



Bilkent University

Department of Computer Engineering

CS 353 Term Project

Project Tracking Software

Final Report

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1. Brief Description of The Application

TrackIT is an issue tracking system that goes beyond an ordinary software development project issue tracker which can be used by companies and individuals to track the work being done by the team on their projects as well as the issues, releases or the general state of the project. This application system is web-based, therefore users from different platforms can utilize the system in a compatible manner, i.e. users do not need to install anything extra to benefit from all the functionalities that the system provides. The system forces the user to choose one of the two types, such as standard and privileged user, which will thereafter determine their access to the system. There will definitely be privileges to privileged users including creating and deleting boards, adding and removing other users to cards, creating releases or inviting other members to the team. The system is created to support the teamwork, by supporting a whole system of issues, features and release-tracking options. Each project has boards which contain lists (ex: TO-DO list etc.) and each list has cards (ex: a task/ a TO-DO list item). Assigning a card to a user is still a right reserved for privileged users.

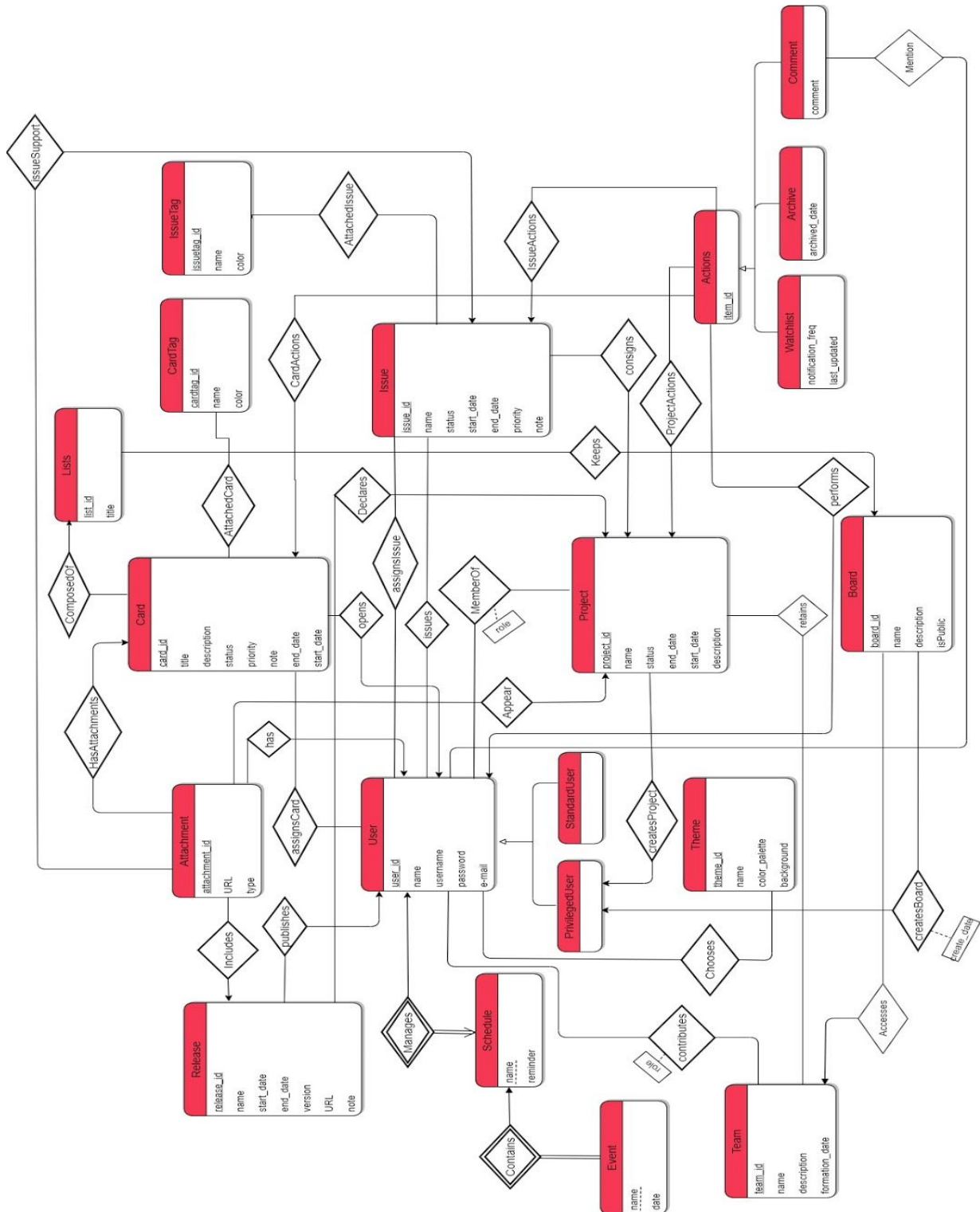
The system is free and a user is by default a standard user unless it is chosen otherwise during the signup procedure. Signup is an easy in-a-few-steps procedure that allows an individual to make use of (most of) its features (if a standard user is to be considered). Besides registering on their own, a new team member can be sent an invitation to join a team by joining the system in the first place. Teams are a crucial part of the system as they stand in the center of the project and they can be created and managed by the administrator ('creator') of the project. The administrator can add/invite members, give them privileges or delete them, therefore is capable of changing the team of his/her project. All issues of a project can be seen by all team members which are allowed to reassign an issue to themselves. This would indicate a change/update in the team members' issues board.

