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# APP ARCHITECTS WEB APPLICATION DOCUMENTATION

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## TEAM MEMBERS:

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## Introduction

A university needs to be safe and well-maintained in order to provide students, staff, and faculty members with a secure and productive learning environment. Nonetheless, it can be difficult to maintain a large university with many buildings and departments.

The Power Platform, which consists of Power Pages, Data verse, Power Automate, and Power Apps, was used to develop a solution to this problem. The goal of this solution is to provide a web application that makes it easier for students and staff to report and track maintenance issues.

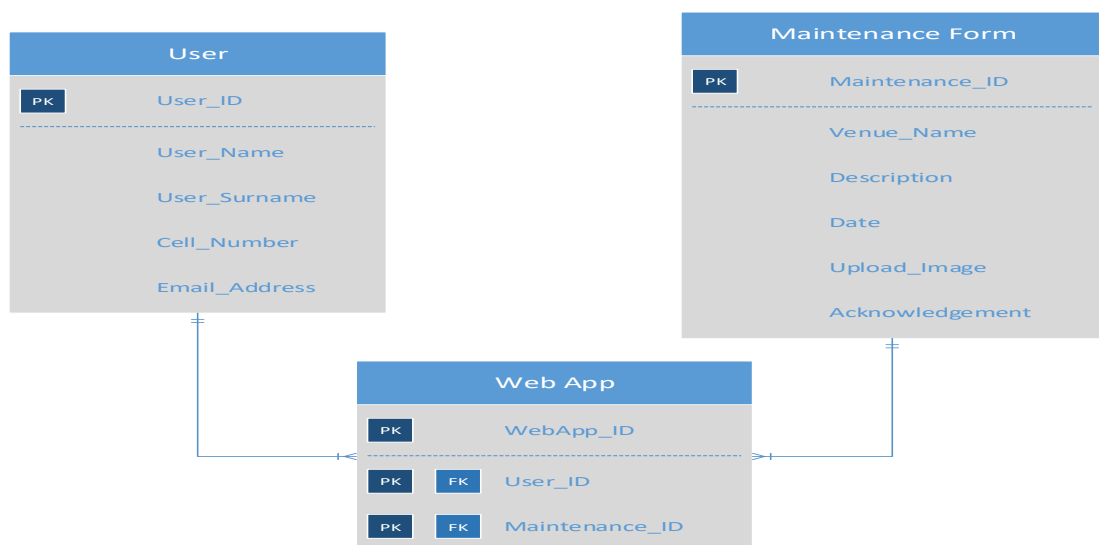
Users of the proposed web app will be able to submit maintenance issues, such as damaged facilities, broken equipment, and safety hazards, which are processed and monitored by the Maintenance Unit.

## Software Development Process Model

We as a team decided to use the Agile methodology in our project. Agile methodologies are renowned for their adaptability and flexibility to changing requirements. It permits quick iterations and constant supply of useful software, guaranteeing that the finished result satisfies the expectations of the users. Also, the emphasis on collaboration and teamwork encourages communication and guarantees that everyone on the team is on the same page and pursuing the same objectives.

