Title: Improving IT Systems at Middlesex University through Quality Management

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Section 1 Introduction

The report centres on current issues of Middlesex University IT systems, the focus is on four processes, attendance, learning tool, grading and notifications.

Quality management theories is presented in this project, such as Total Quality Management, Six Sigma, Ishikawa Diagrams and Kaizen (Continuous Improvement), we propose a phased action plan with measurement of priority. The plan consists of redesigning attendance system, MyLearning accessibility, and making the grading format simpler and customising notification. These developments aim to address users' issues, improve how dependable the system is in tracking attendance and user engagement. Implementing these recommendations, Middlesex University will improve user experience, processes, enhance quality of services, this interest stakeholders and assists maintaining brand reputation.

Our role as managers is to improve and apply quality management theories, process business models, address issues and create solutions.

1. Investigate and create business process models for the current and proposed processes (Appendices A and B). List any assumptions that you make.

Section 2 Processes

This examines the current business processes **(Appendices A)** and proposes change **(Appendices B)** for Middlesex University applications (Business Analyst Time, 2024).

2.1 Attendance Process

Current Process: Students check in through GPS, it validates or invalidates their attempt.

Issue found: GPS-tracking is unjust because lecturers can dismiss class early, which results in an incomplete check in. This effects attendance inaccurately, leading to frustration from their behalf and further matters can arise (Celonis, 2024).

Proposed Changes: The solution is to adopt a manual attendance format where lectures call out student names and log their attendance. The student receives a confirmation text on application, notifying their registration.

Benefits: Teacher takes controls, removes dependency on GPS and attendance is confirmed.

Assumptions: Students are physically present in the classroom, lecturers are willing to implement manual attendance, and the system supports confirmation notifications. This

change will require resources to update systems, the cost will be moderate because of system development, assuming Middlesex University has the budget for it.

2.2 My Learning Process

Current Process: Students access My Learning page through clicking a small icon, then a personalised dashboard appears, including studied or current modules.

Issue Identified: Small icons can lead to students overlooking it despite being a valuable resource.

Proposed Changes: To increase size of icon, position central on dashboard so it is easily obtained by students.

Benefits: It saves time finding icon and improves user experience by making resources simpler to use.

Assumptions: Middlesex can manage changing icon size and placement; functionality of other features work the same when it's updated. The change requires minimal finances and can be completed urgently (Simplilearn, 2024).

2.3 Grades and Progression Process

Current Process: Students can view their grades and progression by clicking on the icon, then read grades which is in a number and level format.

Issues Identified: The grading scale can deceive students as they may correlate higher numbers with a better grade, which can affect student's performance over the course of academic year.

Propose Changes: Design a colour-coded grading system where colour corresponds to different grade levels. Numbering system can mislead students, therefore using common terms such as " 2nd year university grades" would make it easier to understand for students.

Benefits: These adjustments provide a clearer understanding of grading results and students recognise their progression.

Assumptions: Colour-coding and text modification is able to be designed; students understand new colour-coding systems. This change will require major development, the cost will be high as back-end development employees must be paid.

2.4 Alert Process

Current Process: MDXApp alert system notifies students about university events.

Issues Identified: Minimal personal information such as assignments deadlines leads to a disengagement from students.

Proposed Changes: Rename to "My Notifications" and include assignment deadline, personal academic updates, and relevant messages to boost engagement.

Benefits: This personalised approach would strengthen student's experience as notifications now are thoughtful and personal.

Assumptions: Middlesex can filter notification for individual profiles and systems for students. Adjustment is needed, a lengthy timeframe to deploy with an excessive cost.

The changes are a manual attendance, improved visibility, enhancing grading comprehension and personalised system to replace general alerts. After implementing the proposed changes, is a regular feedback format that will be introduced to ensure changes align with stakeholder's needs and expectations. (Quantive, 2024).

Designed processes for current and proposed models in **Appendices A and B**.

2. Consider how the quality theory and methods discussed in the CST4310 module could be applied to improve quality. Also consider the amount of effort and timescales involved in making the different quality improvements and the benefits (stakeholder value) likely to be achieved. Evaluate the different available improvements and make recommendations as to which quality improvements to prioritise providing supporting evidence (Appendices C). List any assumptions that you make.

Section 3 Quality Management

Application of Quality Theories and Methods to Improve Quality

By applying relevant quality management theories or methods, Middlesex University IT resources can efficiently target the inefficiencies found in section two. They form the Total Quality Management (TQM) approach, Kaizen (Continuous Improvement), methods such as Six Sigma, Ishikawa Diagrams that prioritises process enhancements and meeting user requirements. This part provides an assessment of these methodologies, their importance in the process and how it improves the student experience.

Analysis of Quality Theories and Methods

3.1 Total Quality Management (TQM):

Application: Total Quality Management is an all-inclusive approach to continuous improvement through decision-making (Oakland, 2014). Redesigning a feature such as MDXApp dashboard, then acquire student feedback can ensure usability improvements that cater to user expectations.

Impact: To increase student satisfaction and improve access to timetables and materials.

3.2 Kaizen (Continuous Improvement)

Application: Conduct orderly reviews of the MyLearning dashboard and attendance system for continual improvement (Imai, 1986). For example, changes such as scaling up icons or support for grading can be done in steps rather than all at once to reduce adoption friction.
Impact: Incremental improvement of user engagement by proactively solving user issues.

3.3 Six Sigma

Application: Six Sigma defines a five-phase approach, DMAIC (Define, Measure, Analyse, Improve and Control) for achieving process improvement and error reduction (Gygi et al. 2012), similarly, to grading or attendance tracking.
Impact: This method combines the way services are provided which increases the reliability of the operation and builds user confidence.

