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**JOHOR  
INNOVATION  
INVENTION  
COMPETITION  
AND  
SYMPOSIUM  
2023**



"Innovation Inspires a Society  
to be Critical and Creative"



# JOHOR INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2023

"Innovation Inspires a Society to be  
Critical and Creative"

**Editors-in-Chief**

**AHMAD KHUDZAIRI KHALID  
NUR INTAN SYAFINAZ AHMAD**



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Kampus Pasir Gudang**

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## **Preface**

**In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.**

**This e-book compiles the extended abstracts that submitted to Johor Innovation Invention Competition and Symposium 2023 (JIICaS2023), where JIICaS2023 is a virtual platform for all creative minds to share and present their invention and innovation. The extended abstracts are divided into two categories, which are Category A (Higher Educational Student/ Any Recognized Institutional Students in Malaysia) and Category B (Primary/ Secondary School Students / Special Education School Students in Johor). Each abstract gives a brief background on the innovation or project.**

**We hope that this e-book will help the readers to get to know the innovation done by the students from both categories and get some ideas to develop future innovation products.**



## REVOLUTIONIZING HOSTEL MANAGEMENT: A COMPREHENSIVE CAMPUS MANAGEMENT SYSTEM

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### ABSTRACT

A campus management system is usually designed to manage all student resident activities. The current trend of this type of management system can optimize processes and resources. For example, the campus does not worry about managing interactions between campus and resident students, as the system creates a smooth management process. This allows the campus to focus solely on process implementation and maintaining the entire system. Furthermore, using a computer-based system can lead to improvement outcomes, such as reducing risks and increasing quality and productivity. However, it is worth noting that the campus management system is rarely used in Malaysia. This paper introduces the structure of the system and explains how we implement some utility functions on the system to build an efficient computer-based system. We have implemented this system for the student resident at Southern University College, making management more convenient. The current system is traditional, and our goal is to transform it into a computer-based information system. As a result, resident students can manage all miscellaneous tasks through our mobile application, while the management team can easily handle miscellaneous tasks through our application service.

**Keywords:** Campus Management system, Image Recognition, YOLO v4, Flask Python, OCR.

### 1.0 INTRODUCTION

Our current system has implemented in traditional practice which has limitation in functions, especially for security services, accommodation, and facilities compliance. Other than that, current procedure for visitor and residence registration has no integration between components. In addition, the current practice has quite a number of officer which lead to the excessive unnecessary manpower that can be allocated for other tasks.

### 2.0 OBJECTIVE

The primary objective of this study is to integrate all module system in our own campus, Southern University college. Specifically, we aim to (1) develop a holistic system that assist campus visitors and residence on facilities access, (2) to integrate the campus facilities services and residence services as one complete system to reduce task redundancy, and (3) to automate and facilitate the manual processes of logging or recording in accessing vehicles in the campus.

### 3.0 DESCRIPTION OF INNOVATION/METHODOLOGY

The concept of the system is to use license plate scanning technology to automate the security work. Users can invite visitors using a QR code and it can create a link. Visitors will be given an electronic pass to gain access to the resident after register successfully with the link. Not only that, but the management can also manage and view the occupancy status of each room in the dormitory and the payment records of the residents through another webpage. Figure 1 below shown the context diagram of this system.

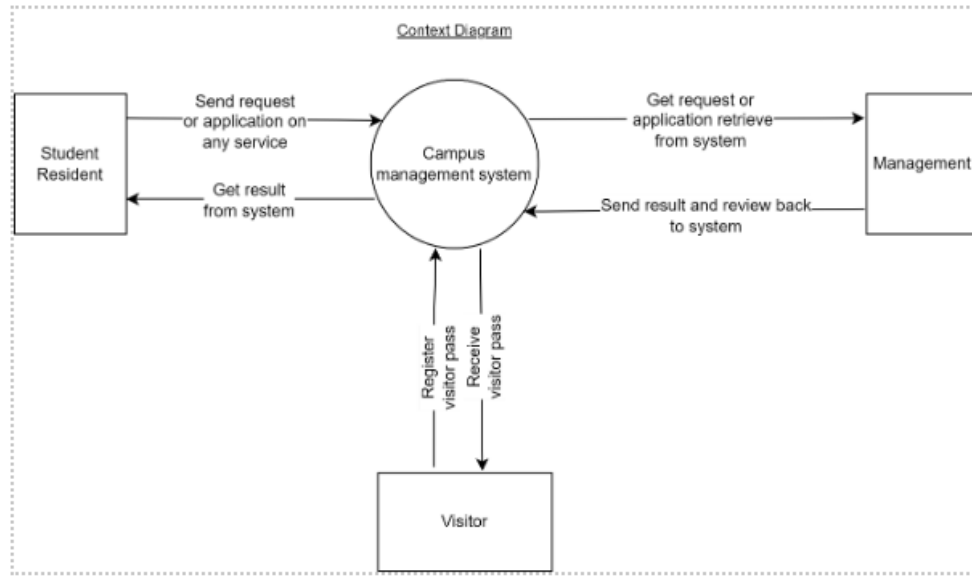


Figure 1: Campus Management System workflow

### 4.0 ADVANTAGE/IMPACT/RESULTS/NOVELTY

We have successfully developed a robust and reliable system that effectively addresses the initial problem statement. Through careful research, analysis, and implementation, we have designed a solution that meets the specific needs and requirements of our users.

In addition, the successful achievement of our goals in transforming the current system into a comprehensive campus management solution with three distinct user interfaces: management, student, and visitor. By integrating a mobile application, we have increased convenience and accessibility, allowing users to manage various aspects of campus life at their fingertips. This achievement was made possible through the use of information technology (IT) inventions and innovations that leveraged existing technology and hardware to streamline campus operations.

### 5.0 CONCLUSION

This project is not just about harnessing the power of technology; it's about solving real-life challenges and transforming the campus experience for the better. By streamlining registration processes and utilizing AI-driven vehicle plate number detection, we empower our campus community to focus on what truly matters - their education, growth, and well-being. Together, we are shaping a more connected, secure, and sustainable campus environment for generations to come.