Smart Select

Business Case Summary and Project Charter

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Business Case Summary

Project Title

Smart Select - A Modernized Student Registration System

Brief Business Background

The University of Technology, Jamaica (UTech) is a leading tertiary institution located in the Greater Kingston Metropolitan Region. UTech offers a wide range of programs across various disciplines, with a commitment to fostering lifelong learning, personal development, and service to the community. The university's mission is to positively impact Jamaica and the wider Caribbean through high-quality learning opportunities, research, and innovative solutions to meet the needs of industry, government, and society. The university's core values of respect, integrity, excellence, innovation, team spirit, and accountability guide its operations and interactions with the community.

However, the current module selection system at UTech, used by thousands of students each semester, is outdated and struggles to accommodate the high volume of registrations during peak periods. This results in inefficiencies, such as system slowdowns and delays, which negatively affect the academic experience. The inability of the system to handle simultaneous student registrations has led to overcrowded classes, with many students unable to register for critical courses in time. These issues not only hinder academic progression but also diminish overall satisfaction with the university's services.

Recognizing the need to provide a more efficient, user-friendly solution, the aim is to upgrade its registration platform. A new system is essential to ensure the institution can continue meeting the needs of its growing student population, while maintaining its standards of academic excellence and supporting students in completing their programs on time.

Business Objectives

- **Enhance Educational Excellence**: Pursue excellence in academic programs and the work of faculty and staff to provide high-quality education and research.
- **Address National and Regional Needs**: Respond to the human-resource needs of Jamaica and the wider Caribbean through relevant programs and initiatives.
- **Promote Flexible Learning**: Provide flexible delivery systems to accommodate students who follow non-traditional routes to higher education.
- **Foster Strategic Partnerships**: Establish partnerships with local, regional, and international institutions, governments, and corporate entities to support growth and collaboration.
- **Encourage Applied Research**: Promote applied, product-oriented research as a core responsibility of faculty to drive innovation and societal impact.

Problem/ Opportunity Statement

Problem

The current module selection system at the University of Technology, Jamaica (UTech) is outdated and inadequate for managing the high volume of student registrations during peak periods. This inefficiency results in significant delays, system slowdowns, and frustration, as many students are unable to enroll in essential courses before they reach capacity. The challenges are particularly evident among third- and fourth-year students, who often miss out on required classes, impacting their academic progression and overall satisfaction. Late entry into classes adds to the difficulties students face in keeping up with course material. A more effective, staggered registration approach is urgently needed to ensure fair access to courses and enhance both the student experience and administrative efficiency.

Opportunity

The implementation of a modern, scalable web-based registration system presents a significant opportunity to enhance the user experience and streamline the registration process. By adopting a staggered selection approach, where students from different faculties have designated weeks to register, UTech can ensure that all students have equitable access to the courses they need. This system will not only alleviate congestion during peak registration times but also improve administrative efficiency by simplifying the registration workflow.

Moreover, with real-time registration capabilities and enhanced security features, the new system will foster a more reliable and secure environment for handling sensitive student information. Ultimately, this modernization will contribute to a more organized, user-friendly experience for students and faculty alike, positioning UTech as a forward-thinking institution committed to delivering quality education and effective administrative solutions.

Critical Assumptions and Constraints

Assumptions

1. **Internet Infrastructure**: The existing internet infrastructure at UTech will be robust enough to support the demands of the new registration system, including multiple simultaneous users.
2. **User Receptiveness**: Both students and faculty will be open to adopting the new registration system, recognizing the need for improvements in the registration process.
3. **Technical Expertise**: The development team will possess the necessary skills and expertise to effectively implement the new system, including familiarity with the required programming languages, tools, and methodologies.
4. **Stakeholder Support**: Key stakeholders, including university administration and faculty members, will provide the necessary support and resources to facilitate successful implementation.
5. **Data Integrity**: Existing student registration data will be accurate and ready for migration to the new system without significant cleaning or modifications.

Constraints

1. **Development Time**: The project must be completed within the five-month timeline, constrained by the academic calendar, ensuring the system is ready before the next registration period.

2. **Budget Limitations**: The project must stay within the estimated budget range of $120,000 to $235,000, covering all aspects of development, including maintenance and support.
3. **Resource Availability**: Availability of key personnel, such as senior programmers and project managers, must align with their other commitments to the university.
4. **User Training**: Adequate training for students and faculty on the new system must be conducted within the limited time and resources available.
5. **Potential Resistance to Change**: The new system must address potential resistance from users accustomed to the current system, requiring effective change management strategies.

Preliminary Project Requirements

Functional Requirements (Must-Have's):

1. **Web-based Platform**: The system must be a fully web-based registration platform accessible on all major browsers and devices (desktop, mobile, tablet).