3.4 Ishikawa Diagram (Cause-and-Effect Analysis)

Application: Decide the root causes of any inefficiencies like delays in service during peak traffic or failure to log on (Ishikawa, 1986). Analysing server problems can help in developing solutions for load balancing.
Impact: Root-cause analysis allows for targeted interventions, leading to maximise performance and reliability from the overall system. However, the effort, timescales, benefits analysis including prioritisation and recommendations as well the assumptions are depicted in **Appendices C**.

3. What steps would you recommend that the organisation should consider adopting and why? In what order should these steps be taken? Create a plan and provide supporting evidence to justify your plan (Appendix D and Main Body).

Section 4: Recommended Steps and Scope of Plan

We propose a phased action plan to improve the user experience and system efficiency of Middlesex University IT resources. It recognises short and long-term reforms to rectify fundamental deficiencies with the attendance system, MyLearning, grading and progression, notifications system. These recommendations are based on the usability, accuracy, and engagement of stakeholder (students, lecturers, and administrators) satisfaction.

Steps to Adopt and Their Rationale

4.1 Attendance System Improvements

Action: Introducing a manual attendance system that will be orchestrated by lecturers instead of GPS-based tracking. For students, attendance is registered via the MDXApp, and confirmations text is sent.
Rationale: GPS related mistakes are common such as early departure from class or student can face technical glitch. It saves time manually and gives the lecturers control over the records of attendance and makes sure that nothing is lost.

Priority: High - Attendance affects the academic and electronic systems in which students are graded and recorded.

Effort: Moderate - Modification needed to set up notification and training provided for lecturers.

Timeframe: 3 months

Supporting Evidence: Research shows that physical attendance systems provide powerful tools for confirmation (Oakland, 2014).

4.2. Improve MyLearning Accessibility

Action: MyLearning icon being redesigned, resized, and repositioned on the MDXApp dashboard for greater visibility.
Rationale: The tiny icon is easily overlooked by students, which leads to delays in accessing essential learning materials. When the process is more enjoyable and simpler, being satisfied is likely.
Priority: High - MyLearning is a key academic tool, making it more accessible helps all users instantly.

Effort: Low - Involves fundamental UI/UX changes with minimal technical complexity.

Timeframe: 2 weeks

Supporting Evidence: Students regularly show that the icon does not stand out (Imai, 1986).

4.3 Simplify Grading and Progression System

Action: Colour-coded grading system, description instead of numeric levels (e.g., 2nd Year University Results).

Rationale: Numeric grading scales have never been appropriately used, because students falsely assume that higher numbers equate to better performance. Descriptive terms with colour-coding, helps users understand progress in grades.

Priority: High - The misinterpretation of the grades can influence on students' academic planning and self-esteem.

Effort: High - Dependent on back-end development for visuals and change grading system.

Timeframe: 4 months

Supporting Evidence: Understanding how simplified grading systems work reduces the anxieties of students (Gygi et al. 2012).

4.4 Personalize Notifications System

Action: Change name to My Notifications and personalise notifications about assignment deadlines, academic updates, and course-specific information.
Rationale: Generic announcements about university happenings only slightly interest students. It increases relevance and usefulness through personalisation.

Priority: Medium - This is moderately important however not at the severity of attendance and grading systems.

Effort: Moderate - System equipment needing upgrading, to filter and distribute notifications accordingly.

Timeframe: 7 months

Supporting Evidence: However, implementing the same technology is not enough – having personalised communication is needed to increase user attention and satisfaction rate (Ishikawa 1986).

4.5 Order of Implementation

1. **Attendance System Improvements:** High priority due to its direct impact on students' academic experience.
2. **Improve MyLearning Accessibility:** Enhancing MyLearning Accessibility — passes the quick-fix test. Improves user experience instantly.
3. **Simplify Grading and Progression System:** Minimises uncertainty, leading to positive clarification.

4. **Personalize Notifications System:** A modification to increase the long-term engagement and satisfaction of the user.

See the proposed Plan Summary in **(Appendices D).**

4.6 Monitoring and Risk Mitigation

Monitoring Improvements: Use student surveys and feedback after each phase to gauge satisfaction. Evaluate system performance using indicators like statistics and failure rates.

Risk Mitigation: Avoid disruption, install updates when traffic is low. Train and support users for a smooth transition.

Section 5 Conclusion

The report points out areas for improvement within Middlesex University IT system, focusing on processes that affect user experience. By using quality management theories, we proposed a phased action plan prioritising user needs and delivering solutions.

5.1 The Current Issues

Students currently face challenges with attendance tracking, understanding grading format, unnecessary notification and accessing learning materials.

Inconsistent GPS-based attendance, a small icon that is hard to find named MyLearning, grading scale confusion leads to frustrations and can hinder academic progression. Generic alerts with little value led to students not engaging.

5.2 Solution

We have recommended Middlesex University for a four-step plan to satisfy stakeholders, all going under improvements whilst considering implementation effort and timescales.

Accurate Attendance Tracking: Remove GPS tracking and replace it with a manual system managed by lecturers. Students receive confirmation notifications through application, this leads to correct recorded attendance and ends users' complaints.

Easier Access to Learning Materials: Redesign and centralise icon on dashboard for better visibility. Students can access essential resources quickly, saving time and minimising confusion.

Understanding of Grading: Introduce colouring system with descriptive terms such as “Second Year University Results” to replace numeric scales. This reduces confusion around grades, students now can be aware of their results.

Engagement in Notification: Rename to “My Notifications,” instantly gives it a personal feel then deliver key reminders including assignment deadlines and relevant academic information. This increases relevance and purpose of service and will boost student engagement.