## Architecture

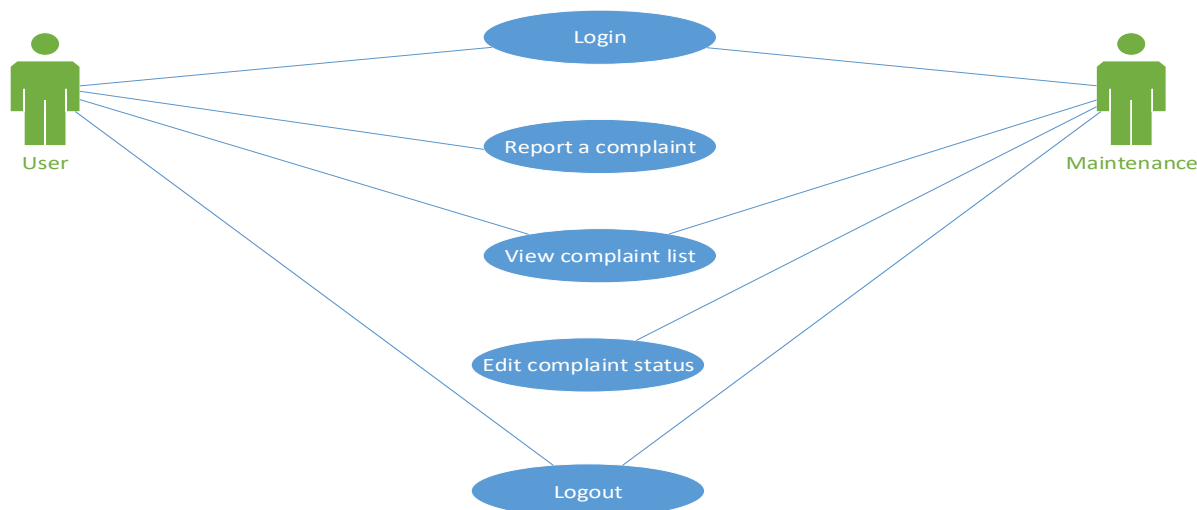
- Create an account- a user will be allowed to create their own account within the site which will allow them to report a complaint.
- Maintenance Form – a user will be allowed to fill in a maintenance form of issues around campus that require maintenance.
- Maintenance List - users can view a list of existing maintenance required.



## Functionality

### Features:

- 1. User authentication:** Users will be required to log in with their email address and password to ensure that only authorized users can report or view issues.
- 2. Issue reporting:** Users will be able to report issues by filling a form. The form will include fields such as the type of issue, location, description, and images if needed.
- 3. Issue management:** The maintenance unit will be able to view all the issues reported and assign them to staff members for resolution. The staff members will be able to update the status of the issue and add notes on the progress.
- 4. Notification system:** The web application incorporates a function that uses the Power Automate flow to generate a unique notification after each significant user interaction with the system. In reaction to client feedback, we have integrated an Outlook API to send email notifications. In addition, to ensure a more reliable and comprehensive implementation, we have configured a Twilio API, which sends SMS notifications to confirm successful user interactions with our system.
- 5. Dashboard:** A dashboard will be provided for the maintenance unit to view the status of all reported issues and prioritize them according to urgency.
- 6. User roles and permissions:** The system will have different user roles such as students, staff, and maintenance unit, each with different permissions and access levels.
- 7. Mobile-responsive design:** The system will be designed to work on mobile devices to ensure that users can report issues from anywhere on campus.
- 8. Issue monitoring platform:** We've implemented a function to our web application that allows users to access a social media platform created by Yammer that displays all current campus maintenance and repair activities. This feature ensures that both students and faculty members are aware of current activities and can take appropriate safety precautions such as avoiding construction zones.



## Testing and Deployment

### Security

1. During our testing, we used a variety of methods to verify the system's authenticity. We specifically tested the password, password recovery, default login, and logging out functionality. These tests were designed to validate the security and efficacy of the **authentication** measures in place.
2. We investigated the system's **authorization** as part of our testing efforts. We did this by entering various data sets into the application and watching how the system responded. This allowed us to determine whether the system was granting or denying access to specific resources or functionalities based on the user's authorization level correctly. Our goal was to ensure that the authorization mechanisms were working properly and that users had the appropriate level of access.

### Portability

We tested for **adaptability** the look and feel of the application in the various browser types and various browser versions (Tutorialpoint.2023):

- We ran test on Google Chrome, Microsoft Edge, Firefox and the web application worked on all browsers.

### Performance

We tested for **scalability** to determines the maximum user load the software application can handle (Guru99.2023):

- We ran test with many users filling a maintenance form and submitting the form at the same time.

Our web application was hosted via Microsoft Power Pages.

