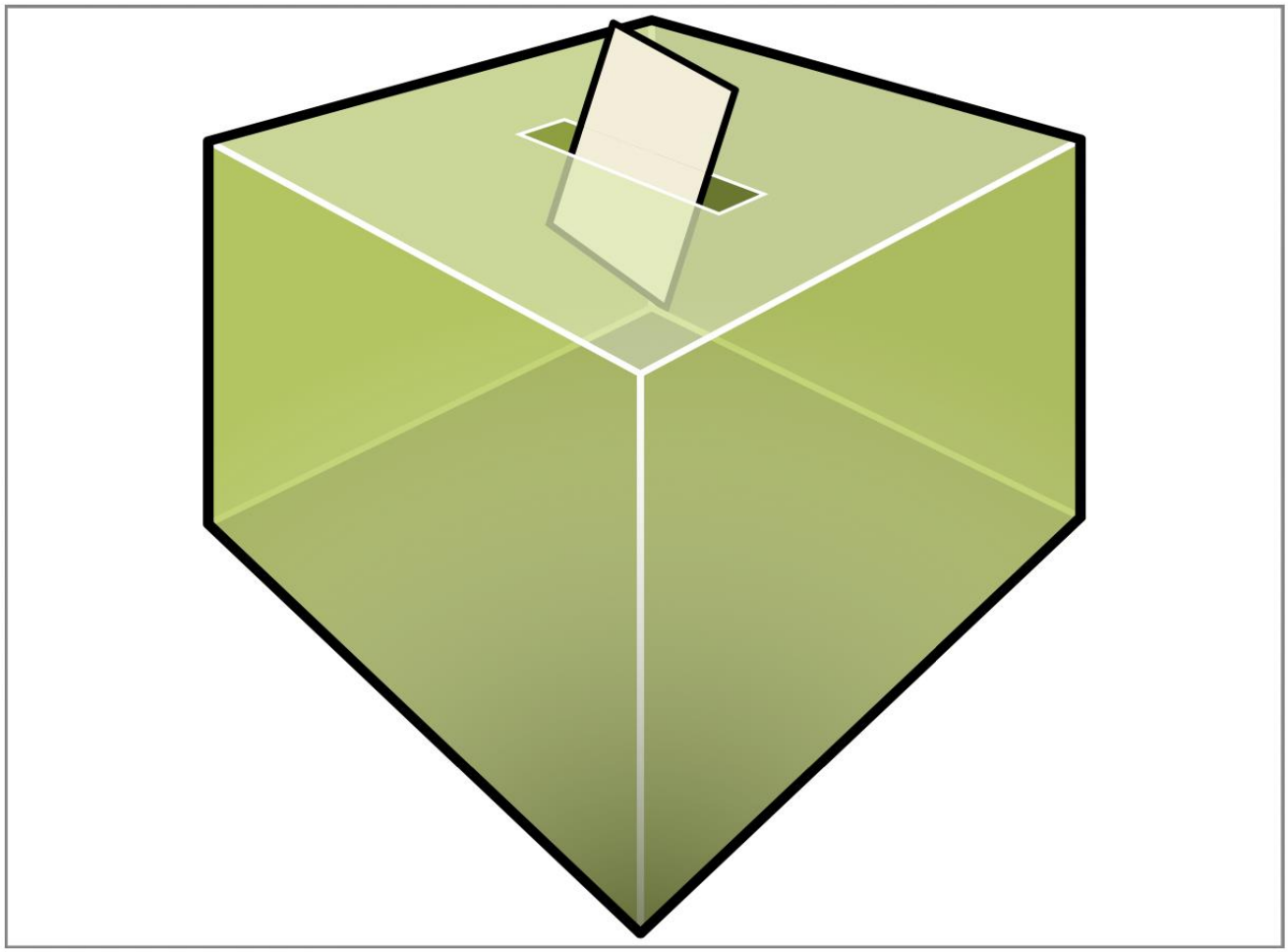
EVS



Date: 24/09/2023

Team: xray

Team Members:

Abhinav Ralhan (221202684)
Ahmad Alfajr (222202421)
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Danoosh Peachkah (220200841)

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Software Description

The Electronic Voting System (EVS) facilitates electronic voting. This voting platform is web-based, enabling organizers to generate polls and formulate associated inquiries for said polls. The system accommodates three distinct question formats: binary (yes-no), single-selection, and multiple-choice questions. Voters possess the option to refrain from casting a vote. Upon the commencement of a poll, participants receive an email-delivered token, serving as their vote. Upon conclusion of the voting timeframe, the organizer gains access to a textual representation portraying the poll's outcomes.

Installation & Configuration

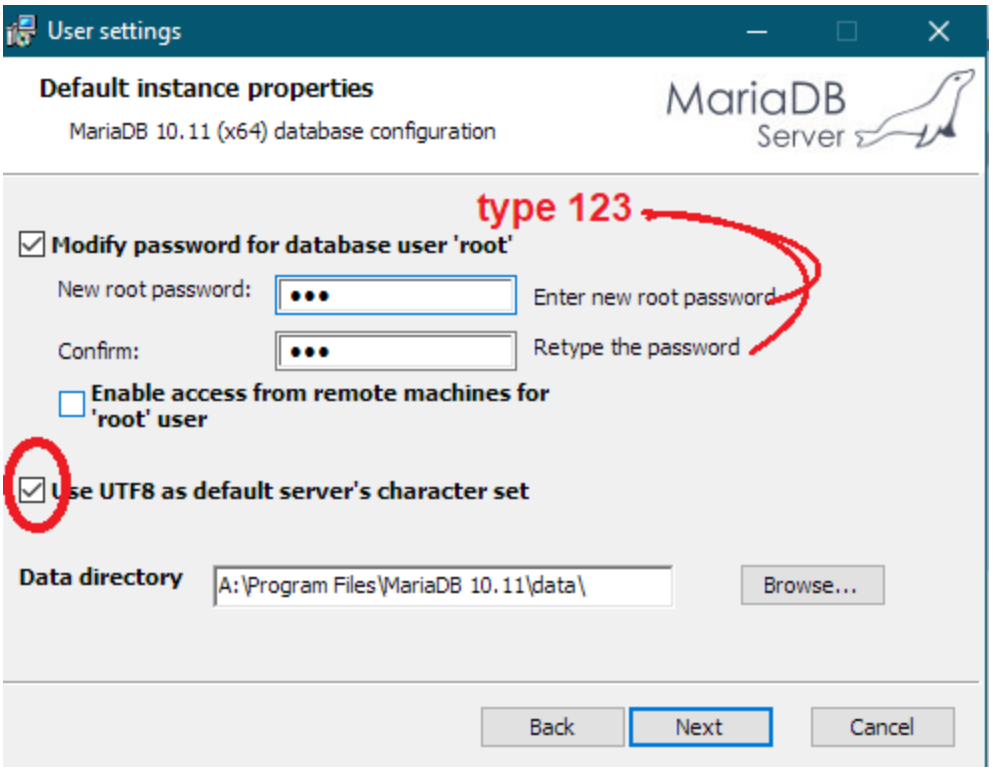
Installation prerequisites to use the software includes:

- OpenJDK 17
- Payara Server v5+
- MariaDB
- Web Browser: FireFox, Chrome and Edge all should be version 116 and above

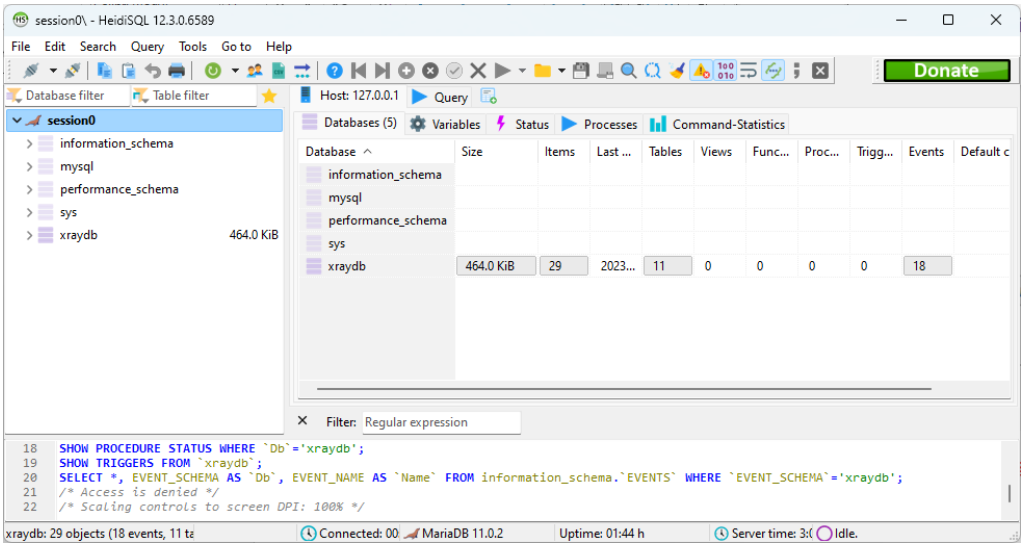
If you encounter challenges, it is advisable to adhere to the installation guidelines provided in the course materials.

Database

To ensure the proper functioning of the application, it is imperative to establish a MariaDB database during the installation process. When configuring the installation, it is recommended to bear in mind the password you designate. We propose setting the password to "123", as illustrated below with additional details.



Subsequently, employ HeidiSQL to generate a database for the project, named as "xraydb".