5.3 Guidelines

This plan is implemented in phases, with each step checked through student feedback and system performance metrics. Communicating will be regular and user training will be provided for smooth transitions. Focus on high impact changes will be a priority such as attendance tracking followed by the rest of processes.

5.4 Benefits

These strategic decisions address current issues, improve readability and stakeholder satisfaction.

Academic Understanding: Accurate attendance records and clear grading style helps students to track and achieve their academic goals rather than misinterpreting.

Enhanced User Experience: Easier access to learning materials and notifications being reduced just to personal updates helps users feel alerted and appreciated.

Engagement Increased: Students can become invested in their studies due to the new user-friendly style and informative system.

Processes: Manual attendance tracking and improved system design can direct to contentment from users.

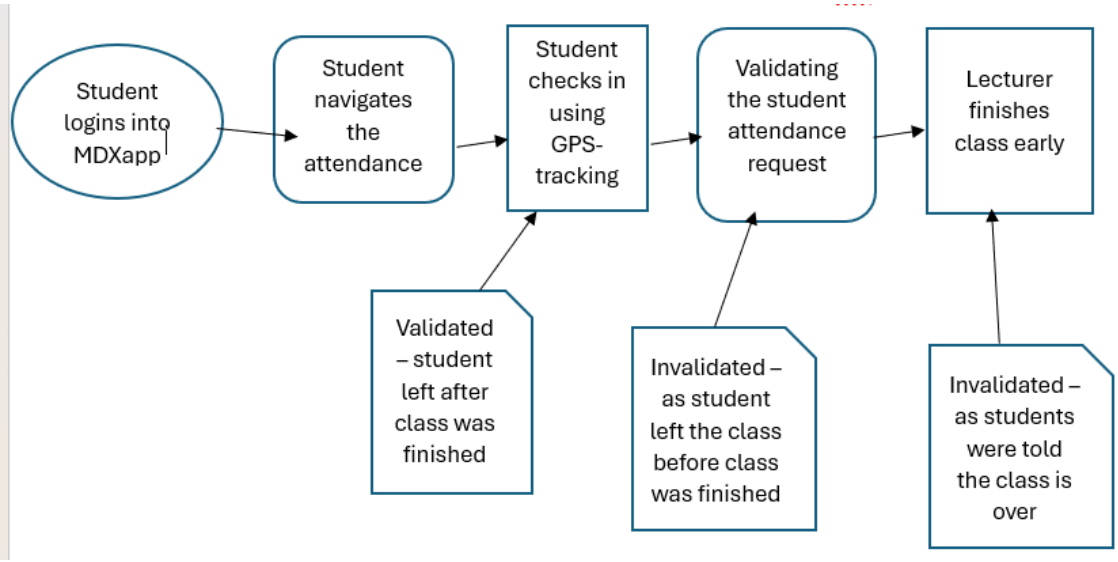
5.5 Discussion

By implementing these recommendations, Middlesex University highlights their commitment to improve. The new IT systems empower students, enhances learning experiences and scales university reputation positively.

Appendix A should show the current processes. There should be a brief explanation of the proposed changes showing which sub-processes the proposed changes would affect.

Current Process 1: Attendance System

This is a step-by-step walkthrough of how Middlesex University runs their attendance system.

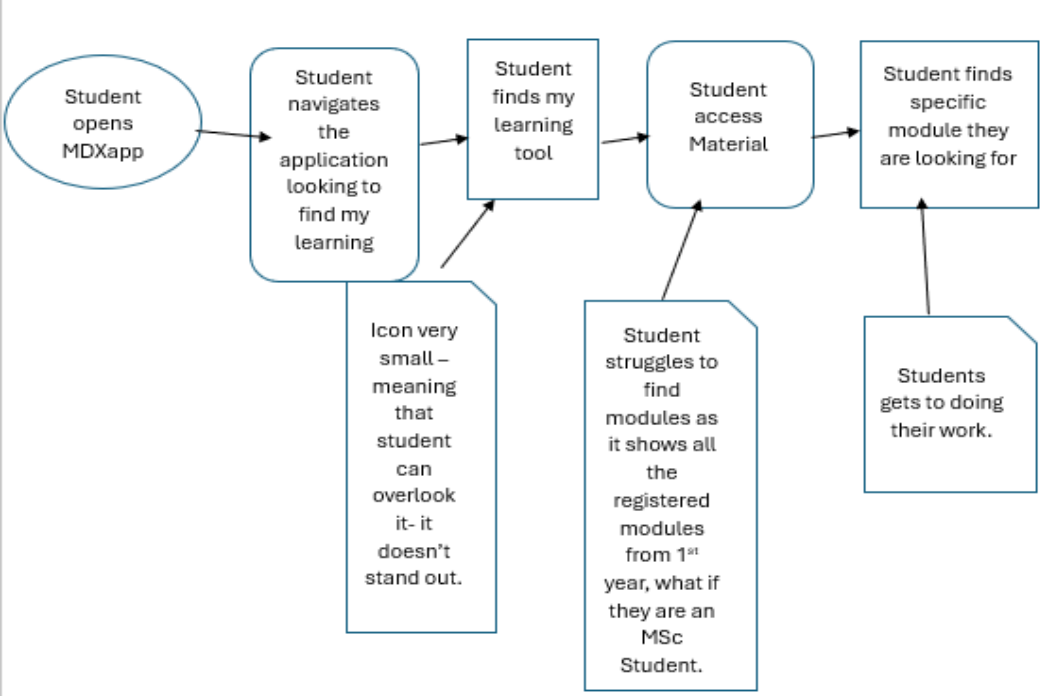


The current process of Middlesex attendance uses a GPS tracking of students, which has a lot of inconsistencies as the lecturer can decide to dismiss class earlier than expected, the students have no choice to leave the room which can invalidate their attendance.

