COMP 693: INDUSTRY PROJECT REPORT

FINAL REPORT

Lincoln University
Information Technology Service (ITS)
Change Advisory Board Upgrade

(Industry Project)

Submitted by

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Date:
5th October 2024

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Lincoln University

Executive Summary

The Information Technology Services (ITS) department at Lincoln University manages and maintains critical infrastructure and services. The ITS department currently use an outdated change advisory board application to log, approve, track and document change requests.

This project aims to upgrade to a modern change management application that utilizes newly Lincoln ITS approved technologies. The new system will focus on:

1. Enhanced change requests with different workflows, detailed implementation tasks, post-implementation feedback, and a review option instead of outright denial.
2. Improve security with Azure Active Directory based access control.
3. Efficient approval processes, request ownership and automated monthly reporting to admin.
4. Leveraging Microsoft Power Apps and Microsoft SharePoint, which automatically updates its platform and capabilities, eliminating the need for manual security patches and updates.

The new LU IT Change Advisory Board system has received positive feedback from stakeholders and mentor in the showcase meeting on 27th September 2024. The application is planned to be put into use from the start of the next year (2025).

This improvement significantly lowers the ITS department's administrative overhead while also streamlining change management operations. By utilizing technology platforms that are kept up-to-date and secured automatically, allows the department to focus more on crucial technological changes and upgrades, ultimately supporting ITS operational efficiency and organisation’s mission.

Table of Contents

1. Background

1.1 Overview

Lincoln University is a public university in Lincoln, New Zealand that was established in 1878 and is the oldest agricultural teaching institution in the southern hemisphere. As of 2023, there are 3123 students and 577 employees. (Lincoln University Annual Report, 2023).

The Information Technology Services (ITS) department at Lincoln University supports a wide range of technological services catering to both students and staff and is integral part of the institution. These services include everything from network infrastructure, administrative software, systems and applications for organisation and technological resources for both students and employees.

To ensure careful implementation of any modifications to these systems, the ITS department utilizes an application called General Application Service (GAS). The application helps in the tracking, documenting, obtaining approval from board members and maintaining overall accountability of changes. The application also is a place to keep a record all modifications made and review changes at later stage.

1.2 Problem

The Information Technology Services (ITS) department at Lincoln University is currently operating with an outdated change management system, leading to significant operational inefficiencies. This legacy system hinders the department's ability to effectively carry out service change requests. This outdated system has the following issues:

1. **Lacks modern features that can make the process more efficient:**
   Requires users to visit a separate portal from the approval notification email to approve or decline a service change request. A modern feature that could make the process easier and efficient.

2. **Outdated user experience and design**:
   The user interface design is outdated and clunky. Missing implementation task

details, post-implementation feedback, and a review option instead of outright denial.

3. **Built on outdated technology:**
   The technology of the current system is outdated and has passed its lifecycle. Which requires constant security patches to keep up with security requirements of Lincoln University.

1.3 Project Team

Project Owner:

The project owner is Andrew Frapwell, the IT Service Manager and owner of the Lincoln University change management system. He will be the main stakeholder.

Email: Andrew.Frapwell@lincoln.ac.nz

Phone: +64 342 30118

Mentor and Supervisor:

The project supervisor is Brandon Kennedy, who is the ITS Operations Team Leader. Who has specialist experience in various technologies and will provide guidance on technology and technical decisions.

Email: Brandon.Kennedy@lincoln.ac.nz

Phone: +64 342 30116

Developer:

The primary developer of the new change management system. Responsible for the designing and coding the core functionalities to requirements, testing and deployment. Bringing a fresh perspective and strong foundation for project success.

Email: Kithusan.Albert@lincolnuni.ac.nz

Phone: +64 022 410 8973

2. Requirements and Goals

The primary goal of this project is to upgrade Lincoln University ITS's outdated change management system to a modern, efficient system that enhances user experience and improves the overall change management process. The new system will enhance user experience, improve efficiency, and align with current ITS standards. Success will be measured through comprehensive testing of final application and stakeholder feedback.

Functionality:

1. Create a new efficient and improved system to the current change management system and workflow.
2. Integrate Microsoft connectors (Lincoln University Azure Active Directory) and implement Role-Based Access Control.

   Success Criteria:

   a) All core features implemented and operational by the project end date.
   b) System demonstrates improved efficiency in handling change requests compared to the legacy system.
   c) Successful authentication and authorization with Azure Active Directory

Alignment with Lincoln ITS Standards:

1. The system should utilize technologies already vetted and approved by Lincoln ITS for seamless integration and ongoing support.
2. The chosen technologies and development approach should be within the skillset of existing Lincoln ITS staff, ensuring efficient maintenance and future enhancements.

   Success Criteria:

   a. Successful use of Microsoft Power Apps and Microsoft Automate.

User Adoption and Efficiency:

- Stakeholders provide positive feedback and find the new system to be efficient and significantly improve their change management workflows.
- The new system should automate tasks, improve data flow, and reduce processing times, leading to more efficient change management processes.

  Success Criteria:

  a) Achieve positive stakeholder approval at the end of the project meeting
  b) Key automated features are implemented using chosen technology (Microsoft Power Automate).
  c) Perform gap analysis interview with stakeholder and survey with end-users.

Testing:

Perform thorough unit testing during development to ensure all functionalities work correctly without errors. Final functionality test after deployment to ensure the system works as intended in the live environment.

Success Criteria:

a) Achieve 100% pass in comprehensive test plan.
b) Zero critical bugs in the production environment and all test cases functionality test.

3. Method

3.1 Overview

Upgrading Lincoln University's ITS legacy change management system is structured using a phased approach. This project incorporates elements of waterfall project management methodology and Agile development methodology. Actively including stakeholder involvement throughout the project phases and continuously gather feedback on development and decisions made at each phase.

Phase 1: Requirements Gathering

1. Assessing current system workflows and user needs and identifying areas for improvement. Identifying areas within the change management policy to be translated to other functionalities that does not exist currently.
2. Gap Analysis interview with stakeholder and end-users to identify features that can be included in the new system.

Phase 2: Design

1. Choosing the types of technology to use with the guidance of the project supervisor.
2. Designing the user interface, system design and database.
3. Planning the integration of necessary Microsoft connectors, and for implementing Role-Based Access Control (RBAC) using Azure Active Directory.

Phase 3: Development

1. Development of the new system based on the design specifications. This phase includes integrating Microsoft connectors, implementing RBAC, and ensuring the system components work together seamlessly.
2. Iterative feedback from supervisor and key stakeholder conducted throughout the development process.

Phase 4: Testing and Deployment

1. Unit testing during development as well as a test plan to ensure all functionalities work correctly without errors.
2. Phase 4 will also include gathering feedback from stakeholders for refinements and deployment in a controlled environment.

Phase 5: Documentation and Training

1. Deployment and troubleshooting issues related to live environment
2. ITS staff training session.

3.2 Design

The following diagram shows the system technology architecture for the solution, which utilizes Microsoft Power Platform as its core technology.

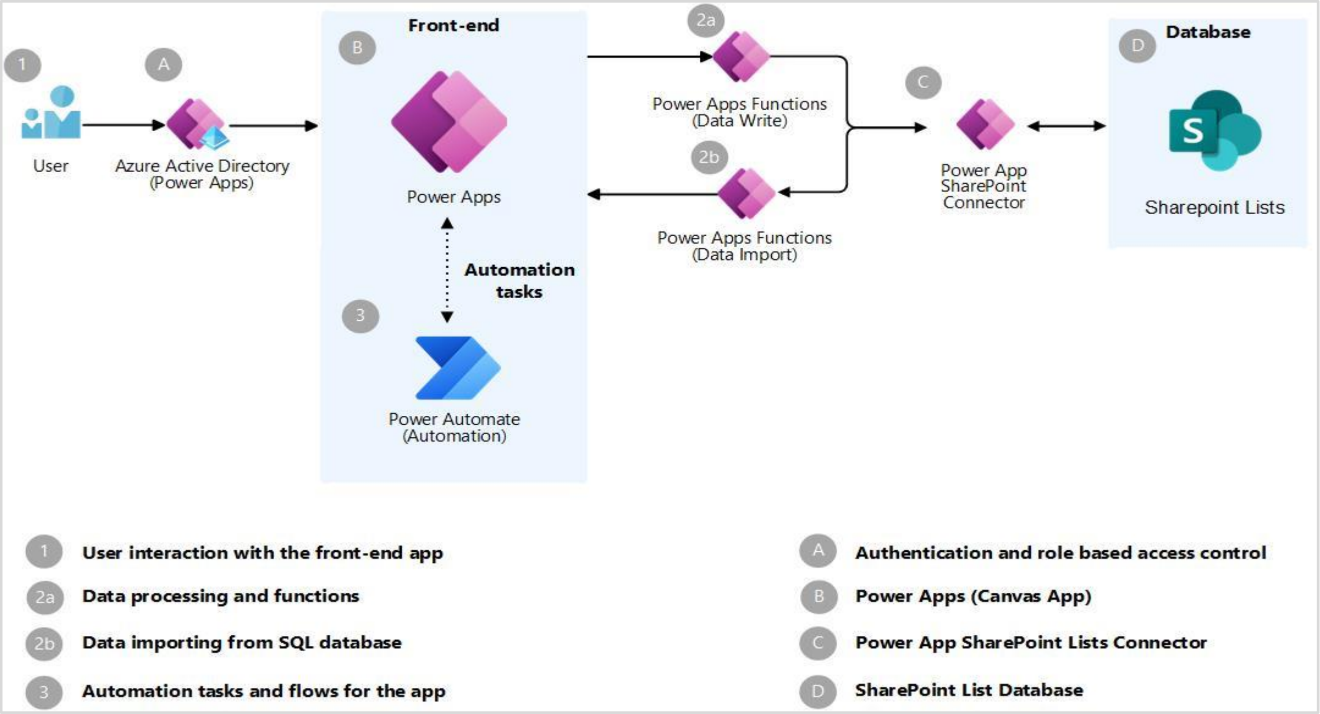

1
User
A
Azure Active Directory (Power Apps)
Front-end
B
Power Apps
Automation tasks
3
Power Automate (Automation)
2a
Power Apps Functions (Data Write)
2b
Power Apps Functions (Data Import)
C
Power App SharePoint Connector
D
Database
Sharepoint Lists
1 User interaction with the front-end app
2a Data processing and functions
2b Data importing from SQL database
3 Automation tasks and flows for the app
A Authentication and role based access control
B Power Apps (Canvas App)
C Power App SharePoint Lists Connector
D SharePoint List Database

FIGURE 1: TECHNOLOGY ARCHITECTURE

Figure 1: Technology Architecture Explanation

Access to the LU IT Change Advisory Board application is managed through Lincoln University's existing Office 365 infrastructure. Users who already have access to Lincoln University's Office 365 environment can seamlessly access the application, eliminating the need for separate user management. This integration simplifies access control and user provisioning.

Microsoft Power Apps was chosen as the front-end interface technology for several reasons. Firstly, Power Apps is a cloud-based development platform maintained by Microsoft, which means that the university does not need to manage upgrades or maintenance internally. This reduces the burden on IT staff and ensures that the application remains up-to-date with the latest features and security enhancements.

To handle advanced application logic and workflows, the application leverages Microsoft Power Automate. Power Automate enables the creation of advanced workflows and automation, allowing for streamlined processes and increased efficiency.

Data storage for the application is handled by SharePoint lists. SharePoint lists provide a scalable and reliable storage solution, with each list capable of holding up to 30 million records (SharePoint limits, 2024). Given the anticipated usage and data requirements of the LU IT Change Advisory Board application, SharePoint lists offer ample capacity and performance.

By utilizing these Microsoft technologies such as Power Apps, Power Automate, and SharePoint the application benefits from a robust, cloud-based architecture that minimizes internal management overhead while providing a user-friendly interface, advanced workflow capabilities, and scalable data storage. This combination of technologies aligns well with the university's existing Office 365 ecosystem, enabling seamless integration and reducing the need for additional infrastructure or management.

Another key reason for choosing this architecture was the minimal cost associated with the system. All the features used in this solution are included in the basic Microsoft license already held by Lincoln University users, resulting in no additional licensing costs.

This cost-effectiveness played a crucial factor in the decision to opt for SharePoint lists as the data storage solution instead of a traditional SQL database as this required additional premium license per user at a per month cost of $20 NZD (Power Apps pricing, 2024). Which equates to $620 NZD per month for all 31 full-time and contractor employees.

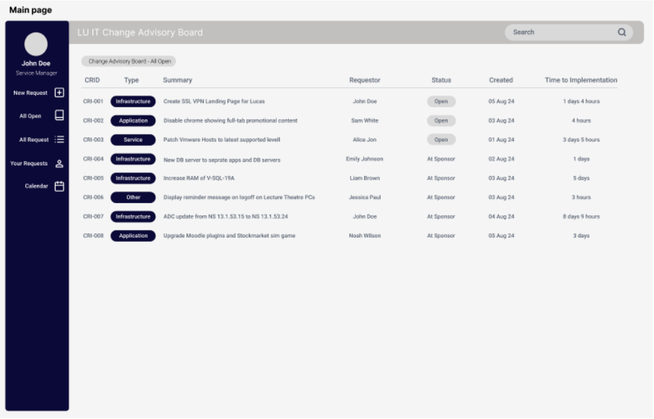
The *LUITSAppSVC* service account, which handles the Power Automate features, is covered under the existing Dynamics 365 Sales Enterprise Edition license assigned to account for other ITS tasks. By leveraging this existing license, the university avoids the need for additional licenses specifically for the LU IT Change Advisory Board

This cost-effective approach maximizes the value of the university's existing Microsoft investments while cost effective solution that aligns with the Lincoln ITS financial objectives.

User Experience (UX) Design

The initial user experience (UX) design for the LU IT Change Advisor Board was create in interface design tool called Figma (Figma, 2023). This phrase began after the stakeholder requirements meeting to understand requirements of the current system.

Figma was used to show case a final user experience prototype including app layout, color scheme and navigation flow. The iterative process of the development meant that there will be additional refinements made to the user experience to ensure seamless experience for the end users.



CRID	Type	Summary	Requestor	Status	Created	Time to Implementation
CRI-001	Infrastructure	Create SSL VPN Landing Page for Lucas	John Doe	Open	05 Aug 24	1 days 4 hours
CRI-002	Application	Disable chrome showing full-tab promotional content	Sam White	Open	03 Aug 24	4 hours
CRI-003	Service	Patch Vmware Hosts to latest supported levell	Alice Jon	Open	01 Aug 24	3 days 5 hours
CRI-004	Infrastructure	New DB server to seprate apps and DB servers	Emily Johnson	At Sponsor	02 Aug 24	1 days
CRI-005	Infrastructure	Increase RAM of V-SQL-19A	Liam Brown	At Sponsor	03 Aug 24	5 days
CRI-006	Other	Display reminder message on logoff on Lecture Theatre PCs	Jessica Paul	At Sponsor	03 Aug 24	3 hours
CRI-007	Infrastructure	ADC update from NS 13.1.53.15 to NS 13.1.53.24	John Doe	At Sponsor	04 Aug 24	8 days 9 hours
CRI-008	Application	Upgrade Moodle plugins and Stockmarket sim game	Noah Wilson	At Sponsor	05 Aug 24	3 days

FIGURE 2: ALL REQUEST VIEW MOCKUP

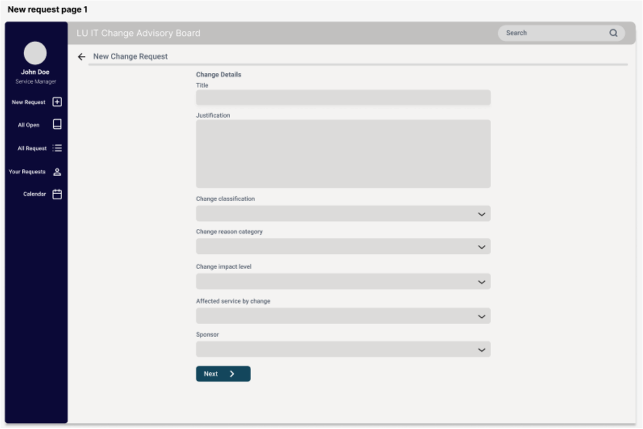


FIGURE 3: NEW REQUEST MOCKUP

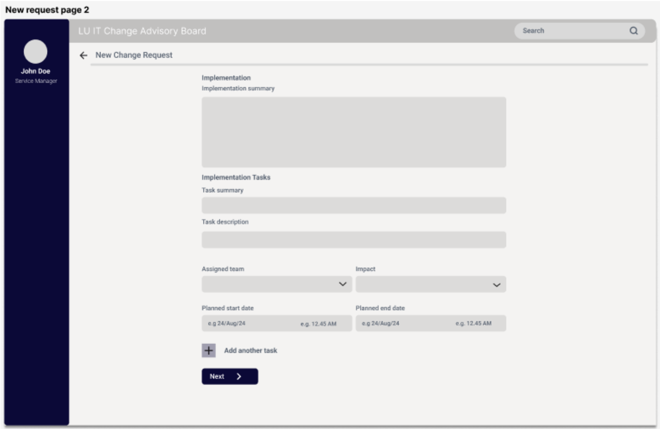
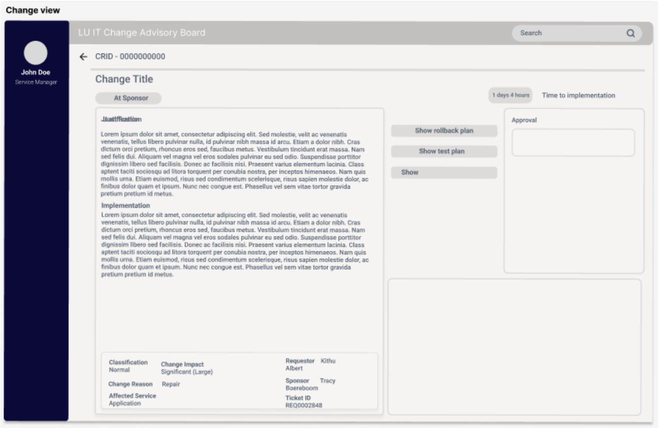


FIGURE 4: NEW REQUEST MOCKUP



Justification

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed molestie, velit ac venenatis venenatis, tellus libero pulvinar nulla, id pulvinar nibh massa id arcu. Etiam a dolor nibh. Cras dictum orci pretium, rhoncus eros sed, faucibus metus. Vestibulum tincidunt erat massa. Nam sed felis dui. Aliquam vel magna vel eros sodales pulvinar eu sed odio. Suspendisse porttitor dignissim libero sed facilisis. Donec ac facilisis nisi. Praesent varius elementum lacinia. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Nam quis mollis urna. Etiam euismod, risus sed condimentum scelerisque, risus sapien molestie dolor, ac finibus dolor quam et ipsum. Nunc nec congue est. Phasellus vel sem vitae tortor gravida pretium pretium id metus.

Implementation

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed molestie, velit ac venenatis venenatis, tellus libero pulvinar nulla, id pulvinar nibh massa id arcu. Etiam a dolor nibh. Cras dictum orci pretium, rhoncus eros sed, faucibus metus. Vestibulum tincidunt erat massa. Nam sed felis dui. Aliquam vel magna vel eros sodales pulvinar eu sed odio. Suspendisse porttitor dignissim libero sed facilisis. Donec ac facilisis nisi. Praesent varius elementum lacinia. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Nam quis mollis urna. Etiam euismod, risus sed condimentum scelerisque, risus sapien molestie dolor, ac finibus dolor quam et ipsum. Nunc nec congue est. Phasellus vel sem vitae tortor gravida pretium pretium id metus.