## An overview of the website

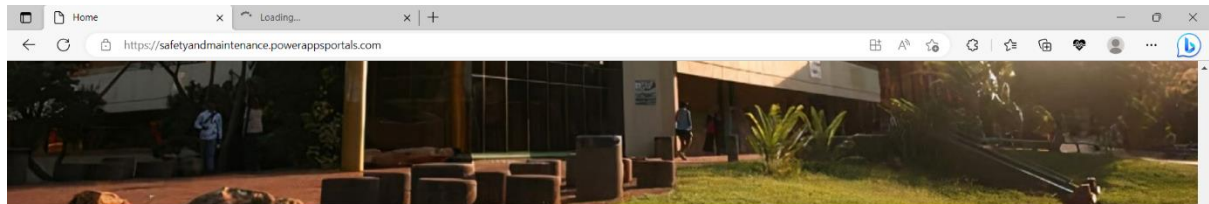
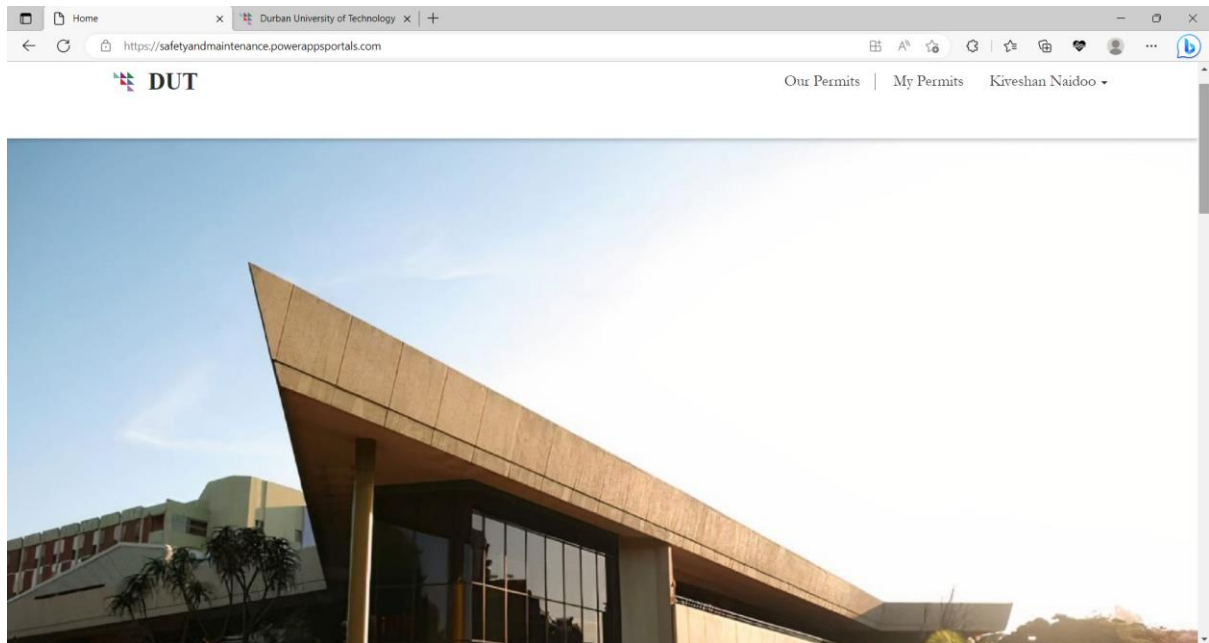
### Register Page

The screenshot shows the 'Register Page' of the DUT website. The browser address bar displays the URL: <https://safetyandmaintenance.powerappsportals.com/Account/Login/Register?returnUrl=%2F>. The page header includes the DUT logo and navigation links: 'Our Permits', 'My Permits', and 'Sign in'. Below the header, there are three links: 'Sign in', 'Sign Up' (highlighted with a rounded rectangle), and 'Redeem invitation'. The main content area is divided into two sections: 'Register for a new local account' and 'Register using an external account'. The 'Register for a new local account' section contains four input fields: '\* Email', '\* Username', '\* Password', and '\* Confirm password', followed by a green 'Register' button. The 'Register using an external account' section features a green 'Azure AD' button.