The proposed changes include a flexible attendance system that lecturers have control, to which they call out names and they manually sign in students, then students get a confirmation notification saying they have signed in, this ensures correct attendance keeping and prevents invalidation.

Current Process 2: My Learning

This is a step-by-step walkthrough of how Middlesex University operate their learning system.

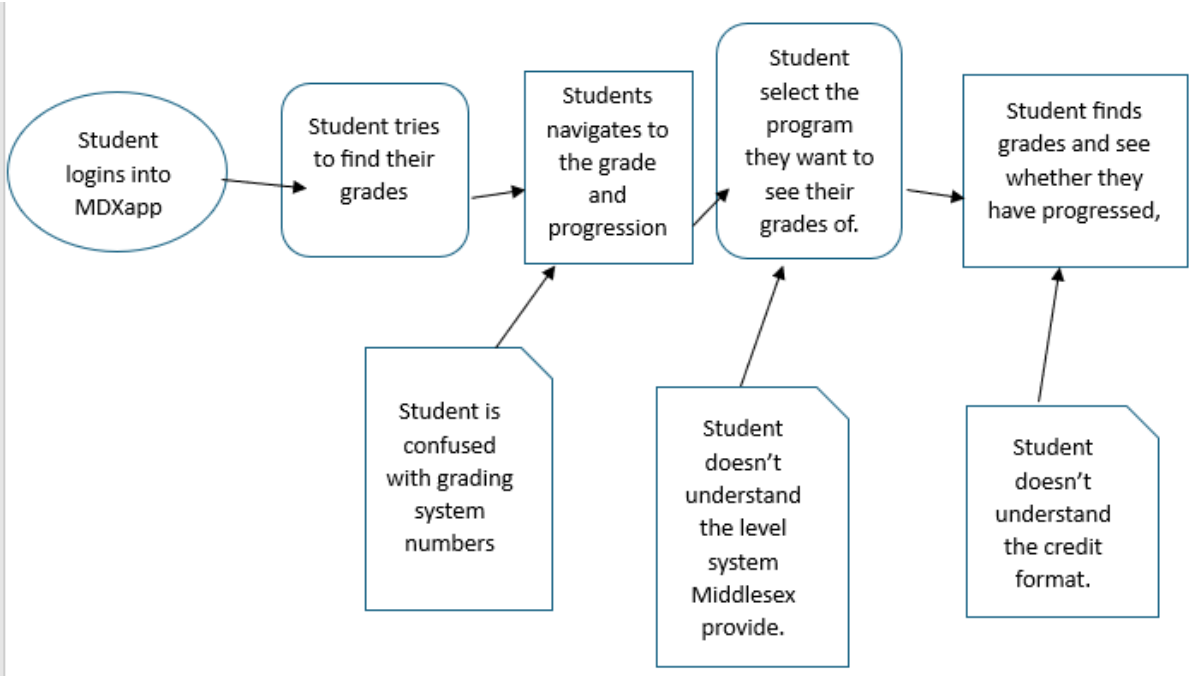


The current process is clicking on the small icon "My Learning," then a dashboard will appear of all modules currently or previously studied. Students can overlook the icon despite it being one of the most important tools for academics.

The proposed changes include increasing the size of the MyLearning icon, position central to ensure students can access any learning materials easier and reduces wasted time.

Current Process 3: Grades and Progression

This is a step-by-step walkthrough of how Middlesex University uses their grading and progression system.

