SMART TASK MANAGEMENT SYSTEM WITH AI-BASED PRIORITY SUGGESTIONS

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CHAPTER 1: INTRODUCTION

People today are faced with an overwhelming number of tasks, from work obligations to personal commitments, and managing these tasks effectively can be daunting. Traditional task management tools often fall short when it comes to helping users decide what to focus on first. By incorporating AI, task management can become smarter and more adaptive, relieving users of the burden of constant decision-making and improving time management.

Background of the Study

In the modern workplace, managing multiple tasks efficiently has become an essential skill for professionals and students alike. With an increasing number of tasks to juggle, many users of traditional task management systems find themselves overwhelmed, spending valuable time manually organizing and prioritizing their responsibilities. The emergence of artificial intelligence (AI) offers promising advancements in automating task prioritization based on real-time data such as deadlines, importance, and user preferences. This study proposes the development of a Smart Task Management System with AI-Based Priority Suggestions, aimed at streamlining how users prioritize and complete their tasks.

Statement of the Problem

Despite the popularity of task management tools, many of these systems still rely heavily on user input for task prioritization. Users must manually rank tasks based on urgency or deadlines, which can be time-consuming and subjective. Moreover, as users accumulate more tasks, it becomes increasingly difficult to manage them effectively. This research seeks to address the inefficiencies of traditional task management systems by integrating AI that learns from user patterns and suggests task priorities based on various factors, reducing the burden on the user.

Many task management tools depend on manual input, requiring users to decide which tasks are most urgent or important. This process can be highly subjective and time-consuming, leading to inefficiencies. As task lists grow, users struggle to manage priorities effectively. *How can AI help automate and improve task prioritization in a way that is both efficient and personalized?*

Traditional systems often lack the ability to adapt to individual user behavior, meaning they provide the same prioritization structure regardless of personal working styles. This uniform approach fails to optimize task management for diverse users. *Personalized AI models could provide dynamic suggestions, but how can these be tailored to each user's habits and workflow? Can an AI-powered system learn from user behavior to offer adaptive task prioritization?*

Existing tools don't always account for real-time changes in task urgency, often missing the context of deadlines or task difficulty. Users might end up focusing on the wrong tasks, lowering productivity. *How can AI predict task urgency in real time and provide smarter, context-aware prioritization?*

Objectives of the Study

Generally, this study aims to develop an AI-enhanced task management system that provides real-time, intelligent task prioritization based on user inputs and behavior.

Specifically, the study aims to:

1. design and implement an AI algorithm that considers deadlines, task complexity, and user preferences to prioritize tasks.
2. ensure the system can adapt to users over time, improving task suggestions based on patterns.
3. assess the impact of AI-driven prioritization on productivity and task completion rates through user testing.

Time and Place of the Study

This study was conducted at Cavite State University – Imus Campus, located in Imus City, Cavite, over the academic year 2024-2025. The study commenced in November 2024 and is expected to conclude in 2025, with the exact end month yet to be determined.

Scope and Limitations of the Study

This study focuses on the development of a task management system for individual users, leveraging artificial intelligence (AI) to provide intelligent task prioritization suggestions. The system will track various task-related factors such as deadlines, task complexity, and user interaction to enhance its prioritization accuracy over time. The system is designed to improve productivity by automating task prioritization, reducing the need for manual organization.

However, this study is limited in several ways. First, the system will not support team collaboration features, as it is primarily intended for individual users. Additionally, the application will be web-based, meaning it will require an internet connection and will not support offline task management.

Task Input and Management Module. This module allows users to input, edit, and delete tasks while organizing them into categories such as work, personal, or deadlines. It serves as the core interaction point for users to manage their tasks effectively. This module is essential because it provides the primary interface through which users interact with their task lists, ensuring tasks are properly organized and accessible.

AI Priority Suggestion Module. This module analyzes task deadlines, complexity, and user behavior using artificial intelligence to suggest task prioritization. It automates the process of task prioritization based on learned user habits. The AI Priority Suggestion Module is crucial because it offers the intelligent task prioritization that differentiates this system from traditional task managers.