### Login Page

The screenshot shows the 'Login Page' of the DUT website. The browser address bar displays the URL: <https://safetyandmaintenance.powerappsportals.com/SignIn?returnUrl=%2F>. The page header includes the DUT logo and navigation links: 'Our Permits', 'My Permits', and 'Sign in'. Below the header, there are three links: 'Sign in' (highlighted with a rounded rectangle), 'Sign Up', and 'Redeem invitation'. The main content area is divided into two sections: 'Welcome, please log in to continue.' and 'External Sign In'. The 'Welcome, please log in to continue.' section contains two input fields: '\* Username' (with the placeholder text 'Enter your username') and '\* Password' (with the placeholder text 'Enter your password'), followed by a checkbox labeled 'Remember me?'. A green 'Sign in' button is located below these fields. The 'External Sign In' section features an orange 'Azure AD' button. A link labeled 'Forgot your password?' is located at the bottom right of the page.

## Home Page



### Ritson Campus



Ritson Campus is located in Berea, Durban, housing faculties of Accounting and Informatics, and Applied Sciences.

### ML Sultan Campus



ML Sultan Campus in Greyville, Durban, housing faculties of Arts and Design, Accounting and Informatics, and the DUT City Campus


### Steve Biko Campus




Main campus in Durban housing faculties of Applied Sciences, Engineering and Built Environment, Health Sciences, and Management Sciences.

Home Loading...  
https://safetyandmaintenance.powerappsportals.com


## How To Report Issues



**Submission**  
After you completed your complaint, you will be able to submit it online and track its status on this site.




**Review**  
When the report has been received, a permit technician will be able to review your application. Application review can take up to 14 business days.



**Decision**  
This step is optional based on the report submitted. If more information is needed, a permit technician will reach out to you.

Home Loading...  
https://safetyandmaintenance.powerappsportals.com



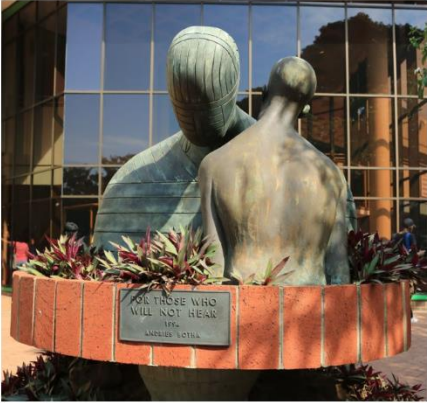
**Explore more**



## Information Page

Summary

https://safetyandmaintenance.powerappsportals.com/summary/



### Durban University of Technology


Durban University of Technology (DUT) is a leading higher education institution located in Durban, South Africa. DUT offers a range of undergraduate and postgraduate programs across six faculties, including the Faculty of Applied Sciences, the Faculty of Arts and Design, and the Faculty of Engineering and the Built Environment. With a student population of over 30,000, DUT is committed to providing quality education, research, and innovation to meet the needs of the 21st century. The university also has a strong focus on community engagement and sustainability, aiming to make a positive impact on society and the environment.

[Learn More](#)

Summary

Durban University of Technology


https://www.dut.ac.za



DUT  
DURBAN UNIVERSITY OF TECHNOLOGY  
INVESTED TOGETHER WITH VISION AND PASSION  
CREATIVE. DISTINCTIVE. IMPACTFUL.

[STUDENTS](#)[LIBRARY](#)[RESEARCH](#)[STAFF](#)[ALUMNI](#)[COVID-19](#)[DUT SOLIDARITY FUND](#)[ENVISION2030](#)

[APPLICATION REGISTRATION INFORMATION](#)[ABOUT](#)[ACADEMIC](#)[RESEARCH, INNOVATION & ENGAGEMENT](#)[BECOMING ENTREPRENEURS](#)[SUPPORT SERVICES](#)[NEWS, EVENTS & PUBLICATIONS](#)[QUICK LINKS](#)[CONTACT](#)[Application and Registration Information 2023](#)



**THE World University Rankings 2023 TOP 500**

Chatbot



Summary

https://safetyandmaintenance.powerappsportals.com/summary/

## App Architects Yammer

Our MS Yammer page is a centralized platform that aims to streamline the reporting of maintenance issues on our university campus. It provides clear guidelines on how to report different types of issues and categorizes them for efficient handling. Our page outlines the expected response time for different types of issues and encourages individuals to provide feedback and updates on their reported issues. It also offers links to relevant resources, an FAQ section, and contact information for the maintenance unit and other relevant departments. Our Yammer page is a user-friendly platform that aims to ensure a safe and functional learning environment for all students, staff, and faculty members by enabling efficient communication and prompt resolution of maintenance issues.

