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EMPLOYEE AVAILABILITY DASHBOARD

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ABSTRACT

This paper presents the development and evaluation of the Employee Availability Dashboard (EAD) designed to streamline lecturer scheduling and resource management within the School of Computing (SOC). The EAD was created to overcome the inefficiencies of manual tracking systems and static spreadsheets, offering real-time updates and predictive analytics. The system enhances collaboration, minimizes scheduling conflicts, and facilitates better resource allocation by integrating attendance data, leave management, and task assignments into a centralized platform. A field test was conducted with five lecturers to evaluate the dashboard's usability and effectiveness. Results indicate that the system significantly improved scheduling accuracy and task coordination, although some design improvements were suggested. This paper concludes that EAD has the potential to enhance operational efficiency in academic institutions and offers recommendations for future development.

Keywords: Employee Availability, Academic Scheduling, Resource Management, Predictive Analytics, User Evaluation

INTRODUCTION

Managing lecturer availability in academic institutions, particularly in fast-paced environments such as the School of Computing (SOC), presents a significant challenge. Traditional methods, including manual tracking systems and static spreadsheets, have long been the standard for scheduling and managing academic staff. However, these conventional approaches are prone to errors, inefficiencies, and lack the agility required to respond to the dynamic and ever-changing needs of an academic environment. In fast-paced academic settings like SOC, where faculty availability often shifts due to teaching schedules, research commitments, and administrative duties, relying on outdated methods can lead to scheduling conflicts, mismanagement of resources, and delayed responses to unexpected changes. As educational institutions continue to evolve, with an increasing emphasis on real-time coordination and efficient use of resources, there is a growing need for more robust, automated solutions that can handle the complexities of scheduling, leave management, and task allocation in real-time.

The Employee Availability Dashboard (EAD) was developed as a response to these challenges, aiming to streamline the management of lecturer availability, attendance, and resource allocation in the School of Computing. The EAD offers a centralized, user-friendly platform that integrates real-time data to provide a comprehensive view of faculty schedules and availability. By incorporating real-time updates, predictive analytics, and centralized task allocation, the EAD ensures that lecturers, department heads, and administrators have accurate, up-to-date information at their fingertips, enabling them to make data-driven decisions with greater efficiency. This innovative tool eliminates the need for manual tracking, reducing human errors, and improving the overall efficiency of scheduling processes. Through its centralized platform, the EAD also enhances collaboration and communication among faculty members, as they can easily access each other's schedules, leave statuses, and available times for collaborative initiatives.

This paper provides a detailed overview of the development, functionality, and evaluation of the EAD, highlighting its potential to improve academic management processes at SOC. It delves into the system's core features, such as real-time tracking of lecturer availability, integration with academic timetables, leave management, and predictive analytics to forecast availability trends. The paper further explores how the EAD facilitates better resource allocation and reduces scheduling conflicts by providing a single, integrated platform for faculty and administrators. Through a comprehensive evaluation, this paper assesses the effectiveness and usability of the system based on real-world feedback from SOC lecturers, providing valuable insights into the system's strengths and areas for improvement. By presenting the development and outcomes of this project, the paper underscores the potential of the EAD to not only enhance scheduling efficiency but also promote better collaboration, resource management, and overall operational efficiency within academic institutions. Ultimately, the introduction of the Employee Availability Dashboard marks a significant step towards modernizing the management of academic resources, paving the way for more streamlined, effective, and data-driven approaches to managing lecturer schedules and availability

LITERATURE REVIEW

1. Resource Management and Scheduling in Academic Environments

Effective resource management in academic institutions has long been a challenge due to the dynamic nature of academic scheduling and the diversity of tasks lecturers handle. According to Singh and Soni (2020), the traditional methods of scheduling, such as paper-based systems and static spreadsheets, are not scalable and prone to human error, especially in larger institutions. The authors argue that academic institutions can benefit from automated systems that provide real-time updates, reduce scheduling conflicts, and optimize resource allocation. Several studies have proposed using intelligent scheduling systems that integrate historical data and real-time updates to predict and resolve conflicts before they arise (Lee et al., 2021). The need for dynamic scheduling systems that can handle complex workflows, such as teaching, research, and administrative duties, is increasingly being acknowledged. These systems, as emphasized by Patel et al. (2021), allow institutions to respond quickly to changes in lecturer availability and make data-driven decisions regarding task allocation.

2. The Role of Predictive Analytics in Resource Allocation

Predictive analytics has gained significant attention in various fields, including education, as a tool for enhancing resource management and decision-making processes. In academic settings, predictive analytics uses historical data to forecast availability trends, student needs, and resource requirements. A study by Ramachandran et al. (2022) found that implementing predictive analytics in resource allocation can significantly reduce scheduling conflicts and improve task distribution. The authors highlighted that machine learning algorithms could be trained on historical data to predict lecturer availability, anticipate peak demand periods, and optimize the allocation of teaching, research, and administrative tasks. Similarly, Sampson et al. (2021) demonstrated that by integrating predictive models into academic dashboards, institutions could make more accurate predictions regarding lecturer attendance and availability, enabling better long-term planning. These tools, the authors argue, are critical for addressing the increasing complexity of managing resources in educational institutions, especially as they become more reliant on technology for operational efficiency.

3. The Development of Dashboards for Academic Resource Management

Dashboards have become a popular tool for monitoring and managing academic resources due to their ability to centralize complex data and provide real-time insights in an easily understandable format. Jang et al. (2020) examined the use of dashboards in higher education settings, emphasizing their effectiveness in visualizing key performance indicators (KPIs) such as lecturer availability, attendance, and task completion. They found that dashboards, when integrated with real-time data sources, can improve decision-making and operational efficiency within academic institutions. Moreover, Bourne et al. (2019) explored the development of custom dashboards for university management systems, highlighting that the use of interactive visualizations can streamline administrative tasks and improve communication among staff. Their study suggests that such systems can enhance collaboration and transparency by providing department heads and administrators with immediate access to faculty schedules, leave statuses, and workload distribution. Furthermore, Chen and Wang (2021) demonstrated that dashboards equipped with data visualization and predictive analytics features can significantly improve the management of resources by helping staff anticipate and resolve potential conflicts before they occur.