A user's status can be changed during their membership to the system as well. This can be done by whoever has higher access (i.e. is a privileged user) on the same project. TrackIT also provides users with some statistical results represented on analytical reports, which can be generated by the system on request.

TrackIT is to be considered a safe and secure system for it provides encryption of passwords and also has error checks which make the system less erroneous, by preventing failures in the data updates, additions and deletions. The system is designed to be easy to use with a user-friendly and responsive Graphical User Interface. The user interface can be customized by each user during their signup to the system, which makes the system even more personalized to fit each user's need.

To sum up, TrackIT is an optimal issue tracking software that brings to an end the issue management problem. It creates a team mentality that encourages a simple and efficient group work overall.

2. Final E/R



3. Final List of Tables

3.1 Theme

Theme(name, color_palette, background, theme_id)

- Primary key: theme_id
- Foreign key(s): *none*

3.2 Team

Team(team_id, name, description, formation_date)

- Primary key: team_id
- Foreign key(s): *none*

3.3 CardTag

CardTag(cardtag_id, name, color)

- Primary key: cardtag_id
- Foreign key(s): *none*

3.4 IssueTag

IssueTag(issuetag_id, name, color)

- Primary key: issuetag_id
- Foreign key(s): *none*

3.5 User

User(user_id, name, username, password, e-mail)

- Primary key: user_id
- Foreign key(s): *none*

3.6 PrivilegedUser

PrivilegedUser(user_id)

- Primary key: user_id
- Foreign key(s):
 - FOREIGN KEY(user_id) REFERENCES User(user_id),

3.7 StandardUser

StandardUser(user_id)

- Primary key: user_id
- Foreign key(s):
 - FOREIGN KEY(user_id) REFERENCES User(user_id),

3.8 Contributes

Contributes(user_id, team_id, role)

- Primary key: user_id, team_id
- Foreign key(s):
 - FOREIGN KEY (user_id) REFERENCES User(user_id),
 - FOREIGN KEY (team_id) REFERENCES Team(team_id)

3.9 Chooses

Chooses(theme_id, user_id)

- Primary key: theme_id, user_id
- Foreign key(s):
 - FOREIGN KEY (theme_id) REFERENCES Theme(theme_id),
 - FOREIGN KEY (user_id) REFERENCES User(user_id)

3.10 Schedule

Schedule(user_id, name, reminder)

- Primary key: user_id
- Foreign key(s):
 - FOREIGN KEY (user_id) REFERENCES User(user_id)

3.11 Project

Project(project_id, name, status, end_date, start_date, description, user_id)

- Primary key: project_id
- Foreign key(s):
 - FOREIGN KEY (user_id) REFERENCES User(user_id)

3.12 Releases

Release(release_id, name, start_date, end_date, version, URL, note, user_id, project_id)

- Primary key: release_id
- Foreign key(s):
 - FOREIGN KEY (user_id) REFERENCES User(user_id),
 - FOREIGN KEY (project_id) REFERENCES Project(project_id)