Explore

Summary

Yammer - App Architects solution

https://web.yammer.com/main/org/dut4life.ac.za/groups/eyJfdHlwZSI6Imdyb3VwIiwiaWQiOiIxMz0Dg5ODU4NTYifQ/all

Yammer

App Architects ...

DN

D Naidoo (21730530)

Home feed

Communities

Storylines

Inbox

Favorites

Improve your Yammer experience by creating a list of your favorite communities.

My communities

App Architects solution

All Company

Create a community

App Architects solution

Conversations About Files Events

DN

Share thoughts, ideas, or updates

Discussion Question Praise Poll

All conversations

Recent posts

AL

A Lwanga (22383051)

7h ago @1

Seen by 1

Diverse reactions on Yammer

At Yammer, we celebrate diversity. Select a default skin-tone to apply to reactions in Yammer. You can update your choice here or at any time in Yammer settings.


Try it now

Pinned

Add files or links that are important to this community.

Summary

https://safetyandmaintenance.powerappsportals.com/summary/



### Durban University Maintenance Unit


The maintenance unit at Durban University of Technology (DUT) is responsible for the upkeep and repair of buildings, equipment, and infrastructure on the DUT campus. The unit is made up of skilled professionals who handle tasks such as repairing plumbing, electrical systems, and HVAC systems, as well as maintaining landscaping and managing custodial services. The goal of the maintenance unit is to ensure that the facilities at DUT are safe, functional, and well-maintained for the benefit of students, staff, and visitors.

Report Issue

## Maintenance Complaint Form Page

Default Permit

safetyandmaintenance.powerappsportals.com/default/



[Our Permits](#) | [My Permits](#) | [Kiveshan Naidoo](#)

Applicant Info

Issue Description

Required Documents

Acknowledgement

Review

**First Name**

Jadene

**Last Name**

Pappah

**Email Address**

22010078@dut4life.ac.za


**Phone Number \***

0630034848

Next

Default Permit

https://safetyandmaintenance.powerappsportals.com/default/?stepid=befaf024-e4c1-ed11-83ff-000d3adbba46

Our Permits | My Permits Kiveshan Naidoo

Applicant Info ✓

Issue Description

Required Documents

Acknowledgement

Review

Enter Venue - Issue e.g. (DB 1001 - Chairs Broken)


BC0202 - Air conditioning is not working

PreviousNext

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Default Permit

https://safetyandmaintenance.powerappsportals.com/default/?stepid=bdfaf024-e4c1-ed11-83ff-000d3adbba46

Our Permits | My Permits Kiveshan Naidoo

Applicant Info ✓

Issue Description ✓

Required Documents

Acknowledgement

Review

Upload Image

Change File AdobeStock\_501907392.jpeg Delete

PreviousNext

Copyright © 2023. All rights reserved.

Default Permit

https://safetyandmaintenance.powerappsportals.com/default/?stepid=b6fa024-e4c1-ed11-83ff-000d3adbba46

Applicant Info ✓

Issue Description ✓

Required Documents ✓

Acknowledgement ✓

Review

**First Name**  
Jadene

**Last Name**  
Pappah

**Email Address**  
[22010078@dut4life.ac.za](mailto:22010078@dut4life.ac.za)

**Phone Number \***  
0630034848

**Description**  
BC0202 - Air Conditioning not working

Previous

Submit

Default Permit

https://safetyandmaintenance.powerappsportals.com/default/?stepid=b6fa024-e4c1-ed11-83ff-000d3adbba46

Our Permits | My Permits | Kiveshan Naidoo ▾

Applicant Info ✓

Issue Description ✓

Required Documents ✓

Acknowledgement

Review

**I hereby certify that I have read, understand, and agree to the terms of this report relating to Durban University of Technology**  
☐ No ☒ Yes

**Initials \***

Previous

Next

Default Permit

https://safetyandmaintenance.powerappsportals.com/default/?stepid=bbfa024-e4c1-ed11-83ff-000d3adbba46