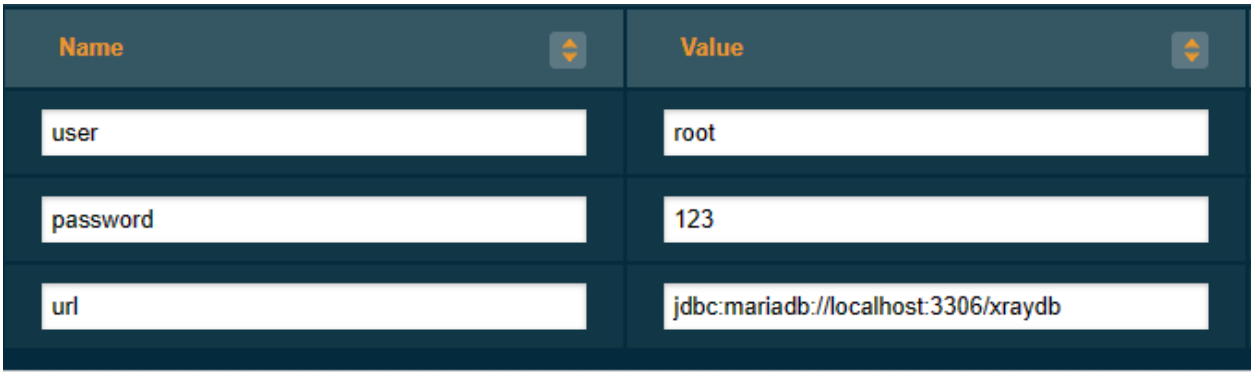


Payara Server Configuration

JDBC Connection Pools

Generate a novel JDBC Connection Pool within Payara, incorporating the ensuing parameters:

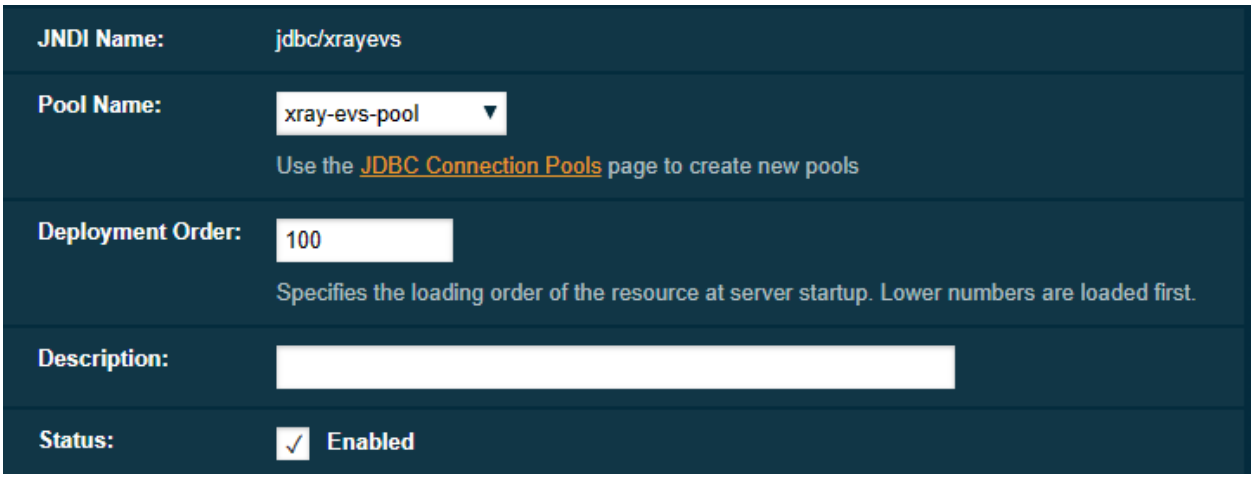
Pool Name: xray-evs-pool
Resource Type: javax.sql.DataSource
Datasource Classname: org.mariadb.jdbc.MariaDbDataSource
Additional Properties:



JDBC Resources

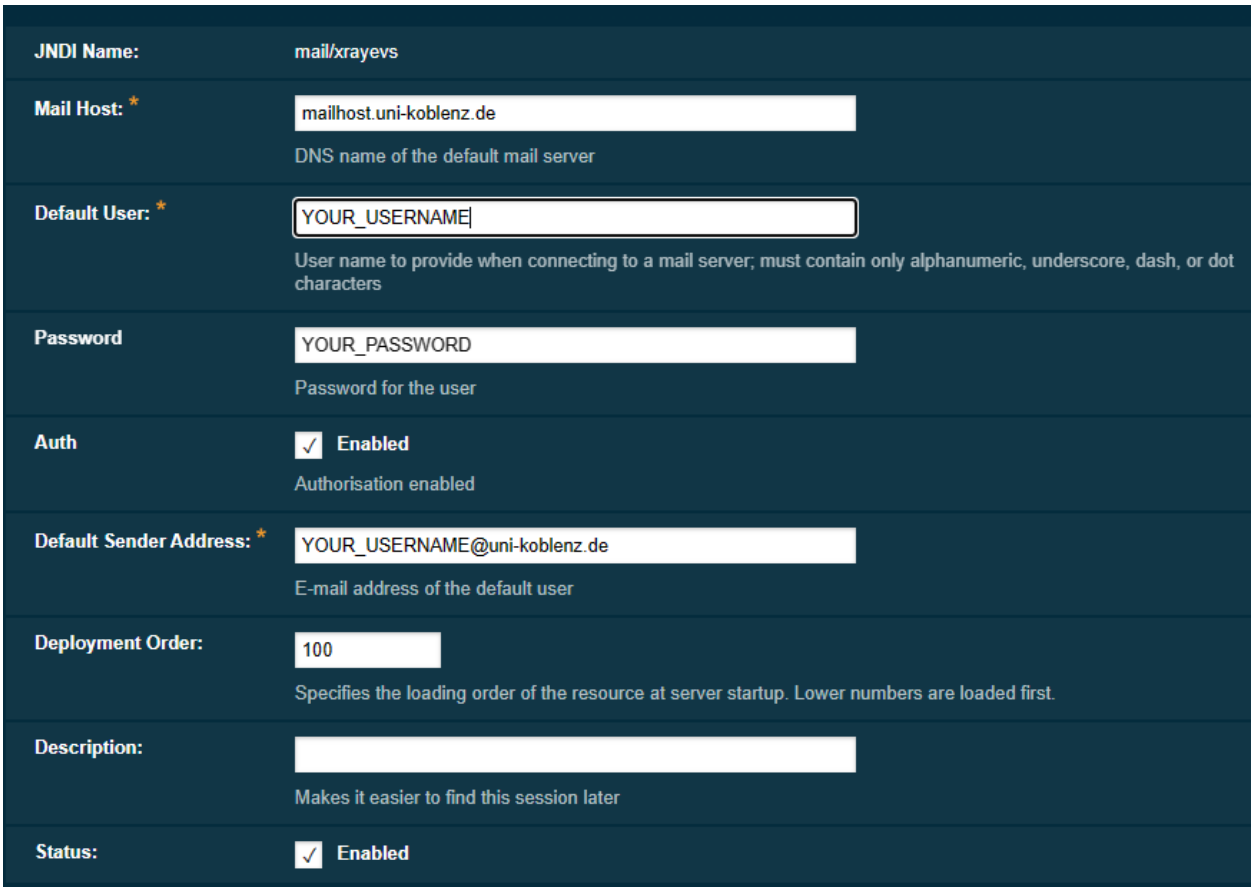
Establish a JDBC Resource to furnish the application with a mechanism for establishing a connection to the database via the previously configured JDBC connection pool.

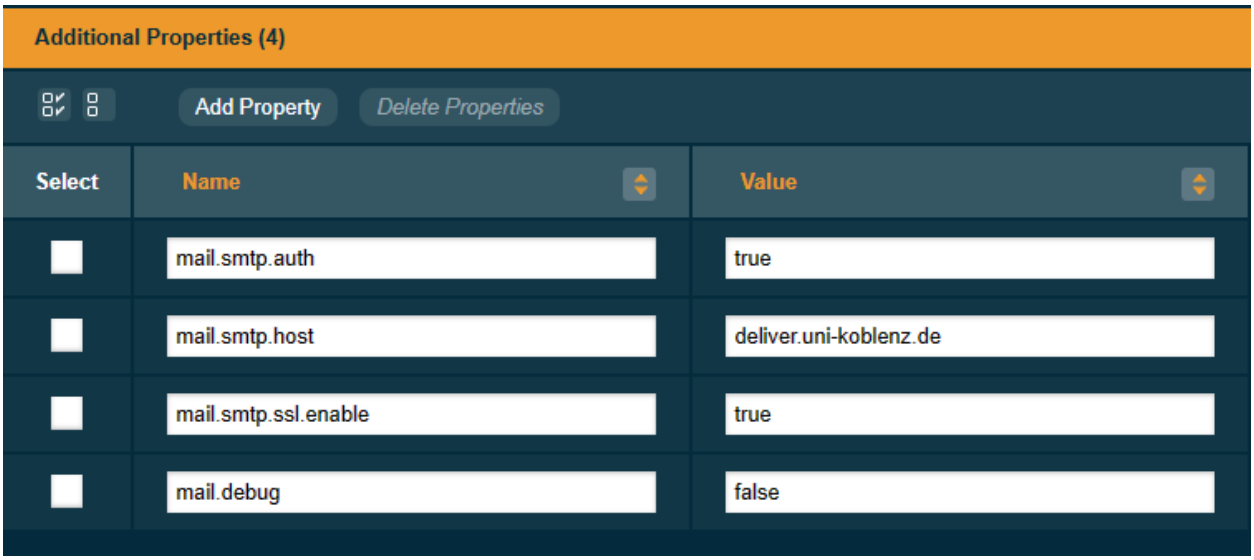
JNDI Name: jdbc/xrayevs
Pool Name: xray-EVS-pool



