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 Makerere University Business School

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**MAKERERE UNIVERSITY BUSINESS SCHOOL****DEVELOPING A SMART TASK AND PRODUCTIVITY MANAGEMENT SYSTEM FOR STUDENTS
AND SMALL BUSINESSES IN UGANDA****By**

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A Project Proposal Submitted to the Faculty of Computing & Informatics of Makerere University Business School in Partial Fulfillment for the Award of the Degree of Bachelor of Business Computing of Makerere University

DECLARATION

We, the undersigned, declare that to the best of our knowledge, this proposal is our original piece of work, and has never been published and/or submitted for any award in any other University or Higher Institution of Learning.

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INTRODUCTION

1. INTRODUCTION

This section provides the foundational context for the project. It outlines the global shift towards digital productivity tools and contrasts it with the specific challenges faced by university students and small businesses in Uganda. The section articulates the identified problem, defines the project's goal and objectives, summarizes its scope, anticipates its significance, and states the key assumptions upon which the project plan is based.

1.1 Project Background

In the contemporary digital economy, the effective management of tasks, time, and resources is a critical determinant of success for both individuals and organizations. Globally, the adoption of digital productivity tools has transformed workflows, enabling enhanced efficiency, collaboration, and data-driven decision-making (Smith, 2023). The proliferation of applications such as Asana, Trello, and Notion underscores a significant shift towards automated and integrated management systems designed to mitigate human error and optimize performance. These systems represent a broader trend in digital transformation, where technology is leveraged to solve complex operational challenges.

Within the Ugandan context, this global shift presents both an opportunity and a challenge. While urban centers like Kampala are experiencing rapid digital adoption, a significant disparity exists between the availability of sophisticated software and the practical needs of local users. University students, who are often engaged in multifaceted roles involving academics, group projects, and part-time employment, frequently resort to fragmented methods for managing their responsibilities—ranging from paper planners to a disjointed array of digital apps. This lack of a unified system often leads to missed deadlines, poor time management, and increased stress levels, ultimately impacting academic performance (Makerere University IT Dept., 2025).

Similarly, small and medium-sized enterprises (SMEs), which form the backbone of the Ugandan economy, predominantly rely on manual, paper-based systems for inventory tracking, sales recording, and customer management. This reliance on analogue methods results in critical inefficiencies, including data entry errors, difficulty in tracking stock levels, loss of customer records, and challenges in managing finances. These inefficiencies not only incur operational costs but also limit the growth potential of these businesses (Omondi, 2024; Nakawa Traders Association, 2024). The high cost of subscription-based international software, coupled with features that are often not tailored to local needs and unreliable internet connectivity, further exacerbates this problem, creating a clear gap in the market.

This project, therefore, proposes the development of a Smart Task and Productivity Management System (STPMS). The STPMS is conceived as a context-aware, user-friendly digital solution aimed at automating and streamlining task and productivity management for two primary user groups: university students and small business owners in Uganda. By focusing on affordability, offline functionality, and simplicity, the proposed system seeks to bridge the digital divide and empower users with tools that are both accessible and effective in their

1.2 Statement of the Problem

There exists a significant disparity between the ideal of digitally-enabled productivity and the current reality for students and small businesses in Uganda. The ideal environment is characterized by integrated digital tools that streamline task management, communication, and data handling, thereby maximizing efficiency and reducing stress (Smith, 2023).

However, investigations reveal that the current situation is starkly different. Students at Makerere University rely on fragmented methods like paper diaries and a disjointed mix of mobile apps, leading to missed deadlines, poor group coordination, and heightened academic stress. Similarly, small businesses in the Nakawa area depend on error-prone, manual systems such as paper ledgers and basic spreadsheets for critical operations like inventory and sales tracking, resulting in data inconsistencies and operational inefficiencies (Nakawa Traders Association, 2024). This gap has severe consequences. For students, it can result in lower academic performance and higher dropout rates. For SMEs, it translates directly into financial losses, stock-outs, and stifled growth. This cycle of low productivity hinders both individual potential and broader economic development.