2. **Real-time Registration**: The system must allow students to register, drop, and swap modules in real-time with immediate feedback on module availability and capacity.

3. **Staggered Registration**: The system must implement a staggered registration process based on faculty schedules, ensuring that students from different faculties have designated time periods for module selection.

4. **User Authentication & Role Management**: The system must provide secure authentication using university credentials for students, faculty, and administrators. It must also manage different roles (student, faculty, admin) with varying levels of access.

5. **Module Information Display**: The system must display all relevant module information, including prerequisites, corequisites, available seats, and timetables, to assist students in making informed decisions.

Non-Functional Requirements (Nice-To-Have's):

1. **Scalability & Load Management**: The system must handle high volumes of simultaneous users without performance degradation, especially during peak registration periods.

2. **Data Security & Privacy**: The system must comply with data protection regulations and ensure the secure handling of student information, including encryption of sensitive data during transmission and storage.

3. **Performance & Uptime**: The system must maintain 99.9% uptime during the registration period and handle concurrent registrations from a minimum of 5,000 users without crashing.

4. **User-Friendly Interface**: The interface must be intuitive and easy to navigate for both students and faculty, reducing the learning curve and minimizing support requests.

5. **Backup & Recovery**: The system must include automated backups and recovery protocols to ensure no loss of registration data in case of system failures.

Potential Risks Overview

Risk Breakdown Structure (RBS):

1. Technical Risks:

- **Development delays due to technical challenges**: Unexpected technical difficulties, such as bugs or integration issues, may delay the project timeline.
- **System performance issues during peak registration**: The system may face performance bottlenecks under heavy loads, especially during registration periods.
- **Potential security vulnerabilities**: There may be gaps in security that could expose student data or allow unauthorized access.

2. Operational Risks:

- **Downtime during the switch from the old system to the new one**: During the transition to the new system, unexpected downtime could disrupt ongoing registration processes.
- **Failure to meet user expectations**: The system may not meet the functional or usability expectations of students or faculty, leading to dissatisfaction.

3. Organizational Risks:

- **Resistance from students or faculty during the transition period**: Users may resist adopting the new system due to familiarity with the old system or reluctance to change.
- **Unforeseen costs related to infrastructure upgrades**: Infrastructure may need unexpected upgrades, increasing the overall project cost.

Budget Estimate & Financial Analysis

Budget Estimate

1. **Initial Development Costs:**
    - **Software Development**: $70,000 - $100,000 (for web-based platform development, real-time registration capabilities, load management, and security)
    - **Hardware Acquisition**: $20,000 - $50,000 (servers, network infrastructure, backup systems)
    - **Personnel**: $30,000 - $85,000 (development team, project managers, technical support)
    - **Total Initial Cost**: **$120,000 to $235,000**
2. **Ongoing Costs:**
    - **Annual Maintenance**: $10,000 - $20,000 (technical support, server maintenance)
    - **Annual Support**: $15,000 - $35,000 (system updates, troubleshooting)
    - **Total Ongoing Annual Cost**: **$25,000 to $55,000**

Financial Analysis

- **Cost Savings**: The projected annual savings of **$45,000 to $80,000** come from reduced administrative workload, fewer system crashes, and improved operational efficiency. These savings arise from automating manual tasks and reducing the need for administrative staff to resolve registration issues, system downtimes, and overcapacity issues in classrooms.
- **Return on Investment (ROI)**: With an initial investment between **$120,000 and $235,000**, UTECH will break even after approximately **2-3 years** due to savings in administrative costs and enhanced efficiency. After this period, the system will start generating positive returns by reducing long-term operational costs.
- **Impact on UTECH**: The new system will minimize the costs associated with registration errors, system downtime, and overcapacity in classes. This could result in more efficient use of university resources, better data management, and improved student satisfaction. In the long run, UTECH may see lower personnel costs and fewer expenses related to technical issues, contributing to a streamlined and efficient registration process.

Project Justification Statement

The Smart Select project is justified based on its long-term financial and operational benefits. With an initial investment of **$120,000 to $235,000**, the project will generate annual savings of **$45,000 to $80,000**, leading to a break-even point within **2-3 years**. This financial return makes the project cost-effective, as UTECH will reduce administrative workloads and inefficiencies, resulting in fewer system crashes and delays.

Beyond financial savings, the new system will enhance the student registration experience, improve scalability to handle future growth, and offer greater data security. These improvements will align with UTECH's mission to provide a high-quality educational environment and ensure compliance with data protection regulations. Overall, the Smart Select project represents a strategic investment in UTECH's operational efficiency and student satisfaction, ensuring long-term value for the university.