Applicant Info ✓

Issue Description ✓

Required Documents ✓

Acknowledgement ✓

Review

**First Name**  
Jadene

**Last Name**  
Pappah

**Email Address**  
[22010078@dut4life.ac.za](mailto:22010078@dut4life.ac.za)

**Phone Number \***  
0630034848

**Description**  
BC0202 - Air Conditioning not working

Previous

Submit



App Architects - Issue has been reported -  
Application ID 1016



Durand Pillay

To: J Pappah (22010078)

Fri 2023/03/17 11:20



**CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.**

Dear Jadene,

Thank you for submitting a report regarding the maintenance issue you observed on the university campus. We appreciate your efforts in helping us to maintain a safe and functional learning environment for everyone.

Our Maintenance Unit has received your report and is working to address the issue as soon as possible. We strive to ensure that all areas of the campus are kept in excellent condition, and your report will assist us in achieving this goal.

We appreciate your feedback and encourage you to continue reporting any maintenance issues you observe on the university campus. Together, we can maintain a safe and functional environment for all members of our community.

Thank you again for your contribution to the upkeep of our campus.

Sincerely,  
App Architects Maintenance System



Reply

## My Maintenance List Page

The screenshot shows a web browser window with the URL <https://safetyandmaintenance.powerappsportals.com/View-My-Permits/>. The page header includes the DUT logo and navigation links: "Our Permits", "My Permits", and a user profile "Kiveshan Naidoo". The main content area is titled "My Applications" and contains a table with the following data:

Application ID	Permit Type	Permit Submit Date	Permit Status	Status Update Date	
1015	Default	3/17/2023	Submitted	3/17/2023	▼
1016	Default	3/17/2023	Submitted	3/17/2023	▼

## Admin Page

The screenshot shows a web browser window with the URL <https://safetyandmaintenance.powerappsportals.com/admin-home/>. The page header includes the DUT logo, "Admin Home", and a user profile "Duvand Pillay" with a dropdown menu showing "Profile" and "Sign out". The main content area features a banner titled "Issues Reported" and a "Snapshot" section with three metrics:


- 2 Permits submitted
- 0 Action Required
- 0 Finalized Decision



Profile

Home > Profile

Profile

Durand Pillay

Profile

Profile

Security

Change password

Change email

Manage external authentication

Please provide some information about yourself.

The **First Name** and **Last Name** you provide will be displayed alongside any comments, forum posts, or ideas you make on the site.

The **Email Address** and **Phone** number will not be displayed on the site.

Your **Organization** and **Title** are optional. They will be displayed with your comments and forum posts.

Your email requires confirmation.

Confirm Email

Your information

First name

Durand

Last name \*

Pillay

E-mail

durandtimothypillay@gmail.com

Business Phone

Provide a telephone number

[Admin] Homepage

https://safetyandmaintenance.powerappsportals.com/admin-home/

2 Permits submitted

0 Action Required

0 Finalized Decision

Permit Status

Apply

Search

Application ID	Permit Type	Applicant Name	Permit Status	Permit Submit Date ↑	
1015	Default	Durand Pillay	Submitted	3/17/2023	
1016	Default	Kiveshan Naidoo	Submitted	3/17/2023	

## **Conclusion**

The App Architects used Power Platforms, Power Pages, and Power Automate to create a functional web application that provides a secure and welcoming environment for staff, students, and faculty members. We successfully incorporated security verification using Power Pages through the implementation of various features, allowing only authenticated users to access a complaint submission.

Furthermore, only admin users are permitted to view or modify any proposed complaint, with specific access granted to a single designated user.

We also integrated the previously mentioned APIs (Outlook and Twilio) and thoroughly tested them to ensure proper functionality. As a result, users will receive an SMS confirmation that their maintenance complaint will be addressed as soon as possible.

## **References**

1. Tutorials point. 2023. *Portability Testing*. Available: [https://www.tutorialspoint.com/software\\_testing\\_dictionary/portability\\_testing.htm](https://www.tutorialspoint.com/software_testing_dictionary/portability_testing.htm) (Accessed 13 March 2023)
2. Guru99. 2023. *Performance testing*. Available: <https://www.guru99.com/performance-testing.html> (Accessed 13 March 2023)