3.13 Board

Board(board_id, name, description, isPublic, team_id, user_id, create_date)

- Primary key: board_id
- Foreign key:
 - FOREIGN KEY (team_id) REFERENCES Team(team_id),
 - FOREIGN KEY (user_id) REFERENCES User(user_id)

3.14 Lists

Lists(list_id, title, board_id)

- Primary key: list_id
- Foreign key(s):
 - FOREIGN KEY (board_id) REFERENCES Board(board_id)

3.15 Cards

Card(card_id, title, description, priority, status, note, start_date, end_date, user_id, list_id)

- Primary key: card_id
- Foreign key(s):
 - FOREIGN KEY(user_id) REFERENCES User(user_id),
 - FOREIGN KEY(list_id) REFERENCES Lists(list_id),

3.16 Issue

Issue(issue_id, name, status, start_date, end_date, priority, note, project_id, user_id)

- Primary key: issue_id
- Foreign key(s):
 - FOREIGN KEY (project_id) REFERENCES Project(project_id),
 - FOREIGN KEY (user_id) REFERENCES User(user_id),

3.17 AttachedCard

AttachedCard(cardtag_id, card_id)

- Primary key: cardtag_id, card_id
- Foreign key(s):
 - FOREIGN KEY (issuetag_id) REFERENCES Card(card_id),
 - FOREIGN KEY (cardtag_id) REFERENCES CardTag(cardtag_id)

3.18 AssignsIssue

AssignsIssue(issue_id, user_id)

- Primary key: card_id, user_id
- Foreign key(s):
 - FOREIGN KEY (issue_id) REFERENCES Issue(issue_id),
 - FOREIGN KEY (user_id) REFERENCES User(user_id)

3.19 MemberOf

memberOf(user_id, project_id, role)

- Primary key: user_id, project_id
- Foreign key(s):
 - FOREIGN KEY (user_id) REFERENCES User(user_id),
 - FOREIGN KEY (project_id) REFERENCES Project(project_id)

3.20 Actions

Actions(item_id, card_id, user_id, project_id, issue_id)

- Primary key: item_id
- Foreign key(s):
 - FOREIGN KEY (user_id) REFERENCES User(user_id),
 - FOREIGN KEY (project_id) REFERENCES Project(project_id),
 - FOREIGN KEY (issue_id) REFERENCES Issue(issue_id),
 - FOREIGN KEY (card_id) REFERENCES Card(card_id)

3.21 Watchlist

Watchlist(item_id, notification_freq, last_updated)

- Primary key: item_id
- Foreign key(s):
 - FOREIGN KEY (item_id) REFERENCES Actions(item_id)

3.22 Archive

Archive(item_id, archived_date)

- Primary key: item_id
- Foreign key(s):
 - FOREIGN KEY (item_id) REFERENCES Actions(item_id)

3.23 AssignsCards

AssignsCard(card_id, user_id)

- Primary key: card_id, user_id
- Foreign key(s):
 - FOREIGN KEY (user_id) REFERENCES User(user_id),
 - FOREIGN KEY (card_id) REFERENCES Card(card_id)

3.24 Retains

Retains(project_id, team_id)

- Primary key: project_id, team_id
- Foreign key(s):
 - FOREIGN KEY (project_id) REFERENCES Project(project_id),
 - FOREIGN KEY (team_id) REFERENCES Team(team_id)

3.25 Comment

Comment(item_id, comment)

- Primary key: item_id
- Foreign key(s): *none*

3.26 Mention

Mention(item_id, user_id)

- Primary key: item_id, user_id
- Foreign key(s):
 - FOREIGN KEY (item_id) REFERENCES Comment(item_id),
 - FOREIGN KEY (user_id) REFERENCES User(user_id)

3.27 AttachedIssue

AttachedIssue(issuetag_id, issue_id)

- Primary key: issuetag_id, issue_id
- Foreign key(s):
 - FOREIGN KEY (issuetag_id) REFERENCES IssueTag(issuetag_id),
 - FOREIGN KEY (issue_id) REFERENCES Issue(issue_id)

3.28 Attachment

Attachment(attachment_id, url, type, card_id, project_id, user_id, issue_id, release_id)