JavaMail Session

To ensure the proper functionality of email sending from the application, it is imperative to configure a JavaMail session resource on the Payara Server, incorporating the subsequent configuration settings:

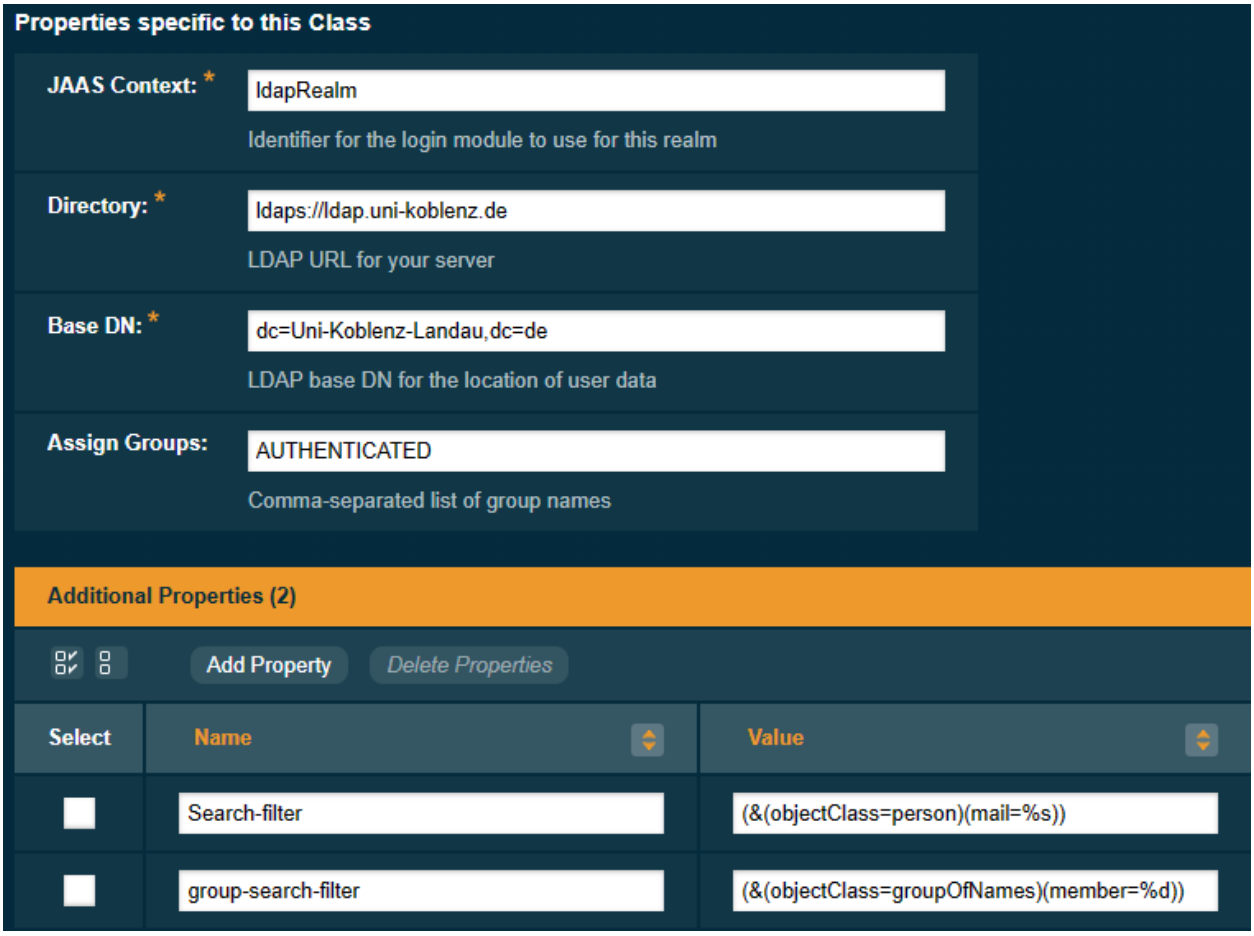




Security Realms

Create a fresh security authentication realm, enabling users to undergo authentication via LDAP (Lightweight Directory Access Protocol):

Realm Name: LDAPUniRealm
Class Name: com.sun.enterprise.security.auth.realm.ldap.LDAPRealm
JAAS Context: ldapRealm
Directory: ldaps://ldap.uni-koblenz.de
Base DN: dc=Uni-Koblenz-Landau,dc=de
Assign Groups: AUTHENTICATED
Additional Properties:
Search-filter (&(objectClass=person)(mail=%s))
group-search-filter (&(objectClass=groupOfNames)(member=%d))



Roles assignment for testing while using LDAP authentication:

Within the glassfish-web.xml file, you retain the ability to modify role assignments. This allows for the experimentation of various roles using your account, even in the absence of LDAP groups. Should you choose to access the application with the administrative role, you can insert your email address as the principal in this context. Note that the emails do not use “@uni-koblenz.de” for logging in.

Security Role Mappings

ADMIN

Security Role Name : ADMIN

Principals Assigned to this Role

Principal Name	Class Name
danp	

Add Principal... | Edit Principal... | Remove Principal(s)

Groups Assigned to this Role

Group Name
admin

Add Group... | Edit Group... | Remove Group(s)

ORGANIZER

Security Role Name : ORGANIZER

Principals Assigned to this Role

Principal Name	Class Name
abhinavr8	
ahmadalfagr	
danp	

Add Principal... | Edit Principal... | Remove Principal(s)

Groups Assigned to this Role

Group Name
employee
admin

Add Group... | Edit Group... | Remove Group(s)

USER

Security Role Name : USER

Principals Assigned to this Role

Principal Name	Class Name

Add Principal... | Edit Principal... | Remove Principal(s)

Groups Assigned to this Role

Group Name
AUTHENTICATED

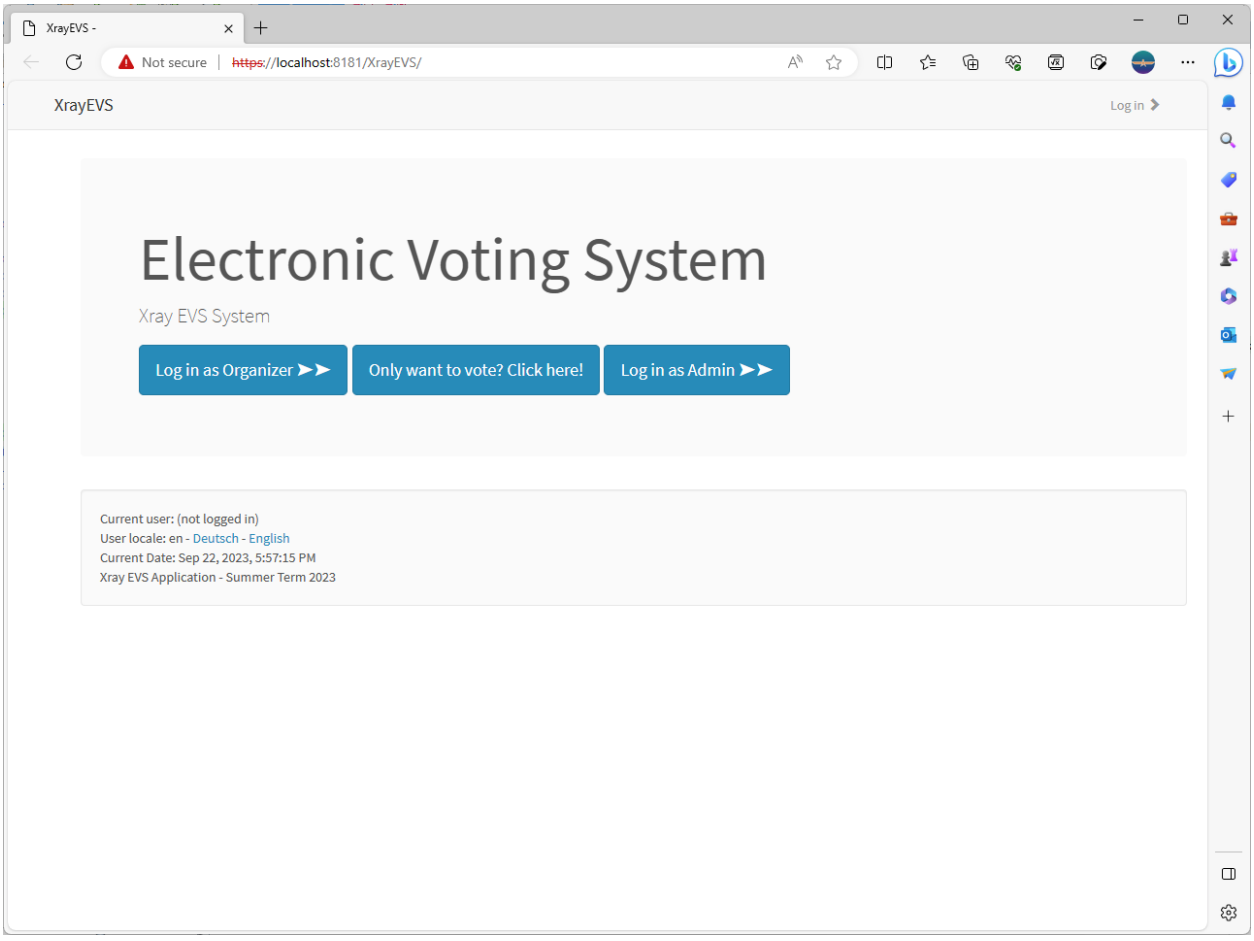
Add Group... | Edit Group... | Remove Group(s)