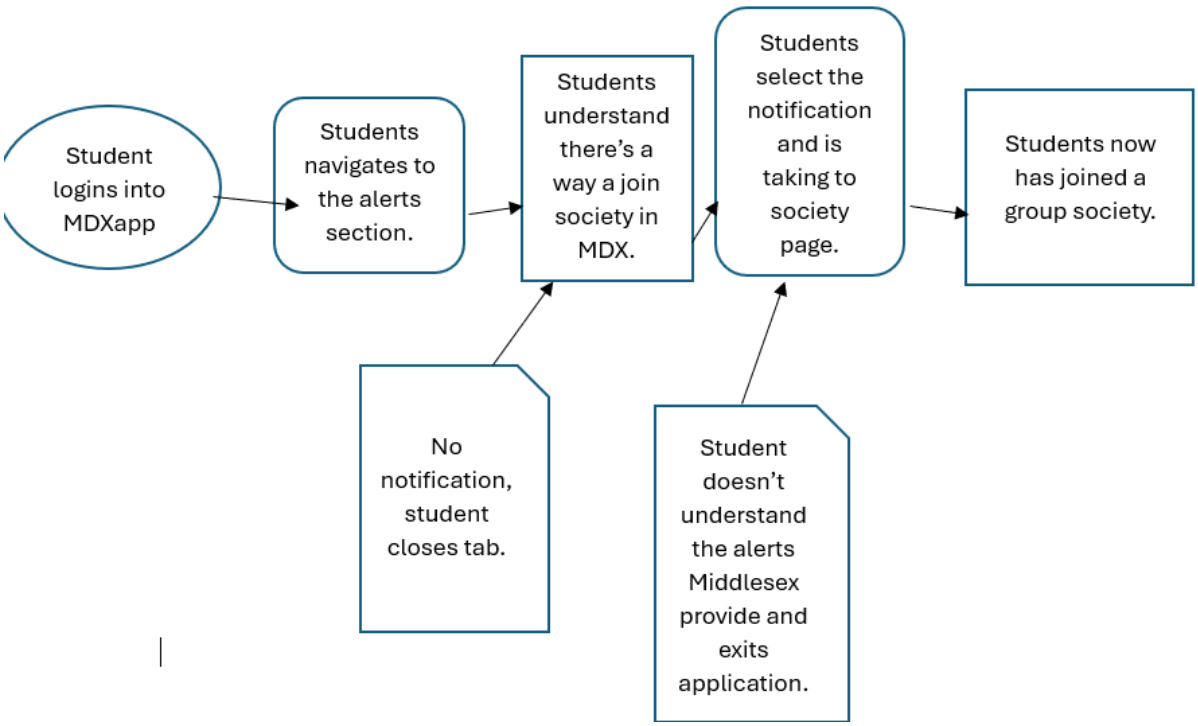


The current process with the grades and progression icon is to allow students to view their progression, however the icon similarly is small, reducing the chance of finding it. Also, numbering grading system can mislead users because higher number can be associated with getting the best grades, but in Middlesex University high numbers means lower final grade.

Therefore, changing the numbering systems to a description, students are more likely to understand "2nd year university results" rather than level 5.

Current Process 4: Alerts

