IS 636: Structured System Analysis and Design

Deliverable 4 : Systems Proposal

Project Title: Enhanced Course Enrollment and Notification System

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1. **Systems Proposal:**

The proposed solution for the "Enhanced Course Enrollment and Notification System" is intended to transform the way students and staff interact with course registration and receive critical information. This project aims to redesign the current enrollment process into a more streamlined and intuitive experience, thereby enhancing the overall educational journey at UMBC. By integrating automated notifications and user-friendly features, this system aligns with UMBC's strategic objectives to elevate student engagement, enhance academic services, and improve administrative efficiency, demonstrating the institution's dedication to leveraging technology for a better academic environment.

Overview of the proposed Solution:

The goal of UMBC's Enhanced Course Enrollment and Notification System is to improve the efficiency, transparency, and user engagement of the enrollment procedures by implementing cutting-edge technological solutions. The automated features of this system will take the place of antiquated manual procedures and meet the changing demands of UMBC's varied student body and administrative staff. In order to enhance academic planning and administrative operations, strategic goals will direct the system's integration into UMBC's current infrastructure.

2. **Key features:**

Automated Waitlist Management: This feature lowers administrative costs and increases accuracy by automatically monitoring waitlist statuses and alerting students when spots become available.
Cross-Departmental Registration: This makes it easier for students to register by facilitating smooth registration between departments with integrated permit processing and requirement checks.
Real-time Notifications: Via the students' preferred communication channels, students receive timely and customized notifications on waitlist status, course enrollments, and drops.
User Dashboard: Improving the openness and accessibility of the enrollment process, this platform gives students a single location to manage their courses, monitor their current enrollment status, and obtain waitlist information.

Impact on Organizations:
Because the UMBC Enhanced Course Enrollment and Notification System automates enrollment procedures, minimizes administrative errors, and reduces workload, it will greatly increase operational efficiency. By making courses easier to access and offering real-time changes, this system improves transparency and student happiness, which in turn improves the academic environment. From a strategic standpoint, this enhances UMBC's competitive advantage and reputation by positioning it as a pioneer in the use of cutting-edge instructional technologies. Furthermore, the system's scalability guarantees that it can accommodate future expansion, and its adherence to data protection laws safeguards student information, bolstering UMBC's dedication to security and privacy.

3. **Organizational Benefits:**

Improved Student Satisfaction: It is anticipated that the system would result in increased levels of student involvement and satisfaction by making the enrolling process more transparent and easy.
Enhanced Administrative Efficiency: Hand labor and administrative workload will be greatly reduced by automating regular operations like course registration and waitlist management.
Improved Data correctness: The system guarantees the correctness and dependability of enrollment data through automated processes and real-time updates, which is essential for efficient academic planning and resource allocation.
Scalability and Flexibility: Designed to grow with the number of students and program offerings in the future without compromising performance, guaranteeing that the system can eventually adjust to changing needs.
Assistance in Making Strategic Decisions: Improved data gathering and reporting features will give admins useful information on patterns and trends in enrollment, enabling better decision-making.

4. **Feasibility Analysis:**

Description: The Enhanced Course Enrollment and Notification System incorporates cross-departmental registration, automated waitlist management, and real-time notifications in an effort to enhance UMBC's present enrollment procedure. The system will make use of the current IT infrastructure, concentrating on internal development and possibly integrating outside technologies as needed.

Development and Description:

1. System Architecture and Design: For smooth integration, a thorough system architecture and design are necessary.

2. Software Development: The main functionalities of the system will be developed via agile software development.

3. Testing and Quality Assurance: Extensive testing together with QA will confirm functionality and performance.

4. Phased Rollout and Training: To guarantee gradual adoption and continuous support, a phased rollout in conjunction with training is necessary**.**

5. **Economic feasibility Analysis:**

Costs:

Development expenditures: Between $100,000 to $150,000 is the approximate range of initial expenditures for software development, testing, and implementation. This covers the price of developing internally, integrating current systems, and, if necessary, using outside vendor services.
Maintenance Costs: It is estimated that recurring annual expenses for technical support, updates, and system maintenance will come to about $25,000. These will pay for regular software upgrades, server maintenance, and customer assistance.
Training Expenses: Creating training materials, setting up workshops, and offering assistance during the transition will all be covered by training costs. The projected cost of this is between $10,000 and $15,000**.**

Benefits:

Enhanced Efficiency: By automating manual processes related to course enrollment, the system will lessen the administrative burden, which will eventually result in significant labor savings.
Enhanced Data Accuracy: Automation will improve data accuracy, which will improve academic preparation and lower the likelihood of mistakes that could endanger students or faculty.
Improved Student Experience: Giving students more control over how they enroll will boost their happiness and may lead to higher academic results, which will lessen the need for more administrative help**.**
Flexibility and Scalability: The system's scalable architecture will allow it to accommodate expanding student enrollment and changing course offerings without the need for significant system modifications, saving money over time.