Network

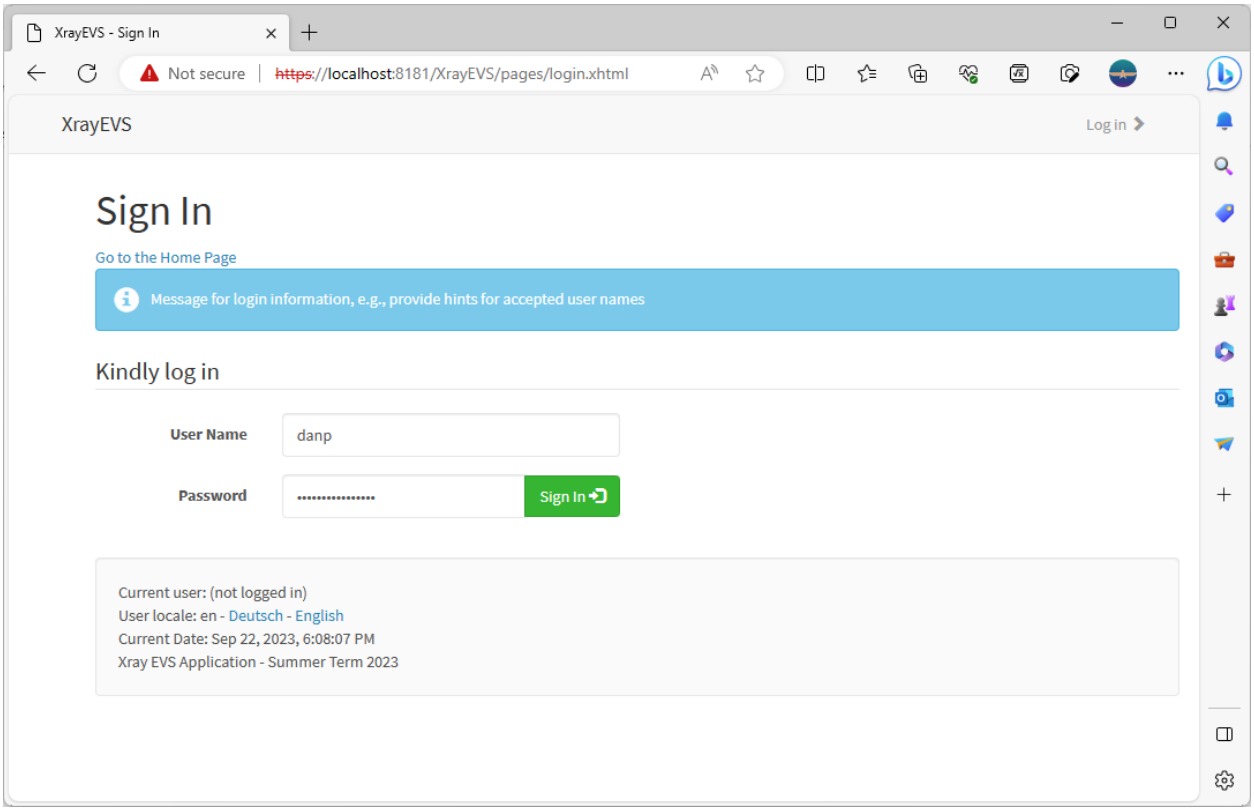
To enable LDAP-based authentication for the application, it is essential to establish a connection to the University VPN or be within the University network prior to executing the application.

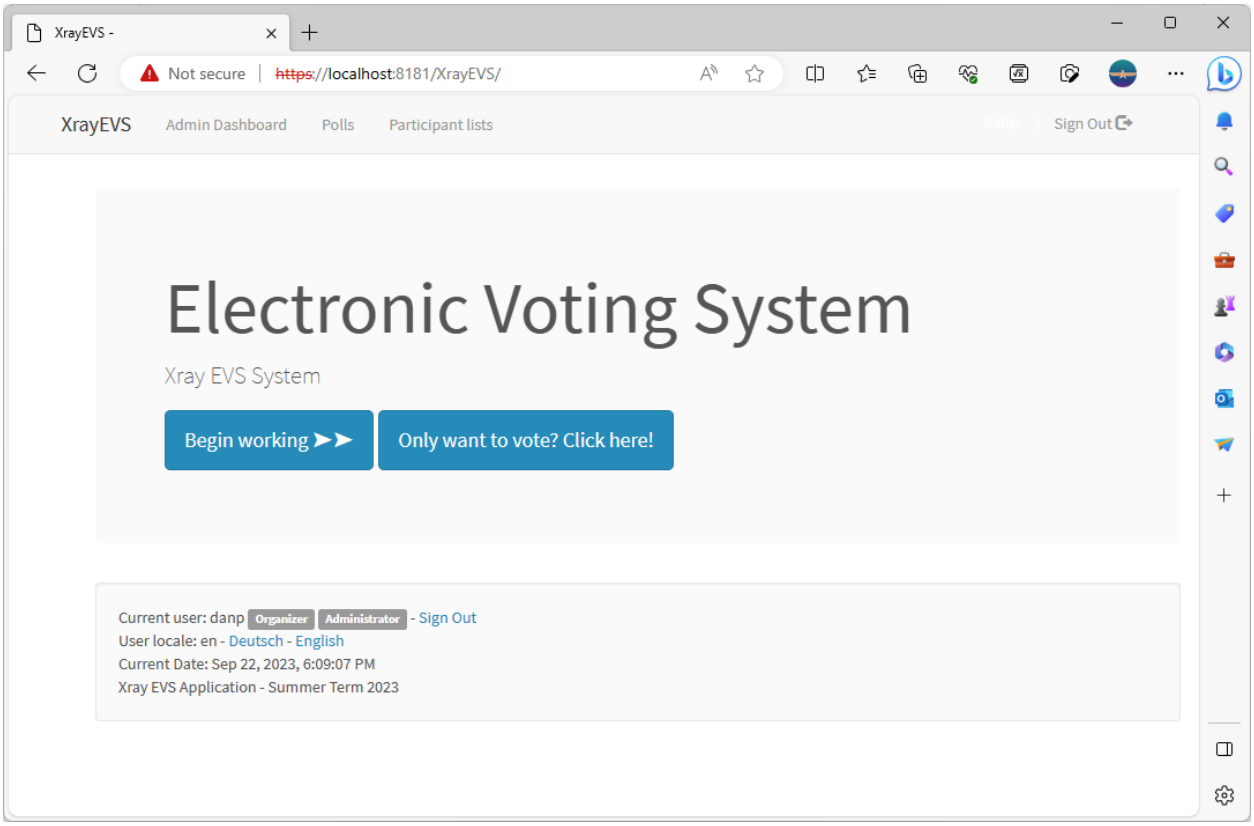
User Interface

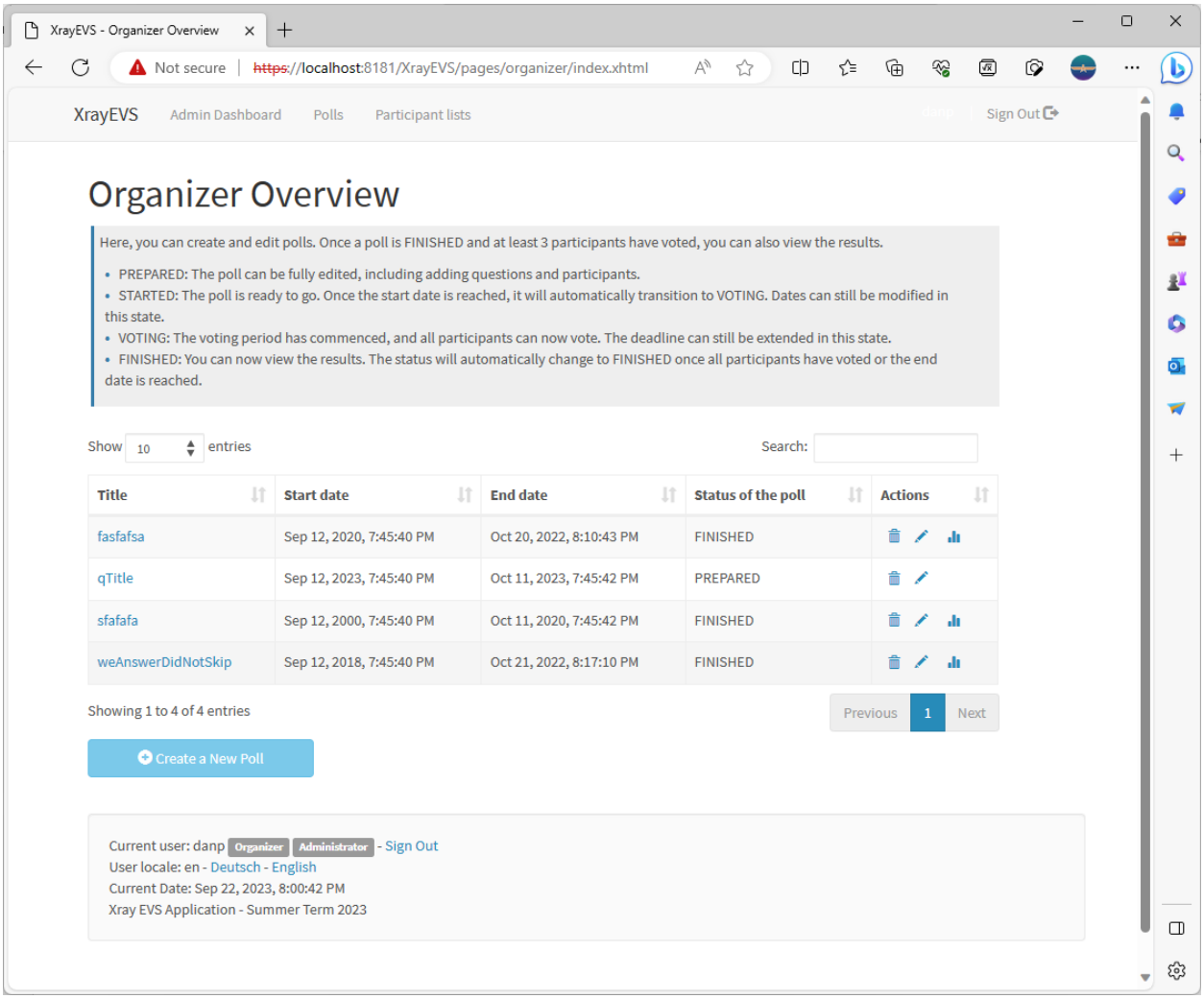
Upon accessing the application, a welcome page is presented to the user. With this, the user can log in for the purpose of engaging in poll management tasks or alternatively, opt to participate in a poll. Furthermore, language selection options are available, with all English, German and French languages accessible via links provided within the footer of the page.