Classification
Normal

Change Impact
Significant (Large)

Change Reason Repair

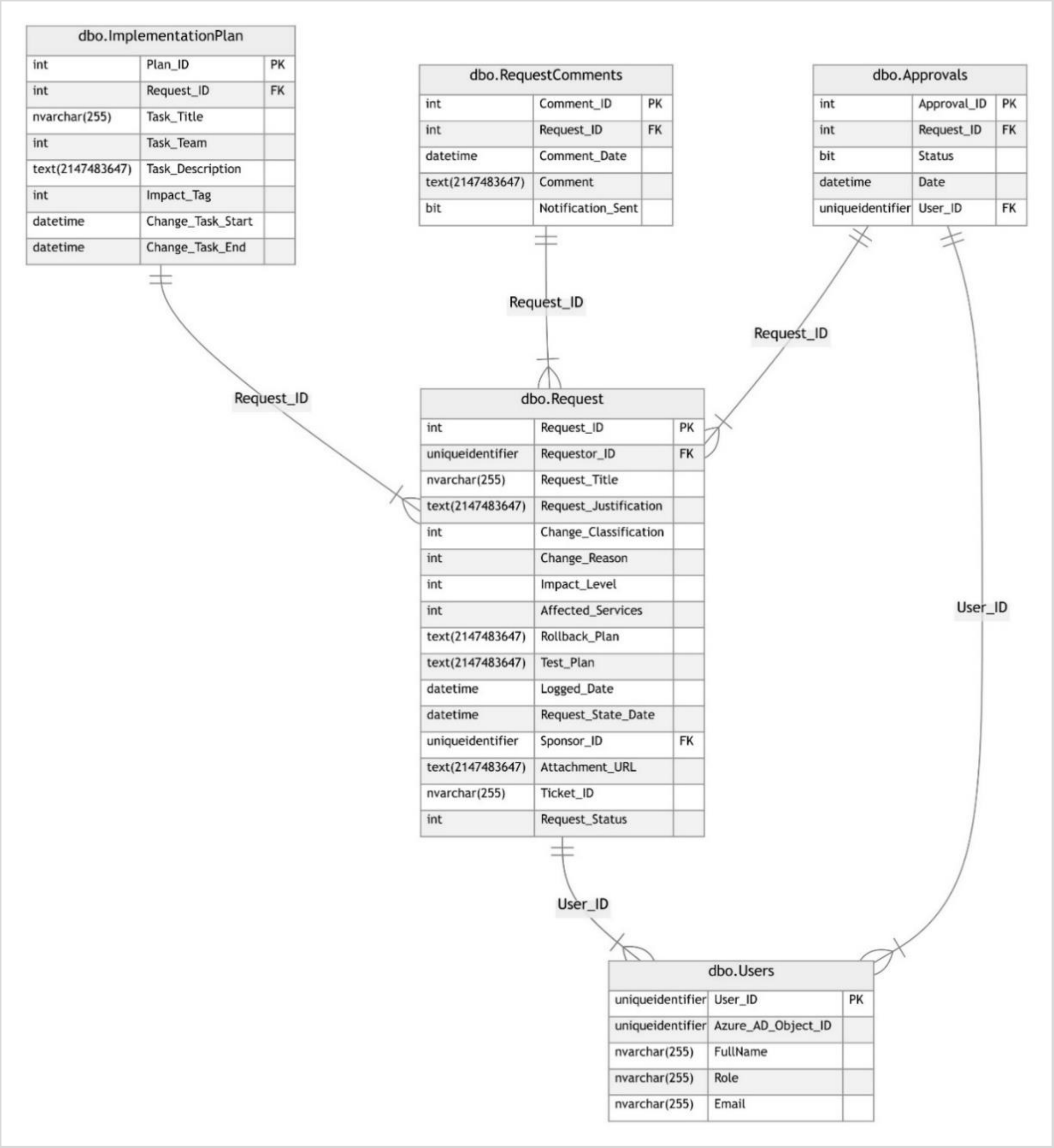
Affected Service
Application

Requestor Kithu Albert

Sponsor Tracy Boereboom

Ticket ID
REQ0002848

FIGURE 5: REQUEST VIEW MOCKUP



dbo.ImplementationPlan		
int	Plan_ID	PK
int	Request_ID	FK
nvarchar(255)	Task_Title	
int	Task_Team	
text(2147483647)	Task_Description	
int	Impact_Tag	
datetime	Change_Task_Start	
datetime	Change_Task_End	

dbo.RequestComments		
int	Comment_ID	PK
int	Request_ID	FK
datetime	Comment_Date	
text(2147483647)	Comment	
bit	Notification_Sent	

dbo.Approvals		
int	Approval_ID	PK
int	Request_ID	FK
bit	Status	
datetime	Date	
uniqueidentifier	User_ID	FK

dbo.Request		
int	Request_ID	PK
uniqueidentifier	Requestor_ID	FK
nvarchar(255)	Request_Title	
text(2147483647)	Request_Justification	
int	Change_Classification	
int	Change_Reason	
int	Impact_Level	
int	Affected_Services	
text(2147483647)	Rollback_Plan	
text(2147483647)	Test_Plan	
datetime	Logged_Date	
datetime	Request_State_Date	
uniqueidentifier	Sponsor_ID	FK
text(2147483647)	Attachment_URL	
nvarchar(255)	Ticket_ID	
int	Request_Status	

dbo.Users		
uniqueidentifier	User_ID	PK
uniqueidentifier	Azure_AD_Object_ID	
nvarchar(255)	FullName	
nvarchar(255)	Role	
nvarchar(255)	Email	

FIGURE 6: SQL DATABASE DESIGN

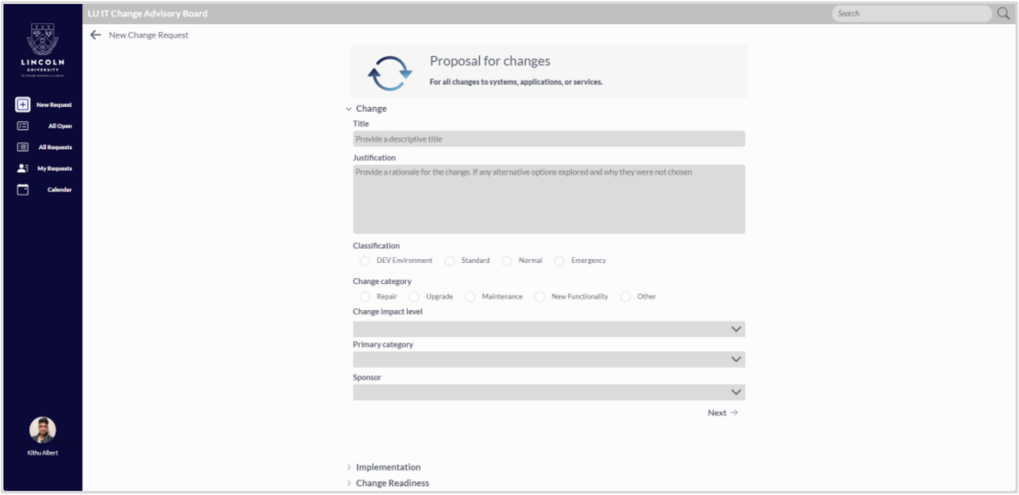
Figure 6 shows an entity-relationship diagram (ERD) for the SQL database design. The database consists of several tables and their relationships for the LU IT Change Advisory Board. This database structure allows for storing and managing information about implementation plans, requests, comments, approvals, and users in a relational manner.

SQL database design was developed during the project's design phase. However, due to the costs associated with SQL Database integration, it was decided to implement the database design using SharePoint lists instead. This change enables a more cost-effective solution while maintaining the necessary functionality and data structure.

3.3 Application Architecture

User Interface (Power Apps):

The primary user interface for the LU IT Change Advisory Board application. Users can log in with their Lincoln University Microsoft account to create, view, modify, and delete requests, as well as comment, search, and make request decisions.



New Change Request

Proposal for changes

For all changes to systems, applications, or services.

Change

Title: Provide a descriptive title

Justification: Provide a rationale for the change. If any alternative options explored and why they were not chosen

Classification: ○ DEV Environment ○ Standard ○ Normal ○ Emergency

Change category: ○ Repair ○ Upgrade ○ Maintenance ○ New Functionality ○ Other

Change impact level

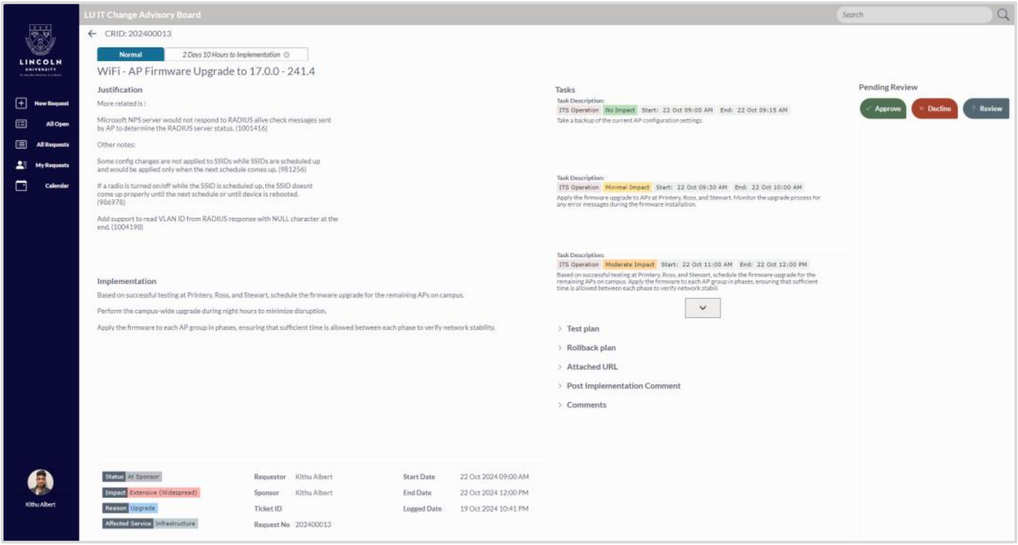
Primary category

Sponsor

Implementation

Change Readiness

FIGURE 7: IMPLEMENTED NEW REQUEST FORM



CRID: 202400013

Normal | 2 Days 10 Hours to Implementation

WiFi - AP Firmware Upgrade to 17.0.0 - 241.4

Justification

More related is :

Microsoft NPS server would not respond to RADIUS alive check messages sent by AP to determine the RADIUS server status. (1001416)

Other notes:

Some config changes are not applied to SSIDs while SSIDs are scheduled up and would be applied only when the next schedule comes up. (981256)

If a radio is turned on/off while the SSID is scheduled up, the SSID doesnt come up properly until the next schedule or until device is rebooted. (986978)

Add support to read VLAN ID from RADIUS response with NULL character at the end. (1004198)

Implementation

Based on successful testing at Printery, Ross, and Stewart, schedule the firmware upgrade for the remaining APs on campus.

Perform the campus-wide upgrade during night hours to minimize disruption.

Apply the firmware to each AP group in phases, ensuring that sufficient time is allowed between each phase to verify network stability.

Tasks

Task Description:
ITS Operation | No Impact | Start: 22 Oct 09:00 AM | End: 22 Oct 09:15 AM
Take a backup of the current AP configuration settings.

Task Description:
ITS Operation | Minimal Impact | Start: 22 Oct 09:30 AM | End: 22 Oct 10:00 AM
Apply the firmware upgrade to APs at Printery, Ross, and Stewart. Monitor the upgrade process for any error messages during the firmware installation.

Task Description:
ITS Operation | Moderate Impact | Start: 22 Oct 11:00 AM | End: 22 Oct 12:00 PM
Based on successful testing at Printery, Ross, and Stewart, schedule the firmware upgrade for the remaining APs on campus. Apply the firmware to each AP group in phases, ensuring that sufficient time is allowed between each phase to verify network stabili

Test plan

Rollback plan

Attached URL

Post Implementation Comment

Comments

Pending Review

Status	At Sponsor	Requestor	Kithu Albert	Start Date	22 Oct 2024 09:00 AM
Impact	Extensive (Widespread)	Sponsor	Kithu Albert	End Date	22 Oct 2024 12:00 PM
Reason	Upgrade	Ticket ID		Logged Date	19 Oct 2024 10:41 PM
Affected Service	Infrastructure	Request No	202400013		

FIGURE 8: IMPLEMENTED CHANGE REQUEST VIEW

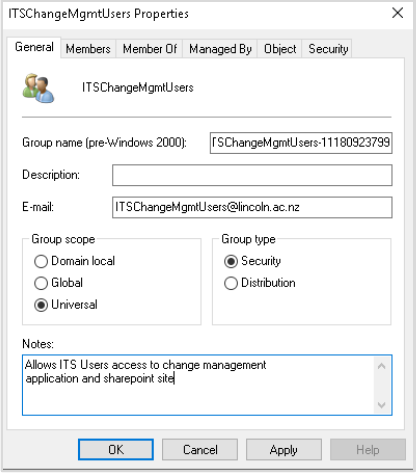
The user interface is a modern and intuitive design, presenting and capturing the required information clearly, which aligns with the requirements and non-functional requirements of the project.

- Captures essential information of proposed change and change workflow.
  (see Appendix 1 for detailed information about the change view)
- Shows detailed information about the change request. Including title, justification, implementation summary and tasks associated with the change.
  (see Figure 8 for image of request view)
- The view shows structured additional details of change specifications and approval workflow.
- A comment section allows the members to submit comment
- A review section allows member to make a decision for the request.
- Change classification and the timeline at the top show's importance of the proposed change. *(see Figure 8 for image of request view)*
- The side navigation items, My Requests, All Open, All Request, Calendar and search bar allows the users to search request based on user requirements.
  (see Appendix 2 for detailed information about the side navigation and views)
- User management feature accessible only to users with the 'Admin' role. Allows administrators to update user roles directly within the application.
  (see Appendix 2E for detailed information about admin management feature)

Authentication:

The access to LU IT Change Advisory Board application is controlled by Active Directory security group called *ITSChangeMgmtUsers*, which also syncs to Azure Active Directory. Users are added this group, which Integrates with the organization's existing authentication system of Office 365 to gain access to the application.

Since this system is authenticated with Office 365, Microsoft security is applied when users try accessing from outside of campus, such as multi-factor authentication and session timeout after a certain period of inactivity.


ITSChangeMgmtUsers Properties

ITSChangeMgmtUsers

Group name (pre-Windows 2000): TSChangeMgmtUsers-11180923799

Description:

E-mail: ITSChangeMgmtUsers@lincoln.ac.nz

Group scope
○ Domain local
○ Global
● Universal

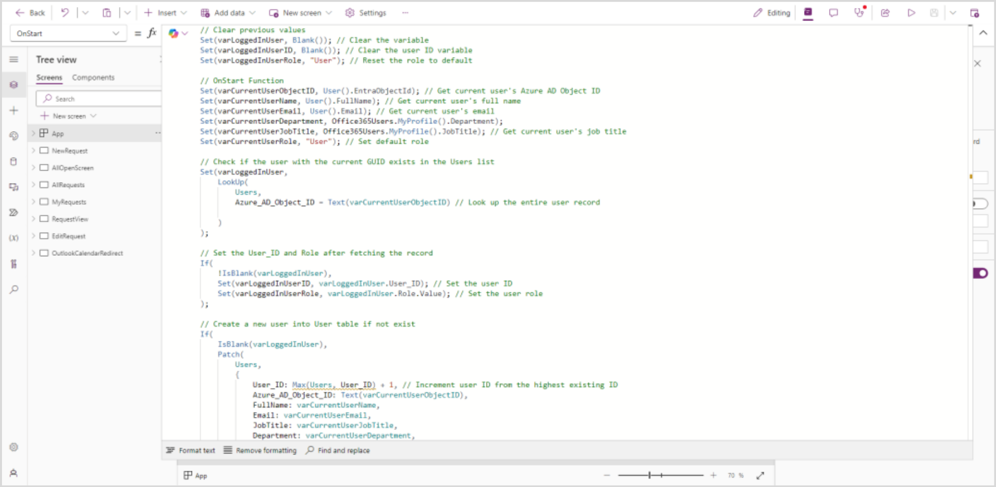
Group type
● Security
○ Distribution

Notes:
Allows ITS Users access to change management application and sharepoint site

FIGURE 9: SECURITY GROUP "*ITSCHANGEMGMTUSERS*" FOR APPLICATION ACCESS IN ACTIVE DIRECTORY

User Session:

The "OnStart" event of the LU IT Change Advisory Board application is triggered when application is loaded to maintain user's session information.



```
// Clear previous values
Set(varLoggedInUser, Blank()); // Clear the variable
Set(varLoggedInUserID, Blank()); // Clear the user ID variable
Set(varLoggedInUserRole, "User"); // Reset the role to default

// OnStart Function
Set(varCurrentUserObjectID, User().EntraObjectId); // Get current user's Azure AD Object ID
Set(varCurrentUserName, User().FullName); // Get current user's full name
Set(varCurrentUserEmail, User().Email); // Get current user's email
Set(varCurrentUserDepartment, Office365Users.MyProfile().Department);
Set(varCurrentUserJobTitle, Office365Users.MyProfile().JobTitle); // Get current user's job title
Set(varCurrentUserRole, "User"); // Set default role

// Check if the user with the current GUID exists in the Users list
Set(varLoggedInUser,
    LookUp(
        Users,
        Azure_AD_Object_ID = Text(varCurrentUserObjectID) // Look up the entire user record

    )
);

// Set the User_ID and Role after fetching the record
If(
    !IsBlank(varLoggedInUser),
    Set(varLoggedInUserID, varLoggedInUser.User_ID); // Set the user ID
    Set(varLoggedInUserRole, varLoggedInUser.Role.Value); // Set the user role
);

// Create a new user into User table if not exist
If(
    IsBlank(varLoggedInUser),
    Patch(
        Users,
        {
            User_ID: Max(Users, User_ID) + 1, // Increment user ID from the highest existing ID
            Azure_AD_Object_ID: Text(varCurrentUserObjectID),
            FullName: varCurrentUserName,
            Email: varCurrentUserEmail,
            JobTitle: varCurrentUserJobTitle,
            Department: varCurrentUserDepartment,
```

FIGURE 10: CODE FOR MANAGING LOGGED-IN USERS AND SESSIONS

Access to the application is restricted to users who are members of the "ITSChangeMgmtUsers" security group. When a user authenticates using their Office 365 credentials, the application checks if their unique Azure AD object ID exists in the user table. If the user is found, their role is set for the session. If the user does not exist, the application creates a new user record with details such as their unique Azure AD object ID, name, email, department, and job title.

Components:

Components handle CRUD (Create, Read, Update and Delete) operations. Each components have individual functions which perform CRUD actions when using the components. Components functions work together to provide a set of operations within the application. The logic held within the components eliminates the need for repetitious code within the app. This approach was done to bring consistency in how CRUD actions is done throughout the application.

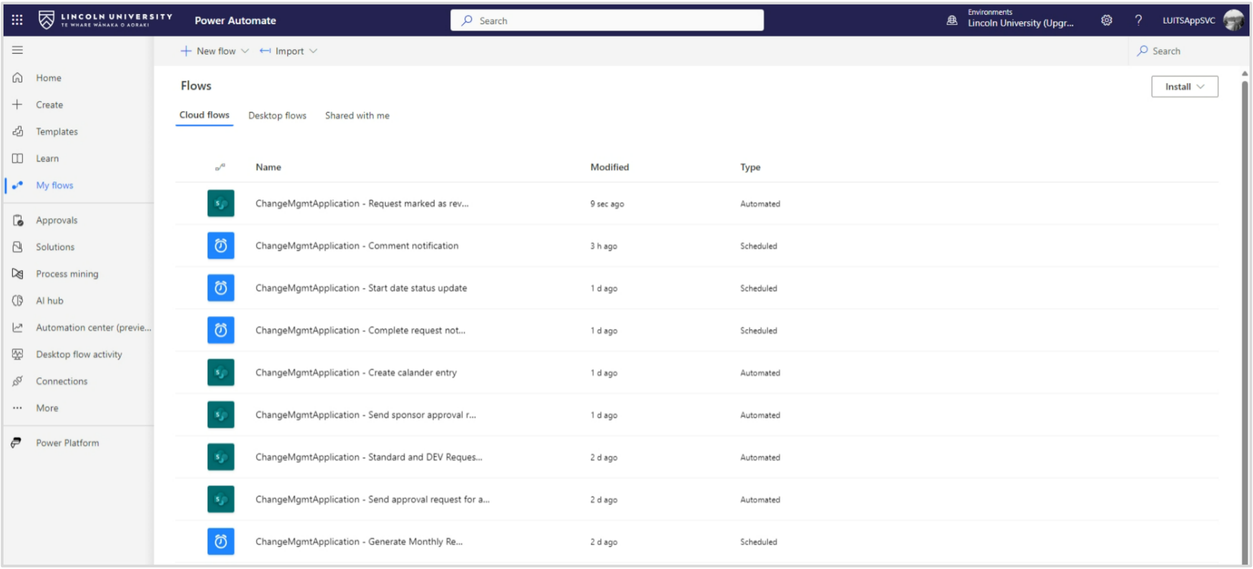
All Component Property	
VarRequestID	Stores and passes the unique ID number of the currently viewed request into component.
RequestItems	Contains all the information related to request data in a Record or Table format

Component Functions	
Name: AllOpenRequestPanelComponent	
GetAllOpenRequests	Get all change requests that are currently open, scheduled and rejected.
Name: AllRequestPanelComponent	
GetAllRequests	Get all change requests or filter by search keyword.
Name: MyRequestPanelComponent	
GetMyRequests	Get all requests associated with the current user
Name: RequestViewApprovalPane	
UpdateReviewAction	Updates the review status of a request (e.g., approve, reject, review)
CurrentApprovalStatus	Check and gets all the latest approvals for specified request
IsStanardRequest	Determines if a request is classified as a standard (pre-approved) or DEV Environment request. To show the approval panel.
Name: RequestViewCommentsPane	
GetComments	Get all comments associated with a specific request

CreateComment	Adds a new comment to a specific request

Workflows:

The LU IT Change Advisor Board application integrates with Microsoft Power Automate to streamline the application workflow. This automation integration for communication, approval workflows, and status notification enhances efficiency and keeping all advisory board members and users informed throughout the change process.



Name	Modified	Type
ChangeMgmtApplication - Request marked as rev...	9 sec ago	Automated
ChangeMgmtApplication - Comment notification	3 h ago	Scheduled
ChangeMgmtApplication - Start date status update	1 d ago	Scheduled
ChangeMgmtApplication - Complete request not...	1 d ago	Scheduled
ChangeMgmtApplication - Create calander entry	1 d ago	Automated
ChangeMgmtApplication - Send sponsor approval r...	1 d ago	Automated
ChangeMgmtApplication - Standard and DEV Reques...	2 d ago	Automated
ChangeMgmtApplication - Send approval request for a...	2 d ago	Automated
ChangeMgmtApplication - Generate Monthly Re...	2 d ago	Scheduled

FIGURE 11: IMPLEMENTED POWER AUTOMATE FLOWS

Power Automate Workflow details:

Power Automate Flow	Description
Send sponsor approval request	Once a request is created in the LU IT Change Advisory Board app, the following flow checks if the request status is "At Sponsor". Then sends the request for sponsor approval and waits for a response. Upon receiving approval, the status is updated to "Open" or marked as "Rejected" if rejected. Send notification to requestor of final status.
Send approval request for all "Approver" users	Once a request is approved by sponsor, the following flow checks if the request status is "Open". Then sends the request to all board members and waits for a response. Upon receiving response, the response is created as an item in Approval SharePoint list.

Standard and DEV Requests Workflow	When a request is "Standard" or "Dev Environment", marked as "Scheduled" status. A detailed auto-approval notification is sent out to all users of LU IT Change Advisory Board.
Request marked as review	When an advisory board member reviews the request as “review” The flow initiates a notification to requestor with the board member copied in for reference.
Create calendar entry	When a request is marked as 'Open', After one hour, the flow checks for approvals and denials until the request's start date. If a denial is found at any point during this period, the request is immediately "Rejected” and flow is terminated. If 3 approvals are granted, the request status changes to 'Scheduled', and a calendar event is created and sent via the shared calendar luit.changeadvisoryboard@lincoln.ac.nz.
Start date status update	For request's status set to 'Scheduled', the flow initiates a check every 10 minutes. During each check, evaluates whether the request's start time is within the next 10 minutes. If so, update the request's status to 'In Progress'
Comment notification	A scheduled flow to a check every 3 minutes to see if a comment has been added to the comments table, and if so, send an email notification to requestor.
Complete request notification and reminders	For request's status set to 'In Progress', the flow initiates a check every 24 hours. During each check, evaluates whether the request's end date is past 24 hours, 2 day or 5th day. If so, send reminder to complete the request and provide post-implementation feedback.
Generate Monthly Report	A Scheduled monthly report for 'admin' users only. Count of last months: Total Number of Requests, Total Approved Requests, Total Denied Requests, Change Requests by Primary Categories, Change Request Service Types and Change Request Impact Types.

3.4 Risks and Challenges

Throughout the development of the LU IT Change Advisory Board system, several key challenges encountered and successfully addressed. The primary hurdles included the steep learning curve with the Microsoft Power App and Power Automate, and the unexpected change from SQL database to SharePoint lists for database.

These challenges were addressed by maintaining open communication with stakeholders and mentors, and adaptability through dedicated self-directed learning of the new technologies.

Learning Curve of New Technology: Limited experience with Power Platform led to slow development and possible project failure.

> ***Mitigation:*** Allocated dedicated time for self-study to familiarize with the technology. Sought help from mentor. Ultimately led to enhanced skills and more efficient use of the platform.

Change in Database Technology: Change from SQL database to SharePoint lists database led to possible project failure and future cost overruns.

> ***Mitigation:*** Proactively adapted to changed requirements by transitioning to SharePoint list database, a decision that prevented potential future cost overruns and ensured the project remained on schedule. The response enabled seamless integration with existing university technologies while adhering to the projected timeline. Demonstrating project management skills and agility during unexpected project requirement changes.

System Adoption: Potential resistance to the new system from end-users.

> ***Mitigation:*** End-users were involved early in the requirements gathering phase, with a gap analysis survey conducted to end-users. Stakeholder involvement was maintained throughout each project phase, and development progress was showcased weekly for feedback. A training session was also conducted to show case the application workflow.

Balancing Project Workload with Other Responsibilities: Managing project demands alongside coursework and other commitments.

> ***Mitigation:*** Tracking project timeline completion and completing each milestone. Maintaining proactive communication with the industry supervisor about progress and challenges. Ultimately led to successful completion of the project.

3.5 Implementation

The implementation of the LU IT Change Advisor Board system followed a structured approach, with several key phases.

Requirements Gathering

1. Conduct stakeholder interview to gather success criteria and document system requirements.
2. Conduct a gap analysis by surveying end users to identify areas for improvement and potential new features.
3. Analyze current system workflow and business processes.
4. Analyze change management policy for new functionalities and Identify areas for improvement.

Artifacts produced:

Stakeholder interview and gap analysis document and end-user survey, functional and non-functional requirements document, current system architecture diagram and workflow diagram.

Design

1. Design user interface (UX and database schema with input from stakeholders.
2. Research and plan integration of various technologies (Microsoft connectors, On-Premises Gateway, Role-Based Access Control using Azure Active Directory, Power Automate and other technologies that may be required after research).

Artifacts produced:

User Interface (UX) design mockups, new system architecture diagram and SQL database schema of the new system.

Development

1. Setup development environment and integrate with required technologies.
2. Develop the new system based on design specifications, implement database integration and develop Power Apps canvas application.
3. Perform unit testing throughout development and troubleshoot issues found.
4. Gather iterative feedback from stakeholder and supervisor.

Artifacts produced:

Power Apps canvas application, Power Automate flows and SharePoint list database (from initial SQL database design).

Testing and Deployment

1. Developed and carried out a comprehensive test plan of all functional and non-functional requirements.

Artifacts produced:

Comprehensive test plan document and conducted training session with ITS staff to show case and how to use the new application.

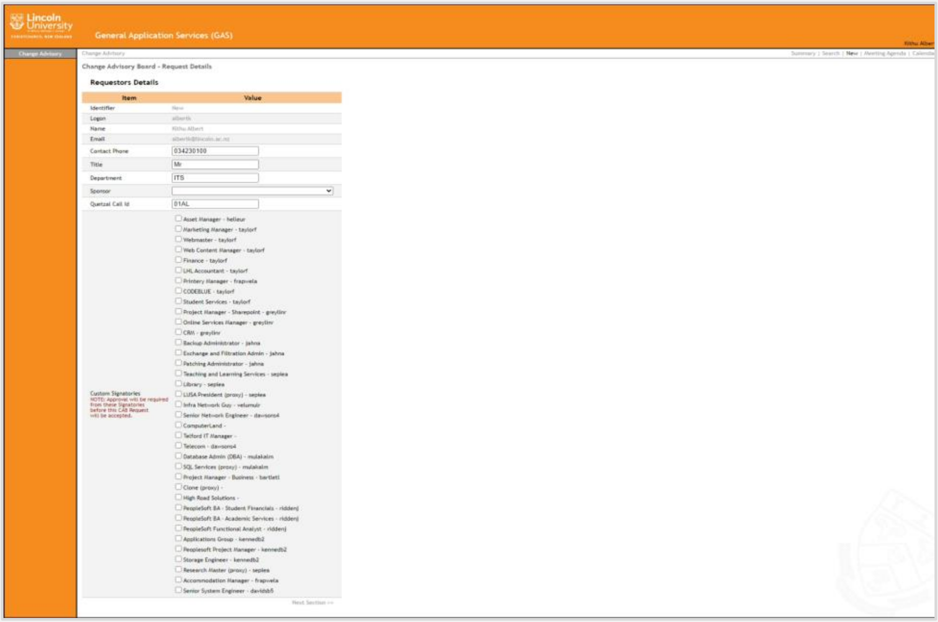
4. Results and Outcomes

4.1 Evidence of Deliverables

The LU IT Change Advisory Board successfully met its project goal of upgrading Lincoln University outdated General Advisory Board (GAS) system to a more modern and effective system.

- Developed a fully functional Power Apps application adhering to industry best practice, A modern change management system that replaces the outdated General Advisory Board (GAS) system.
  (see Appendix 4 for detailed information industry best practice*)*
- Successfully deployed the new system into production using technologies approved by Lincoln University ITS, ensuring compatibility and compliance with existing infrastructure.
- Provided training session to support the adoption and use of the new change management system.

Application Side-by-Side Comparison:



General Application Services (GAS)

Kithu Alber

Change Advisory

Change Advisory

Summary | Search | New | Meeting Agenda | Calendar

Change Advisory Board - Request Details

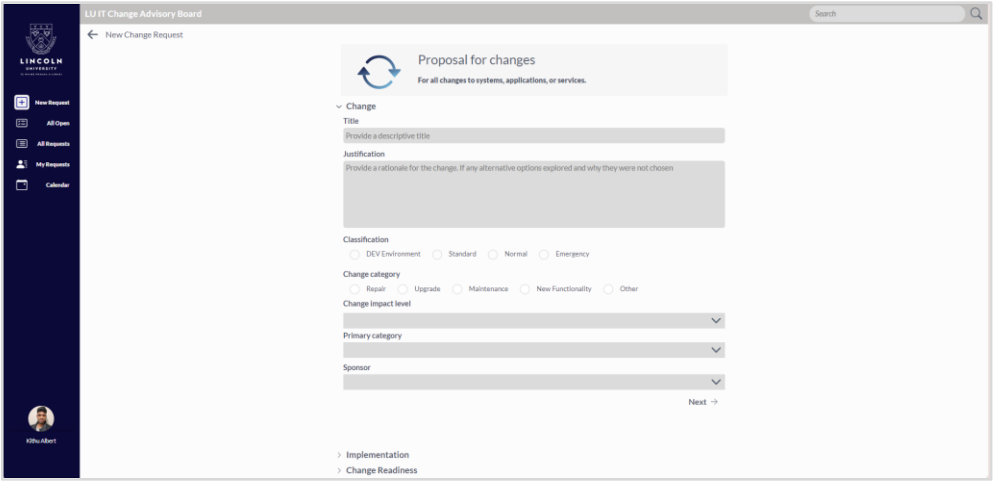
Requestors Details

Item	Value
Identifier	New
Logon	albertk
Name	Kithu Albert
Email	albertk@lincoln.ac.nz
Contact Phone	034230100
Title	Mr
Department	ITS
Sponsor	
Quetzal Call Id	01AL
Custom Signatories NOTE: Approval will be required from these Signatories before this CAB Request will be accepted.	□ Asset Manager - helleur □ Marketing Manager - taylorf □ Webmaster - taylorf □ Web Content Manager - taylorf □ Finance - taylorf □ LHL Accountant - taylorf □ Printery Manager - frapwela □ CODEBLUE - taylorf □ Student Services - taylorf □ Project Manager - Sharepoint - greylinr □ Online Services Manager - greylinr □ CRM - greylinr □ Backup Administrator - jahna □ Exchange and Filtration Admin - jahna □ Patching Administrator - jahna □ Teaching and Learning Services - seplea □ Library - seplea □ LUSA President (proxy) - seplea □ Infra Network Guy - velumulr □ Senior Network Engineer - davsons4 □ ComputerLand - □ Telford IT Manager - □ Telecom - davsons4 □ Database Admin (DBA) - mulakalm □ SQL Services (proxy) - mulakalm □ Project Manager - Business - bartlett □ Clone (proxy) - □ High Road Solutions - □ PeopleSoft BA - Student Financials - riddenj □ PeopleSoft BA - Academic Services - riddenj □ PeopleSoft Functional Analyst - riddenj □ Applications Group - kennedb2 □ Peoplesoft Project Manager - kennedb2 □ Storage Engineer - kennedb2 □ Research Master (proxy) - seplea □ Accommodation Manager - frapwela □ Senior System Engineer - davidsb5

Next Section >>

FIGURE 12: GENERAL APPLICATION SERVICE (OLD) - NEW REQUEST

The old system had 3 separate pages for request proposal with outdated user interface design. The page had constant issues with timeout when users left the form or left open for too long. The request form had several limitations and failed to capture essential information to make an informed decision.



Proposal for changes

For all changes to systems, applications, or services.

Change

Title

Provide a descriptive title

Justification

Provide a rationale for the change. If any alternative options explored and why they were not chosen

Classification

○ DEV Environment ○ Standard ○ Normal ○ Emergency

Change category

○ Repair ○ Upgrade ○ Maintenance ○ New Functionality ○ Other

Change impact level

Primary category

Sponsor

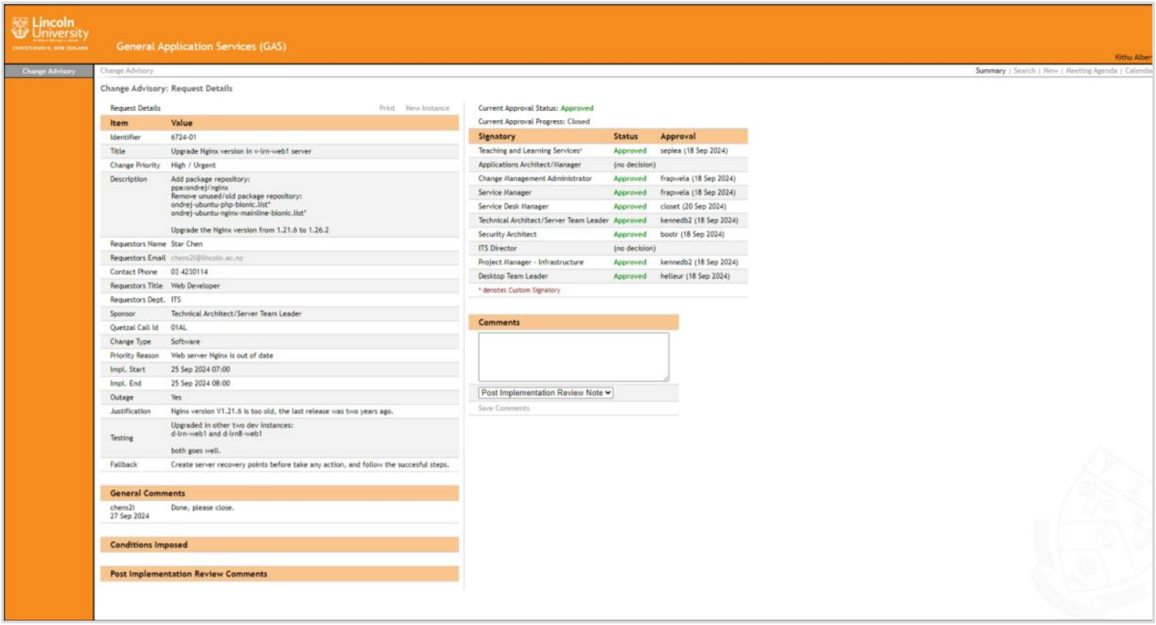
Next →

Implementation

Change Readiness

FIGURE 13: LU IT CHANGE ADVISORY BOARD - NEW REQUEST

Compared to the old system, the new system allows users to complete the change request in one single screen and provide additional information about the change request, such as list of implementation tasks, impacts of tasks, and a workflow of the change in an intuitive manner.



Lincoln University
CHRISTCHURCH, NEW ZEALAND

General Application Services (GAS)

Kithu Albert

Change Advisory

Change Advisory

Summary | Search | New | Meeting Agenda | Calendar

Change Advisory: Request Details

Request Details   Print   New Instance

Item	Value
Identifier	6724-01
Title	Upgrade Nginx version in v-lrn-web1 server
Change Priority	High / Urgent
Description	Add package repository: ppa:ondrej/nginx Remove unused/old package repository: ondrej-ubuntu-php-bionic.list" ondrej-ubuntu-nginx-mainline-bionic.list" Upgrade the Nginx version from 1.21.6 to 1.26.2
Requestors Name	Star Chen
Requestors Email	chens2l@lincoln.ac.nz
Contact Phone	03 4230114
Requestors Title	Web Developer
Requestors Dept.	ITS
Sponsor	Technical Architect/Server Team Leader
Quetzal Call Id	01AL
Change Type	Software
Priority Reason	Web server Nginx is out of date
Impl. Start	25 Sep 2024 07:00
Impl. End	25 Sep 2024 08:00
Outage	Yes
Justification	Nginx version V1.21.6 is too old, the last release was two years ago.
Testing	Upgraded in other two dev instances: d-lrn-web1 and d-lrn8-web1 both goes well.
Fallback	Create server recovery points before take any action, and follow the succesful steps.

General Comments

chens2l
27 Sep 2024   Done, please close.

Conditions Imposed

Post Implementation Review Comments

Current Approval Status: Approved

Current Approval Progress: Closed

Signatory	Status	Approval
Teaching and Learning Services*	Approved	sepiea (18 Sep 2024)
Applications Architect/Manager	(no decision)	
Change Management Administrator	Approved	frapwela (18 Sep 2024)
Service Manager	Approved	frapwela (18 Sep 2024)
Service Desk Manager	Approved	closet (20 Sep 2024)
Technical Architect/Server Team Leader	Approved	kennedb2 (18 Sep 2024)
Security Architect	Approved	bootr (18 Sep 2024)
ITS Director	(no decision)	
Project Manager - Infrastructure	Approved	kennedb2 (18 Sep 2024)
Desktop Team Leader	Approved	helleur (18 Sep 2024)

* denotes Custom Signatory

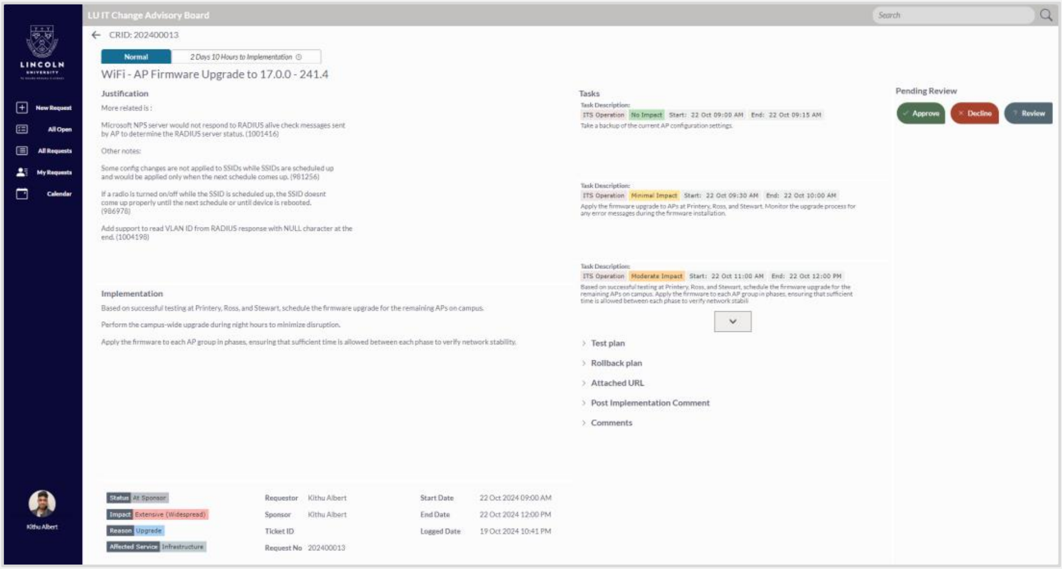
Comments

Post Implementation Review Note ▾

Save Comments

FIGURE 14: GENERAL APPLICATION SERVICE (OLD)- REQUEST VIEW

The old request view lacked additional information to help board members understand how the change request was going to be implemented and its impact. Users must also request the administrator to close the completed request and lacks post-implementation comment.



LU IT Change Advisory Board

Search

LINCOLN UNIVERSITY

← CRID: 202400013

Normal   2 Days 10 Hours to Implementation

WiFi - AP Firmware Upgrade to 17.0.0 - 241.4

Justification

More related is :

Microsoft NPS server would not respond to RADIUS alive check messages sent by AP to determine the RADIUS server status. (1001416)

Other notes:

Some config changes are not applied to SSIDs while SSIDs are scheduled up and would be applied only when the next schedule comes up. (981256)

If a radio is turned on/off while the SSID is scheduled up, the SSID doesnt come up properly until the next schedule or until device is rebooted. (986978)

Add support to read VLAN ID from RADIUS response with NULL character at the end. (1004198)

Implementation

Based on successful testing at Printery, Ross, and Stewart, schedule the firmware upgrade for the remaining APs on campus.

Perform the campus-wide upgrade during night hours to minimize disruption.

Apply the firmware to each AP group in phases, ensuring that sufficient time is allowed between each phase to verify network stability.

Tasks

Task Description:
ITS Operation | No Impact | Start: 22 Oct 09:00 AM | End: 22 Oct 09:15 AM
Take a backup of the current AP configuration settings.

Task Description:
ITS Operation | Minimal Impact | Start: 22 Oct 09:30 AM | End: 22 Oct 10:00 AM
Apply the firmware upgrade to APs at Printery, Ross, and Stewart. Monitor the upgrade process for any error messages during the firmware installation.

Task Description:
ITS Operation | Moderate Impact | Start: 22 Oct 11:00 AM | End: 22 Oct 12:00 PM
Based on successful testing at Printery, Ross, and Stewart, schedule the firmware upgrade for the remaining APs on campus. Apply the firmware to each AP group in phases, ensuring that sufficient time is allowed between each phase to verify network stabili

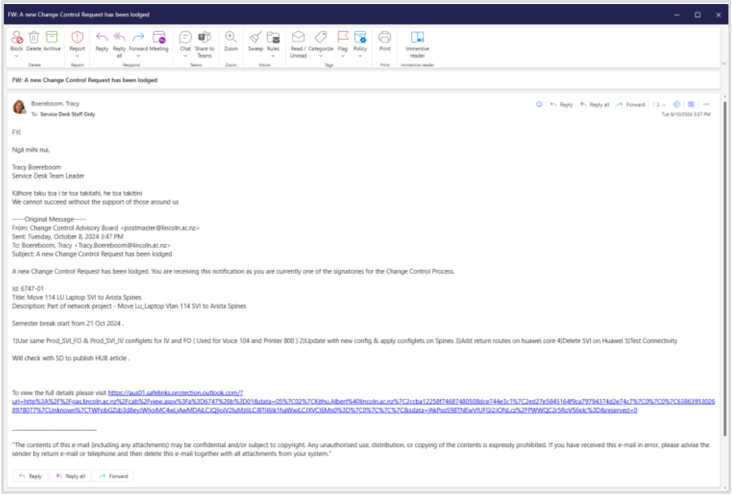
Pending Review

Status	At Sponsor	Requestor	Kithu Albert	Start Date	22 Oct 2024 09:00 AM
Impact	Extensive (Widespread)	Sponsor	Kithu Albert	End Date	22 Oct 2024 12:00 PM
Reason	Upgrade	Ticket ID		Logged Date	19 Oct 2024 10:41 PM
Affected Service	Infrastructure	Request No	202400013		

FIGURE 15: LU IT CHANGE ADVISORY BOARD - REQUEST VIEW

The request view presents essential information in a visually organized manner and review individual tasks. Allowing users to complete their own requests, provide post-implementation feedback after implementation date.

It offers the option to review a change request instead of outright denial, facilitating a more collaborative and constructive approach to change management.



FW: A new Change Control Request has been lodged

Boereboom, Tracy
To: Service Desk Staff Only
Tue 8/10/2024 3:57 PM

FYI

Ngā mihi nui,

Tracy Boereboom
Service Desk Team Leader

Kāhore taku toa i te toa takitahi, he toa takitini
We cannot succeed without the support of those around us

-----Original Message-----
From: Change Control Advisory Board <postmaster@lincoln.ac.nz>
Sent: Tuesday, October 8, 2024 3:47 PM
To: Boereboom, Tracy <Tracy.Boereboom@lincoln.ac.nz>
Subject: A new Change Control Request has been lodged

A new Change Control Request has been lodged. You are receiving this notification as you are currently one of the signatories for the Change Control Process.

Id: 6747-01
Title: Move 114 LU Laptop SVI to Arista Spines
Description: Part of network project - Move Lu_Laptop Vlan 114 SVI to Arista Spines

Semester break start from 21 Oct 2024 .

1)Use same Prod_SVI_FO & Prod_SVI_IV configlets for IV and FO (Used for Voice 104 and Printer 800) 2)Update with new config & apply configlets on Spines 3)Add return routes on huawei core 4)Delete SVI on Huawei 5)Test Connectivity

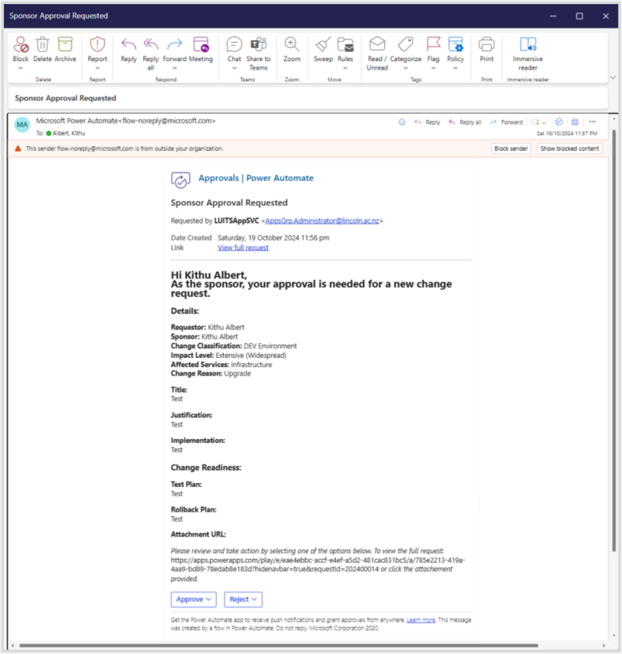
Will check with SD to publish HUB article .

To view the full details please visit https://aus01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fgas.lincoln.ac.nz%2Fcab%2Fview.aspx%3Fa%3D6747%26b%3D01&data=05%7C02%7CKithu.Albert%40lincoln.ac.nz%7C2ccba12258f7468748050 8dce744e3c1%7C2ed27e5845164f9ca79794374d2e74c7%7C0%7C0%7C638639530268978077%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=jhkPso598TNEwVlUFGl2JONLcz%2FPWWQC2r5RoV56plc%3D&reserved=0

"The contents of this e-mail (including any attachments) may be confidential and/or subject to copyright. Any unauthorised use, distribution, or copying of the contents is expressly prohibited. If you have received this e-mail in error, please advise the sender by return e-mail or telephone and then delete this e-mail together with all attachments from your system."

Figure 16:GENERAL APPLICATION SERVICE (OLD) - NOTIFICATION AND APPROVAL PROCESS

In the old system, sponsor and member approvals were hindered by the limited information provided about the proposed change. Users were required to navigate to the application to access the necessary details before making a decision, leading to a cumbersome and time-consuming approval process.



Sponsor Approval Requested

Microsoft Power Automate<flow-noreply@microsoft.com>
To: Albert, Kithu
Sat 19/10/2024 11:57 PM

This sender flow-noreply@microsoft.com is from outside your organization.

Approvals | Power Automate

Sponsor Approval Requested

Requested by **LUITSAppSVC** <AppsGrp.Administrator@lincoln.ac.nz>

Date Created Saturday, 19 October 2024 11:56 pm
Link View full request

Hi Kithu Albert,
As the sponsor, your approval is needed for a new change request.

Details:

Requestor: Kithu Albert
Sponsor: Kithu Albert
Change Classification: DEV Environment
Impact Level: Extensive (Widespread)
Affected Services: Infrastructure
Change Reason: Upgrade

Title:
Test

Justification:
Test

Implementation:
Test

Change Readiness:

Test Plan:
Test

Rollback Plan:
Test

Attachment URL:

Please review and take action by selecting one of the options below. To view the full request: https://apps.powerapps.com/play/e/eae4ebbc-accf-e4ef-a5d2-481cac831bc5/a/785e2213-419a-4aa9-bd89-78edab8e183d?hidenavbar=true&requestId=202400014 *or click the attachement provided.*

Get the Power Automate app to receive push notifications and grant approvals from anywhere. Learn more. This message was created by a flow in Power Automate. Do not reply. Microsoft Corporation 2020.

Figure 17: LU IT CHANGE ADVISORY BOARD - Workflow Email and Approval

The sponsor and member approval process are streamlined, providing key details of the proposed change directly within the notification. Allowing users to make informed decisions without needing to navigate to the application itself, leading to operation efficiency.

(see Appendix 3 for detailed information about the approval workflows)

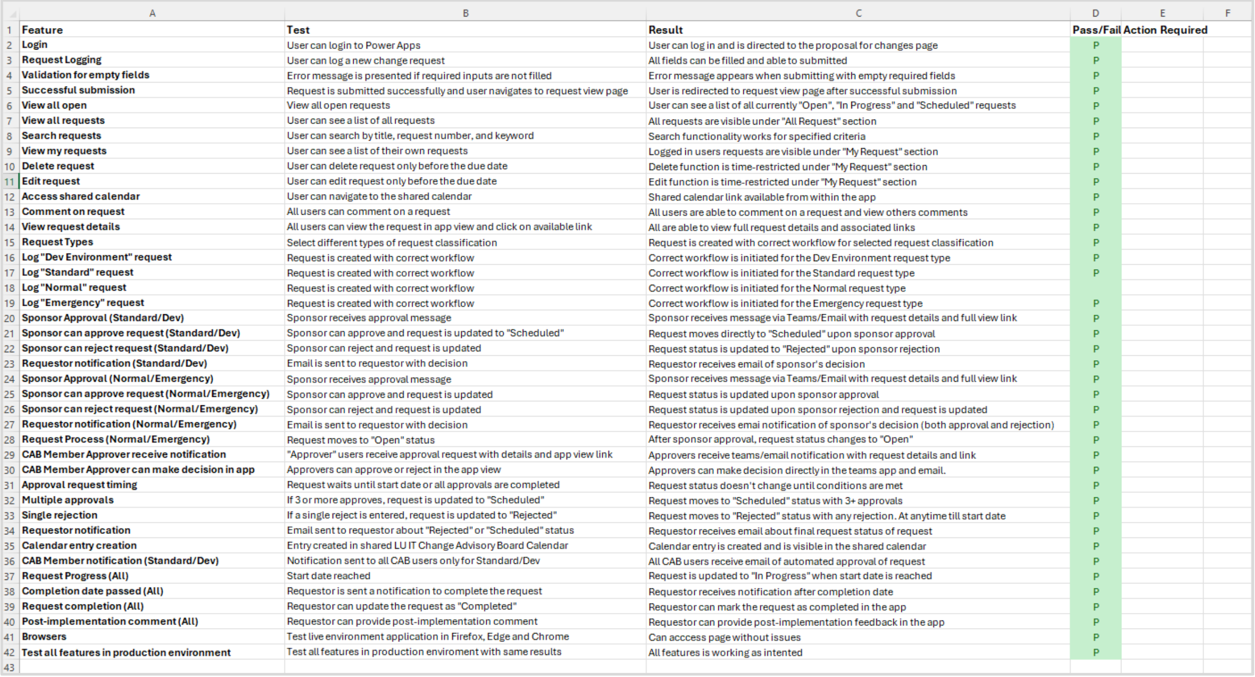
4.2 Testing/validation

To test the new change management system for Lincoln University, following testing strategy was used during development and final deployment to production.

Unit Testing:

- Perform unit testing of components and functionality of the Power Apps as the application is developed.
- Manually verify data flow between different components of the system when developing application.

Comprehensive Test Plan:



Feature	Test	Result	Pass/Fail	Action Required
Login	User can login to Power Apps	User can log in and is directed to the proposal for changes page	P	
Request Logging	User can log a new change request	All fields can be filled and able to submitted	P	
Validation for empty fields	Error message is presented if required inputs are not filled	Error message appears when submitting with empty required fields	P	
Successful submission	Request is submitted successfully and user navigates to request view page	User is redirected to request view page after successful submission	P	
View all open	View all open requests	User can see a list of all currently "Open", "In Progress" and "Scheduled" requests	P	
View all requests	User can see a list of all requests	All requests are visible under "All Request" section	P	
Search requests	User can search by title, request number, and keyword	Search functionality works for specified criteria	P	
View my requests	User can see a list of their own requests	Logged in users requests are visible under "My Request" section	P	
Delete request	User can delete request only before the due date	Delete function is time-restricted under "My Request" section	P	
Edit request	User can edit request only before the due date	Edit function is time-restricted under "My Request" section	P	
Access shared calendar	User can navigate to the shared calendar	Shared calendar link available from within the app	P	
Comment on request	All users can comment on a request	All users are able to comment on a request and view others comments	P	
View request details	All users can view the request in app view and click on available link	All are able to view full request details and associated links	P	
Request Types	Select different types of request classification	Request is created with correct workflow for selected request classification	P	
Log "Dev Environment" request	Request is created with correct workflow	Correct workflow is initiated for the Dev Environment request type	P	
Log "Standard" request	Request is created with correct workflow	Correct workflow is initiated for the Standard request type	P	
Log "Normal" request	Request is created with correct workflow	Correct workflow is initiated for the Normal request type		
Log "Emergency" request	Request is created with correct workflow	Correct workflow is initiated for the Emergency request type	P	
Sponsor Approval (Standard/Dev)	Sponsor receives approval message	Sponsor receives message via Teams/Email with request details and full view link	P	
Sponsor can approve request (Standard/Dev)	Sponsor can approve and request is updated to "Scheduled"	Request moves directly to "Scheduled" upon sponsor approval	P	
Sponsor can reject request (Standard/Dev)	Sponsor can reject and request is updated	Request status is updated to "Rejected" upon sponsor rejection	P	
Requestor notification (Standard/Dev)	Email is sent to requestor with decision	Requestor receives email of sponsor's decision	P	
Sponsor Approval (Normal/Emergency)	Sponsor receives approval message	Sponsor receives message via Teams/Email with request details and full view link	P	
Sponsor can approve request (Normal/Emergency)	Sponsor can approve and request is updated	Request status is updated upon sponsor approval	P	
Sponsor can reject request (Normal/Emergency)	Sponsor can reject and request is updated	Request status is updated upon sponsor rejection and request is updated	P	
Requestor notification (Normal/Emergency)	Email is sent to requestor with decision	Requestor receives emai notification of sponsor's decision (both approval and rejection)	P	
Request Process (Normal/Emergency)	Request moves to "Open" status	After sponsor approval, request status changes to "Open"	P	
CAB Member Approver receive notification	"Approver" users receive approval request with details and app view link	Approvers receive teams/email notification with request details and link	P	
CAB Member Approver can make decision in app	Approvers can approve or reject in the app view	Approvers can make decision directly in the teams app and email.	P	
Approval request timing	Request waits until start date or all approvals are completed	Request status doesn't change until conditions are met	P	
Multiple approvals	If 3 or more approves, request is updated to "Scheduled"	Request moves to "Scheduled" status with 3+ approvals	P	
Single rejection	If a single reject is entered, request is updated to "Rejected"	Request moves to "Rejected" status with any rejection. At anytime till start date	P	
Requestor notification	Email sent to requestor about "Rejected" or "Scheduled" status	Requestor receives email about final request status of request	P	
Calendar entry creation	Entry created in shared LU IT Change Advisory Board Calendar	Calendar entry is created and is visible in the shared calendar	P	
CAB Member notification (Standard/Dev)	Notification sent to all CAB users only for Standard/Dev	All CAB users receive email of automated approval of request	P	
Request Progress (All)	Start date reached	Request is updated to "In Progress" when start date is reached	P	
Completion date passed (All)	Requestor is sent a notification to complete the request	Requestor receives notification after completion date	P	
Request completion (All)	Requestor can update the request as "Completed"	Requestor can mark the request as completed in the app	P	
Post-implementation comment (All)	Requestor can provide post-implementation comment	Requestor can provide post-implementation feedback in the app	P	
Browsers	Test live environment application in Firefox, Edge and Chrome	Can acccess page without issues	P	
Test all features in production environment	Test all features in production enviroment with same results	All features is working as intented	P	

FIGURE 18: COMPLETED COMPREHENSIVE TEST PLAN

- Manually test different (RBAC) roles in application and their functionality.
- Perform Power Automate flows testing manually by using the application and triggering application workflows.
- Test the application of different web browsers to ensure compatibility.
- Test application and change request workflow process.
- Test and verify all functionality works as intended in the production environment.

Feedback:

- Feedback improvements from industry supervisor and stakeholder at the weekly meeting.

5. Reflections

5.1 Reflections

Overall, I successfully achieved the primary goal of upgrading Lincoln University's ITS change management system to a modern, efficient platform. The new LU IT Change Advisory Board system meets the functional requirements but also significantly improved user experience and streamlined change management processes.

While the project was successful, it didn't start as exactly expected. The most significant challenge was the shift from using an SQL database to SharePoint lists for data storage. This change, driven by cost considerations required quick adaptation.

Despite this unexpected change, the project remained on schedule due to proactive decision-making and efficient problem-solving. This experience reinforced the importance of flexibility and adaptability in project management.

To achieve the project goals, I had to learn new technologies, such as Microsoft Power Apps, Automate and Azure Active Directory Integration:

In this learning process I have gained new technical knowledge:

- Microsoft Power Platform tools
- Understanding of cloud-based application services and authentication
- Improved database design skills and adaptability to different storage solutions
- Strengthened ability to integrate various technologies into a cohesive system

In conclusion, while the project did present unexpected challenges, this experience reinforced the importance of flexibility and adaptability in project management. Overcoming these challenges led to significant personal and professional development. The experience has not only enhanced my technical capabilities but also strengthened soft skills crucial for an IT professional.

5.2 Conclusions

The new LU IT Advisory Board application offers ITS staff a more straightforward and user-friendly experience. While the system is simple to use, employees will need to familiarise themselves with it.

The use of low-code platform such as Power Apps allows for fast development and a low-maintenance environment but possible limitation in future could arise if advanced customisation is required, compared to a fully programmed solution.

The use of SharePoint lists is a cost-effective data storage options for PowerApps, it may have performance limitation when compared to a dedicated SQL database, especially as data quantities grow over time. The current application is not entirely optimised for mobile devices, which may be a hindrance for users who need to use the system while on the go.

In conclusion, the LU IT Change Advisory Board application met and surpassed stakeholder expectations, resulting in a more efficient change management system for Lincoln University's ITS department.

6. References

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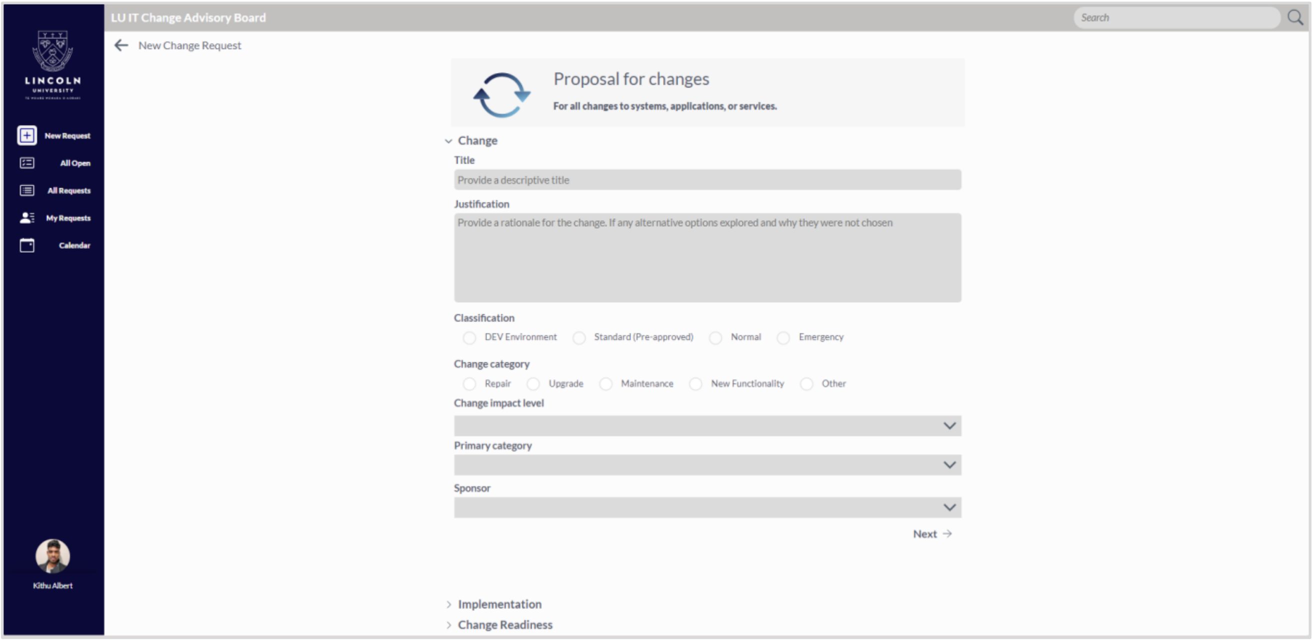
7. Appendices

Appendix 1:

A. New Request: Change *(Collapsible Section)*



Proposal for changes

For all changes to systems, applications, or services.

⌄ Change

Title

Provide a descriptive title

Justification

Provide a rationale for the change. If any alternative options explored and why they were not chosen

Classification

○ DEV Environment ○ Standard (Pre-approved) ○ Normal ○ Emergency

Change category

○ Repair ○ Upgrade ○ Maintenance ○ New Functionality ○ Other

Change impact level

Primary category

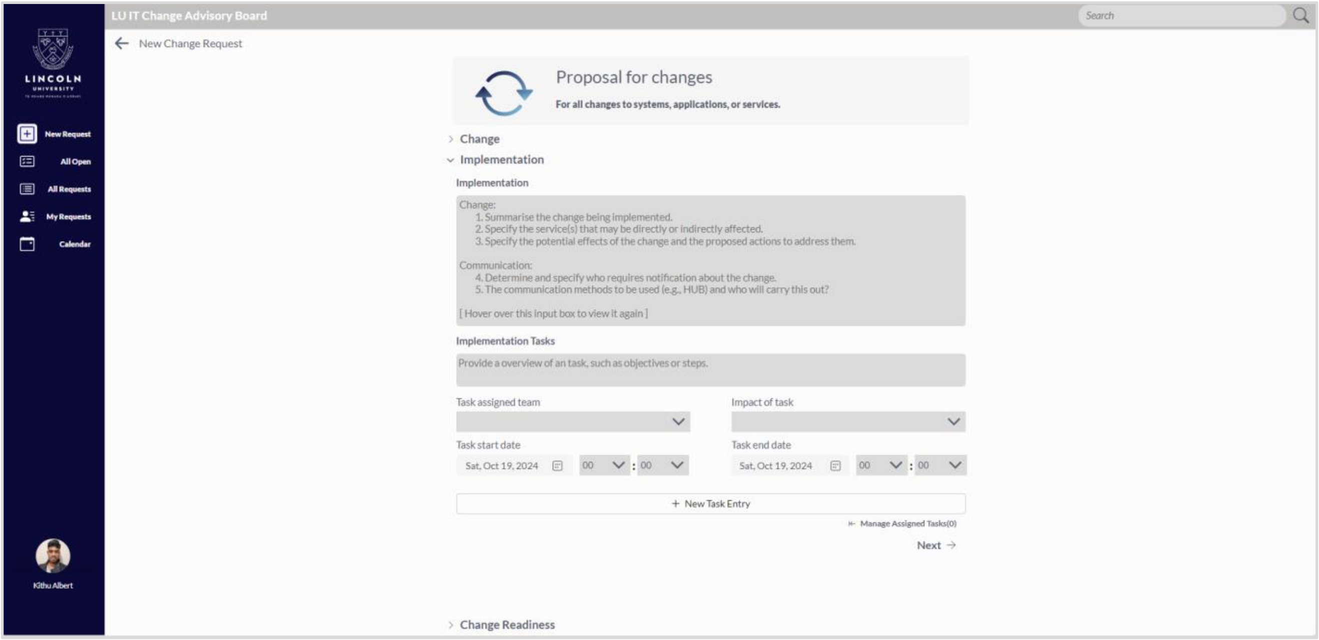
Sponsor

› Implementation

› Change Readiness

Change section captures the essential details of the proposed change in a logical flow, such as change workflow, classification, category, impact of the change, change reason and sponsor.

B. New Request: Implementation *(Collapsible Section)*



Proposal for changes

For all changes to systems, applications, or services.

› Change

⌄ Implementation

Implementation

Change:
1. Summarise the change being implemented.
2. Specify the service(s) that may be directly or indirectly affected.
3. Specify the potential effects of the change and the proposed actions to address them.

Communication:
4. Determine and specify who requires notification about the change.
5. The communication methods to be used (e.g., HUB) and who will carry this out?

[Hover over this input box to view it again]

Implementation Tasks

Provide a overview of an task, such as objectives or steps.

Task assigned team

Impact of task

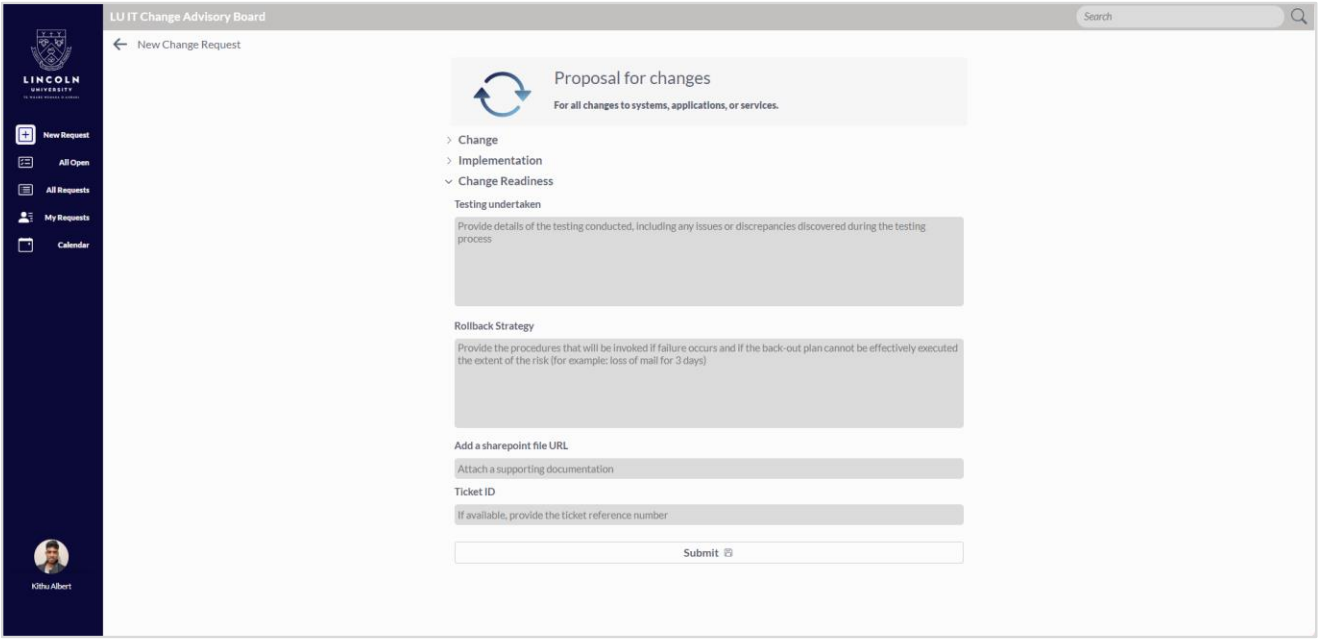
Task start date: Sat, Oct 19, 2024 00 : 00

Task end date: Sat, Oct 19, 2024 00 : 00

› Change Readiness

Implementation section captures and gives requestor guideline on what details should provide before the request is logged. This is so members are aware if the full thought process of the change.

C. New Request: Change Readiness *(Collapsible Section)*



Testing undertaken

Provide details of the testing conducted, including any issues or discrepancies discovered during the testing process

Rollback Strategy

Provide the procedures that will be invoked if failure occurs and if the back-out plan cannot be effectively executed the extent of the risk (for example: loss of mail for 3 days)

Add a sharepoint file URL

Attach a supporting documentation

Ticket ID

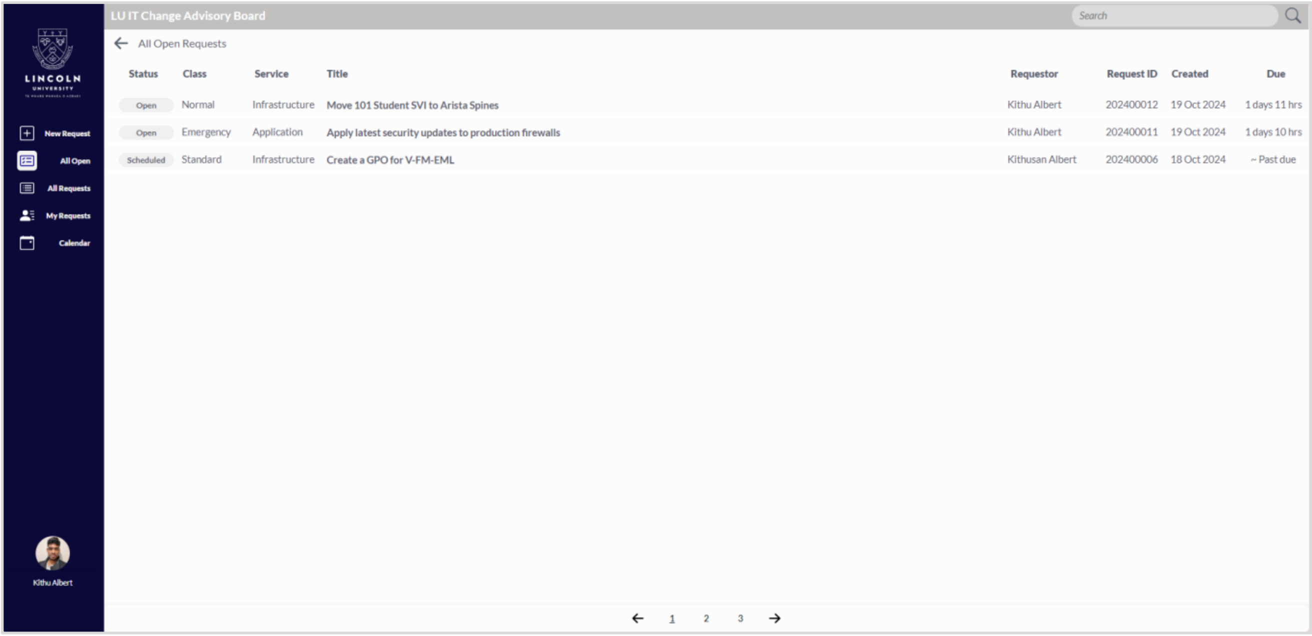
If available, provide the ticket reference number

Submit

Change Readiness section captures final additional information of proposed change. Such as testing undertaken, rollback strategy and optional documentation of change proposal in SharePoint URL and ITS ticketing system ticket reference.

Appendix 2:

A. All Open Request View

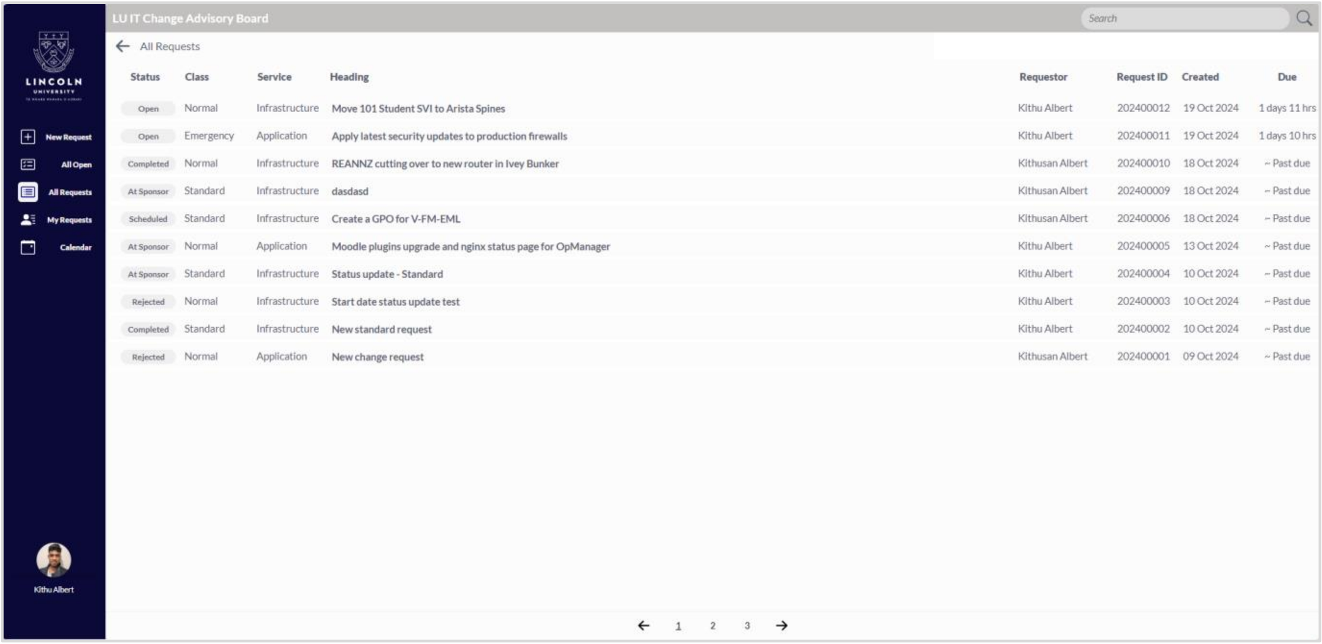


Status	Class	Service	Title	Requestor	Request ID	Created	Due
Open	Normal	Infrastructure	Move 101 Student SVI to Arista Spines	Kithu Albert	202400012	19 Oct 2024	1 days 11 hrs
Open	Emergency	Application	Apply latest security updates to production firewalls	Kithu Albert	202400011	19 Oct 2024	1 days 10 hrs
Scheduled	Standard	Infrastructure	Create a GPO for V-FM-EML	Kithusan Albert	202400006	18 Oct 2024	~ Past due

Open Request view shows only essential requests such as Open, Scheduled or Rejected (if the request hasn't passed it end date).

The view also shows the time to implementation in the same view to allow members take immediate action on upcoming change requests.

B. All Request View



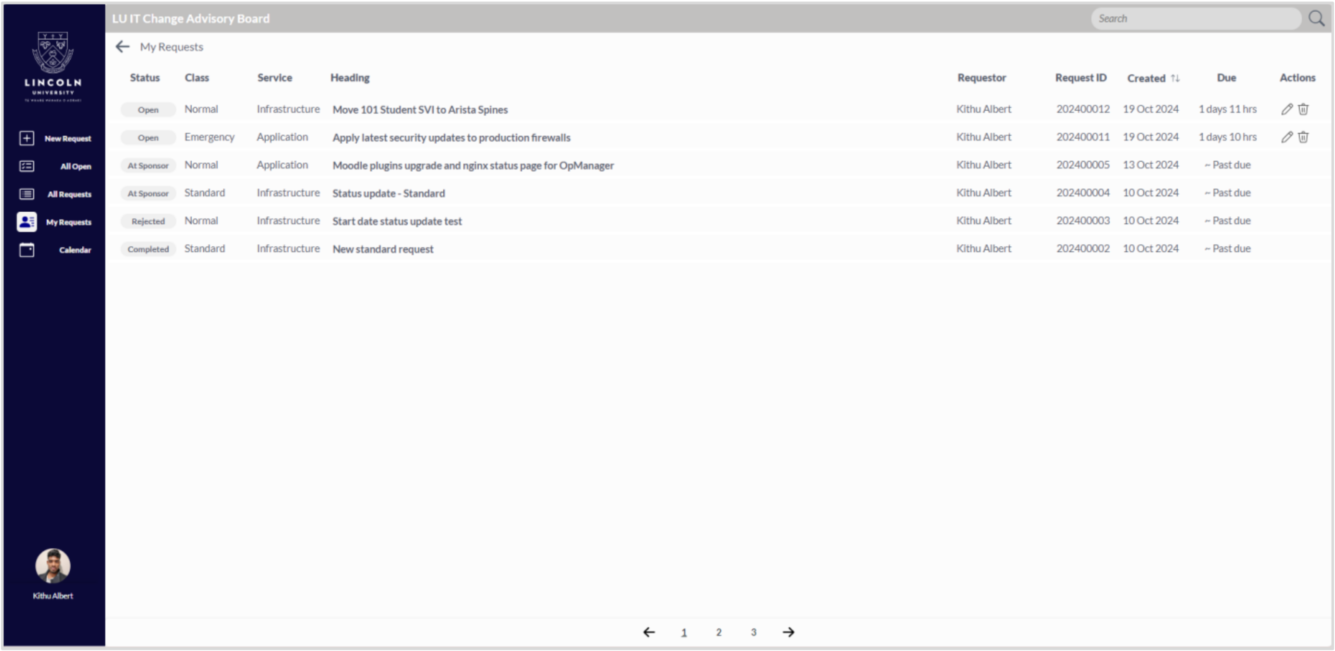
LU IT Change Advisory Board

All Requests

Status	Class	Service	Heading	Requestor	Request ID	Created	Due
Open	Normal	Infrastructure	Move 101 Student SVI to Arista Spines	Kithu Albert	202400012	19 Oct 2024	1 days 11 hrs
Open	Emergency	Application	Apply latest security updates to production firewalls	Kithu Albert	202400011	19 Oct 2024	1 days 10 hrs
Completed	Normal	Infrastructure	REANNZ cutting over to new router in Ivey Bunker	Kithusan Albert	202400010	18 Oct 2024	~ Past due
At Sponsor	Standard	Infrastructure	dasdasd	Kithusan Albert	202400009	18 Oct 2024	~ Past due
Scheduled	Standard	Infrastructure	Create a GPO for V-FM-EML	Kithusan Albert	202400006	18 Oct 2024	~ Past due
At Sponsor	Normal	Application	Moodle plugins upgrade and nginx status page for OpManager	Kithu Albert	202400005	13 Oct 2024	~ Past due
At Sponsor	Standard	Infrastructure	Status update - Standard	Kithu Albert	202400004	10 Oct 2024	~ Past due
Rejected	Normal	Infrastructure	Start date status update test	Kithu Albert	202400003	10 Oct 2024	~ Past due
Completed	Standard	Infrastructure	New standard request	Kithu Albert	202400002	10 Oct 2024	~ Past due
Rejected	Normal	Application	New change request	Kithusan Albert	202400001	09 Oct 2024	~ Past due

All Request view shows the all the request with pagination. The search bar gives users easy ability to search with keyword, request number and requestor name.

C. My Request View



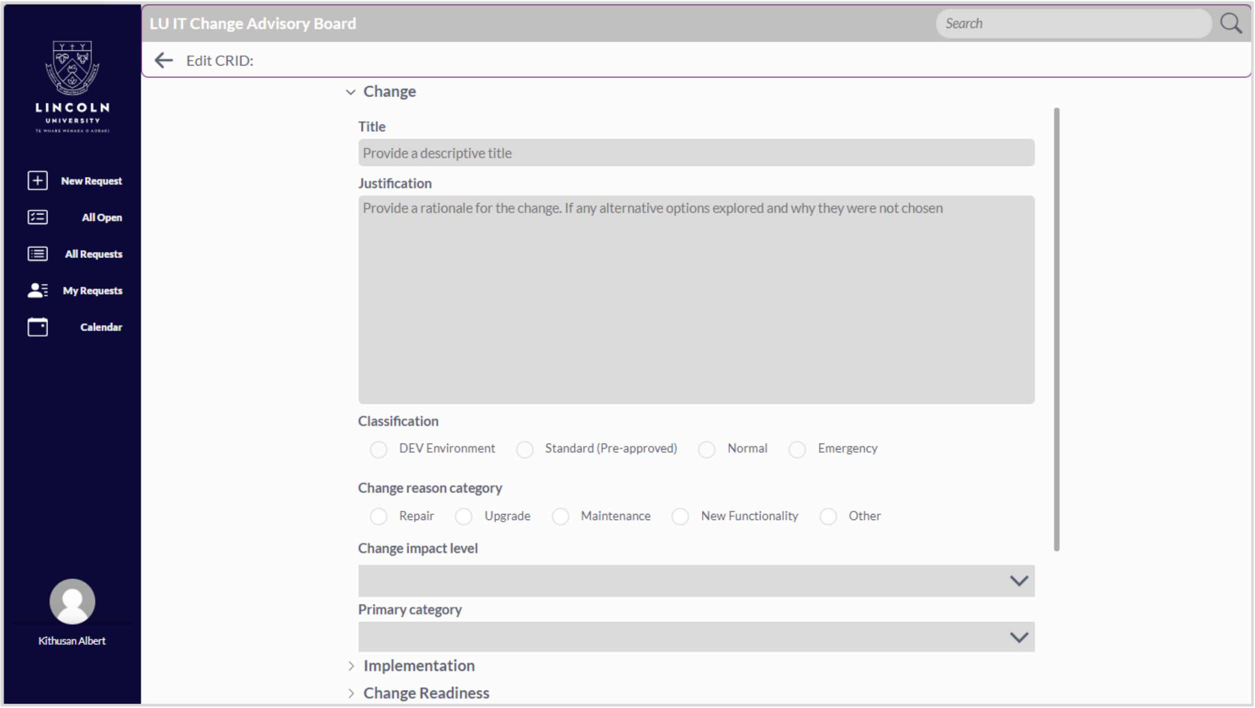
LU IT Change Advisory Board

My Requests

Status	Class	Service	Heading	Requestor	Request ID	Created ↑↓	Due	Actions
Open	Normal	Infrastructure	Move 101 Student SVI to Arista Spines	Kithu Albert	202400012	19 Oct 2024	1 days 11 hrs	✎ 🗑
Open	Emergency	Application	Apply latest security updates to production firewalls	Kithu Albert	202400011	19 Oct 2024	1 days 10 hrs	✎ 🗑
At Sponsor	Normal	Application	Moodle plugins upgrade and nginx status page for OpManager	Kithu Albert	202400005	13 Oct 2024	~ Past due	
At Sponsor	Standard	Infrastructure	Status update - Standard	Kithu Albert	202400004	10 Oct 2024	~ Past due	
Rejected	Normal	Infrastructure	Start date status update test	Kithu Albert	202400003	10 Oct 2024	~ Past due	
Completed	Standard	Infrastructure	New standard request	Kithu Albert	202400002	10 Oct 2024	~ Past due	

My Request view shows the all the request the user has created. This view allows for detection and changes if the request start date hasn't passed. This is to ensures request integrity.

D. Edit Request View



Edit CRID:

Change

Title

Provide a descriptive title

Justification

Provide a rationale for the change. If any alternative options explored and why they were not chosen

Classification

○ DEV Environment ○ Standard (Pre-approved) ○ Normal ○ Emergency

Change reason category

○ Repair ○ Upgrade ○ Maintenance ○ New Functionality ○ Other

Change impact level

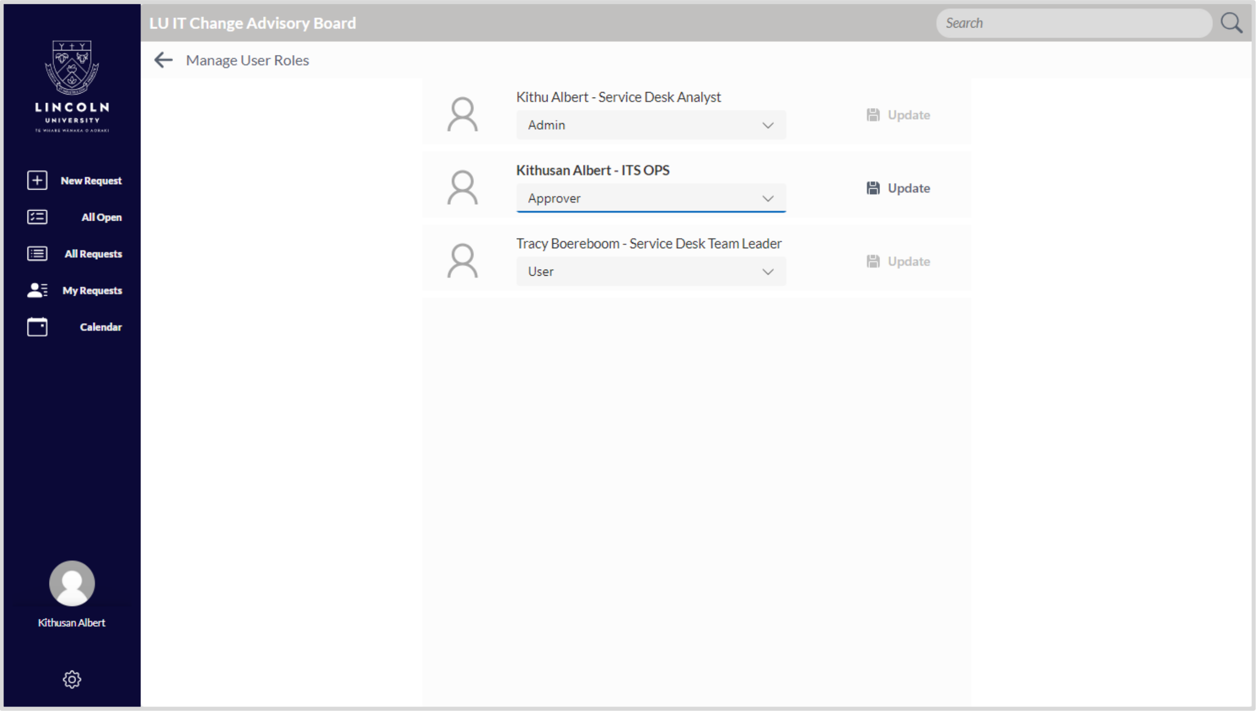
Primary category

Implementation

Change Readiness

Edit request view prefills the information of request for edit and allows the user to edit the proposed request only if the request hasn't passed the implementation date. This is only accessible through the My Request view.

E. Update User Roles



Manage User Roles

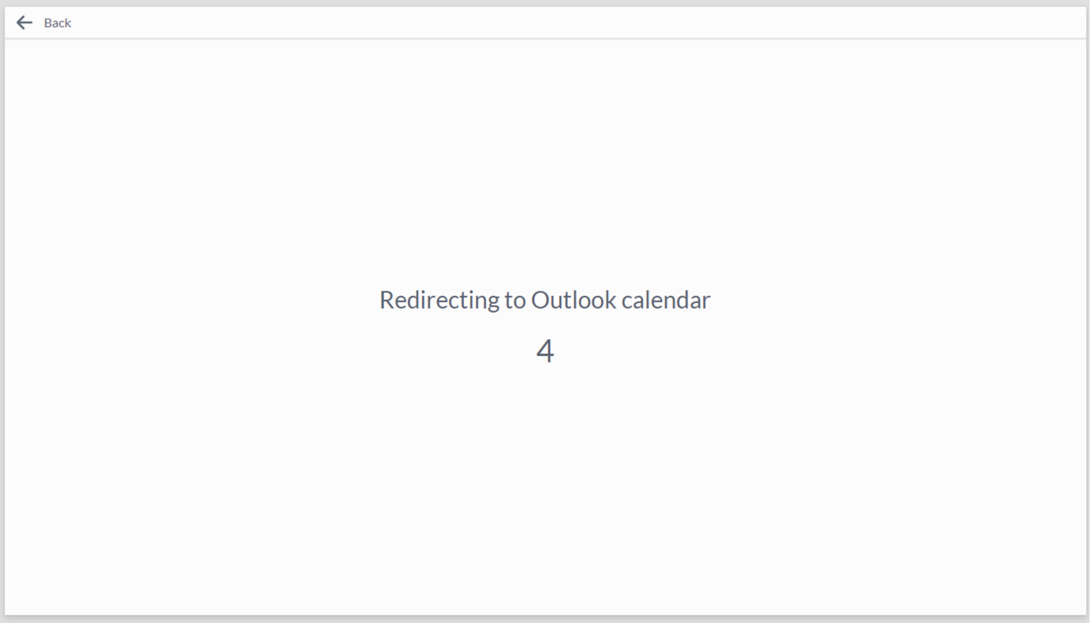
Kithu Albert - Service Desk Analyst: Admin

Kithusan Albert - ITS OPS: Approver

Tracy Boereboom - Service Desk Team Leader: User

Administrators can update user roles directly within the application. By navigating to the 'Manage User Roles', administrators can only view a list of all users and their current roles. They can then select a user and update their role as needed, from roles 'Admin', 'Approver', or 'User'.

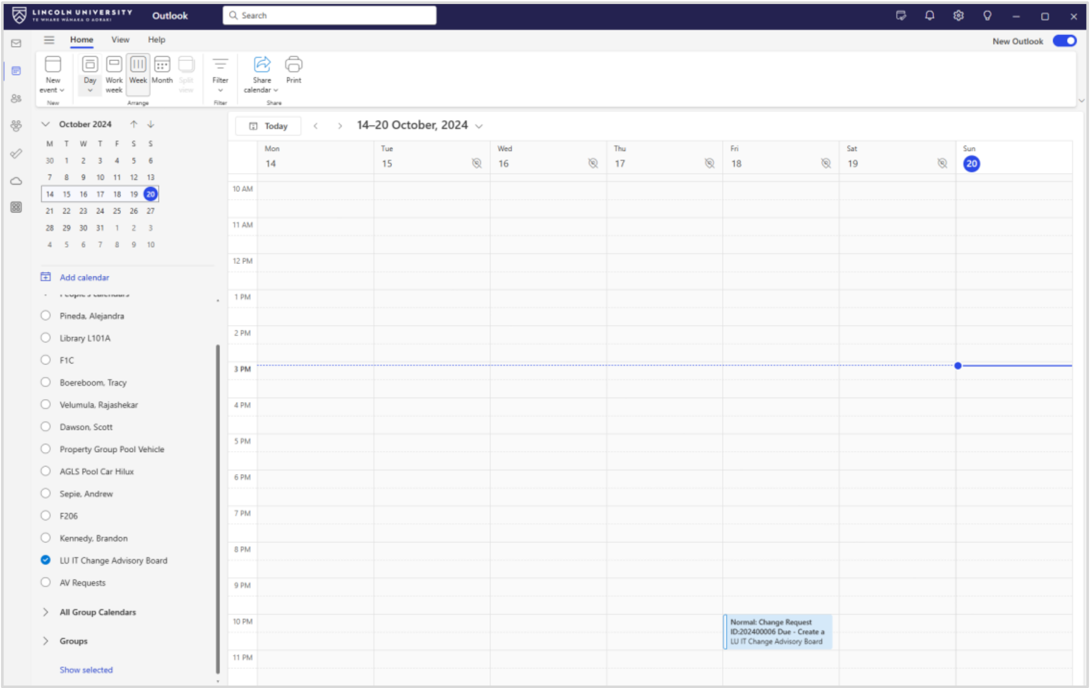
F. Calendar View



← Back

Redirecting to Outlook calendar

4



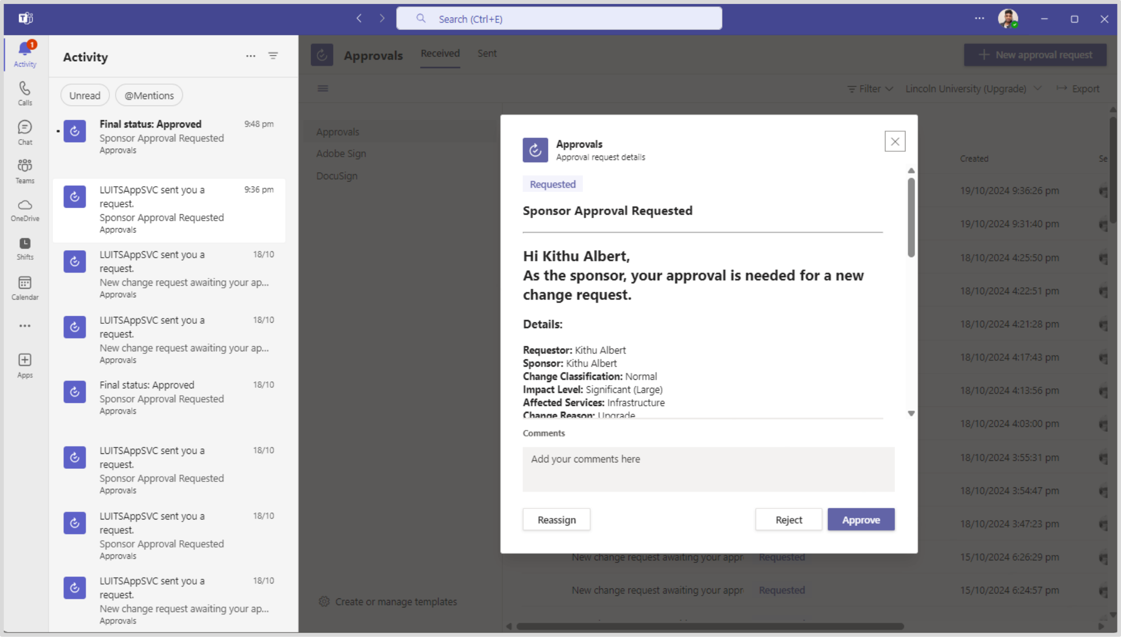
Normal: Change Request ID:202400006 Due - Create a
LU IT Change Advisory Board

The calendar view enables users to view all scheduled changes. The navigation item navigates to the Outlook change calendar online, a visual countdown is used to let the users know that they are being redirected to the Outlook calendar.

Alternatively, users can also access the change calendar from within the Outlook application itself for those who prefer to use the desktop Outlook application.