Task Tracking and Progress Monitoring Module. This module tracks the status and progress of each task, updating as tasks are worked on or completed, and providing notifications or reminders based on deadlines or user patterns. This module is necessary for keeping users updated on their task progress, ensuring that tasks are completed on time, and making sure that the AI prioritization suggestions are based on real-time information.

User Behavior Learning Module. This module continuously monitors and analyzes patterns in user behavior—such as how users handle deadlines and complete different tasks—to tailor future task prioritization suggestions. It's a vital part of making the AI adaptable and personalized, ensuring that prioritization becomes more accurate over time as it learns from user habits.

Task Analytics and Report Module. This module provides insights and reports on completed tasks, time management, and user productivity. It also analyzes how well users adhere to the AI's suggestions, offering feedback to help users improve their task management strategies. This module is important because it offers users a way to reflect on their performance and make informed adjustments to their work habits, further enhancing productivity.

Definition of Terms:

Artificial Intelligence (AI). The simulation of human intelligence in machines that are programmed to think and learn. In this study, AI is used to automatically analyze tasks and suggest appropriate prioritization based on user behavior and task complexity.

Task Management System. A software application designed to help users manage and organize their tasks. This system allows users to add, edit, and delete tasks while categorizing them based on priority and deadlines.

Task Prioritization. The process of arranging tasks in order of importance or urgency. In this study, task prioritization is handled by AI, which considers various factors such as deadlines and complexity to suggest the order in which tasks should be completed.

User Behavior Learning. The system's ability to monitor and analyze the habits and patterns of a user when interacting with tasks. The AI in the system uses this learning to improve task prioritization over time, making the suggestions more personalized and efficient.

Task Complexity. A measure of how difficult or time-consuming a task is to complete. The AI in this study will use task complexity as one of the key factors in determining the priority of tasks.

Task Analytics. A feature that provides users with data and reports on their productivity, task completion rates, and time management. This helps users understand their performance and make informed decisions to improve their workflow.

Predictive Alerts. Notifications sent to users based on predictions made by the AI, such as upcoming deadlines or tasks that require immediate attention. These alerts help users stay on track and focus on the most important tasks at the right time.

Web-based Application. A software application that is accessed via a web browser over a network, such as the internet. This study's task management system will be web-based, meaning it will not function offline.

Theoretical Framework of the Study

1. Artificial Intelligence and Automation Theory

Theoretical Basis: Automation Theory explores how machines and algorithms can perform tasks traditionally handled by humans. This study draws from this theory to implement an AI system capable of automatically prioritizing tasks based on data such as deadlines, complexity, and user habits.

2. Decision Theory

Theoretical Basis: Decision Theory addresses how individuals make choices under uncertain or complex conditions. This theory supports the AI's role in assisting users by making more efficient task prioritization decisions, reducing the cognitive load associated with manual decision-making.

3. Cognitive Load Theory

Theoretical Basis: Cognitive Load Theory suggests that human cognitive resources are limited, particularly when handling multiple tasks. This study applies this theory to demonstrate how an AI-based task management system can alleviate users' cognitive load by automating the prioritization process.

4. Behavioral Learning Theory

Theoretical Basis: Behavioral Learning Theory focuses on how individuals learn from past behaviors and experiences. This theory informs the system’s AI module, which learns from user behavior and adapts its task prioritization suggestions over time for greater personalization.

5. Maslow’s Hierarchy of Needs

Theoretical Basis: Maslow’s Hierarchy of Needs categorizes human motivations into levels. This theory is applied to explain how task management tools, particularly those utilizing AI, can help users manage tasks more effectively, supporting their ability to meet higher-level goals like productivity and personal achievement.

CHAPTER 2: REVIEW OF RELATED LITERATURE/STUDIES

This chapter presents a review of related literature and studies, both local and foreign, which are significant in the development of the Smart Task Management System with AI-Based Priority Suggestions. The related literature and studies provide valuable insights, support the theoretical framework, and help establish a foundation for the design and implementation of the system.

Local Literature and Studies

Operating Systems Usability: A Comparative Study.