Therefore, this research proposes to bridge this gap by developing a tailored Smart Task and Productivity Management System (STPMS). This system will be a unified, offline-capable, and affordable platform designed to directly address these inefficiencies in task scheduling, inventory management, and collaboration, moving the user experience closer to the ideal state of digital productivity.

1.3 Project Goal and Objectives

1.3.1 Project Goal

This project seeks to design, develop, and test a prototype of a Smart Task and Productivity Management System (STPMS) to improve task coordination and operational efficiency for university students and small businesses in Uganda.

1.3.2 Project Objectives

1. To analyze the current task and productivity management processes used by students at Makerere University and small businesses in the Nakawa area.
2. To identify the functional and non-functional requirements for designing a context-aware STPMS that addresses the limitations of existing solutions.
3. To design and develop a prototype STPMS with core features including task management, offline functionality, SMS reminders, and basic inventory tracking.

4. **Turnitin** Turnitin usability tests on the developed prototype with a sample of target users to evaluate its functionality, ease of use, and perceived effectiveness.

1.3.3 Project Scope Summary

This project will be executed over a period of four months. Key deliverables include a comprehensive requirements specification document, system design models (UML diagrams, wireframes), a working software prototype for Android platforms, a test report, and a project report. The scope encompasses the development of a prototype; full-scale commercial deployment and maintenance are beyond this project's scope. The project will engage students from Makerere University Business School and small business owners from the Nakawa community as primary sources of data and test users.

1.4 Anticipated Significance of Project

The successful development of the STPMS is anticipated to yield significant benefits. For students, it will provide a structured tool to enhance time management, reduce missed deadlines, and improve collaboration on group projects, potentially leading to better academic outcomes. For small businesses, the system will automate error-prone manual records, leading to more accurate inventory control, improved customer management, and better financial tracking, which can increase profitability and sustainability.

Academically, this project serves as a capstone experience, allowing the team to synthesize and apply knowledge gained in programming, systems analysis and design, database management, and project management. Technologically, the project contributes a locally adapted, affordable solution that promotes digital inclusion by prioritizing offline functionality and low-tech accessibility, setting a precedent for developing software that is truly designed for the Ugandan context.

1.5 Project Assumptions

The project team has based its planning on the following key assumptions:

1. **Resource Availability:** It is assumed that all team members will have consistent access to necessary hardware (laptops, smartphones), software (IDE licenses, design tools), and internet connectivity for development and collaboration throughout the project duration.
2. **Stakeholder Participation:** It is assumed that the identified user groups (students and business owners) will be willing and available to participate in requirement elicitation interviews, surveys, and usability testing sessions.

3. **Technical Feasibility:** It is assumed that the chosen technology stack (e.g., React Native, Firebase) is suitable for developing the proposed features, particularly offline functionality and SMS integration, and will perform adequately on the range of Android devices common among the target users.
4. **Scope Stability:** It is assumed that the core objectives and scope of the project, as defined in this proposal, will remain stable and not undergo significant changes that would require a fundamental redesign of the system.

REVIEW OF LITERATURE

2 SECTION INTRODUCTION

This section reviews existing scholarly and professional literature relevant to the development of the Smart Task and Productivity Management System (STPMS). The review is structured around key themes including the evolution of productivity tools, identified challenges in the local context, the design gap in existing solutions, and pertinent design philosophies. The purpose is to ground this project in established knowledge, identify best practices, and highlight the niche this project aims to fill. The literature consulted includes academic journals, industry reports, and local studies to ensure a comprehensive understanding of the problem domain.

2.1 The Evolution of Productivity Management Systems

Productivity software has evolved from simple desktop utilities like personal calendars and to-do lists to complex, cloud-based platforms that facilitate enterprise-level project management and collaboration. Hevner et al. (2004), in their seminal work on Design Science Research, argue that effective information systems are artifacts designed to solve identified organizational problems. Modern systems like Asana and Trello exemplify this, offering features like task assignment, progress tracking, and integration with other tools (Smith, 2023). The literature suggests that the effectiveness of such systems is not just in their features but in their ability to integrate seamlessly into users' workflows, a principle this project seeks to emulate.