METHODOLOGY

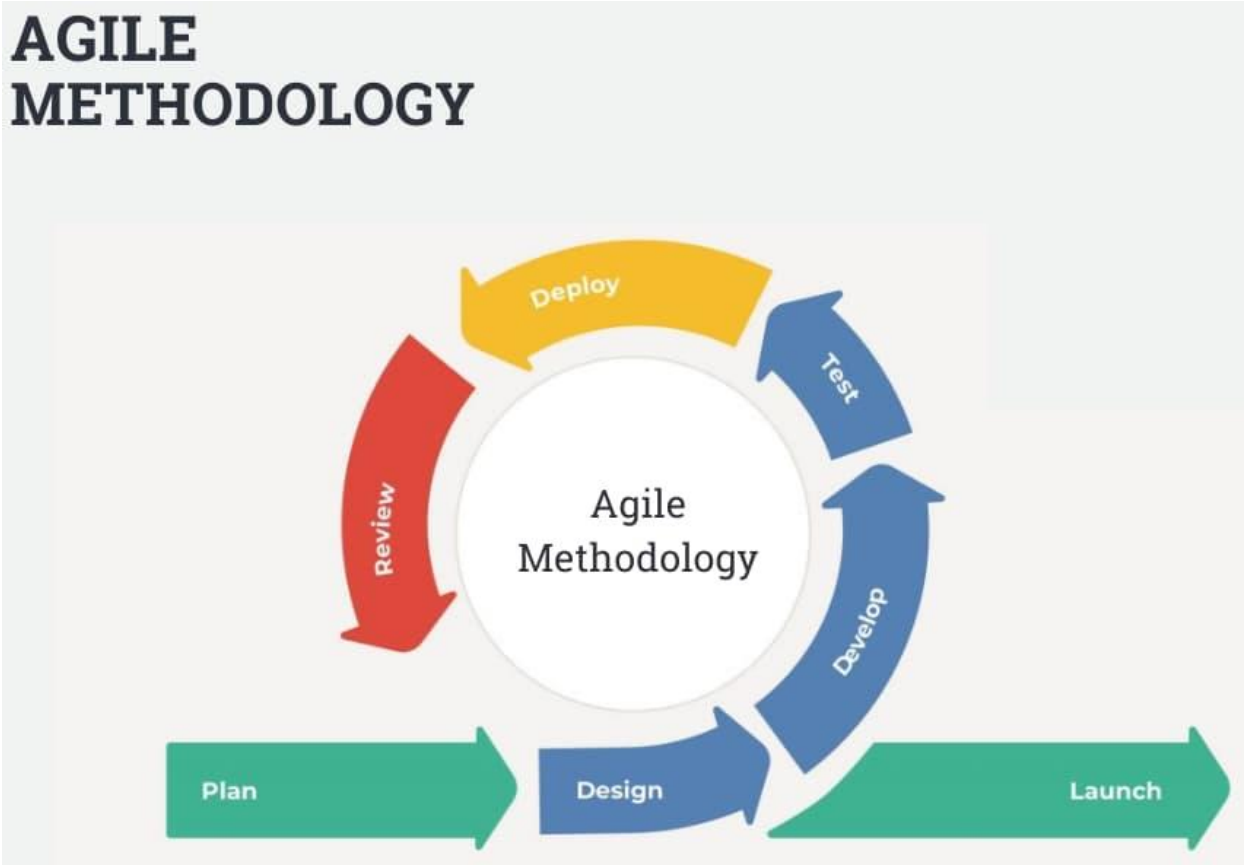


Figure 1 Agile Methodology

The development of the Employee Availability Dashboard (EAD) followed a structured, iterative approach that included key stages of planning, design, development, testing, deployment, and review. These stages ensured the system's functionality and effectiveness in meeting the needs of the School of Computing (SOC).

1. Plan

The planning phase focused on defining the project's objectives, requirements needs. This phase involved:

- Requirements Gathering: Understanding the specific scheduling and resource management needs of SOC, including time tracking of lecturer availability, leave management, task allocation, and predictive analytics..

- Defining Scope and Features: Establishing the scope of the EAD to include time tracking, leave management, task allocation, and predictive analytics .

- Project Plan: Creating a detailed timeline with milestones and deliverables, outlining the overall project schedule, including development phases, testing periods.

2. Design

The design phase involved creating detailed blueprints for the system's architecture and user interface. This phase included:

- UI/UX Design: Designing wireframes and prototypes for the dashboard interface using tools like Microsoft Power BI. The design focused on ease of use, intuitive navigation, and accessibility, ensuring the platform was user-friendly for all participants.

- System Architecture: Determining how the dashboard would integrate with existing systems, such as academic timetables and resource management tools.

- Feature Prioritization: Mapping out features such as time tracking updates, predictive analytics, and task allocation, while ensuring they were optimized for ease of use and practical application.

3. Develop

The development phase focused on building the core functionalities of the Employee Availability Dashboard. This phase involved:

- Core Feature Development: Building the main features, including time tracking of lecturer availability, task allocation, and leave management.

- Backend Integration: Ensuring the dashboard could integrate with the SOC's existing systems (e.g., timetable management tools, resource allocation systems) to ensure seamless data flow.

- System Configuration: Setting up the underlying infrastructure, including database management, user access controls, and data security protocols to protect sensitive lecturer information.

- Iterative Development: Following Agile methodology, development occurred in sprints, with each sprint delivering specific features and functionality. This allowed for continuous feedback and system improvements during the development process.

4. Test

The testing phase was critical for ensuring the system's usability, functionality, and overall performance. This phase involved:

- Unit Testing: Testing individual components and features of the system, including time tracking, leave requests, and task allocation, to ensure each function worked as expected.

- System Testing: Ensuring that all integrated components worked together smoothly, with a focus on time tracking updates, data synchronization, and the accuracy of task allocation.

- User Acceptance Testing (UAT): Conducting testing with a group of SOC lecturers to assess the system's usability, functionality, and effectiveness. This included feedback on the dashboard's design, ease of navigation, and whether the system met their specific needs.

- Bug Fixing and Refinement: Addressing any issues identified during testing, refining features, and adjusting based on user feedback to improve system performance and user satisfaction.

5. Deploy

- Documentation: Documentation is in Innovator 3.0 in the foyer School of Comptuting UUM.

6. Review

- The review phase focused on evaluating the success of the Employee Availability Dashboard and identifying opportunities for future improvements. This phase included:

- Performance Metrics: Analyzing system performance data, including uptime, response time, and the accuracy of time tracking and scheduling.

- Continuous Improvement: Based on the feedback and performance data, adjustments and enhancements were made to improve the system, including interface updates, feature additions, and improvements to time tracking and user navigation.