Patayon, U. B. & Mingoc, N. L. (2019).

This study compares the usability of different versions of Windows operating systems, focusing on effectiveness, efficiency, and user satisfaction. The study's approach to evaluating task completion, user satisfaction, and engagement informs the design of task management systems that emphasize usability, user experience, and engagement. The assessment of task completion times and user frustrations is relevant when designing an AI-based priority system to minimize inefficiencies.

Task-based Supplementary Instructional Materials in Learning Grade 10 Chemistry. Rodriguez, N. (2023).

The development of task-based instructional materials aligns with the principles of task prioritization and management, especially regarding instructional design and organization. The evaluation criteria used, such as instructional quality and assessment, relate to how task management systems can organize and prioritize tasks for users based on various criteria.

Self-Efficacy, Self-Management, and Performance of Teachers in the New Normal. Daria, L. (2023).

This study examines self-management in terms of priority setting and its relationship with performance. The findings on priority setting and self-management are particularly relevant to the AI-based priority suggestion feature, which aims to improve user productivity by helping them manage and prioritize tasks effectively.

Work Task Motivation, Emotional Intelligence, and Public Leadership: Structural Equation Model on Organizational Culture.

Escosora, M. & Guhao Jr., E. (2023).

This research focuses on work task motivation and its role in shaping organizational culture. The findings on task motivation help inform the system's AI features by understanding the impact of motivation on task prioritization, helping users manage workloads efficiently.

Foreign Literature and Studies

Algorithms for Data Sharing-Aware Task Allocation in Edge Computing Systems.

S. Rabinia et al. (2024).

This study develops algorithms for task allocation in edge computing environments, addressing resource optimization and task efficiency. The system's AI-based priority suggestion can benefit from the approaches discussed, particularly in minimizing resource congestion and improving task allocation.

Research on Multi-Task Scheduling in Smart Warehouse Systems Based on Dual-Task Chains.

C. Zhang & W. Wu (2024).

This study's dual-task chain approach for multi-task scheduling offers insights into optimizing task management by selecting and organizing tasks for better performance. This methodology can be adapted in the task management system to improve task selection and prioritization.

Cooperative Digital Healthcare Task Scheduling and Resource Management in Edge Intelligence Systems.

X. Liu et al. (2024).

The study's optimization strategy for task scheduling and resource management is applicable in creating efficient task management systems. The proposed AI system can apply similar principles of task scheduling to ensure tasks are completed with minimal costs and delays.

Blockchain-based Task Planning and Management System for Project Management.

R. Brüggemann & H. Timinger (2023).

The concept of blockchain-based task management can be adapted to improve security and transparency in task handling. This study supports the idea of developing a reliable, AI-assisted task management system with features that ensure accountability and proper task tracking.

Table of Comparison

Study	Focus/Objective	Methodology	Findings	Relevance to the Current Study
Patayon & Mingoc (2019)	Usability of Windows OS	Comparative study	Windows 10 has highest task completion rate	Relevant to evaluating task efficiency and user engagement
Rodriguez (2023)	Task-based instructional materials for Grade 10 Chemistry	Descriptive, weighted mean	Developed materials rated as very satisfactory	Related to task prioritization and instructional design
Daria (2023)	Self-efficacy, self-management, and performance of teachers	Descriptive-correlational	Self-management and priority setting rated as high	Relevant to self-management and task prioritization
Escosora & Guhao Jr. (2023)	Work task motivation and emotional intelligence	Structural equation modeling	Motivation and leadership linked to organizational culture	Supports the AI system's goal of enhancing task motivation
Rabinia et al. (2024)	Data-sharing aware task allocation in edge computing	Algorithm development	DSTA algorithm reduces data traffic by 20%	Related to task optimization and resource allocation
Zhang & Wu (2024)	Multi-task scheduling in smart warehouse systems	Algorithm development	Dual-task chain improves task execution	Useful for improving multi-task scheduling in the system
Liu et al. (2024)	Task scheduling in digital healthcare edge intelligence systems	Optimization strategy, real-world data	Achieved improvements in cost and task success rate	Informative for scheduling tasks based on resource constraints

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