user to create and interact with surveys in real time in forty-five days.

Secondary Objects

- Analyze the users and the context of the prototype model in seven days.
- Design a prototype web application model in fifteen days.
- Implement the prototype web application model in sixteen days.
- Test prototype web application model in seven days.

Definition of users

<table>
<tr><th colspan="4">Persona Canvas</th></tr>
<tr><td>About</td><td colspan="3">David Alejandro Rincón Ballesteros has been a professor at the Universidad Autónoma de Occidente for four years. He is a father who supports his family with his only job. He has taken basic courses in office tools such as Excel and Word.</td></tr>
<tr><td rowspan="8"> 
Photo of LinkedIn Sales Solutions in Unsplash

David Alejandro Rincón Ballesteros</td><td colspan="2">Demographic</td><td>Psychological</td></tr>
<tr><td>Age</td><td>41</td><td rowspan="4">Activities:
- David teaches statistics and finance as a plant professor at the Universidad Autónoma de Occidente.
-David exercises in the gymnasium of the University.
David writes a finance book to publish this year.</td></tr>
<tr><td>Biological sex</td><td>Male</td></tr>
<tr><td>Marital status</td><td>Married</td></tr>
<tr><td>Residence</td><td>Cali, Colombia</td></tr>
<tr><td>Stratum</td><td>3</td><td rowspan="4">Tastes:
-David is passionate about reading accounting books.
-David likes to be aware of national and international news.
-David prefers to use only the tools that the university offers training.
.</td></tr>
<tr><td>Education level</td><td>College</td></tr>
<tr><td>Occupation</td><td>Teacher</td></tr>
<tr><td>Income level</td><td>Middle</td></tr>
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Functional requirements

N °	Requirement	Priority
FR1	The prototype model of web application must allow user to create poll with maximum six options.	Essential
FR2	The prototype model of web application must allow user to see in real time the responses sent.	Essential
FR3	The prototype model of web application must allow user to save the results into a database.	Essential
FR4	The prototype model of web application must allow user to complete the poll when desired.	Essential
FR5	The prototype model of web application must allow user to create an account if user wishes to link their information to them	Desirable
FR6	The prototype model of web application must allow user to create polls without previous register.	Essential
FR7	The prototype model of web application must allow user to edit their profile information.	Desirable
FR8	The prototype model of web application must allow user to see the polls in which he/she has previously participated.	Desirable
FR9	The prototype model of web application must allow user to see the history of created polls.	Desirable
FR10	The prototype model of web application must notify to the user when the time to answer the poll is over.	Essential