2.2 Task Management Challenges in Academic Settings

Research into student productivity indicates that disorganization and poor time management are significant contributors to academic stress and underperformance. Students often struggle to balance lectures, assignments, and personal commitments. While generic tools exist, they are not always tailored to the specific rhythms of academic life, such as semester schedules, assignment submission portals, or group project dynamics. The need for integrated systems that can consolidate these aspects into a single, manageable interface is a gap identified in user feedback from Makerere University (Student Focus Group Transcripts, 2025).

Studies on Ugandan SMEs, such as those by Omondi (2024), consistently highlight manual record-keeping as a critical bottleneck. Paper-based ledgers for inventory, sales, and credit are prone to loss, damage, and error. This leads to operational inefficiencies like stock-outs, overstocking, inability to recover debts, and poor financial visibility. These businesses often cannot justify the cost of complex Enterprise Resource Planning (ERP) systems and find their features overwhelming. Therefore, there is a demonstrated need for a simplified, focused digital solution that addresses these core pain points directly, as echoed in the findings of the Nakawa Traders Association (2024) report.

2.4 Limitations of Existing Productivity Solutions in the Local Context

A critical analysis of popular productivity tools reveals a mismatch with the Ugandan environment. First, their premium models are often cost-prohibitive when converted to local currencies. Second, they are designed for environments with stable, high-bandwidth internet, making them impractical in areas with unreliable connectivity. Third, their user interfaces and feature sets are often built for a Western, tech-savvy audience, lacking cultural and contextual relevance for the average Ugandan user. This creates a significant adoption barrier.

2.5 Design Principles for User-Centric and Context-Aware Applications

The literature on human-computer interaction (HCI) emphasizes the importance of user-centered design (UCD). IDEOU (2023) stresses that solutions must be desirable to users, feasible to build, and viable as long-term offerings. For the STPMS, this means conducting thorough user research to understand the specific needs, limitations, and technological access of students and business owners in Uganda. Features must be prioritized based on this research, not on merely replicating what exists in other software.

2.6 The Role of Offline-First Design in Enhancing Digital Inclusion

An "offline-first" design philosophy is crucial for inclusivity in regions with intermittent internet. This approach ensures core application functionality is available without a connection, syncing data seamlessly when connectivity is restored. This is not merely a technical feature but a core requirement for usability in the Ugandan context, as confirmed by our initial surveys where users cited unreliable Wi-Fi and the cost of mobile data as major constraints.

2.7 Conclusion

The literature confirms the existence of a clear problem space: a lack of suitable, context-aware digital productivity tools for students and SMEs in Uganda. While existing solutions provide a foundational understanding of what features are possible, they fail to address critical local constraints related to cost, connectivity, and usability. This project will contribute to the field by applying the Design Science Research methodology to create an artifact the STPMS that is specifically designed to bridge this gap, adhering to principles of user-centricity, offline-first design, and simplicity.

RESEARCH METHODS

3 PROJECT METHODS

This section outlines the comprehensive strategy for executing the Smart Task and Productivity Management System (STPMS) project. It details the research design, data sources, requirement elicitation techniques, system design and development approaches, anticipated constraints, and the project timeline.

3.1 Research Design

This project will adopt the Design Science Research (DSR) methodology, as formalized by Peffers et al. (2007). DSR is perfectly suited for this project as it is focused on the creation and evaluation of artifacts in this case, the STPMS software prototype designed to solve identified real-world problems. The DSR process is iterative and will be carried out through the following phases:

DSR Stage	Objective Addressed	Proposed Methods & Activities	Expected Output
1. Problem Identification & Motivation	To analyze current processes (Obj. 1)	Literature review, surveys with 50 students and 15 business owners, interviews, and observation of current practices.	A detailed report on the pain points, inefficiencies, and specific user needs.
2. Definition of Objectives	To identify requirements (Obj. 2)	Analysis of data from Stage 1. Brainstorming sessions to define solution objectives. Creation of a	A Software Requirements Specification (SRS) document.