- Primary key: attachment_id
- Foreign key(s):
 - FOREIGN KEY (user_id) REFERENCES User(user_id),
 - FOREIGN KEY (project_id) REFERENCES Project(project_id),
 - FOREIGN KEY (release_id) REFERENCES Release(release_id),
 - FOREIGN KEY (issue_id) REFERENCES Issue(issue_id),
 - FOREIGN KEY (card_id) REFERENCES Card(card_id)

4.Implementation details

4.1 Implementation process

Implementation process for the TrackIT database application was based on the previously thought and improved design of the system. There were minor and slight changes on the User Interface and the way of implementing some of the features that were thought in the previous stages of Project Proposal and Design. Implementation process was mostly based on continuous tests, through which the correctness of the queries and the general functionality and exact results were generated. Testing was used to test edge cases and generate errors which can be crucial before the system is live and open to all users.

4.2 Used technologies

This database web application system was implemented using HTML, CSS, JS, BOOTSTRAP, PHP. Queries that were written to interact with MariaDB were written using SQL. HTML, CS, ...

Libraries were used to enhance the application in its user interface as well as functionalities. In order to enhance the User Interface of the system some font and icon sets were used (eg: Font Awesome); they were embedded to html code through some provided links.

4.3 Encountered problems

During the implementation process, many problems that were faced we believe were related to the fact that there were some new concepts that were needed to implement all the functionalities as we had thought during the proposal and design phase. These problems were solved through a constant learning and test-and-try process. Some other minor problems that were faced were related to the way the code was written by different team members, so that when all codes were to be merged together some methods (eg: PHP, JS) would not be compatible, therefore updates were necessary to reach the synchronized and full-working state of the application.

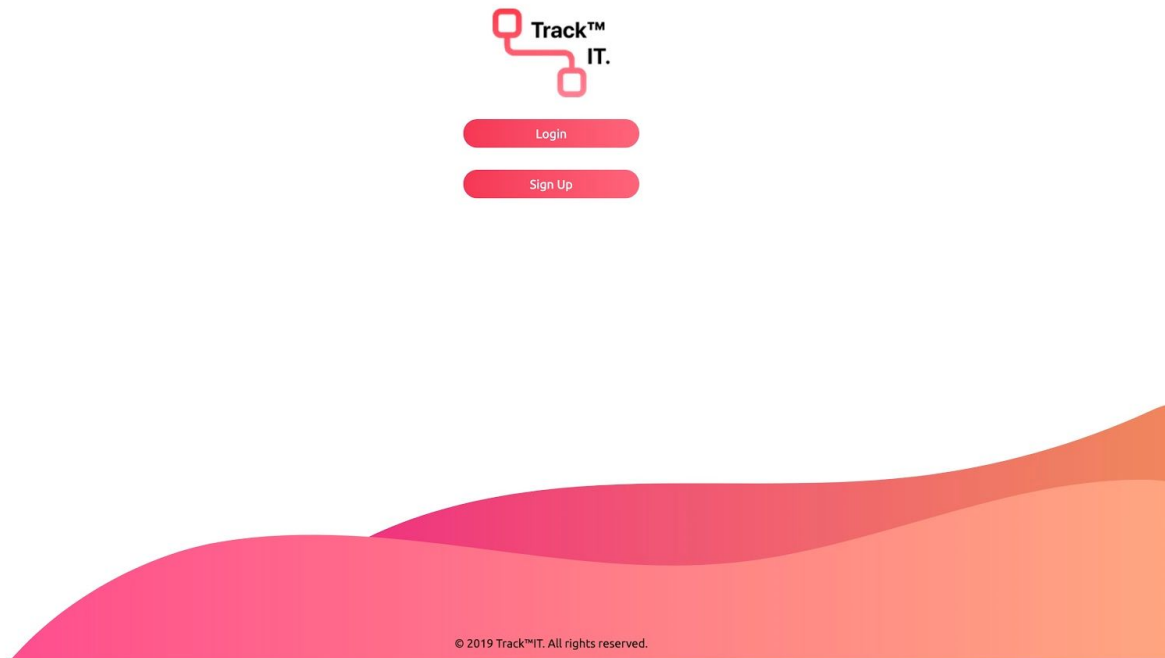
5. User's Manual

5.1 Quick Start Guide

TrackIt is a website that currently does not have a domain. Therefore the user manual will assume TrackIt is an official website and will not be run through localhost. We assume that this User Manual is written for a case that there is a fully established program and a web server. Therefore, instructions for installing tools to run from localhost are not included.