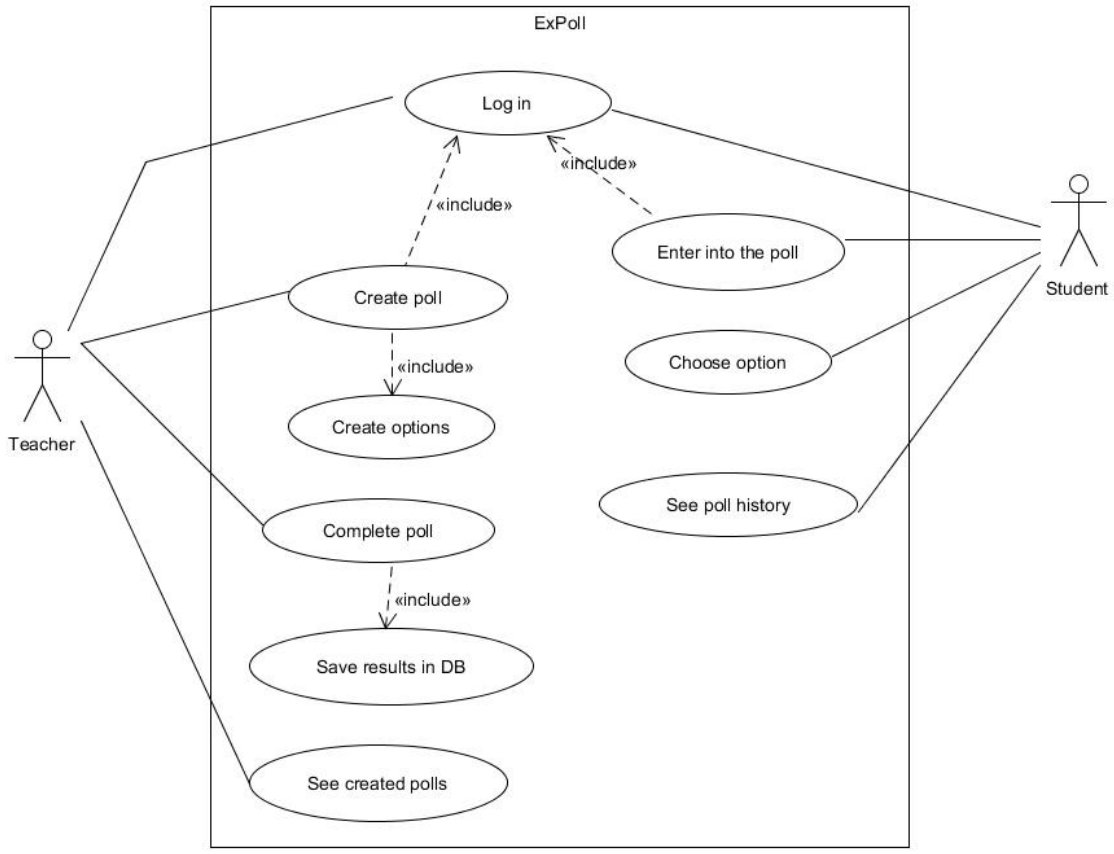
Non-functional requirements

N °	Requirement	Priority
NFR1	The prototype model of web application must allow user to create polls quickly in a few steps.	Essential
NFR2	The prototype model of web application must show on screen the remaining time to completion of the poll user.	Essential
NFR3	The prototype model of web application must generate a link to access to polls.	Desirable
NFR4	The prototype model of web application must be easy to use. For this, must consider the basic principles of usability.	Essential
NFR5	The prototype model of web application must show the poll identifier clearly.	Essential

NFR6	The prototype model of web application must show a QR code to facilitate access to polls.	Desirable low priority
NFR7	The prototype model of web application must allow to user access from anywhere where an internet connection is available.	Essential
NFR8	The prototype model of web application must allow to user to access through a web browser.	Essential
FNR9	The prototype model of web application must allow to user to access through smart phones, tablets, or personal computers.	Essential
FNR10	The prototype model of web application must allow to user to access using any aspect ratio and screen resolution (be adaptive).	Essential

Use Case Diagram

According to the requirements extracted from the problem, the following diagram of the use cases could be generated:



Set of tools chosen

The problem when requiring a web application, you need to develop the visual section of the client (frontend) and the server that will provide the business logic (backend). To carry out this work, it was chosen to use tools that work with the JavaScript language, due to the knowledge and previous experiences it has with this. In addition, this programming language has many guides, resources and libraries that implement it, giving the possibility to choose several tools according to the needs of the case.

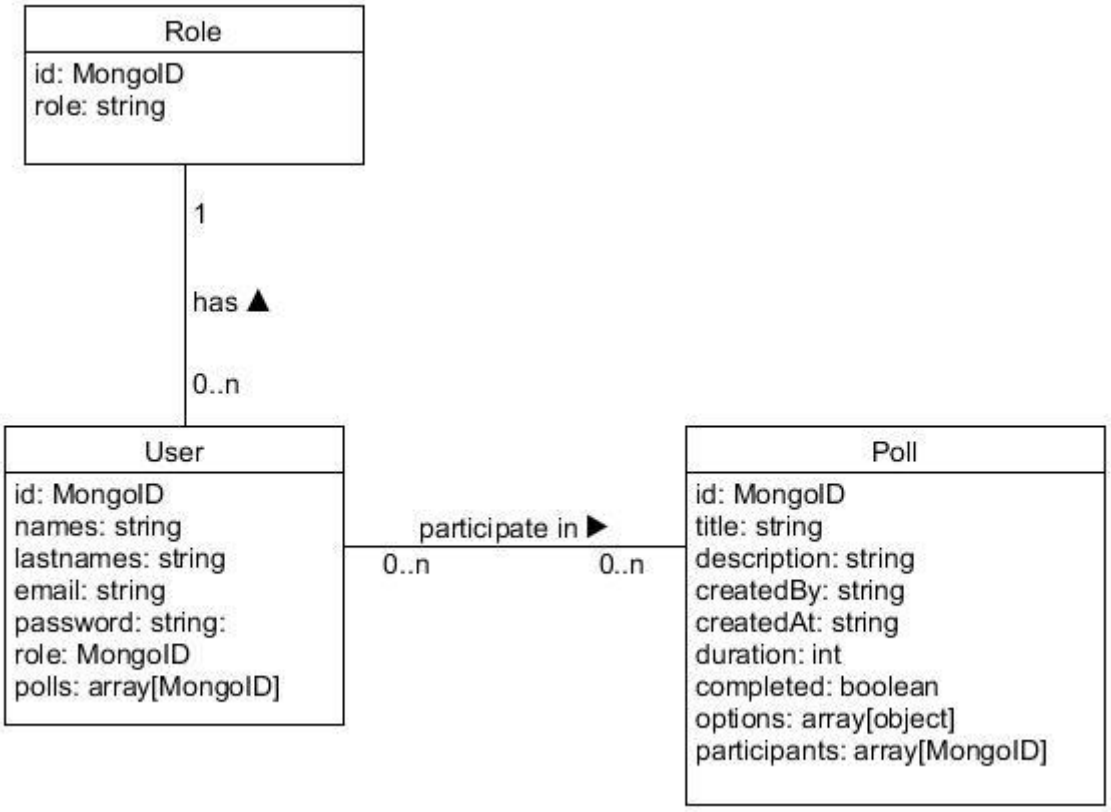
Among the existing tools, it was decided to use React to create user interfaces, Express as infrastructure for building the web application server, NodeJS as a JavaScript-based execution environment and MongoDB as a nonrelational database for storing information.