turnitin DSR Stage	Page 14 of 21 - AI Writing Submission Objective Addressed	Proposed Methods & Activities	Submission ID trn:oid::1:3421553194 Expected Output
		prioritized list of functional and non-functional requirements.	
3. Design & Development	To design and develop the prototype (Obj. 3)	System design using UML diagrams (use cases, activity diagrams). Prototype development using React Native for the frontend and Firebase for the backend and database.	A working prototype (APK file), system design documentation.
4. Demonstration	To test the prototype (Obj. 4)	Controlled lab demonstrations for supervisors. Field deployment of the prototype to a pilot group of 10 students and 5 businesses for a two-week testing period.	A demonstration of core functionality. Initial user feedback.
5. Evaluation	To evaluate functionality and ease of use (Obj. 4)	Collection of structured feedback via surveys and usability testing sessions (e.g., asking users to complete specific tasks while observers note difficulties).	A comprehensive evaluation report detailing usability findings, bugs, and user satisfaction levels.
6. Communication	To disseminate knowledge	Compilation of the final project report, presentation of findings to faculty and stakeholders, and preparation of academic papers if applicable.	The final project report and presentation slides.

3.1.1 Project Organization

The primary clients and users for this project are:

1. **Students:** Specifically, undergraduates from Makerere University Business School who struggle with academic task management. The estimated target population is over 10,000 students.
2. **Small Businesses:** Small-scale retailers and service providers within the Nakawa trading area, with an estimated population of over 500 businesses.

For the purpose of requirement gathering and testing, a sample will be drawn from these groups. Given the large population, a sampling technique will be employed.

3.1.2 Sampling Design/Sampling Technique

A stratified random sampling technique will be used to ensure representation from both user groups (students and business owners). For each group, a sample size will be determined using the Krejcie and Morgan (1970) table for a population of 10,000 (for students) and 500 (for businesses), aiming for a 95% confidence level. This approach is chosen because it provides a representative subset of the larger population, increasing the generalizability of our findings while making data collection manageable within project constraints.

3.2 Sources of Project Data

The project will rely on both primary and secondary data:

- **Primary Data:** This will be the main source for understanding user needs and evaluating the prototype. It will be collected directly from the sampled students and business owners through the methods described in Section 3.3.1.
- **Secondary Data:** This will be used to inform the literature review and understand the broader context. Sources will include academic journals (e.g., from the MUBS My LOFT library system), industry reports on productivity software, and existing studies on Ugandan SMEs.

3.2.1 Requirement Elicitation Techniques

To gather comprehensive and valid requirements, a mix of techniques will be used:

- **Surveys:** Distributed digitally and on paper to a large number of students and businesses to quantify common problems and desired features.
- **Semi-structured Interviews:** Conducted with a smaller subset of users to gain deep, qualitative insights into their challenges and workflows.
- **Focus Group Discussions (FGDs):** Organized with groups of students and business owners to facilitate discussion and generate ideas collaboratively.
- **Direct Observation:** Witnessing firsthand how users currently manage their tasks and inventory to identify unarticulated needs and inefficiencies.

3.3 System Analysis and Design Approaches

The Structured Systems Analysis and Design Method (SSADM) will be the primary approach for modeling the system. This is chosen for its clarity and effectiveness in defining processes and data flows for a business-oriented application like the STPMS.

For the development methodology, an agile approach with elements of Prototyping will be adopted. This allows for iterative development, where a basic version of the prototype is built quickly and then refined based on continuous user feedback from each sprint cycle. This is preferable to a rigid Waterfall model as it accommodates changes and ensures the final product is closely aligned with user needs.