- Long-Term Planning: Planning for future updates and improvements, ensuring that the EAD remains aligned with the evolving needs of SOC and continues to provide value for both faculty and administrators.

The Purpose of the Emplyoo Availability Dashboard

The Employee Availability Dashboard (EAD) is designed to address the challenges of managing lecturer availability, attendance, and resource allocation within the School of Computing (SOC) by providing a centralized, user-friendly platform. The main purpose of the EAD is to streamline the scheduling process, enhance operational efficiency, and improve collaboration among faculty, administrators, and department heads. It allows for time tracking of lecturer availability, ensuring that administrators always have up-to-date information to prevent scheduling conflicts. Additionally, the dashboard facilitates efficient resource allocation by integrating availability data, making it easier to assign teaching, research, and administrative tasks. It also simplifies leave management by automating leave requests and approvals, reducing scheduling conflicts. The inclusion of predictive analytics supports long-term resource planning by forecasting future availability trends. Furthermore, the EAD promotes better collaboration and communication by providing a single platform for viewing and updating schedules. With its intuitive design, the EAD ensures that all users can easily navigate and utilize the system to improve the management of academic resources and schedules at SOC.

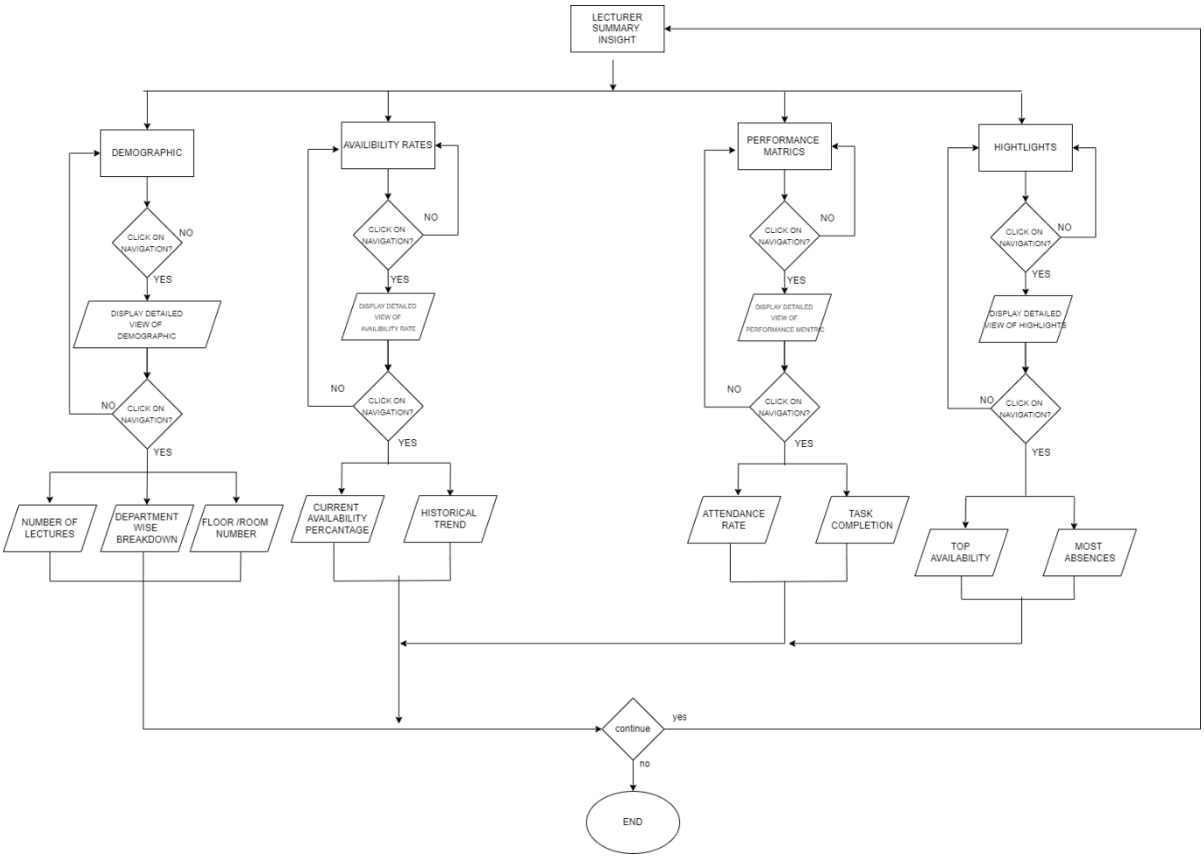


Figure2 Overview(main page)