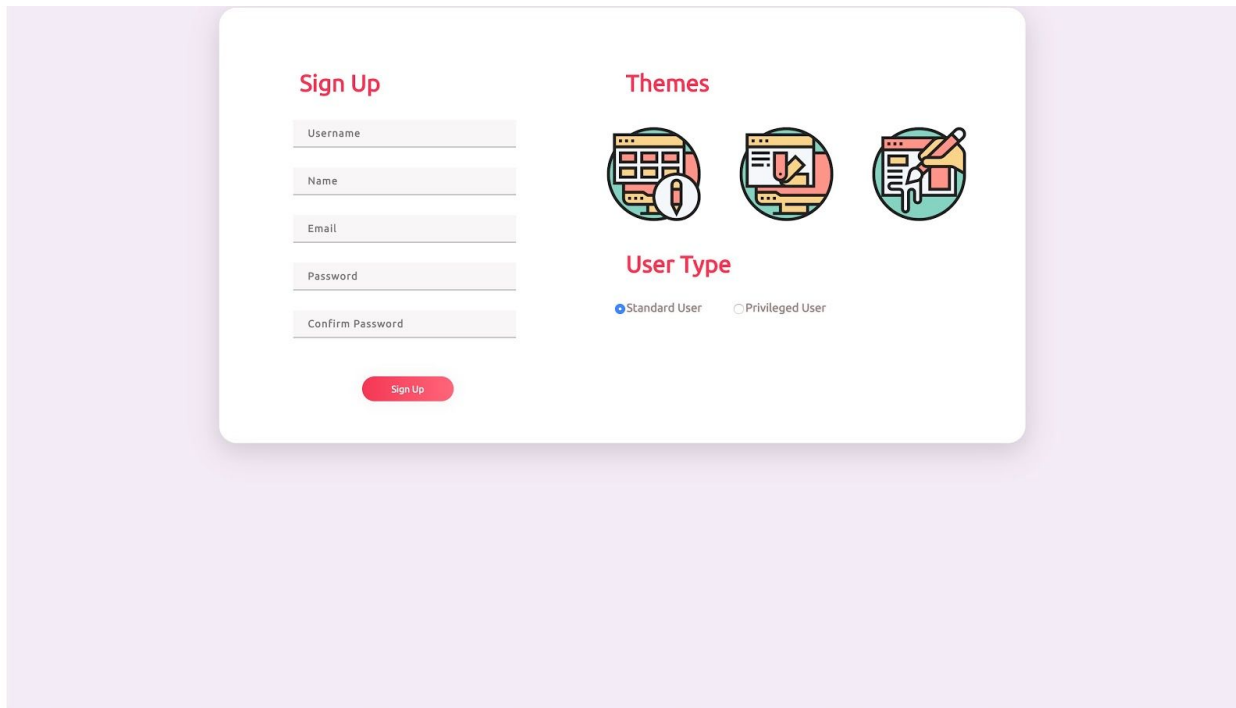
5.2 Opening Screen

As the website is launched, the user is greeted with the the opening screen. There are two choices that one can choose: Either login or sign up.