Database design

Since it is vitally important that application information is persistent and must store real-time information, a database that has a fast write speed is required, competition control and adapts to the different survey structures that users need to create. Because of this, it was decided to choose MongoDB as a possible candidate to perform this task, in addition to having previous experience working with this and its ORM for NodeJS Mongoose.

MongoDB is document-oriented and has had great growth in recent years thanks to its flexibility in how to save data that do not have a defined structure, offering a great scalability process with information that requires a quick read and write.

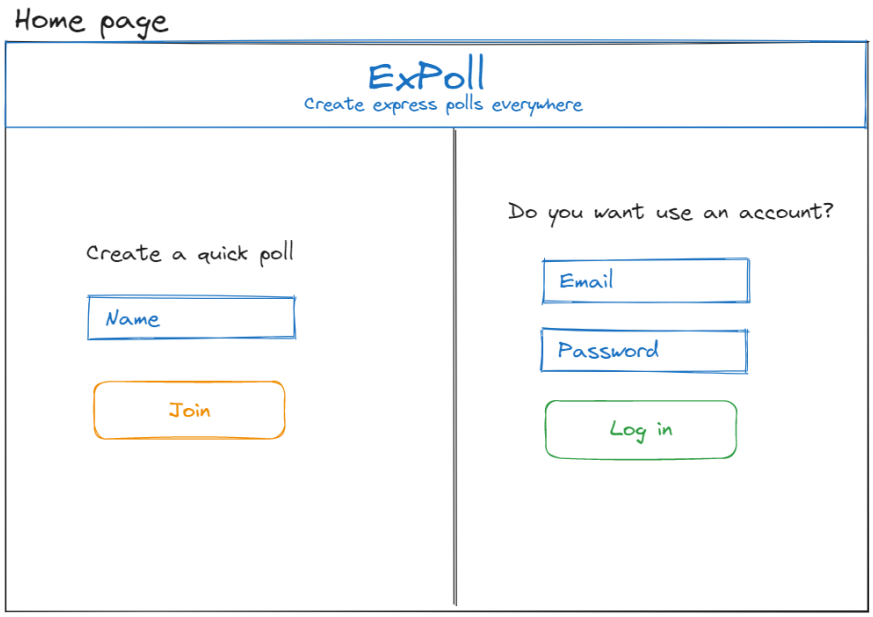
Although the documents within the MongoDB collections are not governed by a fixed structure, performing an Entity-Relationship Model (MER) scheme will help identify the properties of the entities involved in the web application as can be seen in the following image:



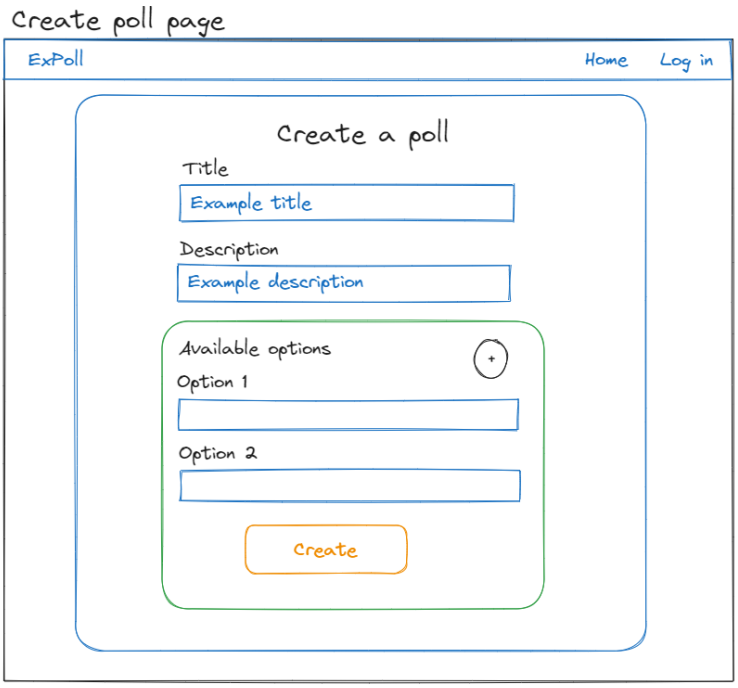
Preliminary design of the interface

To satisfy the requirements that the system must meet, a low fidelity prototyping process has been developed to express the basic functionalities of the web application with simple schemes.

First, the main tab was designed with two forms to create polls: the first will allow you to go to the poll creation form quickly requesting only the name of the creator of the poll and the second by means of a login with an email and password that will be stored in a database:



In the middle of the ideation process, the name ExPoll was chosen, coming from the union of *express* and the word *poll*. Secondly, the page that will contain the form to create the surveys was raised, where there will be fields for the title, description and options available within this, with a maximum of six in accordance with the requirements set out above in order to control the user's capabilities by not saturating a single document with too many possible options.



On the other hand, it is necessary to have an interface that allows the user to see information about the votes in real time and the remaining time of the votes, designing the following interface that provides the user with all the information about it: