



**6th UNDERGRADUATE
SEMINAR ON BUILT
ENVIRONMENT
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(USBET) 2023**

**SUSTAINABLE BUILT
ENVIRONMENT**

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THE STUDENT'S ACCEPTANCE LEVEL OF SMART DOOR LOCK SYSTEM IMPLEMENTATION IN PUBLIC UNIVERSITY HOSTEL

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ABSTRACT

This research investigates how well the smart door lock system is received by students living in public university residence halls, with a particular emphasis on finding adoption barriers and security concerns. The study seeks to offer insightful information that will enhance the use of technology and safety measures in dormitory settings. Data from students living in dormitories at UiTM Seri Iskandar, Perak, was gathered using a quantitative study approach and a standardized questionnaire. The results show that the smart door lock system is widely used, but there are also reservations about potential security flaws. In conclusion, solving the security issues that have been raised is essential for improving the technology's efficacy and user satisfaction. To optimize the student living experience, future research should examine longitudinal user experiences and consider combining smart door lock systems with other smart university technology.

Keywords: *Smart door, lock system, hostel*

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INTRODUCTION

UNIVERSITY CAMPUS ENVIRONMENT

The idea of campus environment is unique; the most distinction between a campus environment and common environment is in its primary purpose of providing a supportive environment for teaching and learning (Hajrasouliha, 2017). The university environment comprises physical structures in which education, teaching and research are undertaken. According to Temple (2008), the learning environment may seem to be a small factor and of no significance but it plays a vital role and influences the whole learning experience. Elliott & Shin (2002) argue that satisfaction actually covers issues of student perception, feelings and the outcome of their expectation during their academic year. Students expect their institution to provide safe and secure student hostel facilities, a conducive learning environment, well maintained and safe facilities to help them attain necessary skills and knowledge to enhance their learning experiences. Sojkin, Bartkowiak & Skuza (2012) were of the opinion that requirements for achieving a desirable tertiary education is meeting student satisfaction from various perspective including types of infrastructure provided, functionality/performance of this infrastructure, and how safe and secure they are on campus during their academic years. The quality of educational physical environment can be traced to the general condition of educational buildings (Mustafa, 2017), as well as the general campus environment. Therefore, proper management of these factors and infrastructure influences student satisfaction and consequently improves the student learning experience.

Public University's Student Hostel Facilities

The student hostel functioned to meet the student's accommodation need. In fulfilling the competitive demand, student hostels are very crucial in providing students with accommodation in support of a better learning opportunity. Indirectly, it attracts and retains student attrition in the university enrolment numbers. To improve the university's performance, student hostels, therefore, need to be equipped with effective facilities and good services (Yen, 2014).

The steady growth of higher education institution enrolment numbers has prompted the government to improve the competitiveness of universities in all aspects. The increase in student enrolment has led to the demands for enhancement of student accommodation, teaching and learning facilities as well as other facilities. Necessary facilities are in place in each university to accommodate the needs of the student population (Shahabudin, Razak & Khoon, 2011).

The need to accommodate such student enrolment numbers had prompt the establishment of multi-storey student hostels by the university, both on and off campus (Dahlan et al., 2009). These multi-storey student hostels mostly from a three

to six-story height, although there are occasional student hostel blocks that are higher than this (Ibrahim et al., 2018) commented on the importance of student hostel facilities which have been regarded as a tangible marketing tool and a channel used by many universities to demonstrate their uniqueness, generate income and exhibit their qualities. Similarly, (Hassanain, 2008) acknowledged the significance of hostel to student academic achievement, as such facilities are provided with the aim of assisting students to have easy access to learning facilities and lecture theatres. (Too & Bajracharya, 2015) further elucidate that student hostel facilities offer students a feeling of home away from home and influence a desirable educational outcome.