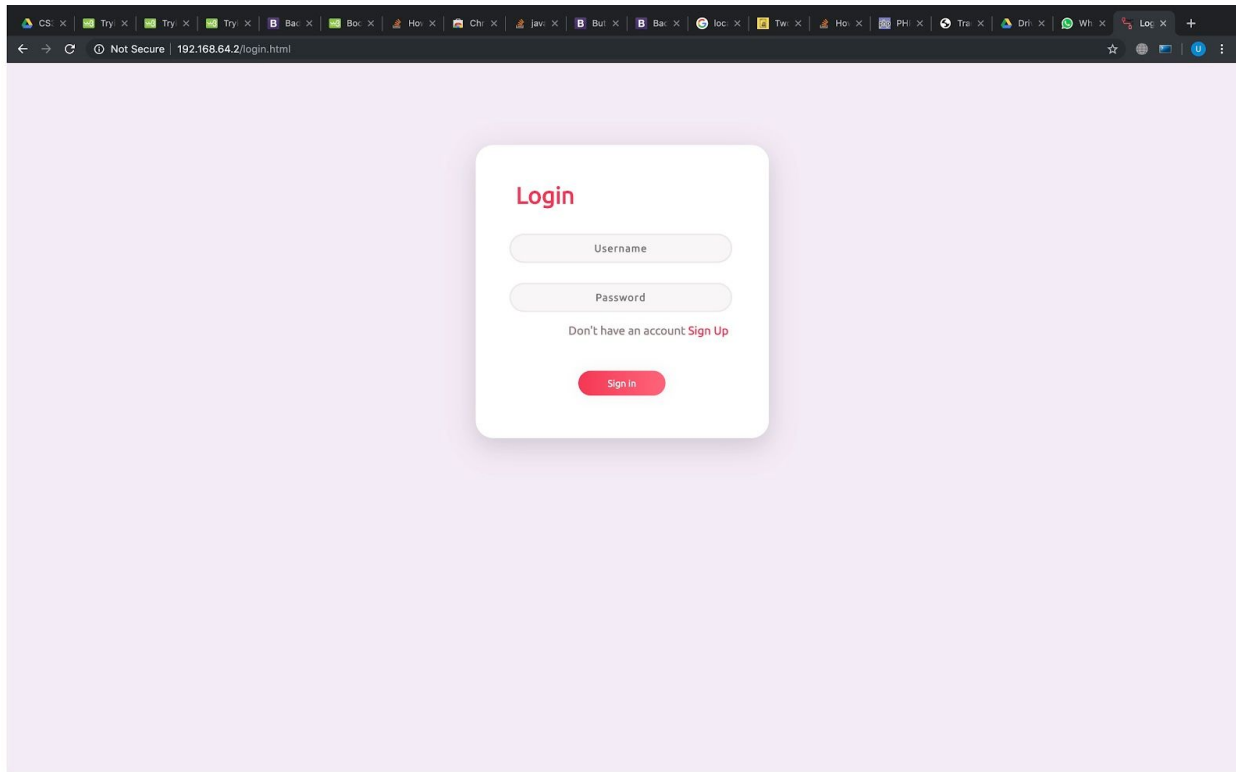
5.2.1 Sign Up Screen

In this screen, one should specify a username, give a name, e-mail and a password. The user will also confirm the password for security purposes. In SignUp screen, the user will also choose the user type which can be manipulated later on by projects creators and the supervisors of the company that this job application is used.



The image shows a 'Sign Up' screen mockup. On the left, under the heading 'Sign Up', there are five input fields: 'Username', 'Name', 'Email', 'Password', and 'Confirm Password'. Below these fields is a red 'Sign Up' button. On the right, under the heading 'Themes', there are three circular icons representing different themes. Below the icons, under the heading 'User Type', there are two radio button options: 'Standard User' (which is selected) and 'Privileged User'.

5.2.2 Login Screen



This screen will show up if the user chooses login on the previous page. In this page, the user is asked to fill username and password to enter the website. The user is also given an option to choose SignUp if one does not have an account yet.

5.3.1 Project Information Screen

In this detailed project information screen, user can see textual information about the project. Also, other users in this project are displayed on the bottom left side. A standard user cannot add the team and use the plus button whereas a privileged user can create a team. Before clicking, the Team menu is collapsed. After clicking the plus button, the panel rolls down and options are seen. A privileged user who wishes to create a team is asked the name of the team, and a short description. The user can use the add button

Project Information

Project name: Aynen
 Status: new
 Description: Oyle
 Start Date: 2019-05-20
 End Date: 2019-05-20
 Participants ▾
 Görkem #1 |

Users

Search



Team +

Team Name

Enter name

Description

Enter description

Add

Team 1 ▾ ⊕

Team description: description

Participants

Görkem #1 |

User ID

Enter ID

Add User

Delete Team

5.3.2 Boards Screen

Boards screen are specific for the team members. This screen displays the different boards of a team in the system. Here, a privileged user can add or delete a board. If a board is deleted, none of the belonging teammates will be able to see it. Both kinds of users can click on a board and go to the “My Board” screen.