Intangible Benefits:

Enhanced Reputation: By implementing cutting-edge technology, UMBC will strengthen its standing as a progressive university and maybe draw in additional instructors and students.
Improved Decision Making: The system's improved data collecting and reporting features will help with academic planning and course offerings, which will improve decision-making and result in more efficient resource allocation.

Uncertainty and Risks:

Cost Overruns: Unexpected technical problems could drive up the price of development. Phased development and strict project management are two ways to reduce these hazards.
Adoption Risks: If students or staff oppose embracing the new system, its benefits may not be fully realized. Comprehensive training and clear communication will help to increase adoption.
Regulatory Shifts: Modifications to educational standards or data privacy laws may have an effect on how the system is designed or put into use. It will be easier to foresee changes and adjust to them if you keep up with rules.

6. **Technical Feasibility Analysis:**

Required Technologies :
Database Systems: To efficiently store and retrieve enrollment data, the system will be dependent on strong database management. To guarantee data consistency, this involves integration with already-existing student databases.
API Development and Integration Tools: These will be necessary to provide smooth data interchange between the new system and the current infrastructure.
User Interface: Web-based interfaces that are responsive and provide an easy-to-use experience for administrators, staff, and students are necessary for the system. These interfaces should be designed utilizing contemporary frameworks.
Notification Systems: In order to integrate real-time alerts with communication channels, specific tools must be able to manage various message systems, such as SMS and email.

Technical Expertise:

Internal Skills: The majority of the development and implementation may be handled internally by UMBC's IT personnel because they have the knowledge and experience required for database administration, software development, and system integration.
Specialist talents: Certain parts may call for specialist talents that can be obtained through outside consulting or training, such as high-level API integration or advanced notification system development.

Compatibility:

Current Systems: To guarantee data consistency and a cohesive user experience, the new system must be seamlessly integrated with UMBC's existing systems, including learning management systems and the student information system.
Scalability: The system architecture shouldn't need to be significantly altered in order to accommodate future expansion, such as an increase in the number of students enrolled or modifications to the course structure.

Risks and Challenges:

Integration Complexity: There may be technological difficulties while integrating the new system with the current UMBC systems. Careful planning and testing will be necessary to guarantee a seamless transition.
Performance Problems: During development, performance optimization and load testing will be necessary to handle high usage periods without system failure or slowness.
Data Security: To maintain compliance with data privacy rules, safeguarding sensitive student data will require robust security measures, such as encryption and access control.

7. **Organizational Feasibility Analysis:**

Schedule:
Projected Timeline: It is anticipated that the system will be developed and put into use over the course of 12 to 18 months, with stages such as requirements collecting, design, development, testing, and deployment.
Important benchmarks: The timetable includes important benchmarks including system architecture completion, first development, pilot testing, full-scale rollout, and training.
Academic Calendar: Taking into consideration the academic calendar will ensure that there is as little disturbance as possible during important times such as registration and exams.

Politics:
Engagement of Stakeholders: Early and ongoing collaboration with stakeholders, including as academics, administrative staff, and students, is essential to the project's success.
Resistance Management: Clearly communicating the advantages of the new system and providing opportunities for feedback will help to mitigate any potential resistance from individuals who are used to the current one.

Change Management:

Training and Support: To guarantee that staff and students are able to use the new system efficiently, in-depth training sessions will be offered. This offers comprehensive support, tutorials, and user manuals.

Transitional Techniques: By allowing users to progressively adjust to the new system while preserving current procedures during the transition, phased adoption will minimize disturbance.

Legal Concerns:

Data Privacy Compliance: To guarantee the protection of sensitive student information, the system shall abide by all applicable data privacy laws, such as FERPA and GDPR.

Accessibility Requirements: The system will be built in accordance with accessibility guidelines, guaranteeing that all pupils, regardless of disabilities or impairments, can use it.

Contractual Obligations: In the event that vendor agreements are required for specific equipment or services, they will be in accordance with the ethical standards and procurement policies of the organization.

Risks and Limitations:

Adoption Risks: The new system's efficacy may be jeopardized if users are unwilling to accept it. This risk will be reduced by tactics like constant assistance and proactive communication.

Resource Allocation: Incorrect resource allocation could have an impact on the project's completion date and standard of work. Project success will be ensured by careful resource planning and distinct responsibility allocation.

Operational Continuity: It is essential to guarantee services won't stop during the implementation stage. Plans for contingencies will be implemented to ensure that enrollment services continue uninterrupted.

8. **Alternative Solutions:**

1. **Enhanced Administrative Process:** This alternative seeks to enhance current administrative operations in order to expedite UMBC's enrollment process. To increase productivity, it entails enhancing worker training, communicating better, and allocating resources as efficiently as possible. The institution can lower manual mistake rates and enhance the enrollment process for students by streamlining current procedures. This method is cost-effective compared to adopting new technology, but its scalability is restricted, and it may face pushback from personnel owing to workflow changes.