Appendix 3:

A. Sponsor approvals notification via Email and Microsoft Teams Approval



Activity

Final status: Approved 9:48 pm
Sponsor Approval Requested
Approvals

LUITSAppSVC sent you a request. 9:36 pm
Sponsor Approval Requested
Approvals

LUITSAppSVC sent you a request. 18/10
New change request awaiting your ap...
Approvals

LUITSAppSVC sent you a request. 18/10
New change request awaiting your ap...
Approvals

Final status: Approved 18/10
Sponsor Approval Requested
Approvals

LUITSAppSVC sent you a request. 18/10
Sponsor Approval Requested
Approvals

LUITSAppSVC sent you a request. 18/10
Sponsor Approval Requested
Approvals

LUITSAppSVC sent you a request. 18/10
New change request awaiting your ap...
Approvals

Created
19/10/2024 9:36:26 pm
19/10/2024 9:31:40 pm
18/10/2024 4:25:50 pm
18/10/2024 4:22:51 pm
18/10/2024 4:21:28 pm
18/10/2024 4:17:43 pm
18/10/2024 4:13:56 pm
18/10/2024 4:03:00 pm
18/10/2024 3:55:31 pm
18/10/2024 3:54:47 pm
18/10/2024 3:47:23 pm
New change request awaiting your appr Requested 15/10/2024 6:26:29 pm
New change request awaiting your appr Requested 15/10/2024 6:24:57 pm

Approvals
Approval request details

Requested

Sponsor Approval Requested

Hi Kithu Albert,
As the sponsor, your approval is needed for a new change request.

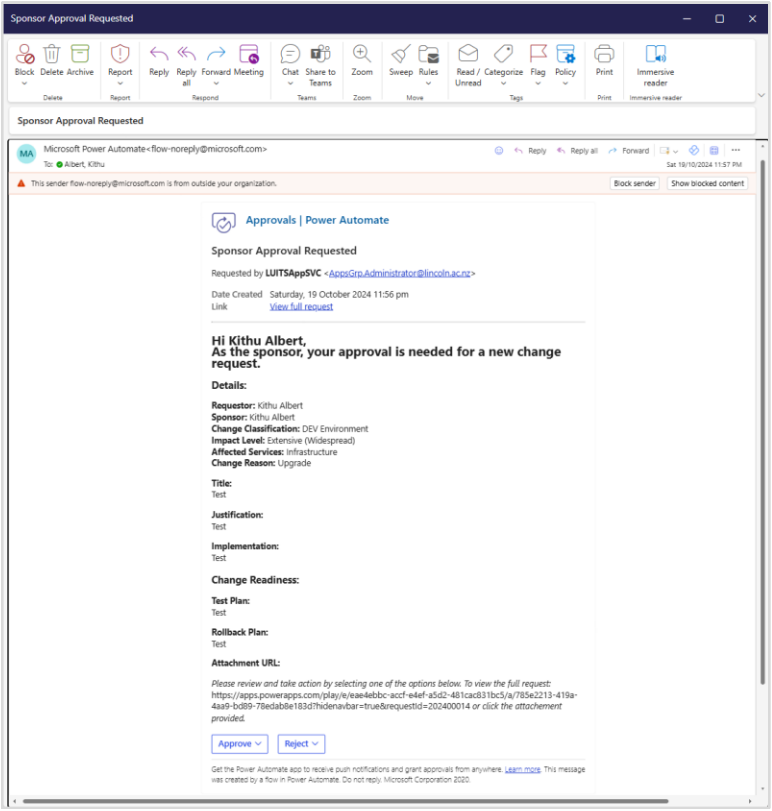
Details:

Requestor: Kithu Albert
Sponsor: Kithu Albert
Change Classification: Normal
Impact Level: Significant (Large)
Affected Services: Infrastructure
Change Reason: Upgrade

Comments

Add your comments here

Reassign Reject Approve



Sponsor Approval Requested

Sponsor Approval Requested

Microsoft Power Automate<flow-noreply@microsoft.com>
To: Albert, Kithu
Sat 19/10/2024 11:57 PM

This sender flow-noreply@microsoft.com is from outside your organization.

Approvals | Power Automate

Sponsor Approval Requested

Requested by **LUITSAppSVC** <AppsGrp.Administrator@lincoln.ac.nz>

Date Created Saturday, 19 October 2024 11:56 pm
Link View full request

Hi Kithu Albert,
As the sponsor, your approval is needed for a new change request.

Details:

Requestor: Kithu Albert
Sponsor: Kithu Albert
Change Classification: DEV Environment
Impact Level: Extensive (Widespread)
Affected Services: Infrastructure
Change Reason: Upgrade

Title:
Test

Justification:
Test

Implementation:
Test

Change Readiness:

Test Plan:
Test

Rollback Plan:
Test

Attachment URL:

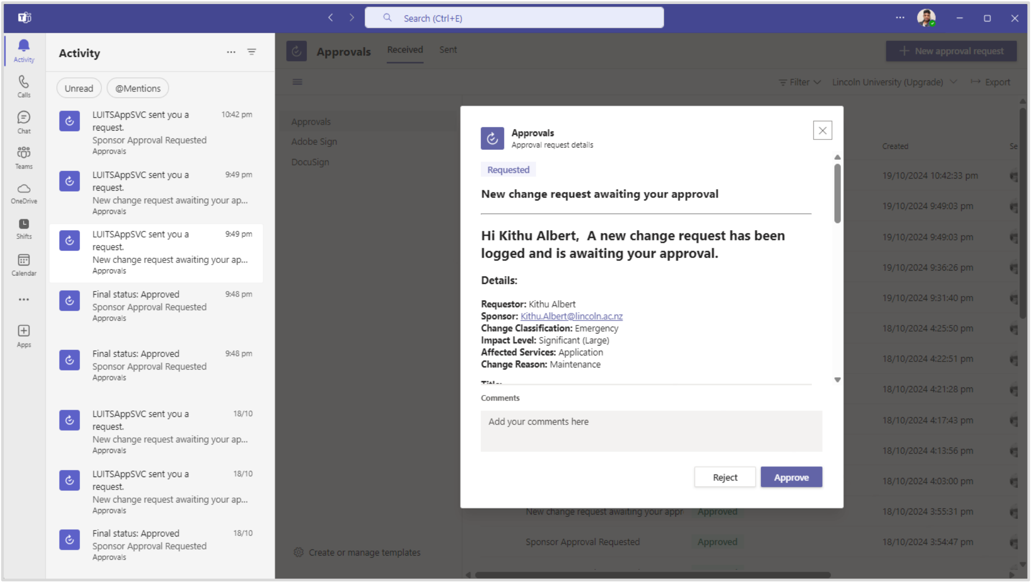
Please review and take action by selecting one of the options below. To view the full request: https://apps.powerapps.com/play/e/eae4ebbc-accf-e4ef-a5d2-481cac831bc5/a/785e2213-419a-4aa9-bd89-78edab8e183d?hidenavbar=true&requestId=202400014 *or click the attachement provided.*

Approve Reject

Get the Power Automate app to receive push notifications and grant approvals from anywhere. Learn more. This message was created by a flow in Power Automate. Do not reply. Microsoft Corporation 2020.

Notifications are sent to both Microsoft Teams and email, ensuring that the sponsor receives the information needed to make a decision. When the sponsor makes a decision on either platform, it is automatically synchronized, reflecting the change in status across both Microsoft Teams and the email thread. This streamlined approach ensures that sponsor decision is gathered at a timely manner.

B. Member approvals notification via Email and Microsoft Teams Approval



Activity

LUITSAppSVC sent you a request. 10:42 pm
Sponsor Approval Requested
Approvals

LUITSAppSVC sent you a request. 9:49 pm
New change request awaiting your ap...
Approvals

LUITSAppSVC sent you a request. 9:49 pm
New change request awaiting your ap...
Approvals

Final status: Approved 9:48 pm
Sponsor Approval Requested
Approvals

Final status: Approved 9:48 pm
Sponsor Approval Requested
Approvals

LUITSAppSVC sent you a request. 18/10
New change request awaiting your ap...
Approvals

LUITSAppSVC sent you a request. 18/10
New change request awaiting your ap...
Approvals

Final status: Approved 18/10
Sponsor Approval Requested
Approvals

Approvals
Approval request details

Requested

New change request awaiting your approval

Hi Kithu Albert, A new change request has been logged and is awaiting your approval.

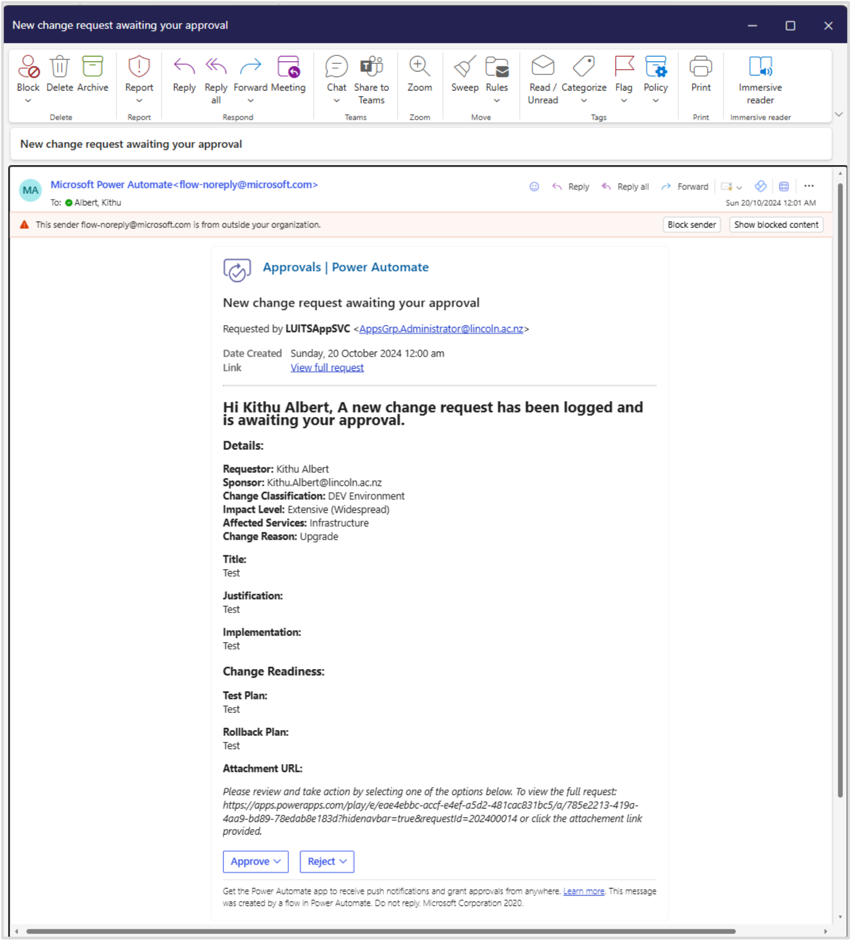
Details:

Requestor: Kithu Albert
Sponsor: Kithu.Albert@lincoln.ac.nz
Change Classification: Emergency
Impact Level: Significant (Large)
Affected Services: Application
Change Reason: Maintenance

Comments

Add your comments here

Reject | Approve



New change request awaiting your approval

Microsoft Power Automate<flow-noreply@microsoft.com>
To: Albert, Kithu
Sun 20/10/2024 12:01 AM

This sender flow-noreply@microsoft.com is from outside your organization.

Approvals | Power Automate

New change request awaiting your approval

Requested by **LUITSAppSVC** <AppsGrp.Administrator@lincoln.ac.nz>

Date Created Sunday, 20 October 2024 12:00 am
Link View full request

Hi Kithu Albert, A new change request has been logged and is awaiting your approval.

Details:

Requestor: Kithu Albert
Sponsor: Kithu.Albert@lincoln.ac.nz
Change Classification: DEV Environment
Impact Level: Extensive (Widespread)
Affected Services: Infrastructure
Change Reason: Upgrade

Title:
Test

Justification:
Test

Implementation:
Test

Change Readiness:

Test Plan:
Test

Rollback Plan:
Test

Attachment URL:

Please review and take action by selecting one of the options below. To view the full request: https://apps.powerapps.com/play/e/eae4ebbc-accf-e4ef-a5d2-481cac831bc5/a/785e2213-419a-4aa9-bd89-78edab8e183d?hidenavbar=true&requestId=202400014 or click the attachement link provided.

Approve | Reject

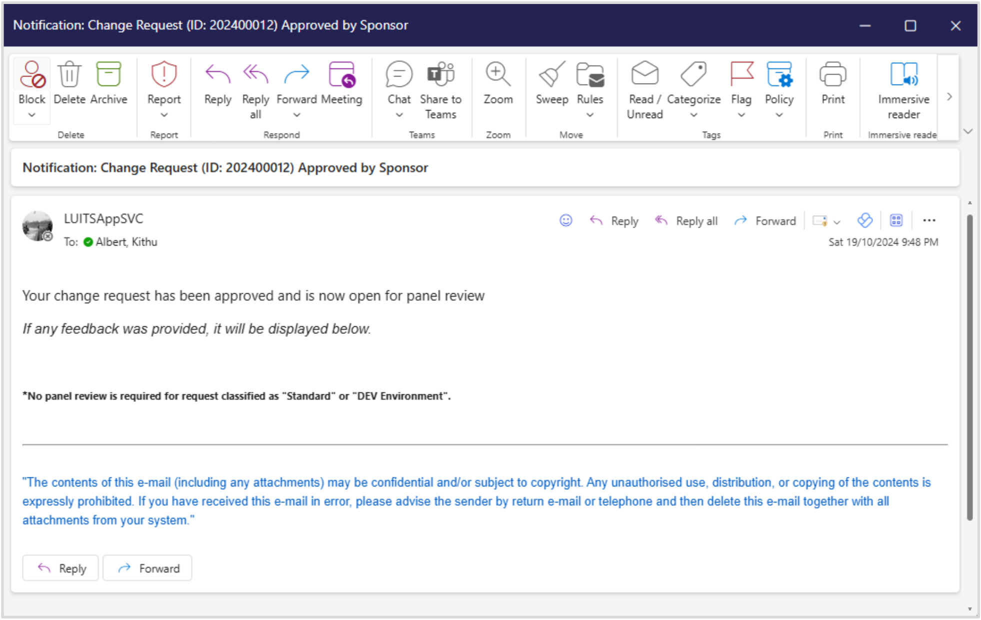
Get the Power Automate app to receive push notifications and grant approvals from anywhere. Learn more. This message was created by a flow in Power Automate. Do not reply. Microsoft Corporation 2020.

Notifications is also sent to both Microsoft Teams and email for board members to approve the any new proposed change requests.

C. Notifications and workflow notifications (Email)

Requestor is updated throughout the workflow of decision and any action taken on proposed changes via email.

Sponsor approval and denial email notification to requestor:



Notification: Change Request (ID: 202400012) Approved by Sponsor

LUITSAppSVC

To: Albert, Kithu

Sat 19/10/2024 9:48 PM

Your change request has been approved and is now open for panel review

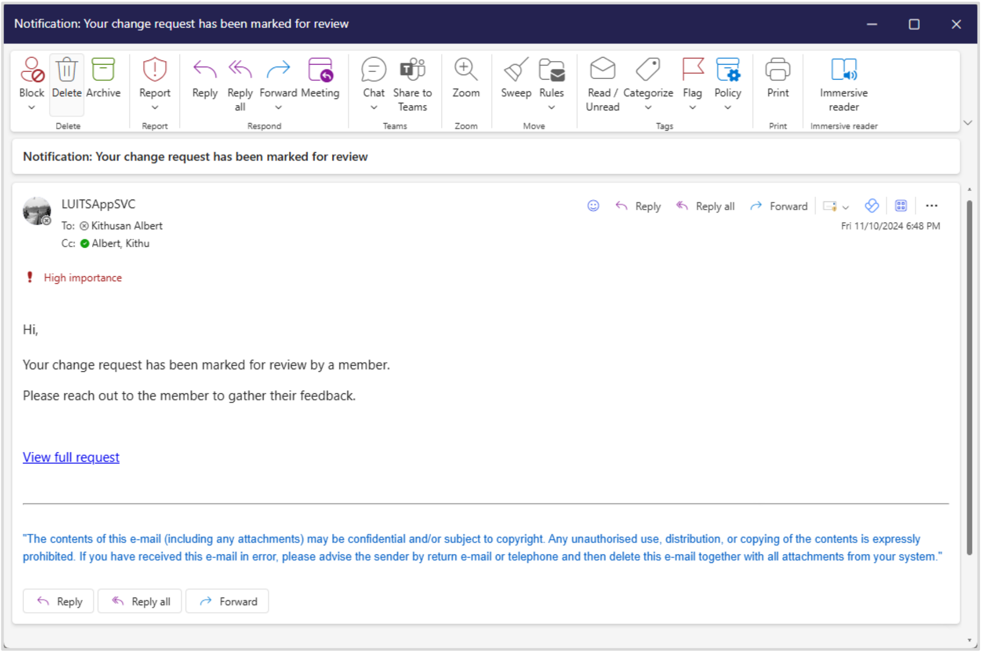
If any feedback was provided, it will be displayed below.

***No panel review is required for request classified as "Standard" or "DEV Environment".**

"The contents of this e-mail (including any attachments) may be confidential and/or subject to copyright. Any unauthorised use, distribution, or copying of the contents is expressly prohibited. If you have received this e-mail in error, please advise the sender by return e-mail or telephone and then delete this e-mail together with all attachments from your system."

Member marked change as review notification to requestor:

Requestor is sent a notification with the member who marked as review cc'd, to start feedback communication.



Notification: Your change request has been marked for review

LUITSAppSVC

To: Kithusan Albert

Cc: Albert, Kithu

Fri 11/10/2024 6:48 PM

High importance

Hi,

Your change request has been marked for review by a member.

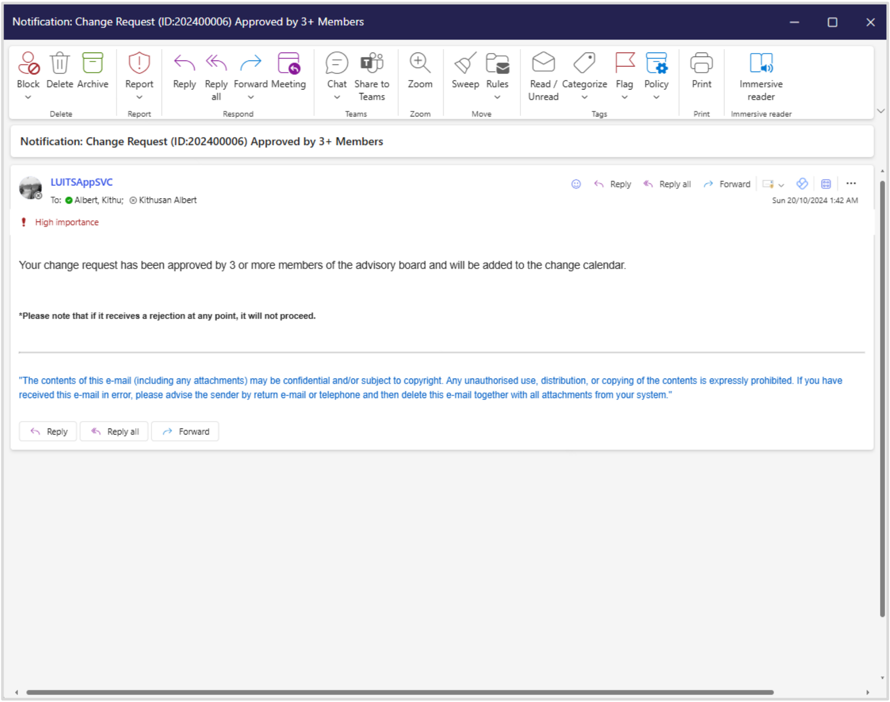
Please reach out to the member to gather their feedback.