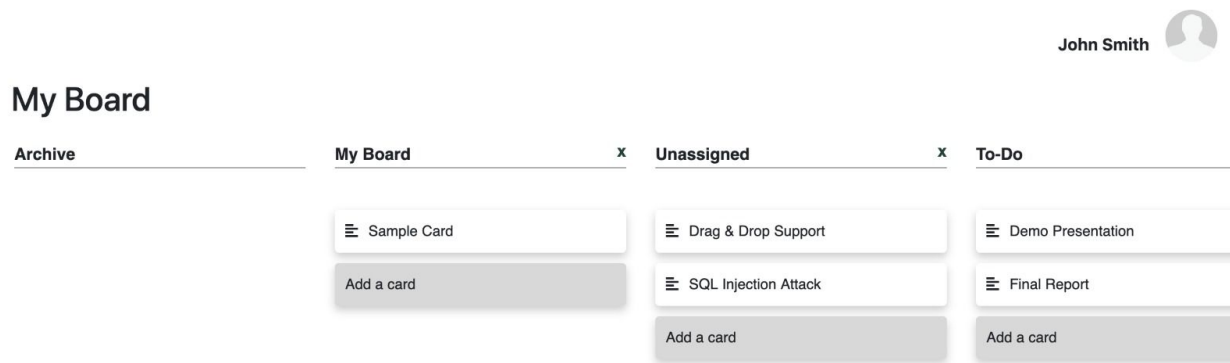
Boards



5.3.2.1 My Board Screen

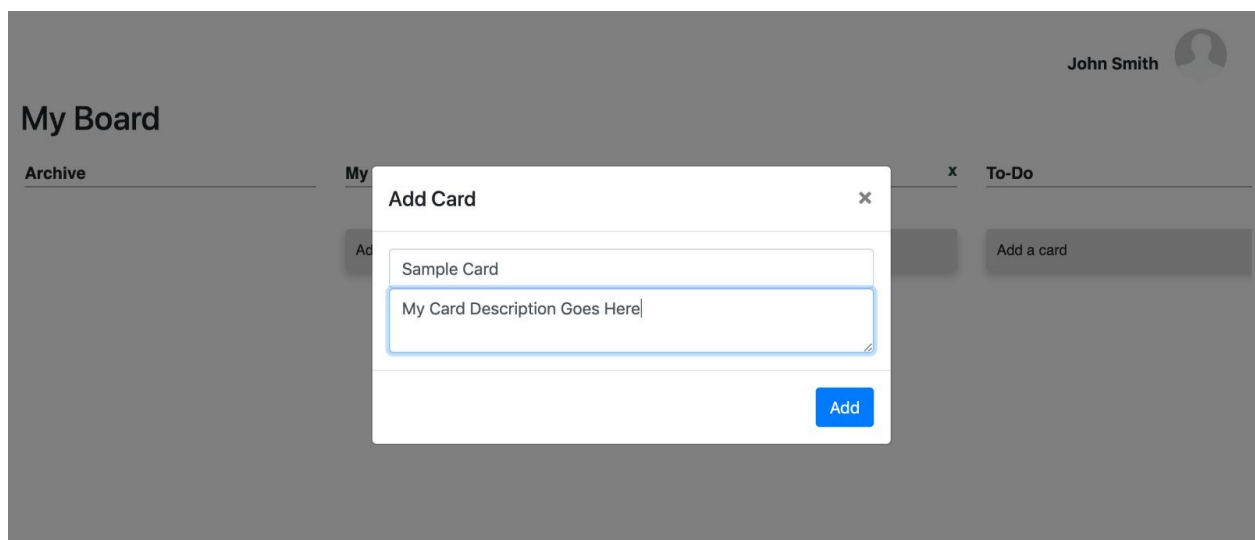
My Board Screen has vertical lists added horizontally next to each other as user continues to add lists. The user can organize the board in whatever she likes. Every list has an option to add a card. The most significant feature is that the cards can be

dragged and dropped. They can be ordered among the list, and can be moved across lists. The user is intentionally left to act intuitively.