This is a step-by-step walkthrough of how Middlesex University works their alert notification system.

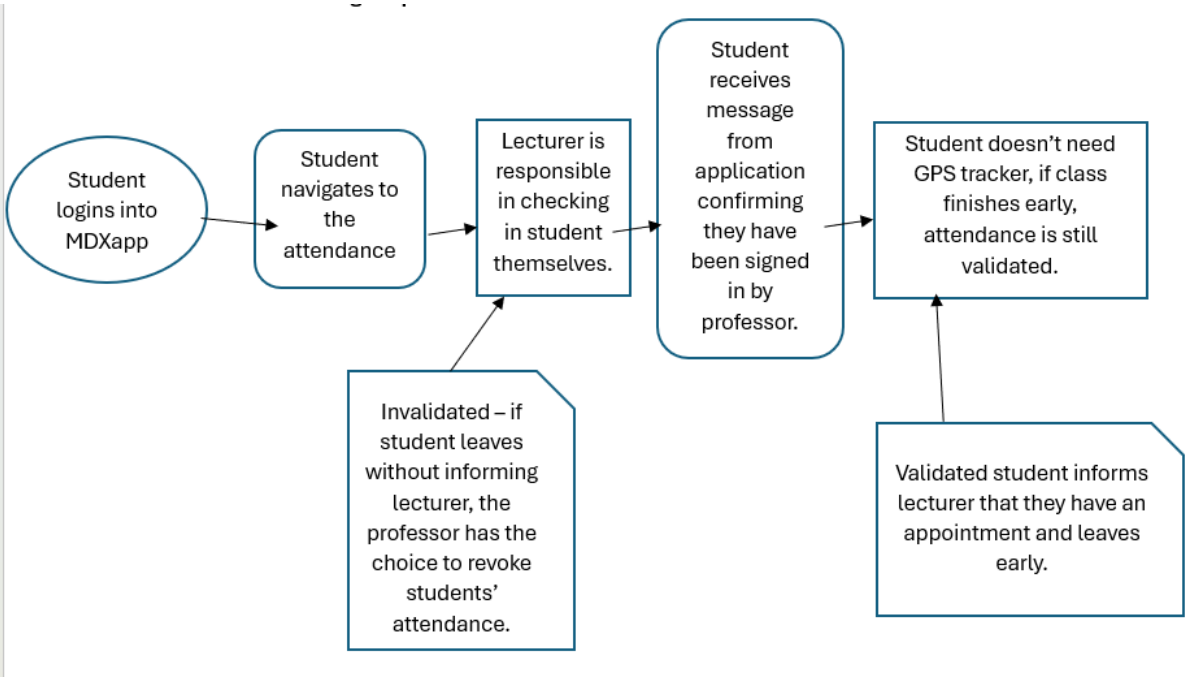


The alert process for MDXApp currently provide generic university events rather than private messages, students are informed about general information.

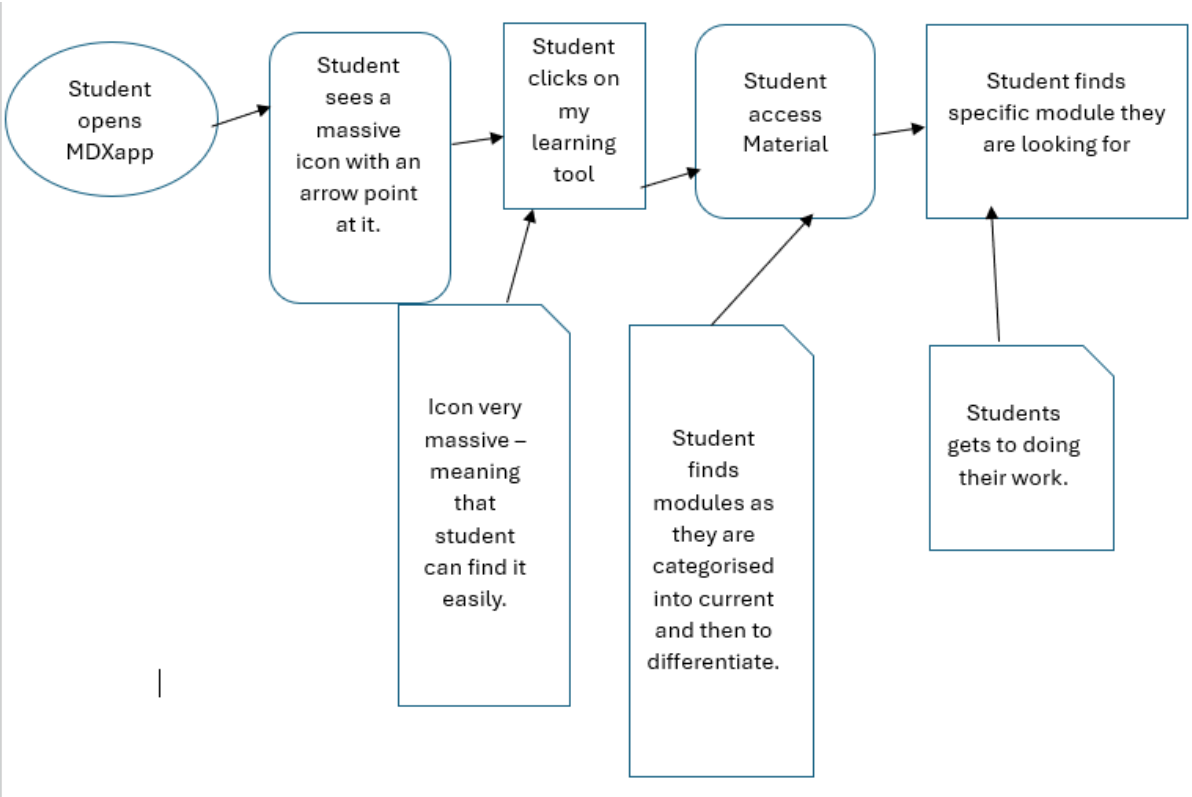
A proposed change includes changing the name to “My notification”, this highlights that it's for the user. Informing students about when their upcoming deadline is much more important, rather than how they can attend a social event can help bring more users to use this feature.