The following techniques will be employed to model and design the system:

- **Use Case Diagrams:** To define the interactions between users (actors) and the system.
- **Entity-Relationship Diagrams (ERDs):** To design the structure of the database that will store tasks, user data, inventory items, etc.
- **Wireframes and Mockups:** To plan the user interface (UI) layout, ensuring it is simple and intuitive.
- **Flowcharts:** To map out the logic behind key processes, such as adding a new task or scanning an inventory item.

3.4 Anticipated Project Constraints

The following constraints are anticipated:

1. **Time Constraint:** The four-month semester timeline is tight for full design, development, and evaluation. Mitigation: Strict adherence to the project schedule using a Gantt chart and prioritization of core features (MoSCoW method).
2. **Technical Skill Constraint:** The team may encounter challenges with advanced programming concepts or new technologies. Mitigation: Peer programming, utilizing online learning resources (e.g., Coursera, Udemy), and seeking timely guidance from the project supervisor.
3. **Access to Users:** Ensuring consistent and willing participation from busy business owners and students can be difficult. Mitigation: Scheduling interviews and tests at their convenience and clearly communicating the benefits of their participation.

3.5 Project Development Process

The development will follow an iterative agile process. The core cycle will be: Plan a sprint (e.g., "develop the task creation module") - Develop - Test with a small user group - Gather Feedback - Implement improvements in the next sprint. This cycle repeats until all core features are developed and refined.

3.6 Ethical Considerations

The project will adhere to ethical research practices:

- **Informed Consent:** All participants in surveys, interviews, and testing will be provided with an information sheet and must sign a consent form.
- **Anonymity and Confidentiality:** Personal data of participants will be kept confidential. Data will be anonymized in reports and presentations.
- **Data Security:** Any collected data will be stored securely on password-protected devices.

3.7 Timeline & Milestones

- **Week 3:** Completion of Literature Review and Finalized Proposal.
- **Week 6:** Completion of Data Collection and SRS Document.
- **Week 10:** Completion of System Design and Prototype V1.0.
- **Week 13:** Completion of User Testing and Evaluation.
- **Week 15:** Submission of Final Project Report and Defense.

4 Disclosure and Declaration Statement:

The project team declares that generative AI tools may be used under the strict guidance of the supervisor for specific tasks such as debugging code, improving writing clarity, and brainstorming design ideas. All AI-generated content will be critically reviewed and validated by the team. The final work will represent the team's original intellectual effort. There are no conflicts of interest to declare.

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APPENDICES

Appendix I: Proposed Project Budget

Item Description	Quantity	Unit Cost (UGX)	Total Cost (UGX)	Notes
Transport			200,000	For field interviews and user testing
Communication (Airtime)			100,000	For surveys, reminders, and coordination
Stationery			50,000	Printed surveys, consent forms

 Page 19 of 21 - AI Writing Submission		Unit Cost (UGX)	Total Cost (UGX)	Submission ID trn:oid:::1:3421553194 Notes
Software Subscriptions			150,000	(e.g., Figma for UI design, if needed)
Contingency			100,000	Unforeseen expenses
TOTAL			600,000	

Appendix II: Data Collection Tools

- Survey Questionnaire for Students
- Interview Guide for Small Business Owners
- Focus Group Discussion Guide
- Usability Testing Task Sheet
- Informed Consent Form

Appendix III: Schedule of Activities/Gantt Chart

A high-level Gantt chart will be generated in Microsoft Project, outlining the 15-week timeline with tasks for each phase of the DSR process, dependencies, and milestones.

Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Planning & Research										
Brainstorming & Organization	■ ■ ■									
Source Review & Initial Writing	■ ■ ■	■								
Form Analysis										
Interviews & Focus Groups (Interviews/Surveys)		■	■							
Analysis & SRS Presentation			■	■						
Form Design										
Final Design & Prototyping				■						
Website Design				■	■					
Final Architecture & Presentation					■					

Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
System Requirement										
UI Requirement										
Database Requirement (MySQL)										
Integration										
Testing & Validation										
Deployment & Integration										
Acceptance Testing (UAT)										
Documentation										
Reviewing & Final										
Compilation & Submission										