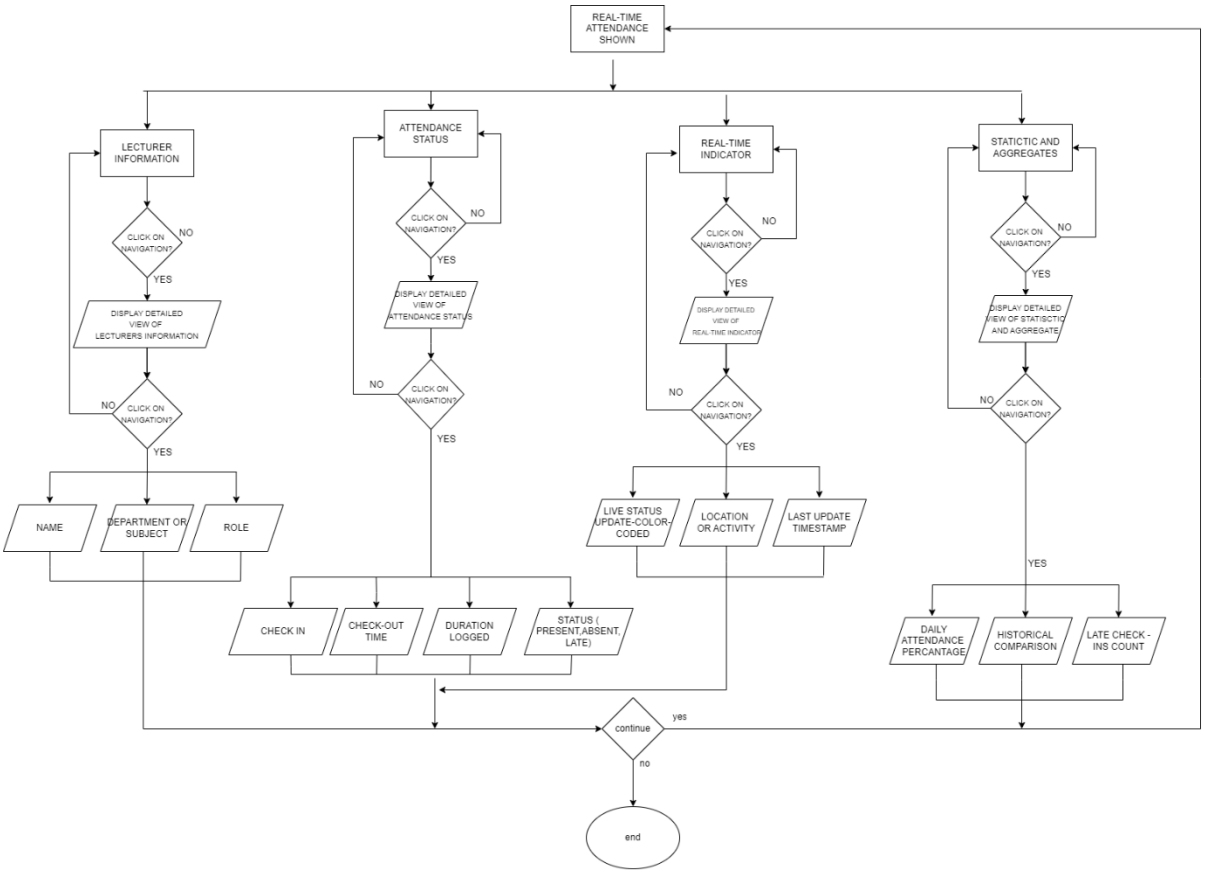


Figure 3Time tracking page

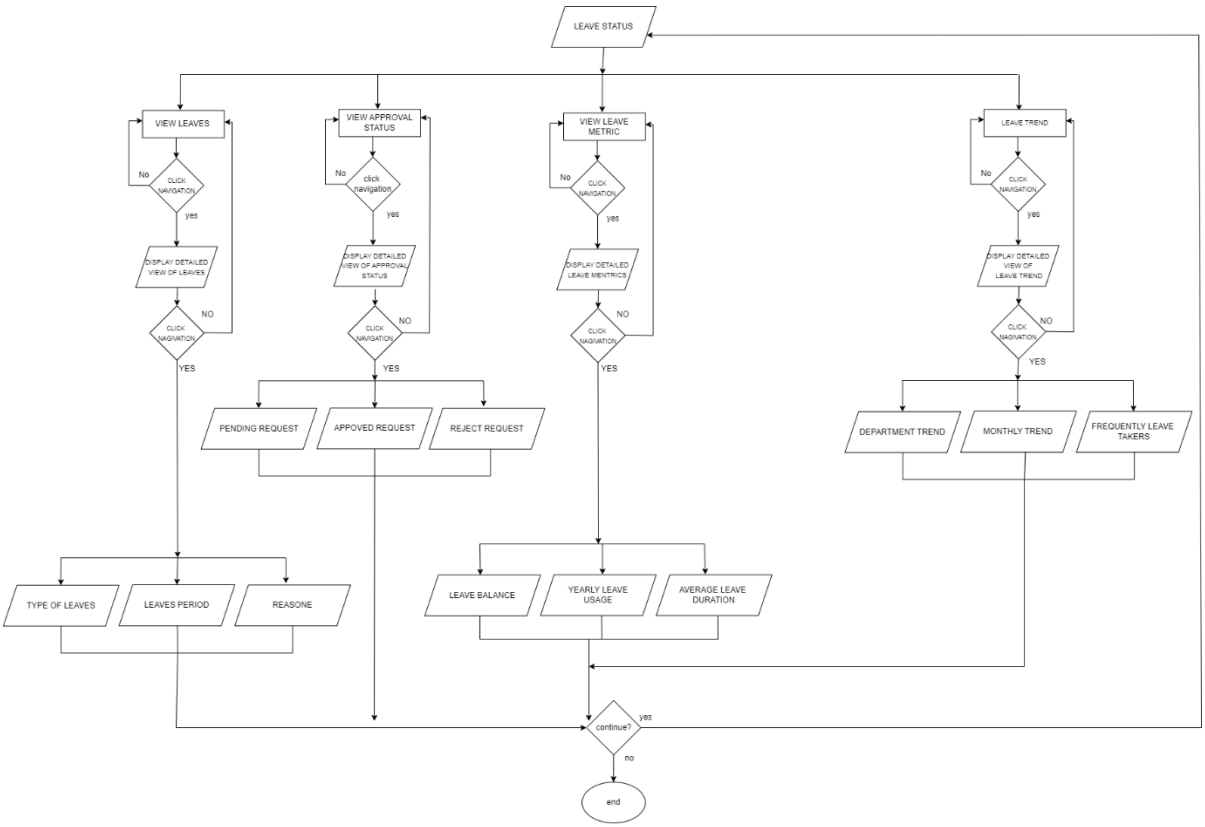


Figure 4 Leave Status page

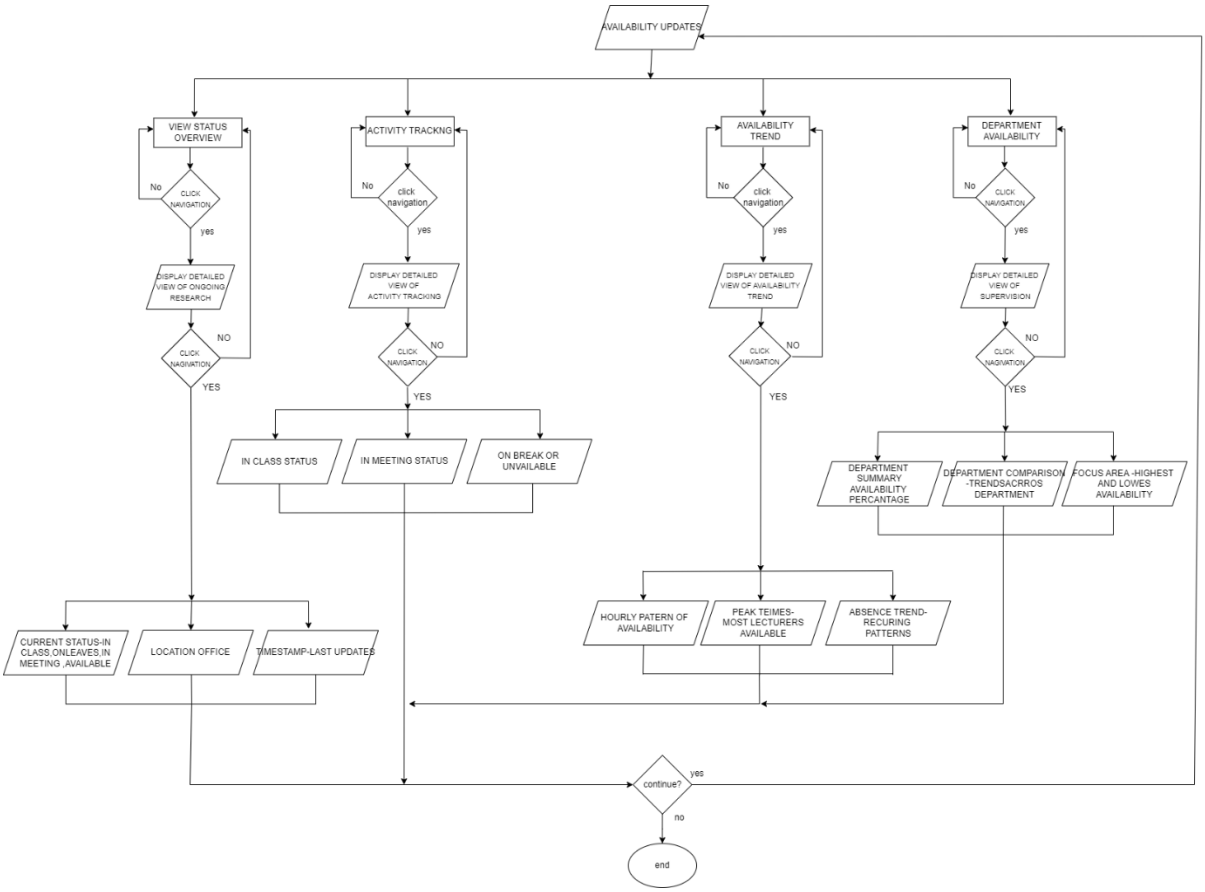


Figure 5 Summary lecturer Insight Page

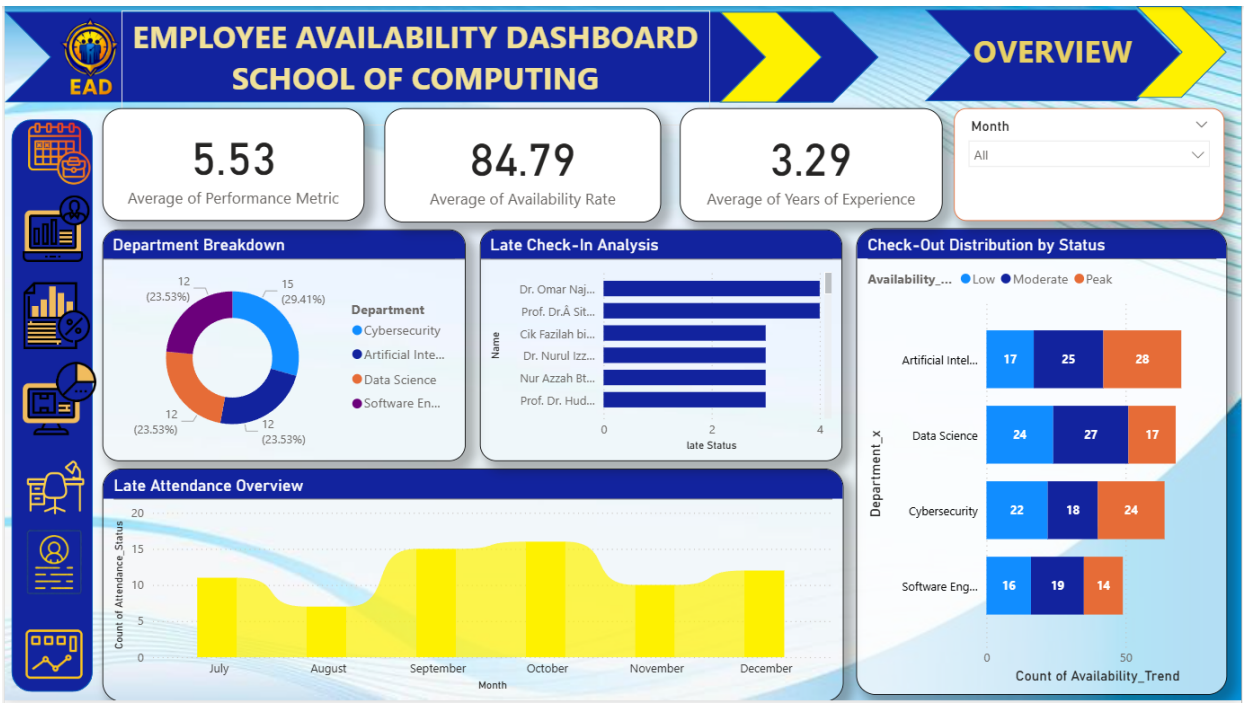


Figure 6 Overview Page of Employee Avalibility Dashboard

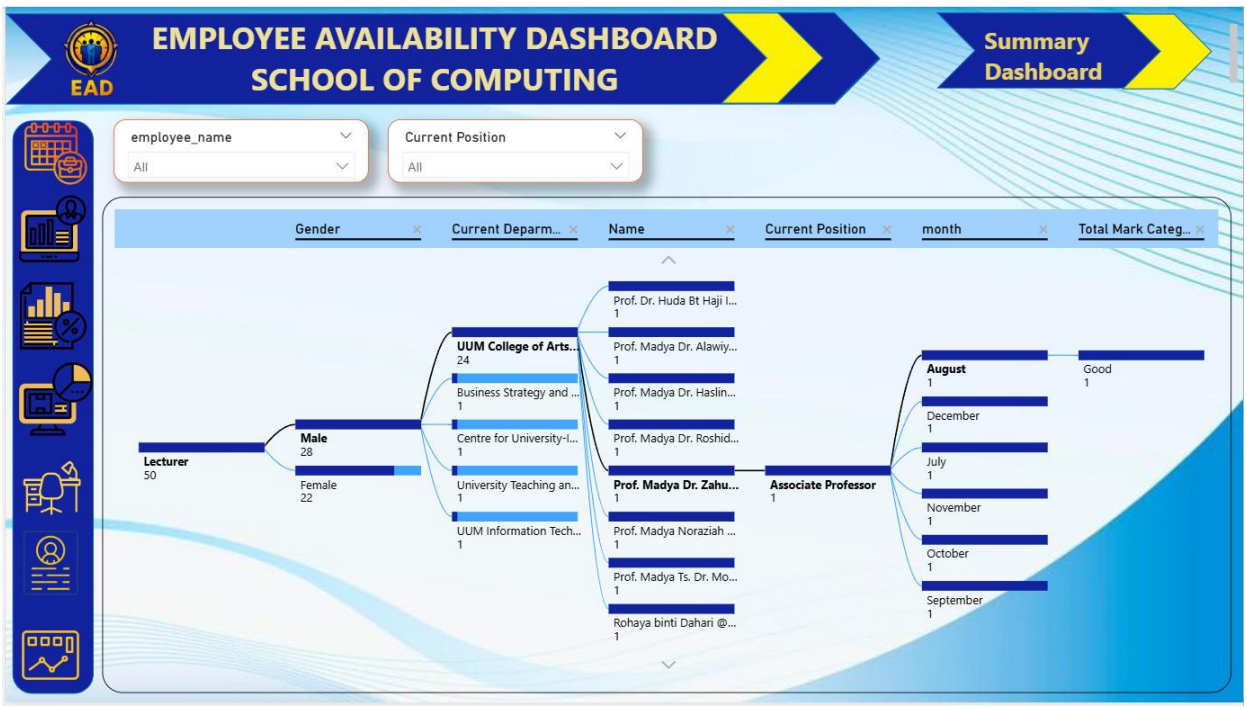


Figure 7 Summary Page of Employee Availability Dashboard

RESULTS AND DISCUSSIONS

The Employee Availability Dashboard (EAD) was evaluated using a structured questionnaire-based survey designed to assess user acceptance, usability, and overall satisfaction with the system. The evaluation aimed to determine how effectively the dashboard performs across its core modules and how well it supports the management of lecturer schedules, availability, and leave requests. A total of 5 expert participants were