Project Charter

Overview

Project Title:	Smart Select - A Modernized Student Registration System
Project Start Date:	October 1, 2024
Project End Date:	February 28, 2025
Budget Information:	Initial Development Cost $120,000 to $235,000 Ongoing Annual Cost $25,000 to $55,000 Projected Annual Savings $45,000 to $80,000
Project Objectives:	Streamline the registration process for students and faculty. Improve system performance to handle increased registration traffic.

	Provide a scalable, user-friendly interface. Enhance security to protect sensitive student data. Implement a staggered registration system to minimize bottlenecks and conflicts.

Project Deliverables

1. **Software Requirement Specification (SRS) Document**
    - Detailed documentation of functional and non-functional requirements, including use cases, user stories, and wireframes of the improved system.

      Use cases are detailed breakdowns of specific user actions (selecting modules, confirming selections, viewing timetable etc.) and how the system responds to those actions. User stories give general explanations on the system's features, written from the perspective of the end user. Wireframes will provide a visual of how the system pages may appear.

2. **System Design Documentation**
    - Includes the system architecture, database schema, interface designs, and integration points.

      System Architecture is a high-level outline of the system's components and how they interact (Client-side – what students and faculty interact with, Server-side – to process requests from the client like retrieving available modules, handling capacity checks etc., Database – information store for students, modules etc., Application Programming Interface or Integration Points – to connect with other university systems. Might include a diagram showing how the client communicates with the server, how the server retrieves data requested and how external systems are linked.

      Database Schema is an outline of how the data is organized in the database, including tables, fields and relationships between tables (student, module, registration tables etc.). using Entity Relationship Diagrams (ERDs).

      User Interface Designs, created as wireframes or mockups to demonstrate what each webpage of the new system will look like and how the user will interact with it, ensuring the interface is user-friendly.

      Integration Points detail how the system will connect with the university's other systems and services like, the student information system, module catalog, email and payment systems if necessary.

3. **Prototype / Wireframe**

- A low-fidelity (basic sketch/ simplified version of the system interface) or high-fidelity (high levels of visual details, including typography, colour schemes, buttons) prototype of the user interface, demonstrating the flow and functionality of the new system.

4. **Fully Developed Web-Based Platform**
    - Complete, scalable, web-based platform capable of handling high registration volumes, secure access, and real-time updates.
5. **User Testing Report**
    - Results from testing with students and faculty to ensure system usability, functionality, and security.
6. **System Security Plan**
    - Documentation of the security measures implemented, including data encryption, user authentication, and access control policies.
7. **Training Materials**
    - User manuals, video tutorials, and workshops for students, faculty, and administrators on how to use the new system.
8. **Deployment Plan**
    - Steps for moving the system from the testing environment to the live environment, including contingencies for rollback.

      The deployment process needs to be structured to ensure a smooth transition from the old system to the improved one, with action plans in place in case something goes wrong (system crash, data corruption etc.), in which case the old system will be restored place while issues are being dealt with.

9. **Final Project Report**
    - Detailed report covering project development, testing, deployment, and project outcomes.
10. **Post-Deployment Support**
    - Support plan for bug fixes, updates, and system performance monitoring for a set period post-deployment.

Success Criteria

The specific conditions or measurable outcomes that will determine whether the project is considered successful (in that the objectives are achieved, and requirements are met).

1. **System Performance**:
   The registration system must handle at least 95% of peak registration traffic without performance slowdowns, ensuring no system crashes or major delays during the registration period.

2. **User Adoption**:
   At least 85% of students and faculty should successfully complete their registrations using the new system in its first roll-out, with positive feedback on ease of use and functionality in post-implementation surveys.

3. **Security Compliance**:
   The system must pass all internal security audits and comply with relevant data protection regulations, ensuring the secure handling of student information.
4. **Cost Efficiency**:
   The project must stay within the allocated budget of $120,000 to $235,000 for initial development, and annual operating costs must remain within the projected range of $25,000 to $55,000, while delivering annual savings of $45,000 to $80,000.
5. **User Satisfaction**:
   A minimum satisfaction rating of 80% must be achieved from students and faculty, based on a post-launch survey regarding the new system's functionality, usability, and reliability.

Approach

- **Project Initiation**
  - Identify project stakeholders, define project goals, and gather initial requirements through meetings with UTECH's IT team and student body representatives.
- **Planning & Requirement Analysis**
  - Create a detailed project plan, outlining resource allocation, timelines, and milestones. Gather detailed requirements for the registration platform, identifying technical and user needs.
- **Design & Prototype**
  - Design the system architecture, database, and user interface, ensuring scalability and security. Develop a prototype for stakeholder review.
- **Development & Implementation**
  - Use agile principles to develop the system in iterative cycles. Each cycle will include coding, testing, and obtaining feedback from stakeholders.
- **Testing & Quality Assurance**
  - Conduct rigorous unit, integration, and user acceptance testing to ensure the system performs well under heavy load and meets all specified requirements.