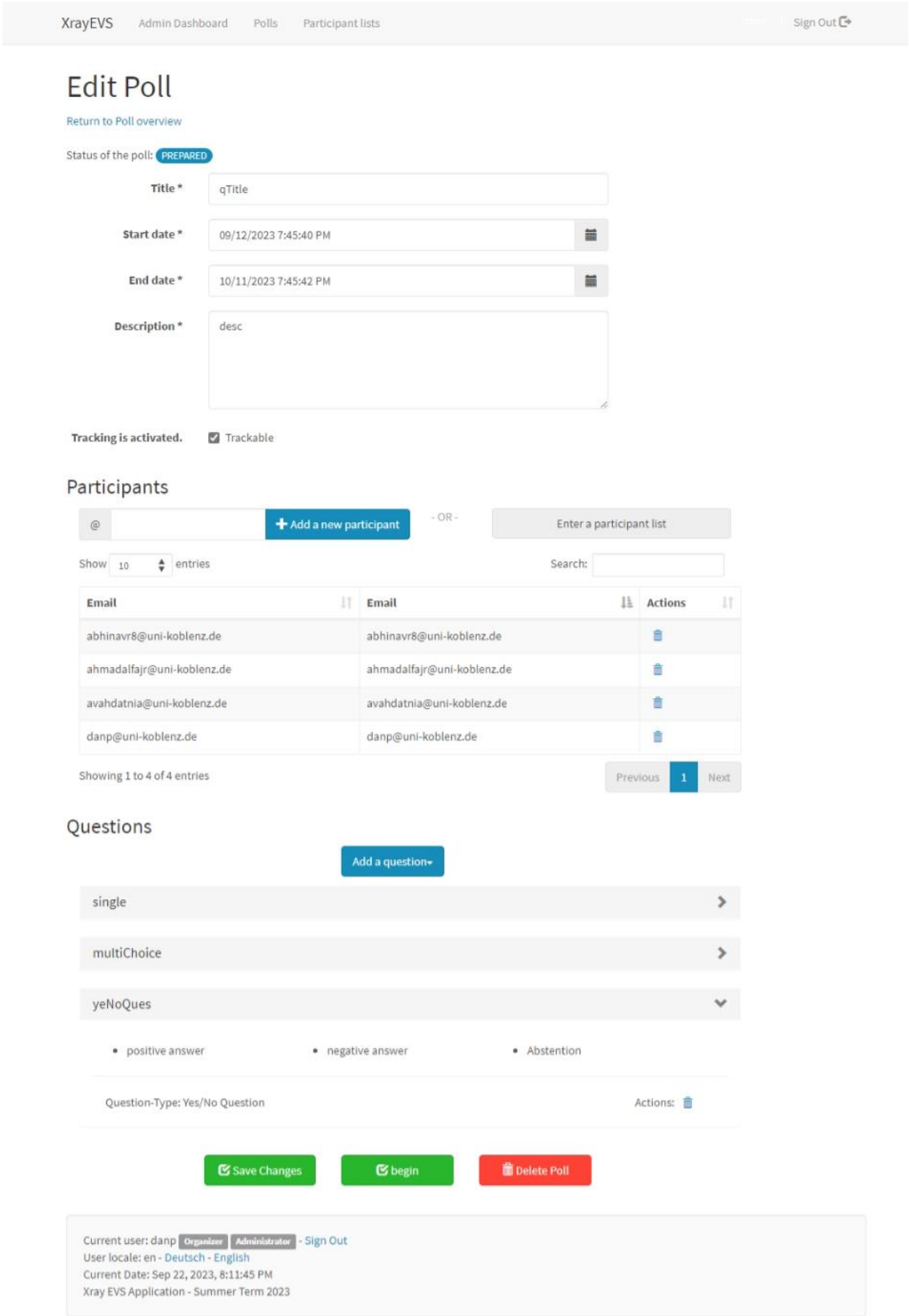


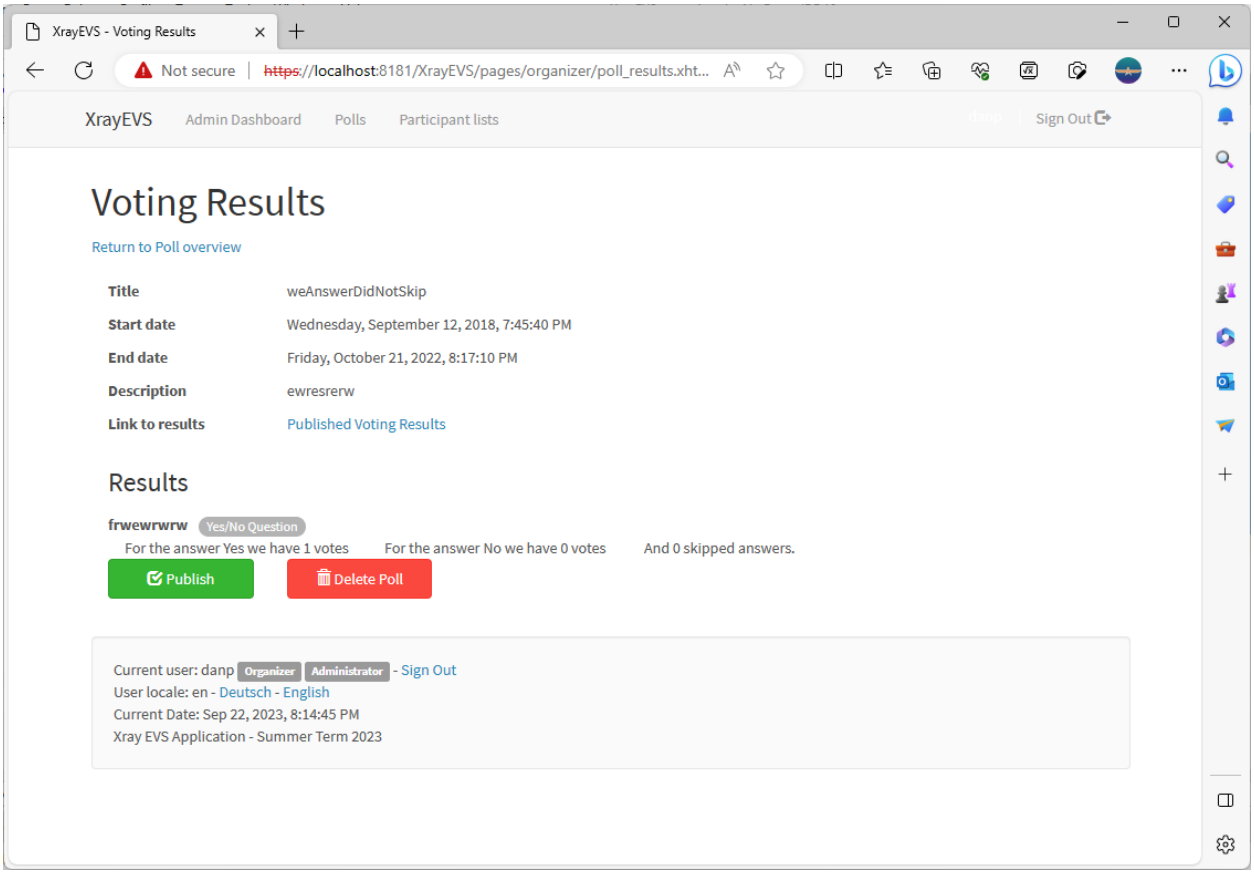
As an organizer, you will encounter specific links within the navigation bar, directing you to pages dedicated to your poll overview and participant lists overview. With the admin role, an additional link is presented at the top, granting access to the admin overview page. The subsequent images depict various aspects of the application's user interface across different views.

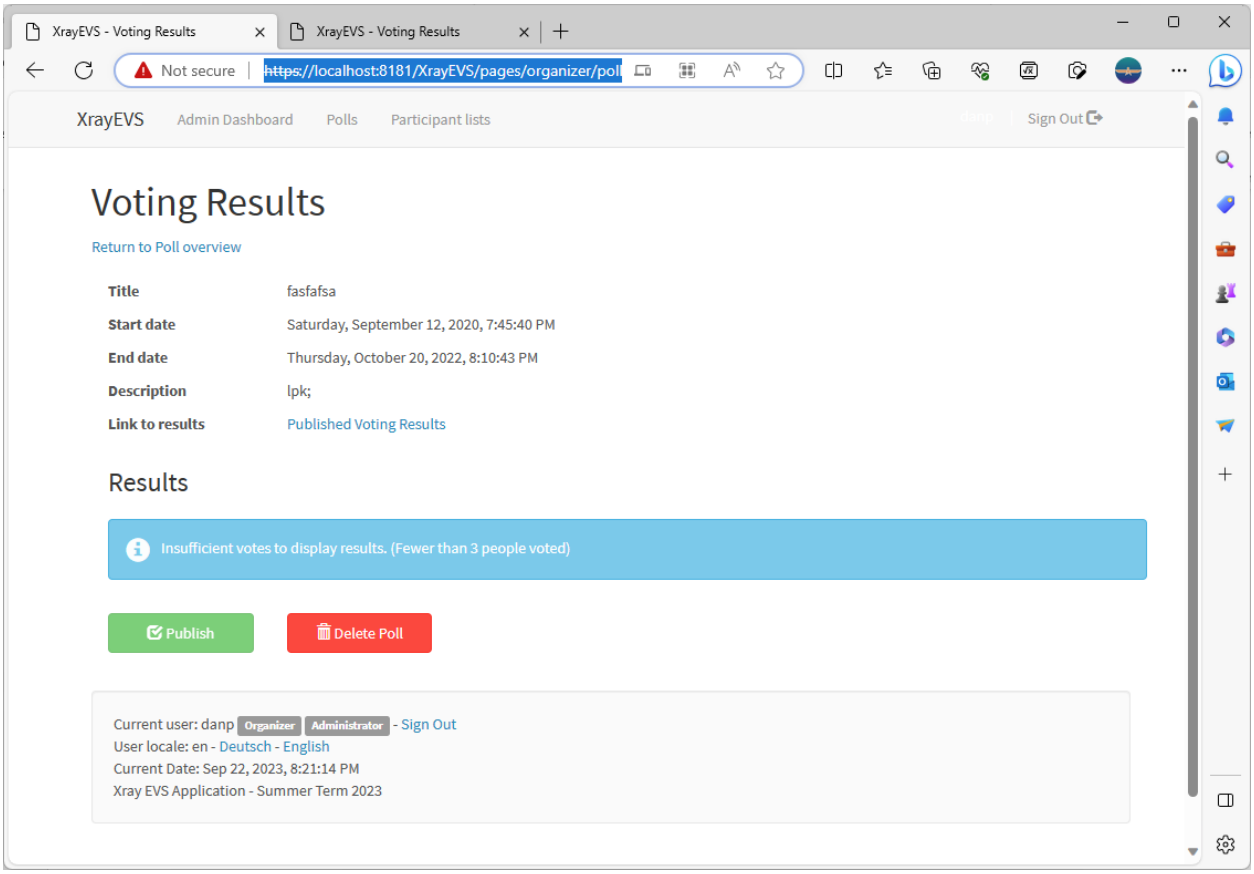

XrayEVS - Sign In
Not secure | https://localhost:8181/XrayEVS/pages/login.xhtml
XrayEVS
Log in
Sign In
Go to the Home Page
Message for login information, e.g., provide hints for accepted user names
Kindly log in
User Name
danp
Password
Sign In
Current user: (not logged in)
User locale: en - Deutsch - English
Current Date: Sep 22, 2023, 6:08:07 PM
Xray EVS Application - Summer Term 2023

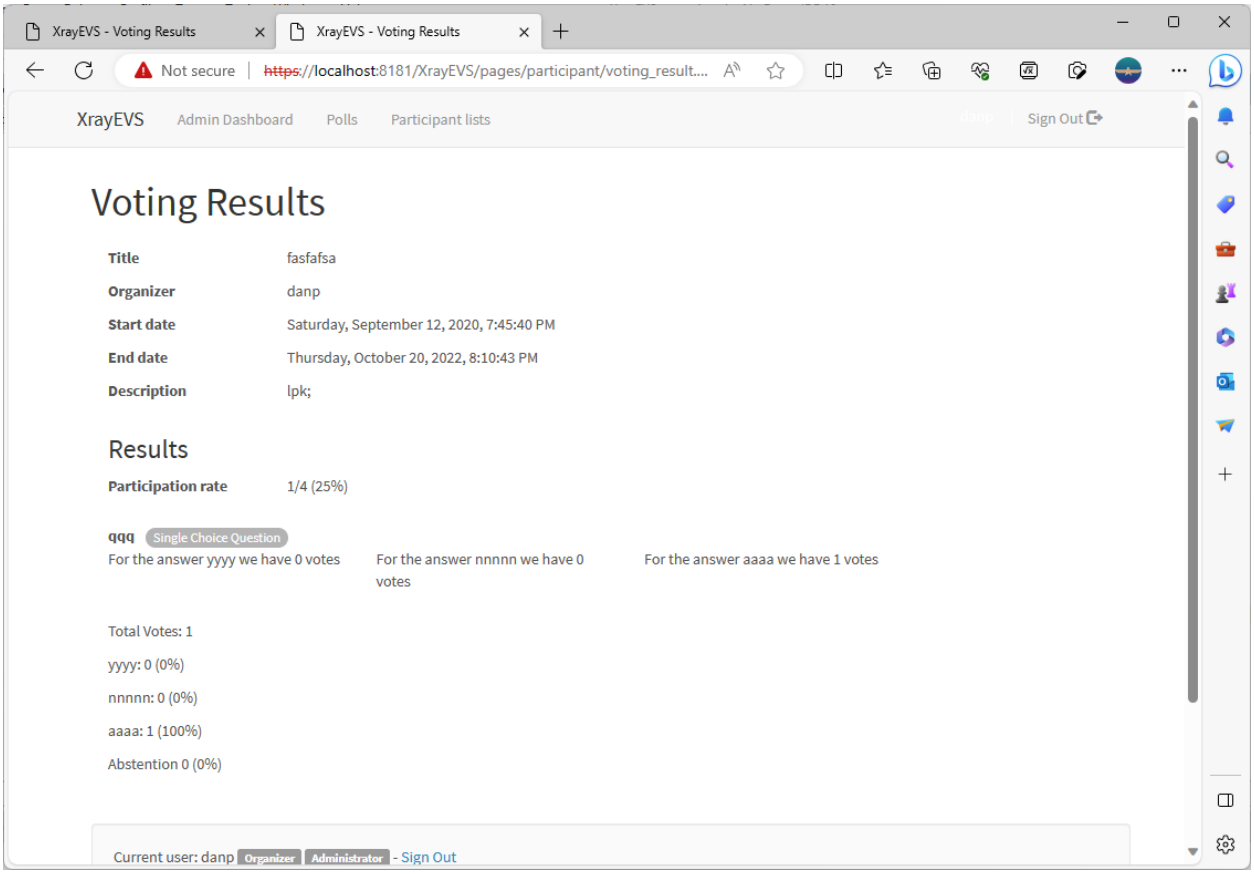

XrayEVS -
Not secure | https://localhost:8181/XrayEVS/
XrayEVS
Admin Dashboard
Polls
Participant lists
Sign Out
Electronic Voting System
Xray EVS System
Begin working
Only want to vote? Click here!
Current user: danp Organizer Administrator - Sign Out
User locale: en - Deutsch - English
Current Date: Sep 22, 2023, 6:09:07 PM
Xray EVS Application - Summer Term 2023