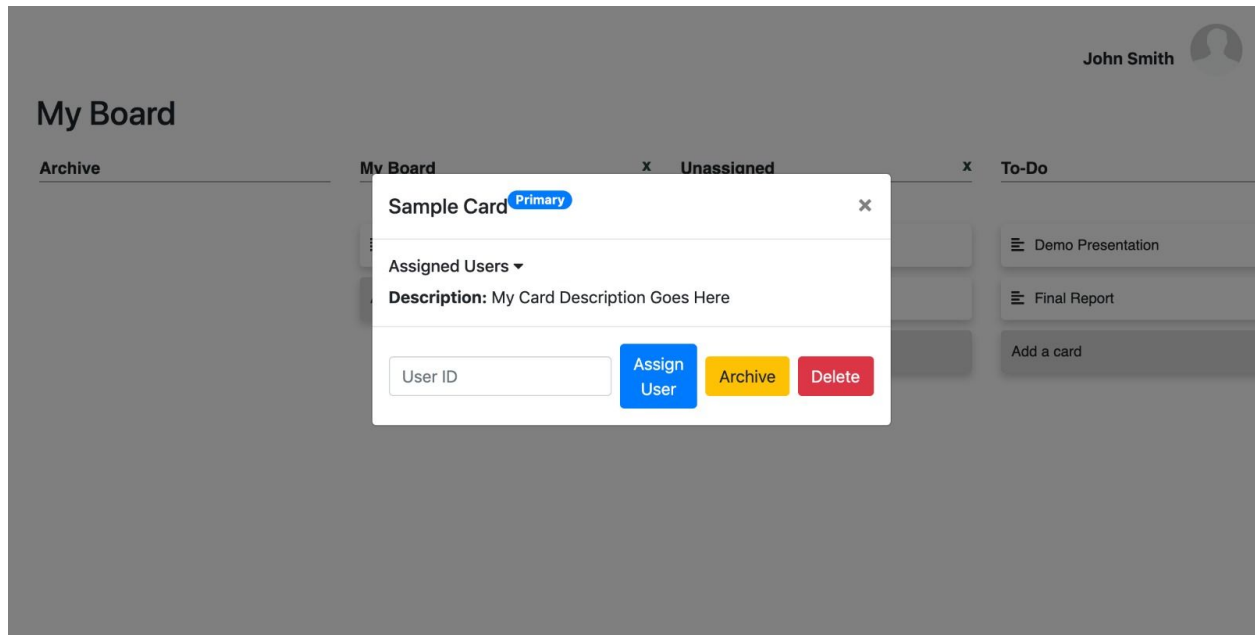
5.3.2.2 Adding a Card

Adding a Card to a List just requires the user to fill a simple pop up. A card will have a name, and a description.



5.3.2.3 Viewing a Card

The user can view a card in detail by clicking on one of them, a modal that displays the card details and functionalities is listed. The user can also add comments to the cards.



5.3.3 Issues Screen

In the Issues Screen, the users can view the issue details by clicking on the issue header. In this visual's case, clicking on the dark gray part of the issue cards will toggle the modal and in the modal, user will be able to see the details of the issue with resolve, delete and cancel option.

Issues

Add Issue

NOTHING WORKS Solved

Priority:2

This project is getting out of control.

  Created 3 mins ago 


debugging active

Priority:3

New issue. Lorem ipsum falan filan.

  Created 3 mins ago 

Track-IT Home Features Pricing




John Smith 

Issues

NOTHING WORKS Sol

Priority:2

This project is getting out of control.

  Created 3 mins ago 

Issue Information

Issue Name:

NOTHING WORKS

Issue Tag:

Issue Status:

Issue Priority:

2

Assign to:

1

Issue description:

This project is getting out of control.

Cancel

Delete

Resolve

5.3.4 Releases Screen

The users are able to publish releases as they go along with the project development. Currently, attachment option is not available but releases can be named and versioned. The user can click on a release card's dark grey part to view the release details.

Releases

Add Release

First Release	V1.1
2019-05-21	
https://trackit.cf	
This is the first release	

Beta Version	V4.1
2019-05-21	
https://trackit.cf	
Beta version is released...	

6.Website

The following link <http://track-it.cf/> directs you to TrackIT project website.