involved in this evaluation. The participants were lecturers from the School of Computing (SOC), selected for their familiarity with the scheduling and resource management processes within the academic environment. Each participant interacted with the dashboard based on their role and provided feedback through a role-specific questionnaire. The questions were directly aligned with the modules they tested.

The evaluation of the Employee Availability Dashboard (EAD) was conducted using User Acceptance Testing (UAT). UAT is a critical evaluation method where real users interact with the system to assess whether it meets their needs and performs as expected in real-world scenarios. This method provides valuable insights into the system's usability, functionality, and overall user satisfaction. UAT allows for an understanding of how well the Employee Availability Dashboard supports lecturers' day-to-day activities in managing their schedules, coordinating tasks, and making data-driven decisions based on the dashboard's functionality. The feedback gathered from this evaluation will help identify any usability issues, potential improvements, and areas where the system effectively meets the expectations of its users. The evaluation was designed to ensure that the Employee Availability Dashboard (EAD) fulfils its intended purpose in optimizing scheduling, leave management, and task allocation for the School of Computing (SOC).

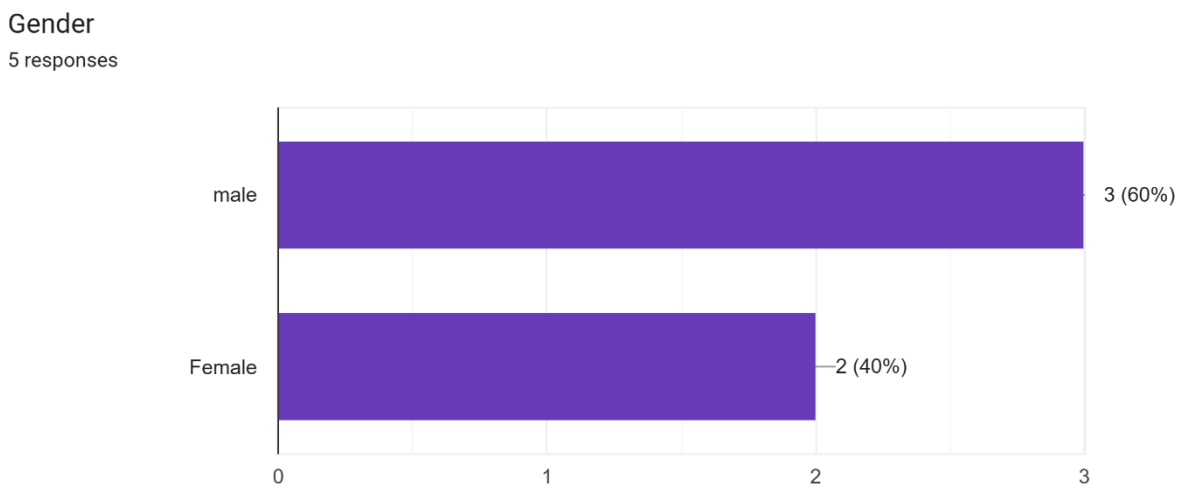
The questionnaire was divided into three sections:

Section A: Demographic Information

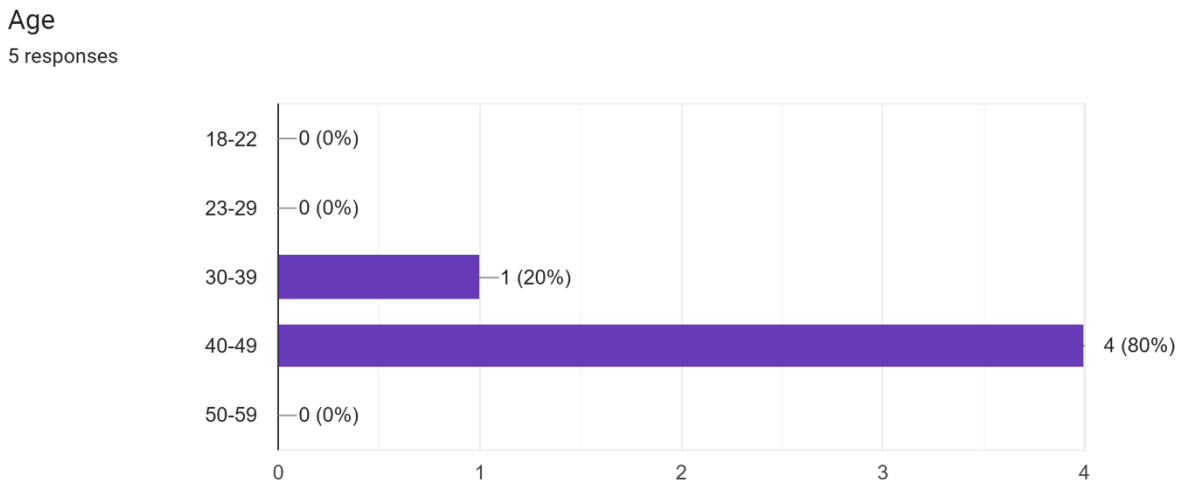
This section collected basic information from the participants to understand their background

and experience level. Questions included:

• Gender

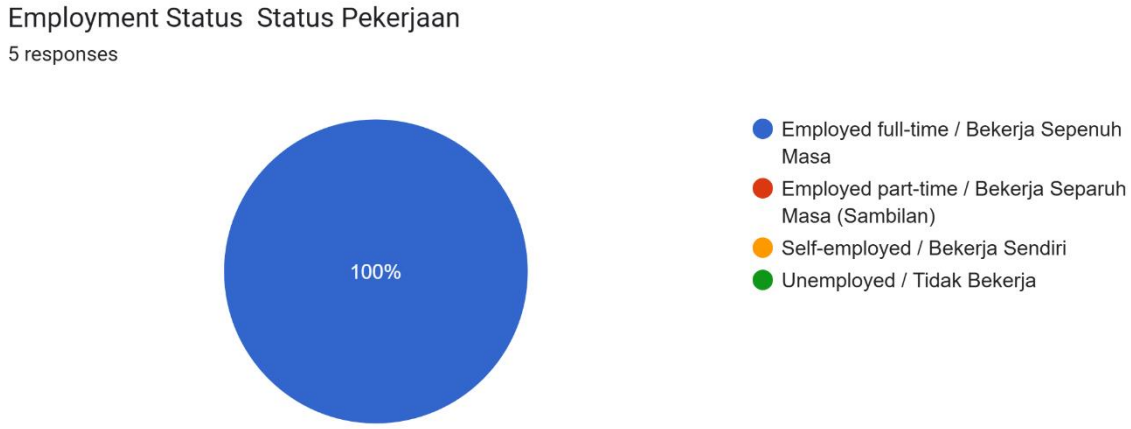


• Age

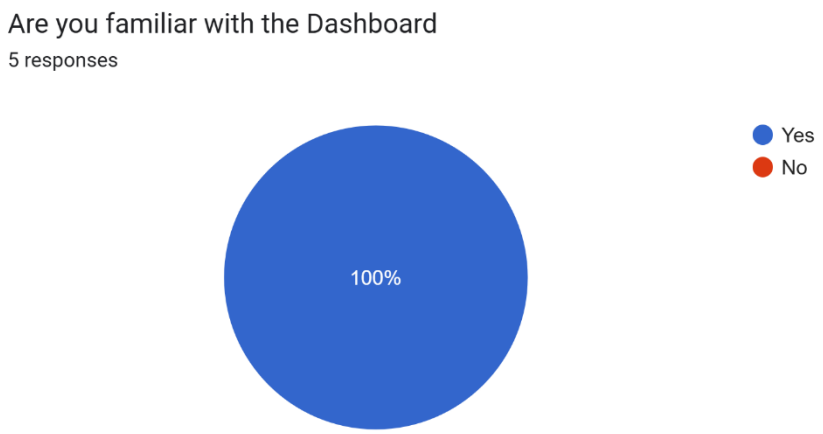


•

Employment Status (e.g., full-time or part-time)



• Familiarity with the dashboard



Section B

NO	Question	Insight	
1	How many 'moderate' Lecturers are in the Cyber Security department for checkout distribution? (overview page)	**How many 'moderate' Lecturers are in the Cyber Security department for checkout distribution?**	**24**
		No. of Respondent	5
		Percentage (%)	**100%**
2	How many lectures were missed in August? (Time Attendance page)	**How many lectures were missed in August?**	**107**
		No. of Respondent	5
		Percentage (%)	**100%**
3	How many leave days are taken for cohort A? (Leave Status Page)	How many leave days are taken for cohort A?	**906**
		No. of Respondent	5
		Percentage (%)	**100%**