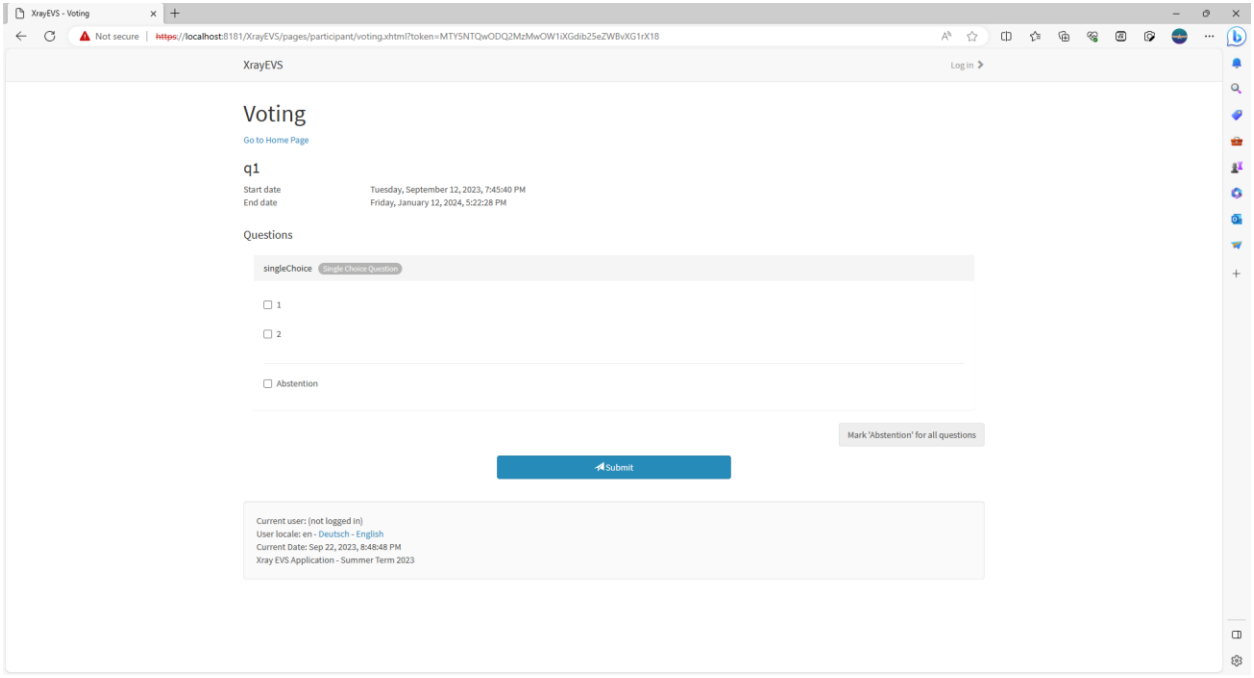

XrayEVS - Organizer Overview
Not secure
https://localhost:8181/XrayEVS/pages/organizer/index.xhtml
XrayEVS
Admin Dashboard
Polls
Participant lists
Sign Out
Organizer Overview
Here, you can create and edit polls. Once a poll is FINISHED and at least 3 participants have voted, you can also view the results.
• PREPARED: The poll can be fully edited, including adding questions and participants.
• STARTED: The poll is ready to go. Once the start date is reached, it will automatically transition to VOTING. Dates can still be modified in this state.
• VOTING: The voting period has commenced, and all participants can now vote. The deadline can still be extended in this state.
• FINISHED: You can now view the results. The status will automatically change to FINISHED once all participants have voted or the end date is reached.
Show 10 entries
Search:
Title
Start date
End date
Status of the poll
Actions
fasfafsa
Sep 12, 2020, 7:45:40 PM
Oct 20, 2022, 8:10:43 PM
FINISHED
qTitle
Sep 12, 2023, 7:45:40 PM
Oct 11, 2023, 7:45:42 PM
PREPARED
sfafafa
Sep 12, 2000, 7:45:40 PM
Oct 11, 2020, 7:45:42 PM
FINISHED
weAnswerDidNotSkip
Sep 12, 2018, 7:45:40 PM
Oct 21, 2022, 8:17:10 PM
FINISHED
Showing 1 to 4 of 4 entries
Previous
1
Next
Create a New Poll
Current user: danp Organizer Administrator - Sign Out
User locale: en - Deutsch - English
Current Date: Sep 22, 2023, 8:00:42 PM
Xray EVS Application - Summer Term 2023


XrayEVS
Admin Dashboard
Polls
Participant lists
Sign Out
Edit Poll
Return to Poll overview
Status of the poll: PREPARED
Title *
qTitle
Start date *
09/12/2023 7:45:40 PM
End date *
10/11/2023 7:45:42 PM
Description *
desc
Tracking is activated.
Trackable
Participants
Add a new participant
- OR -
Enter a participant list
Show 10 entries
Search:
Email
Email
Actions
abhinavr8@uni-koblenz.de
abhinavr8@uni-koblenz.de
ahmadalfajr@uni-koblenz.de
ahmadalfajr@uni-koblenz.de
avahdatnia@uni-koblenz.de
avahdatnia@uni-koblenz.de
danp@uni-koblenz.de
danp@uni-koblenz.de
Showing 1 to 4 of 4 entries
Previous
1
Next
Questions
Add a question
single
multiChoice
yeNoQues
positive answer
negative answer
Abstention
Question-Type: Yes/No Question
Actions:
Save Changes
begin
Delete Poll
Current user: danp Organizer Administrator - Sign Out
User locale: en - Deutsch - English
Current Date: Sep 22, 2023, 8:11:45 PM
Xray EVS Application - Summer Term 2023

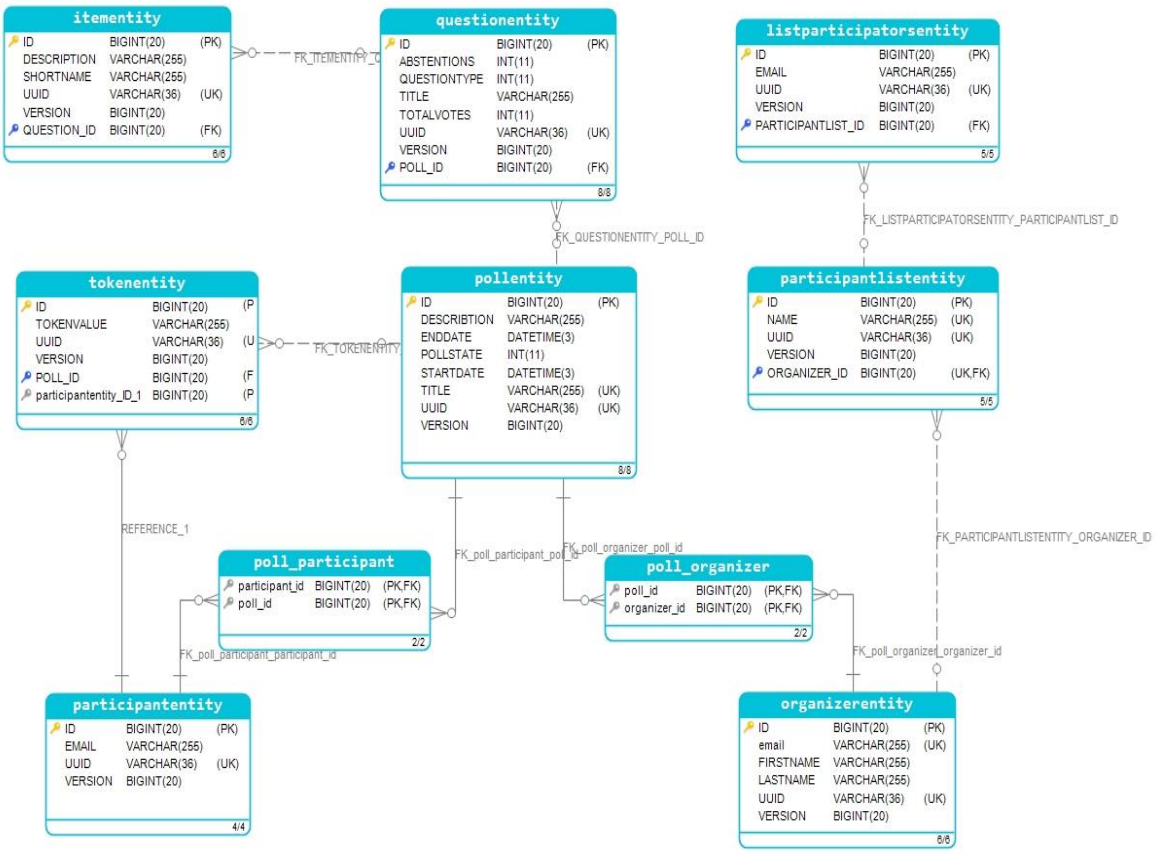

XrayEVS - Voting Results
Not secure
https://localhost:8181/XrayEVS/pages/organizer/poll_results.xht...
XrayEVS
Admin Dashboard
Polls
Participant lists
Sign Out
Voting Results
Return to Poll overview
Title
weAnswerDidNotSkip
Start date
Wednesday, September 12, 2018, 7:45:40 PM
End date
Friday, October 21, 2022, 8:17:10 PM
Description
ewresrerw
Link to results
Published Voting Results
Results
frwewrwrw
Yes/No Question
For the answer Yes we have 1 votes
For the answer No we have 0 votes
And 0 skipped answers.
Publish
Delete Poll
Current user: danp
Organizer
Administrator
- Sign Out
User locale: en - Deutsch - English
Current Date: Sep 22, 2023, 8:14:45 PM
Xray EVS Application - Summer Term 2023


XrayEVS - Voting Results
XrayEVS - Voting Results
Not secure
https://localhost:8181/XrayEVS/pages/organizer/poll
XrayEVS
Admin Dashboard
Polls
Participant lists
Sign Out
Voting Results
Return to Poll overview
Title
fasfafsa
Start date
Saturday, September 12, 2020, 7:45:40 PM
End date
Thursday, October 20, 2022, 8:10:43 PM
Description
lpk;
Link to results
Published Voting Results
Results
Insufficient votes to display results. (Fewer than 3 people voted)
Publish
Delete Poll
Current user: danp Organizer Administrator - Sign Out
User locale: en - Deutsch - English
Current Date: Sep 22, 2023, 8:21:14 PM
Xray EVS Application - Summer Term 2023