2. Third-Party Enrollment Services: This method entails contracting with a specialized outside company to handle UMBC's course enrolling procedure. The vendor uses their knowledge and technology to handle every aspect of registration, including communication and queue

management. Despite the possibility of job losses for present employees and increased recurrent expenses, this strategy gives UMBC the advantage of streamlined enrollment services with little need for internal technical assistance. This method enables scalability contingent on the infrastructure of the provider and may be put into place rapidly.

Criterion 1: Time Management: Evaluates the efficiency of each solution's time management during implementation and continued use. It assesses the effectiveness of the solution in providing users with timely services or information.

Enhanced Administrative Process:
Low Rating (1): Processing times and wait times may increase due to the manual nature of administrative procedures.
High Rating (5): Well-optimized workflows have the potential to drastically cut down on delays and boost productivity.

Third-Party Enrollment Services:
Low Rating(1): If the vendor has backlogs in processing or encounters integration issues, delays could happen.
High Rating (5): Proficient vendors can run extremely effective businesses that provide prompt service.

Criterion 2: Student Satisfaction: This criterion assesses the degree to which the solution satisfies the needs and expectations of staff, professors, and students as well as the user experience and simplicity of use.

Enhanced Administrative Process:
Low Rating (1): Slow replies and inconsistent results might be caused by manual processes and staff shortages, which can lead to unhappiness.
High Rating (5): By offering more individualized support, improved workflows can raise satisfaction.

Third-Party Enrollment Services:
Low Rating (1): Impersonal service may lead to frustration if the vendor is unable to meet particular user needs**.**
High Rating (5): Simplified procedures and competent management can greatly raise satisfaction.

Criterion 3: Error Handling: This criteria evaluates the solution's capacity to manage and reduce errors in data processing and system operation, guaranteeing precision and lowering the possibility of technical problems.

Enhanced Administrative Process:
Low Rating(1): There is a greater possibility of errors and inconsistencies when managing data manually.
High Rating (5): Process optimization and staff training can increase accuracy.

Third-Party Enrollment Services:
Low Rating(1): Inaccuracies or misinterpretations of data may arise from system or data integration problems**.**
High Rating (5): Specialized systems and automation guarantee consistency and reduce errors.

Criterion 4: Costs: This criterion looks at the costs associated with putting each solution into practice and keeping it up to date, including setup fees up front, ongoing operating costs, and possible long-term financial gains.

Enhanced Administrative Process:
Low Rating(1): If considerable personnel and process modifications are needed, costs may be substantial**.**
High Rating (5): There aren't many extra fees when using the resources that are already available.

Third-Party Enrollment Services:
Low Rating (1): High recurrent costs might result from service contracts and vendor fees.
High Rating (5): Increased efficiency could make the expenditure more justified by the vendor's efficient operations.

Criterion 5: Adaptability in changes in Educational Trends: This criterion assesses the degree to which the solution is flexible enough to accommodate new teaching techniques and technological developments while also adapting to evolving educational practices and technologies.

Enhanced Administrative Process:
Low Rating (1): Limited adaptability owing to dependency on traditional workflows.
High Rating (5): Flexible workflows and continuing staff training can boost adaptability.

Third-Party Enrollment Services:
Low Rating(1): Customization for changing demands may be limited by the standardized nature of vendor solutions.

High Rating (5): Adaptability is ensured by vendor flexibility and ongoing system improvements.

Criterion 6: Impact on academic performance: This criterion examines how the answer might affect students' comprehension, motivation, and overall learning outcomes in relation to their academic success.

Enhanced Administrative Process:
Low Rating(1): Students' performance and planning may be hampered by inaccurate and tardy enrollment processes.
High Rating (5): Planning and results for academic work can be improved by increased effectiveness and individualized help.

Third-Party Enrollment Services:
Low Rating (1): The beneficial impact may be limited if generic services do not target individual academic demands.
High Rating (5): Planning and results in the classroom can be greatly enhanced by precise information and streamlined procedures.

9. **Alternative Matrix:**

Criteria	Weight	Enhanced Registration Process	Score (1-5)	Weighted Score	Enhanced Administrative Process	Score (1-5)	Weighted Score	**Third-Party Enrollment Services**	Score (1-5)	Weighted Score
Time Management	20%	High	5	1	Moderate	3	0.6	Moderate	3	0.7
Student Satisfaction	15%	High	4	0.75	High	5	0.7	Moderate	5	0.6
Error Handling	15%	Low	3	0.5	Low	3	0.5	Low	4	0.8
Costs	20%	High	3	0.6	Moderate	3	0.8	High	5	1
Adaptability in changes in Educational Trends	10%	High	5	0.5	Low	3	0.3	Moderate	4	0.3
Impact on academic performance	20%	High	5	1	Modreate	5	0.6	Low	3	0.4
Total	100%			4.35			3.5			3.8

References:

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