Safety and Security Gap in Public University's Student Hostel Facilities

Historically, safety research has focused on design and construction phases, therefore maintenance personnel in the field of FM are unwilling to adjust to the current safety trend in maintenance of facilities (Wetzel & Thabet, 2015). Safety and security have become a topic of interest among researchers and universities in the management of student hostel facilities in both on campus and off campus residences (Hassanain et al., 2008). (Atkin & Brooks, 2015) and (Babatunde & Perera, 2017) observed that safety and security is an important aspect of housing which is often seen as a lower priority issue by many institutions and organisations. Furthermore, (Najib et al., 2011) explain that student housing offers limited safety and security services and university management and hostel managers often gives unnecessary access to complete strangers to student accommodation due to poor access control, lack of CCTV and irregular presence of security personnel. Moreover, (Atkin & Brooks, 2015) argued that safety, security and environment in the management of facilities in many organisations and institutions have become a global issue. (Hassanain, 2008) held that improvement is needed in the aspect of safety and security in the management of SHF as the rate of accidents, sexual harassment, injury, gunshot injury, fire outbreak and theft increase on a daily basis in many student hostel facilities around the world.

SMART DOOR LOCK

Recently, smart door lock system has widely used as a major part of home security system. Smart Door Lock system is considered as a smart authentication access control based on authentication person to lock/unlock the door in home (Corradini et al., 2022). A smart door lock is defined as an electronic and mechanical locking device that opens wirelessly with an authorized user's authentication (Rouse. M, 2017). The existence of a smart door lock began with the smart home automation system. The creation of smart home is where the parts of a home is manipulated and designed to operate wirelessly, where an example of parts of a home is the door. The original basic function of a smart door is to increase a home's security system. By creating a smart door, it can enhance a home's security system by installing an automated door lock, which enables access to authorized user's, and installing a surveillance system, which can help in catching a criminal (IJSRISE, 2015).

Types of Smart Door Lock

There are just few digital approaches for door security locks in the current system. This contemporary smart locking system takes the place of the classic lock and key locking method. Modern living is largely reliant on technological advancements, such as opening doors, managing the air conditioning and regulating the curtains. People want to feel safe in their own homes, offices and stores. The primary motivation for the development of smart lock is to meet the needs of people (Faisal, 2021). Some of these systems will be discussed in this section:

- Fingerprint Locking System

In recent years, Fingerprint based authentication systems have developed rapidly. At present fingerprint based biometric system are exposed to severe attacks. When compared to different fingerprint sensors and spoofing materials, the single feature based static approach does not perform equally. To overcome the issues faced in dynamic software approaches which require user cooperation and longer computational time, we extract these features from a single fingerprint. By the experimental analysis done on LivDet 2011 data had resulted an average Equal Error Rate (EER) of 3.95% over four databases, while the existing best average ERR was 9.62%. Experiments were performed with Livdet 2013 and achieved an average classification error of 2.27% (Dubey et al., 2016).



Figure 1: Fingerprint Locking System

- RFID Based Access Control System

RFID in congregation with biometric technologies has gained immense popularity for security issues. Identification of individuals is always prioritized in secured places like bus and train stations, national and international airports, commercial complexes, movie theatres and so on. Undoubtedly, associated expense is an important factor to be considered while promoting security solutions for such locations. In that sense, RFID is a relatively inexpensive technology which is capable of transmitting data

without the usage of any guided media. In fact, the levels of security provided by RFID technologies are reasonably efficient (Verma & Tripathy, 2010). Enhancement in the usage of this emerging technology is being traced in the fields of business, industry and logistics support in particular due to its capability to detect, track, classify and manage the flow of information systematically (Ngai & Riggins, 2008).



Figure 2: RFID Door Lock

- Internet of Things

The term Internet of Things (IoT) is a well-known term in this modern era. IoT's relationship with smart door lock's is connected through smart home automation. Smart home automation was created to enhance a home's devices to create a wirelessly controlled environment. IoT has been categorized to four applications which are Personal and Home, Enterprise, Utilities and Mobile. Personal and Home applications focus more on devices at houses for example, a smart door lock. Another example of enhancement that has been planned to be created is an interesting development will be using a Twitter like concept where individual things in the house can periodically tweet the readings which can be easily followed from anywhere.

METHODOLOGY

The study is about readiness for implementation of smart door lock in hostel. The research will be carried out at UiTM Seri Iskandar hostel. Student hostel is a residential building that provided for the students. In every hostel, security aspect is important because the building will have many occupants.