Appendix B Proposed Changes

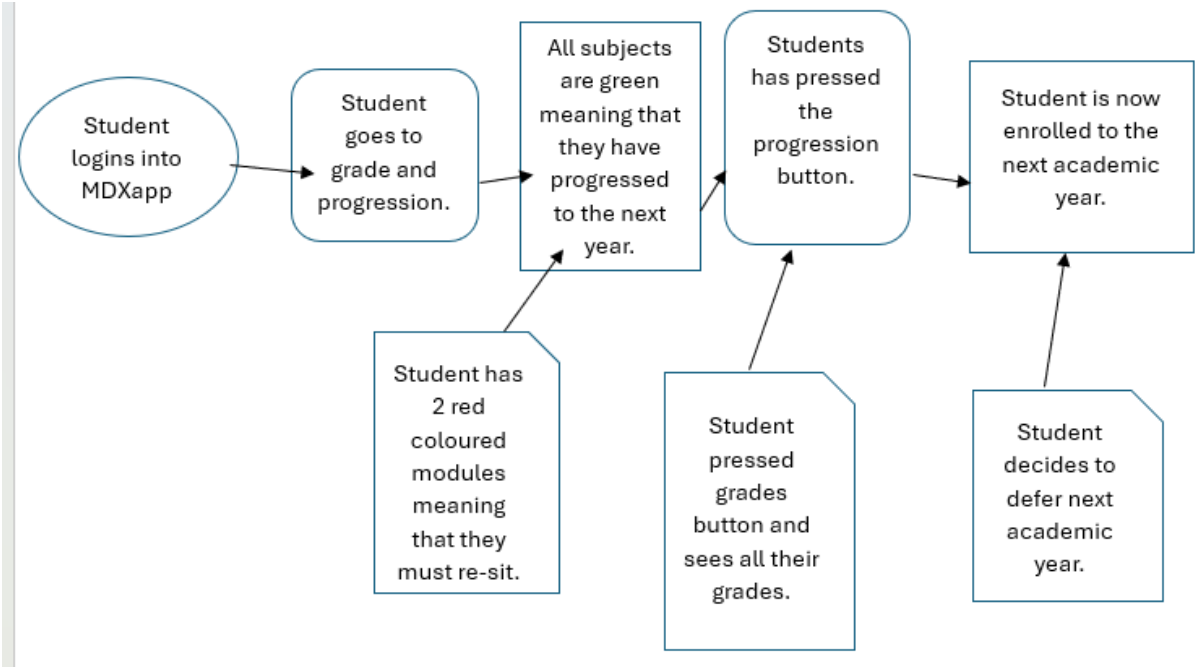
Proposed Change 1: Attendance System



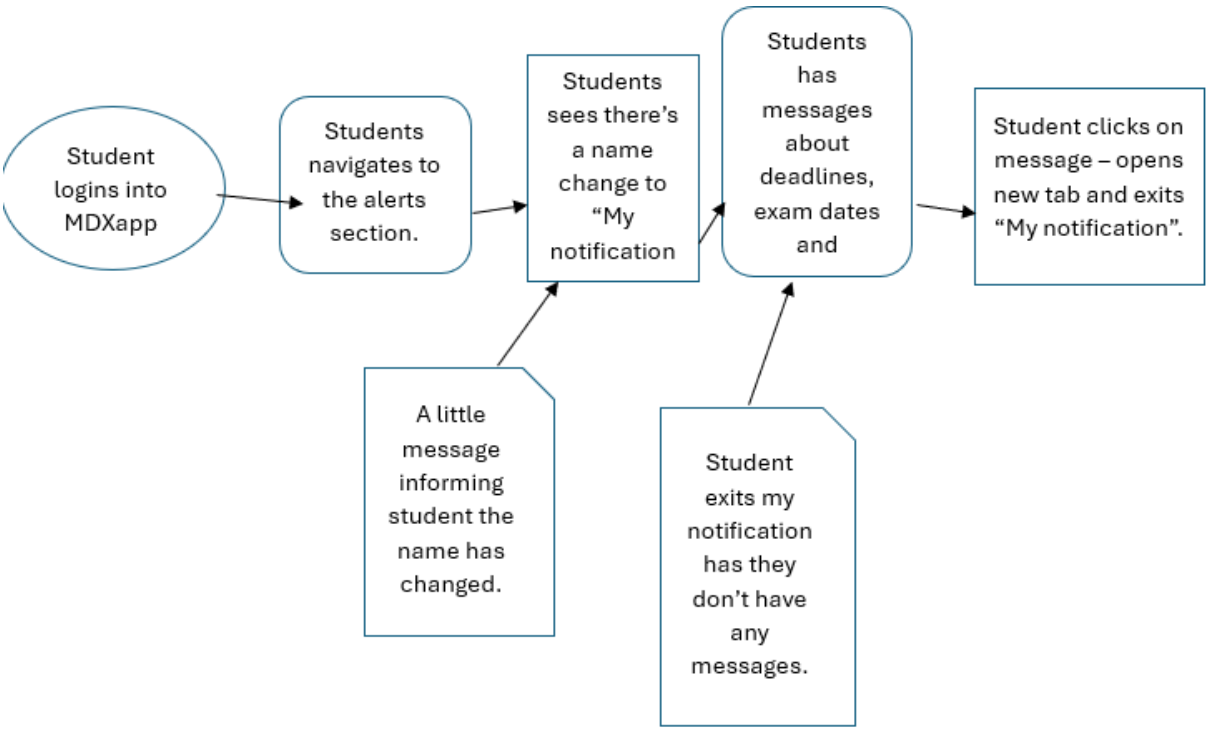
Proposed Change 2: My Learning



Proposed Changes 3: Grades and Progression



Proposed Changes 4: Alerts



Appendix C should show the quality improvements that you have considered. It should also recommend at least four quality improvements for implementation (based on the amount of effort to introduce them, the timescales required for the improvements to occur and the resulting benefits and issues).

Effort, Timescales, and Benefits

Effort and Time Scale Analysis: Each improvement requires varying levels of effort and time for implementation:

Improvements	**Effort Required**	**Timescale**	**Benefits**
Attendance System	Moderate	3 months	Improved accuracy in attendance tracking, reducing administrative errors and students are happier (Gygi et al. 2012).
MyLearning Accessibility	Low	2 weeks	Faster access to learning materials, enhancing user satisfaction, and reduces complaints (Oakland, 2014).
Grading System Simplification	High	4 months	Clearer academic performance communication, reducing confusion and enabling better planning (Imai, 1986).
Notification Personalization	High	7 months	Improved engagement through personalised alerts tailored to individual's needs (Ishikawa 1986).

Prioritization and Recommendations

This is the priority table, with its reasoning and improvements.

Priority	Improvement	Reasoning	Supporting Evidence
Priority 1	Attendance System Improvements	Attendance records are essential for staying on track academically. GPS- based inaccuracies need addressing.	Research shows manual validation minimises errors(Oakland,2014)
Priority 2	My learning Accessibility	Accessibility issues impede academic activity. Having materials front and centre is critical.	Visibility and access are key elements in user-centred design principles (Imai,1986).
Priority 3	Grading and Progression System Simplification	Misunderstandings of grading systems can affect educational results. Simplifying formats reduces ambiguity.	Simplified grading formats help promote clarity and reduce student anxiety(Gygi et al, 2012).
Priority 4	Notification Personalization	Personalised notifications increase relevance but are not essential due to existing general channels.	Gradual system modification enhances engagement without major disruptions(Ishikawa,1986).

Assumptions

- Having stakeholders (students, staff, administrators) willing to use new processes and systems.
- Middlesex University's department has the ability and resources to make the recommended changes explained above.
- These stages are adequately budgeted and timed.

Quality Improvements and Recommendations

Four major enhancements to the quality of Middlesex University's IT systems are listed in this appendix. Every enhancement is evaluated according to the amount of work needed, the expected timelines, the possible advantages, and the potential problems.

See next page for table of recommendations and improvements for Middlesex University to implement.

Quality Improvement	Effort Required	Timescale	Benefit	Potential Issues
1.Attendance System Improvement	Moderate	3 months	-Accurate attendance records. -Reduced dependency on unreliable GPS tracking. -Enhanced user satisfaction.	-Training lecturers on manual attendance processes. -Modifying the app to send confirmation notifications.
2.MyLearning Accessibility	Low	2 weeks	-Improved access to academic materials. -Reduced frustration for students. -Quicker navigation.	-Minimal technical complexity, UI/UX design updates.
3. Grading and Progression Simplification	High	4 months	-Reduced confusion in grade interpretation. -Enhanced academic planning and confidence among students. -Greater user engagement.	-Requires substantial back- end development for colour-coded grades and descriptive labels.
4. Personalized Notification System	Moderate	7 months	-Tailored updates for students, improves relevance.	-Complex system upgrade to enable personalized notifications. -High development cost.

Summary

- These improvements aim to address critical user concerns, enhance system reliability, and increase stakeholder satisfaction.
- Prioritisation follows the principles of stakeholder impact and technical feasibility.
- Each improvement includes considerations for implementation effort and timescales, ensuring a structured approach to execution.

Appendix D should show your proposed plan of action to improve quality within the business processes.