    Unit Test individual components to ensure they work correctly in isolation. After testing individually, combine components to ensure they work together, i.e. Integration Testing. User Acceptance Testing (UAT) is where end users (students and faculty members) test the system to ensure it meets their needs. Simulate high volumes of students registering

simultaneously to ensure the system can handle the high traffic without adverse effects like slowing down or crashing.

- **Deployment & Training**
    - Deploy the system in a phased manner, ensuring minimal disruption to current registration processes. Train UTECH staff and students on using the system.

      "Phased manner" means taking a staggered approach – the system is gradually released for specific groups of students at a time, making it easier to avoid system overwhelm. Training involves providing live, online and pre-recorded tutorials and printouts so users can familiarize themselves with the improved system and fix minor issues on their own.

- **Post-Deployment Monitoring & Support**
    - Monitor system performance during the initial live registration period, address any issues, and provide continued support.

Key Stakeholders

Name	Role	Responsibility
Dr. Kevin Brown, University President	Project Sponsor	Authorizes the distribution of resources and provides financial support; oversees project progress and scope definition.
Mr. David White, Head of School – School of Computing and Information Technology (SCIT)	Project Manager	Manages the project team, ensures timelines and budget are met, and coordinates between stakeholders for smooth execution.
Mr. Ian McGowan, Information & Communication Technology (ICT) Director, SCIT Lecturer	IT Department Head	Leads technical development, ensures infrastructure compatibility, and supervises system security and performance.
Ms. Marion Brown, Vice President & University Registrar	Registrar	Defines registration requirements, ensures the new system aligns with current

		academic processes, and provides operational feedback.
Rick Darby, President of the UTech Students' Union	Student Body Representative	Represents student concerns, offers feedback on usability, and ensures the system meets the needs of the student body.

Milestones & Schedule Estimate

Table 1: Activity Schedule

Activity	Start	End
Project Initiation	Oct 1, 2024	Oct 10, 2024
Requirements Gathering	Oct 11, 2024	Oct 24, 2024
System Design & Prototyping	Oct 25, 2024	Nov 15, 2024
Development Phase 1	Nov 16, 2024	Dec 15, 2024
Development Phase 2	Dec 16, 2024	Jan 15, 2025
Testing & User Feedback	Jan 16, 2025	Feb 1, 2025
System Deployment	Feb 2, 2025	Feb 10, 2025
User Training & Documentation	Feb 11, 2025	Feb 20, 2025
Post-Deployment Support	Feb 21, 2025	Feb 28, 2025

Table 2: Milestones

Summary Activity/ Deliverable	Milestone Date
Project Initiation Complete	Oct 10, 2024
Requirements Document Submitted	Oct 24, 2024
Prototype Reviewed and Approved	Nov 15, 2024
Phase 1 Development Complete	Dec 15, 2024
Phase 2 Development Complete	Jan 15, 2025
User Feedback Received	Feb 1, 2025
System Deployed Successfully	Feb 10, 2025
Training and Documentation Complete	Feb 20, 2025
Post-Deployment Support Ends	Feb 28, 2025

Approval Sheet

Project Approval Sheet

Project Title: Smart Select - A Modernized Student Registration System
Project Start Date: October 1, 2024
Project End Date: February 28, 2025

Project Summary

The Smart Select project aims to modernize UTECH's student registration system, addressing inefficiencies in the current module selection process. The new system will streamline registrations, enhance user experience, and improve operational efficiency.

Stakeholders

Name	*Role*
Dr. Kevin Brown	Project Sponsor
Mr. David White	Project Manager
Mr. Ian McGowan	IT Department Head
Ms. Marion Brown	Registrar
Rick Darby	Student Body Representative

Budget Information

- Initial Development Cost: $120,000 to $235,000
- Ongoing Annual Cost: $25,000 to $55,000
- Projected Annual Savings: $45,000 to $80,000

Resources

- Development team
- Technical infrastructure
- Training materials for users
- Support staff for implementation

Activity Table

Activity	*Start Date*	*End Date*
Project Initiation	October 1, 2024	October 10, 2024

Requirements Gathering	October 11, 2024	October 24, 2024
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System Deployment	February 2, 2025	February 10, 2025
User Training & Documentation	February 11, 2025	February 20, 2025
Post-Deployment Support	February 21, 2025	February 28, 2025

Signatures:

Name	***Role***	***Signature***	***Date***
Dr. Kevin Brown	Project Sponsor	_____	_____
Mr. David White	Project Manager	_____	_____
Ms. Marion Brown	Registrar	_____	_____
Mr. Ian McGowan	IT Department Head	_____	_____
Rick Darby	Student Body Representative	_____	_____