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>4</td><td>What type of leave does Dr.Kang Eng use?(Calendar Leave Page)</td><td>
<table>
<tr><td>What type of leave does Dr.Kang Eng use?</td><td>Unpaid</td><td>unpaid</td></tr>
<tr><td>No. of Respondent</td><td>2</td><td>3</td></tr>
<tr><td>Percentage (%)</td><td>40%</td><td>60</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>How many research submissions has the Cybersecurity department reviewed?(Summary Lecturers Insight)</td><td>
<table>
<tr><td>How many research submissions has the Cybersecurity department reviewed</td><td>37</td></tr>
<tr><td>No. of Respondent</td><td>5</td></tr>
<tr><td>Percentage (%)</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>6</td><td>Find the room Ts. Ali Yusny bin Daudin the map (Room Number Page)</td><td>
<table>
<tr><td>Find the room Ts. Ali Yusny bin Daudin the map</td><td>023</td><td>23</td></tr>
<tr><td>No. of Respondent</td><td>2</td><td>3</td></tr>
<tr><td>Percentage (%)</td><td>40%</td><td>60</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>How many senior lecturers in this dashboard? (Biodata General)</td><td>
<table>
<tr><td>How many senior lecturers in this dashboard</td><td>27</td></tr>
<tr><td>No. of Respondent</td><td>5</td></tr>
<tr><td>Percentage (%)</td><td>100%</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Which department does Ts. Dr. Mohamed Ali bin Saip belong to?(Biodata Detailed Page)</td><td>
<table>
<tr><td>Which department does Ts. Dr. Mohamed Ali bin Saip belongs</td><td>CAS</td><td>UUM CAS</td></tr>
<tr><td>No. of Respondent</td><td>3</td><td>2</td></tr>
<tr><td>Percentage (%)</td><td>60%</td><td>40%</td></tr>
</table>
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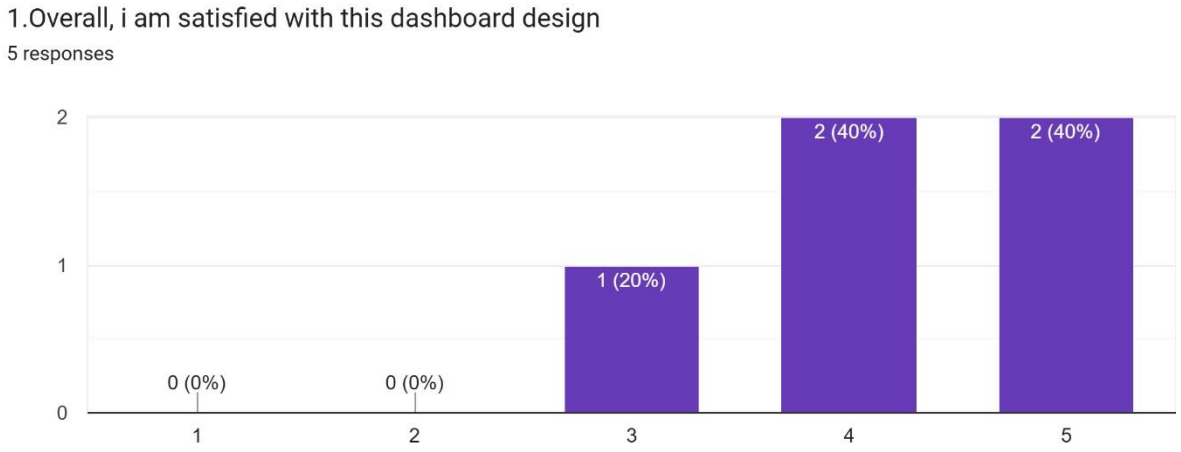
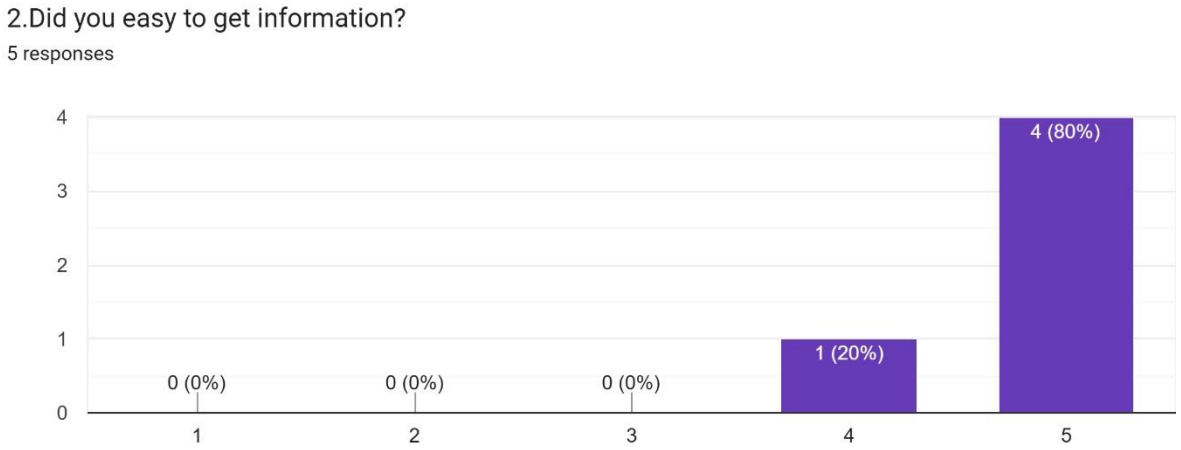
</table>

Section C: Feedback Question



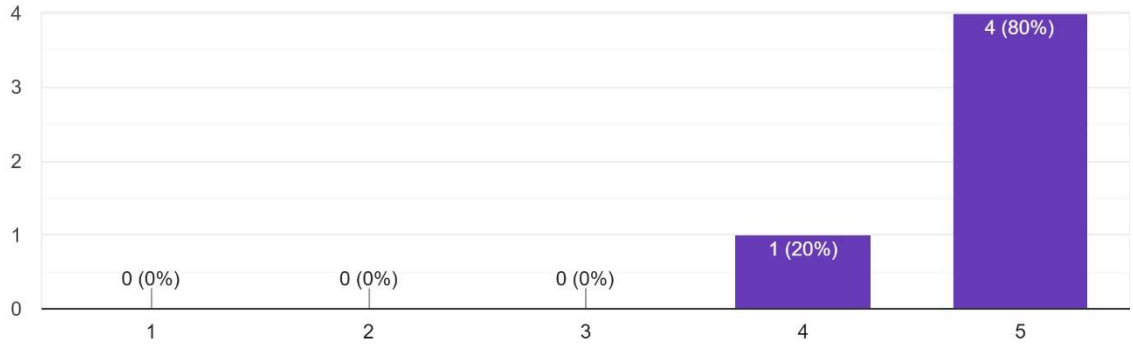
Overall, i am satisfied with this dashboard design	**3**	**4**	**5**
No. of Respondent	1	2	2
Percentage (%)	**20%**	**40%**	**40%**



Did you easy to get information?	**4**	**5**
No. of Respondent	1	4
Percentage (%)	**20%**	**80%**

3. Visual encoding of data is consistent throughout the dashboard.

5 responses



Visual encoding of data is consistent throughout the dashboard.	**4**	**5**
No. of Respondent	1	4
Percentage (%)	**20%**	**80%**

4.In your opinion, how useful is this dashboard for the head of the department

1. Useful because the head of the department can see information about lecturers
2. Very useful
3. Very useful, but needs to change a little bit about the page
4. Very useful
5. It would be useful if the sequence of the pages were arranged appropriately

5.what do you think about this dashboard?

1. use a darker background color. but overall is good
2. Interesting and beneficial
3. basically the dashboard good but can repair about the design to make it more professional
4. interesting
5. The dashboard title does not represent the content and the story line (storytelling) is not smooth

Conclusion

The Employee Availability Dashboard (EAD) has successfully addressed the scheduling and resource management challenges faced by the School of Computing (SOC) by providing a centralized, user-friendly platform for managing lecturer availability, time tracking, leave management, and task allocation. Through its integration of real-time data and predictive analytics, the EAD has significantly enhanced the efficiency of administrative tasks, reduced scheduling conflicts, and facilitated better coordination among faculty and administrators. The User Acceptance Testing (UAT) and feedback collected from lecturers confirmed the dashboard's effectiveness in meeting its objectives, with positive responses regarding its usability, functionality, and overall impact on resource management. Although some areas for improvement were identified, particularly in design and user interface optimization, the system has demonstrated its potential to improve operational efficiency and support data-driven decision-making. The implementation of the EAD represents a significant step towards modernizing scheduling processes within academic institutions, streamlining administrative workflows, and fostering greater collaboration among faculty members. Future updates and refinements, based on user feedback and ongoing evaluation, will further enhance its capabilities and ensure that the dashboard continues to meet the dynamic needs of SOC, ultimately contributing to a more efficient and productive academic environment.

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