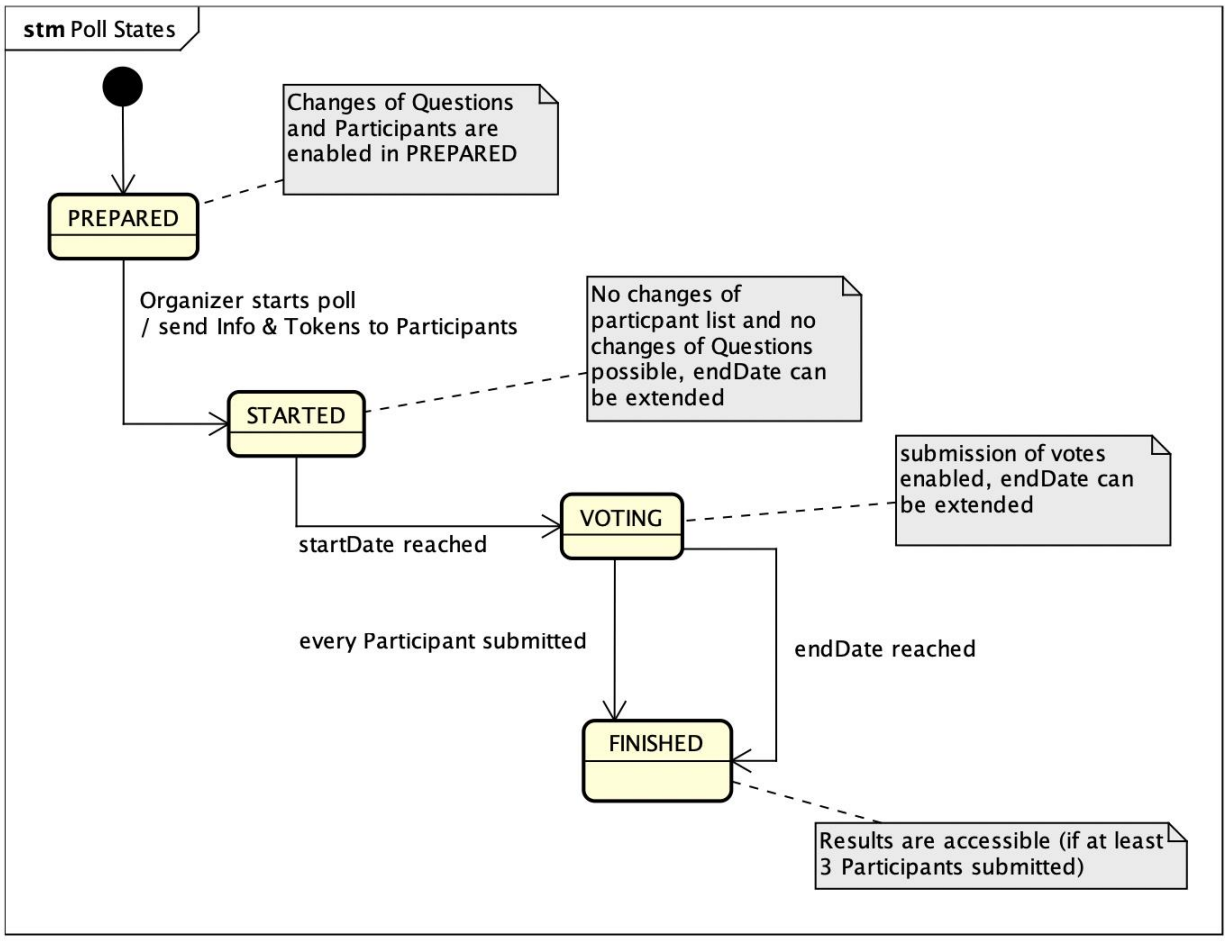

XrayEVS - Voting Results
XrayEVS - Voting Results
Not secure
https://localhost:8181/XrayEVS/pages/participant/voting_result....
XrayEVS
Admin Dashboard
Polls
Participant lists
Sign Out
Voting Results
Title fasfafsa
Organizer danp
Start date Saturday, September 12, 2020, 7:45:40 PM
End date Thursday, October 20, 2022, 8:10:43 PM
Description lpk;
Results
Participation rate 1/4 (25%)
qqq
Single Choice Question
For the answer yyyy we have 0 votes
For the answer nnnnn we have 0 votes
For the answer aaaa we have 1 votes
Total Votes: 1
yyyy: 0 (0%)
nnnnn: 0 (0%)
aaaa: 1 (100%)
Abstention 0 (0%)
Current user: danp
Organizer
Administrator
- Sign Out


XrayEVS - Voting
Not secure
https://localhost:8181/XrayEVS/pages/participant/voting.xhtml?token=MTY5NTQwODQ2MzMwOW1iXGdib25eZWBvXG1rX18
XrayEVS
Log in
Voting
Go to Home Page
q1
Start date Tuesday, September 12, 2023, 7:45:40 PM
End date Friday, January 12, 2024, 5:22:28 PM
Questions
singleChoice
Single Choice Question
1
2
Abstention
Mark 'Abstention' for all questions
Submit
Current user: (not logged in)
User locale: en - Deutsch - English
Current Date: Sep 22, 2023, 8:48:48 PM
Xray EVS Application - Summer Term 2023

Database Model:



Poll States Sequence Diagram:



Requirements

Requirements Completed

Polls

PO01, PO01.1, PO01.2, PO01.3, PO02, PO03

Questions

QU01, QU02, QU03, QU04

Poll states

PS01, PS02, PS03, PS04, PS05, PS06, (PS07)

Organizers

OR01, OR01.1, (OR01.2), OR02, OR02.1, OR02.2, OR05, OR05.1, OR06

Administrators

AD01, AD01.1, AD02, AD03, AD03.1

Participant Lists

PL01, PL01.1, PL01.2, (PL02), PL03, PL03.1, PL04, PL04.1, (PL04.2), (PL05), (PL06), (PL06.1), (PL06.2)

Tokens

TO01, TO02, TO03, TO04

Anonymity

AN01, AN02

Participation tracking

(PT01), (PT02)

Submitting a vote

SV01, SV02, SV02.1, SV03, SV04, SV05, SV06, SV07, SV08, (SV09), SV10, (SV11)

Results

RS01, RS02, RS03, RS04, RS05, RS06, RS07, RS08

User Interface of the EVS

UI01, (UI02), (UI03), (UI04), UI05, (UI06)

Internationalization

IN01, IN01.1, IN01.2, IN03, IN04, IN05

Architecture

AR01, AR02, AR03, AR04, AR05, AR06, AR07

Security

(SE01), SE02, SE04

Project Manual

PM01, PM02, PM03, PM04, PM05

Requirements Missing

Polls

(PO04), (PO04.1), (PO04.2)

Organizers

(OR03), (OR04), (OR04.1), (OR04.2)

Results

(RS09)

Internationalization

(IN06), (IN07)

Security

(SE03)

Decision on Requirements

- (OR04) - Although the relations between entities and classes are correctly implemented and support multiple Organizers for Polls, due to the lack of time we could not prepare the needed functions in the Application layer for the Administrator to do so.
- AD03 - We used LDAP, therefore it is implemented by its nature.
- (PL02) - Although Organizers can add participants from outside the University, they cannot login.
- (PL05) - It is possible to create participant lists, but we do not have ability to import from other applications.
- (SV11) - We have added a button to skip all questions.
- IN03 – We added support for EN, DE, FR.
- (SE01) - We used LDAP, therefore it is implemented by its nature.

Challenges Faced

Technical issues

We encountered challenges in comprehending and extending the domain model, recognizing the need for at least a few additional components. Following several discussions, we eventually arrived at a final solution that was complete and satisfactory.

Initially, we faced problems in the setup of Netbeans and the database. However, after revisiting the instructions and following them carefully, we successfully rectified those errors.

Later, we also met some challenges with setting up emails with Gmail server due to recent strict authentication policy from Google. We also attempted using Hotmail server, but after implementation we found out that Hotmail is not accessible within the University internet.

Ultimately, we chose the university server and it worked perfectly for us.

We also wanted to add Hindi language support to our application, but due to some technical issues in Netbeans we could only see special characters. Even after correctly setting the encoding to utf-8, we were not able to add support for Hindi language.

For token generation, we did not have clarity on how to approach this problem. To implement a solution, we got inspiration from online research for the generation of unique tokens which are non repeating.

Organizational issues

Due to some misunderstanding, we started early but worked on a project without EJB and WAR packages. So, after a few weeks of work, we had to start all over again from scratch after studying online materials like the lectures and such.

Moreover, not only managing our time effectively posed several challenges for us, but also during the lecture period, we were juggling weekly assignment submissions in our other courses, which understandably limited the progress we could make on our JavaEE project during that time.

The situation became more complicated during the exams period as the submission deadlines for our JavaEE project clashed with numerous other exams. This tight scheduling left us with very little available time to dedicate to the project.

Apart from this, we all had part time office work throughout the semester / examinations and that added a lot of stress considering the deadline.

To summarize, overall the hours where we all four members of the team had some overlap of discussion and work time was very little. This is why we could not complete implementing the mandatory requirements by 31st August. However, due to good cooperation and determination, we regularly worked together to complete the tasks throughout the examinations.

Team-related issues

Initially, we met multiple meetings to deliberate on organizational matters, including collaboration, methodology, and areas of responsibility. However, just before the course registration deadline, two of our team members withdrew from the course. This unexpected change caused some uncertainty regarding how to proceed with the project, necessitating a reassessment and revision of our organizational plans.

Description of our methods & operating principles

Our initial discussions primarily revolved around organizational matters and high-level technical project considerations. During these discussions, we covered various topics, including collaboration, methodology, areas of responsibility, domain model, entity relationships, and more.

For the project's implementation, we initially attempted to plan our tasks by creating tickets on the Gitlab issues board. However, we soon realized that this approach was not very effective for our team. Instead, we found it more beneficial to regularly discuss our tasks using alternative communication methods. Given our collaborative approach of focusing on one task at a time, we didn't find it necessary to assign specific tasks to individuals throughout the project. This

approach allowed us to maintain a strong focus on solving the immediate problems at hand and proved especially advantageous when 1-2 members couldn't attend Java work meetings due to exams, as it ensured that there were no impediments to the overall project development.

In the beginning, we divided the group into two segments, with Danoosh and Ali working on the frontend, while Ahmad and Abhinav handled the backend tasks. As the project progressed, we increasingly collaborated on most topics together. This collaborative approach ensured that each team member gained a comprehensive understanding of the project as a whole.

Time Tracking

Task	Time Taken (hours)			
	Danoosh	Ali	Ahmad	Abhinav
Organizational planning, Domain Model	6	6	6	6
Set up Gitlab, IDE setup, JDBC, database	7	12	7	7
Setting up email, LDAP server	4	2	4	4
Initial base class design	7	2	9	9
Frontend WAR setup and pages	8	8		
Logics Implementation			12	5
Feature implementation	10	6	6	10

Functionality testing	8	8	3	8
Localization		5		
Bug Fixing	6	6	6	6
Frontend Logic	12	8		
Documentation	8	8	4	8
Code Review	3	3	3	3