Research Design and Strategy

This chapter will explain about the research design and strategy. The aim of this research is to determine the readiness for implementation of smart security system in public university. The strategy of the research has to be decided before starting to design the study. The strategy of this research was chosen on the basis of research questions and find the suitable method for this research. The decision on the strategy can be quantitative or qualitative research strategy. For this study will use a quantitative research approach by using Google Forms.

Sampling / Case Study

This study will choose hostel at UiTM Seri Iskandar. 113 respondents from the hostel needed to fill up the questionnaire. The question based on the objective of the study. Respondent will tell about readiness for implementation of smart door lock and also security issues happened in their hostel. Their comment can be used to develop conclusion and recommendation.

Research Instrument

A questionnaire was chosen to be the research instrument for collecting information from the respondents. Rather than interviewing them face to face, this strategy proved more effective. This questionnaire was distributed to random respondents of college resident at UiTM Seri Iskandar Perak. The questionnaire develops based on respected Literature Review of past research to address the study's objectives. The questionnaire has two sections relevant to the requirements for achieving the study's objectives. Section 1 examined the respondents' backgrounds which is demographic section. Section 2 included the knowledge and opinion of student about smart door lock system. Sections 2 had multiple-choice and checkboxes.

DATA ANALYSIS AND DISCUSSION

Analysis the data of the quantitative findings that were collected in the fourth stage of the research which is the data collection. The quantitative data collection was conducted using questionnaires via Google Form where it was distributed to students who staying at college UiTM Seri Iskandar. Total of 113 respondents are recorded in this questionnaire. The questionnaire pursued responses to questions about knowledge and opinion of respondents about implementing smart door lock systems in hostel.

Table 1: Gender of Respondents

Gender of Respondents			
	Frequency	Percent (%)	Cumulative percent (%)
Male	69	61.1	61.1
Female	44	38.9	100.0
Total	113	100.0	

Table 2: Age of Respondents

Age of Respondents			
	Frequency	Percent (%)	Cumulative percent (%)
18-20	65	57.5	57.5
21-23	45	39.8	97.3
23-25	3	2.7	100.0
Total	113	100.0	

Table 3: Student Residential College

Student Residential College			
	Frequency	Percent (%)	Cumulative percent (%)
Kolej Cempaka Sari	8	7.1	7.1
Kolej Pasir Salak	64	56.6	63.7

Kolej Indera Mulia	7	6.2	69.9
Kolej Indera Sakti	34	30.1	100.0
Total	113	100.0	

Table 4: Summary of Question

No.	Question	Average mean score
1.	Which of the following types of smart door lock do you know?	2.83
2.	Do you agree that a smart door lock system can enhance the overall security of the hostel?	4.49
3.	Do you agree about the convenience of using a smart door lock system compared to traditional lock and key systems?	4.81
4.	Do you agree if we use the student card as access card for smart door lock in hostel?	3.00

According to the findings of scientific measurements, it can be shown that security problems are rising in hostel in UiTM Seri Iskandar, Perak. Changing to new lock systems in hostel also got approval from majority of responds as they also agree to some other points like physical keys are hustle to bring around and most of them had misplaced the keys at least once. Moreover, they are also aware about the innovation of smart door lock system so there is no need of full education about the smart door lock system for students. Last but not least, majority of respondents did not agree if student card become an access card for the hostel.

CONCLUSION

Smart door lock systems have a lot to offer in terms of efficiency, convenience, and security when they are installed in public university dorms. A questionnaire-based study yielded numerous significant results that illuminate the significance of this innovation in the hostel setting. Furthermore, a large majority of respondents agree that installing smart door lock systems in hostels is important. They are aware of these systems' benefits, which include heightened security elements like biometric authentication, remote monitoring options, and access records. Finally, installing smart door lock systems in public college dorms has the potential to dramatically improve security, convenience, and access control. Public universities may give their students a safer and more secure place to live by addressing the listed issues and increasing student awareness.

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Sekian, terima kasih.

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