View full request

"The contents of this e-mail (including any attachments) may be confidential and/or subject to copyright. Any unauthorised use, distribution, or copying of the contents is expressly prohibited. If you have received this e-mail in error, please advise the sender by return e-mail or telephone and then delete this e-mail together with all attachments from your system."

Request has received 3 approvals from board members notification to requestor:

Once a request received 3 or more approvals from board members it can be implemented. A notification is sent to requestor once this is reached and a calendar appointment in the change request calendar.



Notification: Change Request (ID:202400006) Approved by 3+ Members

LUITSAppSVC

To: Albert, Kithu; Kithusan Albert

Sun 20/10/2024 1:42 AM

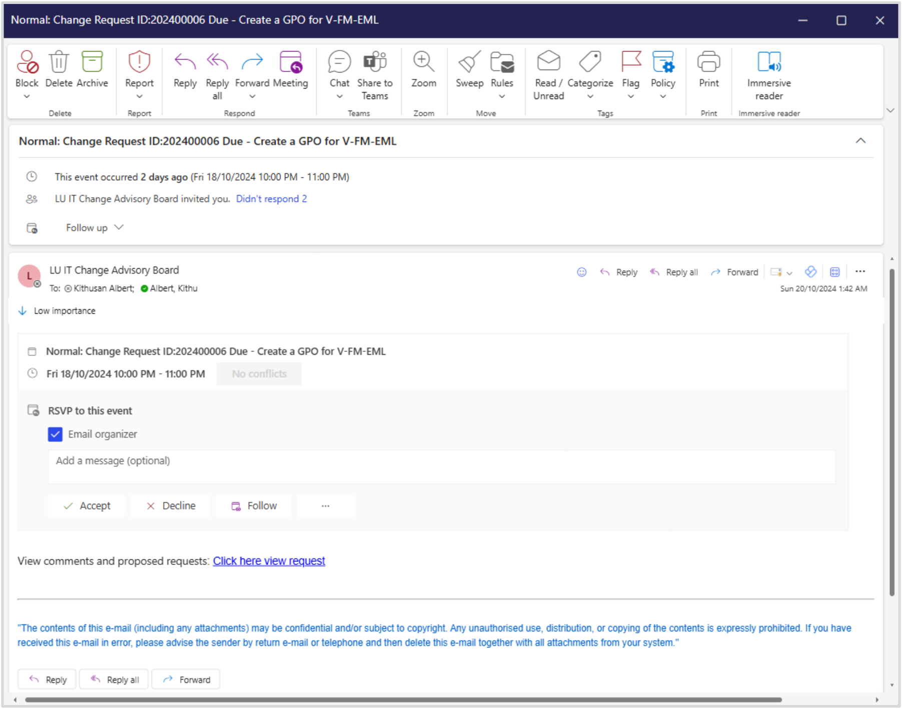
High importance

Your change request has been approved by 3 or more members of the advisory board and will be added to the change calendar.

***Please note that if it receives a rejection at any point, it will not proceed.**

"The contents of this e-mail (including any attachments) may be confidential and/or subject to copyright. Any unauthorised use, distribution, or copying of the contents is expressly prohibited. If you have received this e-mail in error, please advise the sender by return e-mail or telephone and then delete this e-mail together with all attachments from your system."

Calendar invite of change from LU IT Change Advisory Board:



Normal: Change Request ID:202400006 Due - Create a GPO for V-FM-EML

This event occurred **2 days ago** (Fri 18/10/2024 10:00 PM - 11:00 PM)

LU IT Change Advisory Board invited you. Didn't respond 2

LU IT Change Advisory Board

To: Kithusan Albert; Albert, Kithu

Sun 20/10/2024 1:42 AM

Low importance

Normal: Change Request ID:202400006 Due - Create a GPO for V-FM-EML

Fri 18/10/2024 10:00 PM - 11:00 PM No conflicts

RSVP to this event

☑ Email organizer

Add a message (optional)

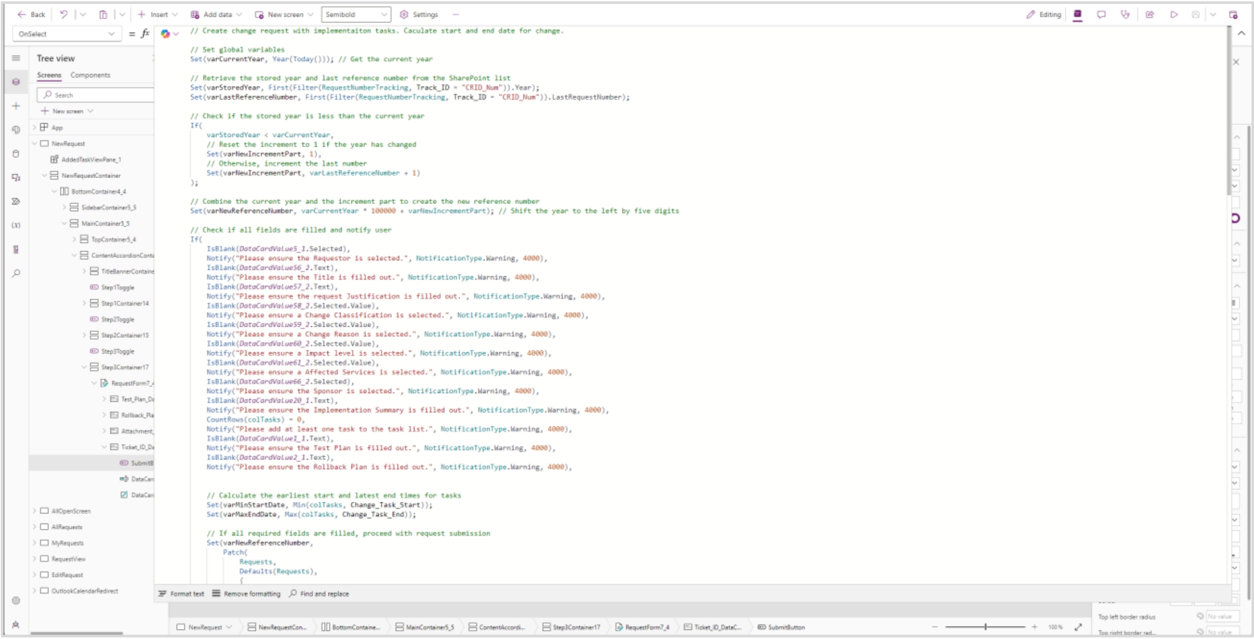
View comments and proposed requests: Click here view request

"The contents of this e-mail (including any attachments) may be confidential and/or subject to copyright. Any unauthorised use, distribution, or copying of the contents is expressly prohibited. If you have received this e-mail in error, please advise the sender by return e-mail or telephone and then delete this e-mail together with all attachments from your system."

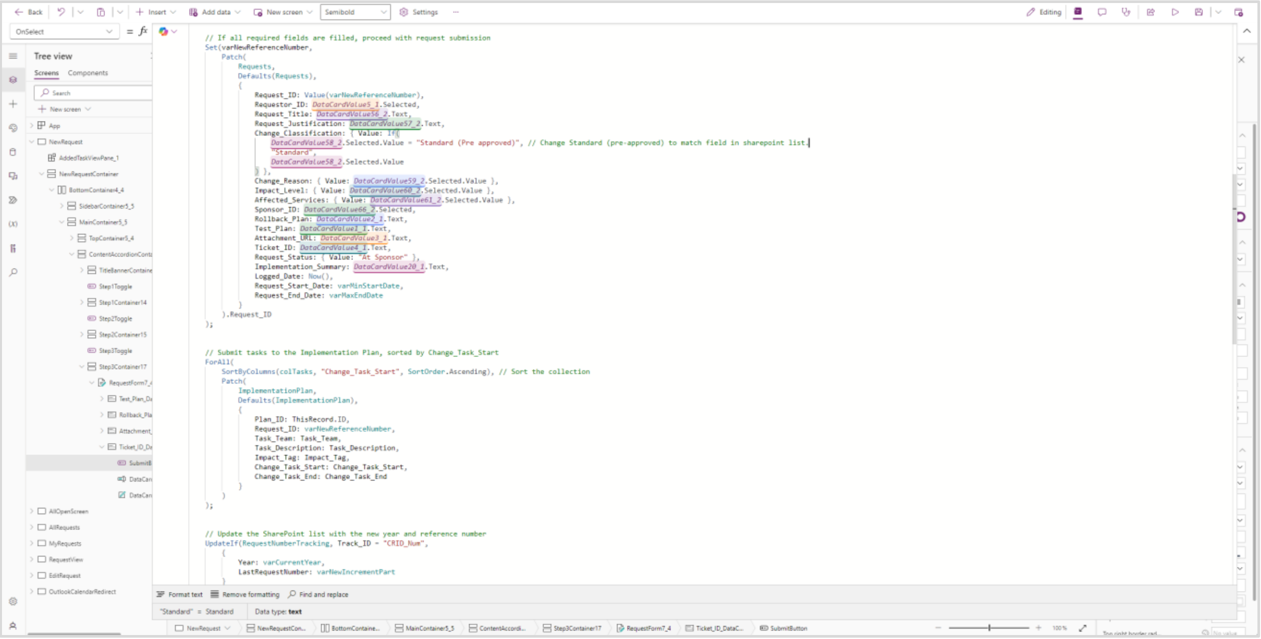
Appendix 4:

Example coding used throughout the Power Apps development**.**

A. The following is logic for creating a new change request. Following best practices to properly validate user input, logical separation of code logic, including error handling and clear commenting.

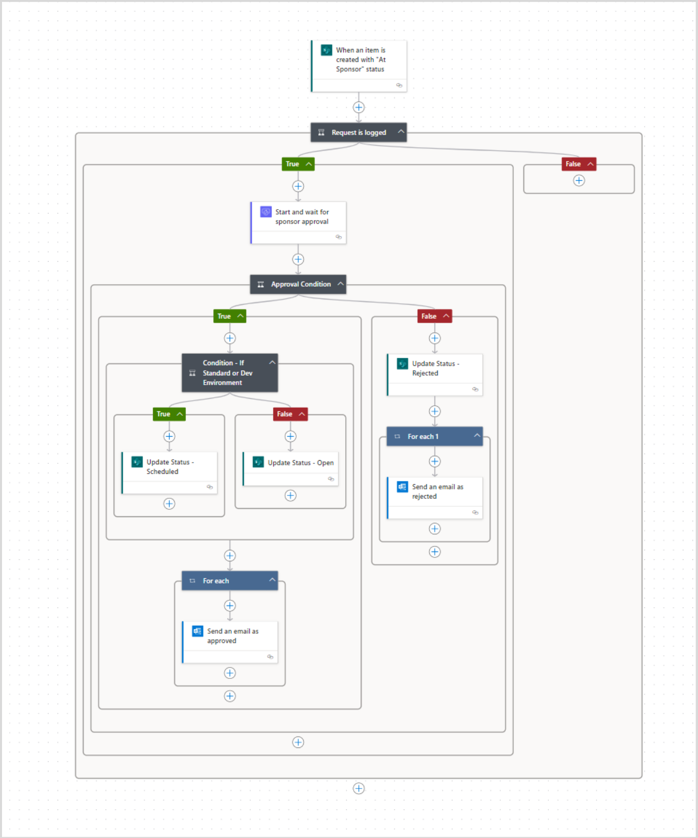


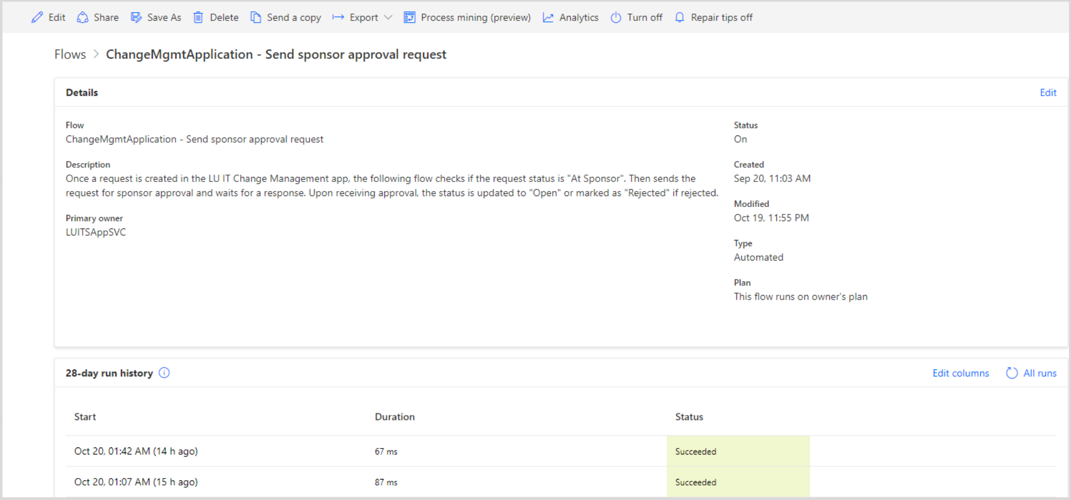
```
// Create change request with implementaiton tasks. Caculate start and end date for change.

// Set global variables
Set(varCurrentYear, Year(Today())); // Get the current year

// Retrieve the stored year and last reference number from the SharePoint list
Set(varStoredYear, First(Filter(RequestNumberTracking, Track_ID = "CRID_Num")).Year);
Set(varLastReferenceNumber, First(Filter(RequestNumberTracking, Track_ID = "CRID_Num")).LastRequestNumber);

// Check if the stored year is less than the current year
If(
    varStoredYear < varCurrentYear,
    // Reset the increment to 1 if the year has changed
    Set(varNewIncrementPart, 1),
    // Otherwise, increment the last number
    Set(varNewIncrementPart, varLastReferenceNumber + 1)
);

// Combine the current year and the increment part to create the new reference number
Set(varNewReferenceNumber, varCurrentYear * 100000 + varNewIncrementPart); // Shift the year to the left by five digits

// Check if all fields are filled and notify user
If(
    IsBlank(DataCardValue5_1.Selected),
    Notify("Please ensure the Requestor is selected.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue56_2.Text),
    Notify("Please ensure the Title is filled out.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue57_2.Text),
    Notify("Please ensure the request Justification is filled out.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue58_2.Selected.Value),
    Notify("Please ensure a Change Classification is selected.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue59_2.Selected.Value),
    Notify("Please ensure a Change Reason is selected.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue60_2.Selected.Value),
    Notify("Please ensure a Impact level is selected.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue61_2.Selected.Value),
    Notify("Please ensure a Affected Services is selected.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue66_2.Selected),
    Notify("Please ensure the Sponsor is selected.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue20_1.Text),
    Notify("Please ensure the Implementation Summary is filled out.", NotificationType.Warning, 4000),
    CountRows(colTasks) = 0,
    Notify("Please add at least one task to the task list.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue1_1.Text),
    Notify("Please ensure the Test Plan is filled out.", NotificationType.Warning, 4000),
    IsBlank(DataCardValue2_1.Text),
    Notify("Please ensure the Rollback Plan is filled out.", NotificationType.Warning, 4000),


    // Calculate the earliest start and latest end times for tasks
    Set(varMinStartDate, Min(colTasks, Change_Task_Start));
    Set(varMaxEndDate, Max(colTasks, Change_Task_End));

    // If all required fields are filled, proceed with request submission
    Set(varNewReferenceNumber,
        Patch(
            Requests,
            Defaults(Requests),
            {
```



```
    // If all required fields are filled, proceed with request submission
    Set(varNewReferenceNumber,
        Patch(
            Requests,
            Defaults(Requests),
            {
                Request_ID: Value(varNewReferenceNumber),
                Requestor_ID: DataCardValue5_1.Selected,
                Request_Title: DataCardValue56_2.Text,
                Request_Justification: DataCardValue57_2.Text,
                Change_Classification: { Value: If(
                    DataCardValue58_2.Selected.Value = "Standard (Pre approved)", // Change Standard (pre-approved) to match field in sharepoint list.
                    "Standard",
                    DataCardValue58_2.Selected.Value
                ) },
                Change_Reason: { Value: DataCardValue59_2.Selected.Value },
                Impact_Level: { Value: DataCardValue60_2.Selected.Value },
                Affected_Services: { Value: DataCardValue61_2.Selected.Value },
                Sponsor_ID: DataCardValue66_2.Selected,
                Rollback_Plan: DataCardValue2_1.Text,
                Test_Plan: DataCardValue1_1.Text,
                Attachment_URL: DataCardValue3_1.Text,
                Ticket_ID: DataCardValue4_1.Text,
                Request_Status: { Value: "At Sponsor" },
                Implementation_Summary: DataCardValue20_1.Text,
                Logged_Date: Now(),
                Request_Start_Date: varMinStartDate,
                Request_End_Date: varMaxEndDate
            }
        ).Request_ID
    );


    // Submit tasks to the Implementation Plan, sorted by Change_Task_Start
    ForAll(
        SortByColumns(colTasks, "Change_Task_Start", SortOrder.Ascending), // Sort the collection
        Patch(
            ImplementationPlan,
            Defaults(ImplementationPlan),
            {
                Plan_ID: ThisRecord.ID,
                Request_ID: varNewReferenceNumber,
                Task_Team: Task_Team,
                Task_Description: Task_Description,
                Impact_Tag: Impact_Tag,
                Change_Task_Start: Change_Task_Start,
                Change_Task_End: Change_Task_End
            }
        )
    );


    // Update the SharePoint list with the new year and reference number
    UpdateIf(RequestNumberTracking, Track_ID = "CRID_Num",
        {
            Year: varCurrentYear,
            LastRequestNumber: varNewIncrementPart
        }
```

B. The following is logic for sending approval request to sponsor when a request is logged. Following best practices to properly named, description and logical separation of code logic, including error handling and clear commenting.


When an item is created with "At Sponsor" status
Request is logged
True
False
Start and wait for sponsor approval
Approval Condition
True
False
Condition - If Standard or Dev Environment
True
False
Update Status - Scheduled
Update Status - Open
For each
Send an email as approved
Update Status - Rejected
For each 1
Send an email as rejected


Edit Share Save As Delete Send a copy Export Process mining (preview) Analytics Turn off Repair tips off

Flows > ChangeMgmtApplication - Send sponsor approval request

Details Edit

Flow
ChangeMgmtApplication - Send sponsor approval request

Description
Once a request is created in the LU IT Change Management app, the following flow checks if the request status is "At Sponsor". Then sends the request for sponsor approval and waits for a response. Upon receiving approval, the status is updated to "Open" or marked as "Rejected" if rejected.

Primary owner
LUITSAppSVC

Status
On

Created
Sep 20, 11:03 AM

Modified
Oct 19, 11:55 PM

Type
Automated

Plan
This flow runs on owner's plan

28-day run history Edit columns All runs

Start	Duration	Status
Oct 20, 01:42 AM (14 h ago)	67 ms	Succeeded
Oct 20, 01:07 AM (15 h ago)	87 ms	Succeeded