Proposed Plan of Action to Improve Quality Within Business Processes

Step	Action	Effort Required	Timeframe	Benefits	Potential Issues
Step 1 Attendance System Improvement	Replace GPS-based attendance tracking with a manual system managed by lectures. Students will receive confirmation notification via MDXApp.	Moderate	3 months	**-**Ensure correct attendance records. -Reduces dependency on unreliable GPS technology. -Enhances students and lecturers' satisfaction**.**	-Lecturer training may require extra coordination. -Development time for application modifications could delay rollout.
Step 2 Improve MyLearning Accessibility	Redesign the MyLearning icon to increase its size and reposition it centrally on the MDXApp dashboard.	Low	3 weeks	-Improve access to essential academic materials. -Enhances user experience by reducing frustration.	**-**Minor risk of system bugs during deployment. -Ensuring icon design is suitable.
Step 3 Simplify Grading and Progression System	Introduce a color-coded grading system with descriptive terms e.g. second year grades to replace numeric scales.	High	4 months	-Reduces confusion around grading scales -Enhances academic planning. -Improve students' engagement and satisfaction.	-Some students preferring the old system and styling, are not satisfied with colour coded grading style.
Step 4 Personalize Notifications System	-Replace generic Alerts with My Notification to include personalised updates such as assignment deadlines and academic news.	Moderate	7 months	-Increases relevance and utility of notifications for students. -Enhances engagement with the MDX app.	-High development cost. -Complex system upgrades may require added testing.

The IT systems at Middlesex University will be upgraded incrementally by setting risk-adjusted improvement priorities. In order to provide instant benefits, the emphasis is on resolving the most urgent user issues that can be managed efficiently and effectively with little time or money.

Prioritization and Order of Implementation

This is a step-by-step order of doing each task with it being ranked to its importance.

Priority	Step	Reason for priority
1	Attendance System Improvement	High impact on academic outcomes and resolves major user frustrations.
2	Improve MyLearning Accessibility	Low effort and immediate improvement to user experience.
3	Simplify Grading and Progression System	Addresses key academic challenges, improving clarity and planning for students.
4	Personalize Notification System	Adds long-term value by increasing user engagement and satisfaction

First, the attendance system will be enhanced to guarantee accuracy and dependability. Next, the MyLearning dashboard will be redesigned to make it more accessible. The next step is to streamline the grading system in order to improve user experience and minimise misunderstandings. Finally, the notification system has been improved to offer customised academic updates. This process addresses complex adjustments whilst highlighting the potential success when executed.

Monitoring and Risk Mitigation

This is the table for how the process will be monitored and avoid potential risks.

Monitoring Improvement	Risk Mitigation
-Conduct student surveys to assess satisfaction after each phase.	-Schedule update during off-peak hours to minimise disruption.
-Track system performance metrics such as app adoption rates and errors rate.	-Provide user training and clear communication to ensure a smooth transition.

To assess progress, system performance indicators and feedback questionnaires are used for ongoing monitoring. Updating at off-peak hours and providing training ensure smooth adoption and reduce potential risks like user resistance or system outages. These tactics guarantee that the suggested enhancements will be implemented successfully while preserving operational effectiveness.

Cost Benefit Analysis

This is the table depicting the cost of the project.

Improvements of IT systems	**Cost Per Employee**	**Quantity**	**Total Cost**	**Job Role**
Attendance System	£500	6	£3000	Developers and Testers
My Learning	£250	4	£1000	UI/UX Designers
Grades and Progression	£1000	5	£5000	Back-end Developers
Notification System.	£1500	4	£6000	System Administrators, Developers

The total cost for the IT system improvements is £16,000, this investment is worthy for Middlesex University as it can lead to benefits such as improved student satisfaction and an increased number of active users on MDXApp. Whilst it is costly, there are several long-term competitive advantages for Middlesex University to follow through and complete this project.

Harvard Reference

Business Analyst Times. (2024). Overcoming 3 familiar challenges of business process modelling. Available from: https://www.batimes.com/articles/overcoming-3-common-challenges-of-business-process-modelling [Accessed 25th November 2024].

Celonis. (2024). Using business process management to transform your business. Available from: https://www.celonis.com/blog/using-business-process-management-to-transform-your-business [Accessed 29th November 2024].

Indeed. (2024). Business planning process: Definition and examples. Available from: https://uk.indeed.com/career-advice/career-development/business-planning-process [Accessed 5th December 2024].

International Institute of Business Analysis. (2014). Why model business processes? Available from: https://www.iiba.org/professional-development/knowledge-centre/articles/why-model-business-processes/ [Accessed 27th November 2024].

Quantive. (2024). What is a business strategy? Available from: https://quantive.com/resources/articles/business-strategy [Accessed 23rd November 2024].

Simplilearn. (2024). Business planning: Definition, process, and types. Available from: https://www.simplilearn.com/business-planning-article [Accessed 21st November 2024].

Okland, J. (2014). *Total Quality Management and Operational Excellence: Text with Case*. [online] Available at: https://www.researchgate.net/publication/297362881_Total_Quality_Management_and_Operational_Excellence_Text_with_Case [Accessed 9 Dec. 2024].

Imai, M. (1986). *Kaizen: The Key to Japan's Competitive Success*. [online] Available at: https://onlinesciencepublishing.com/index.php/ajce/article/download/351/976?inline=1 [Accessed 9 Dec. 2024].

Gygi, C., Williams, J., & K. Leung, J. (2012). *Utilizing Lean Six Sigma Model for Managing Projects in the Oil and Gas Pipeline Industry: A Case Study of Selected Companies in Lagos State, Nigeria*. [pdf] Available at: https://osuva.uwasa.fi/bitstream/handle/10024/12305/Utilizing%20Lean%20Six%20Sigma%20Model%20for%20Managing%20Projects%20in%20the%20Oil%20and%20Gas%20Pipeline%20Industry%20A%20Case%20Study%20of%20Selected%20Companies%20in%20Lagos%20State,%20Nigeria.pdf?sequence=2 [Accessed 9 Dec. 2024].

Investopedia (2023), *Ishikawa Diagram*, Available at: https://www.investopedia.com/terms/i/ishikawa-diagram.asp [Accessed 9 Dec. 2024].