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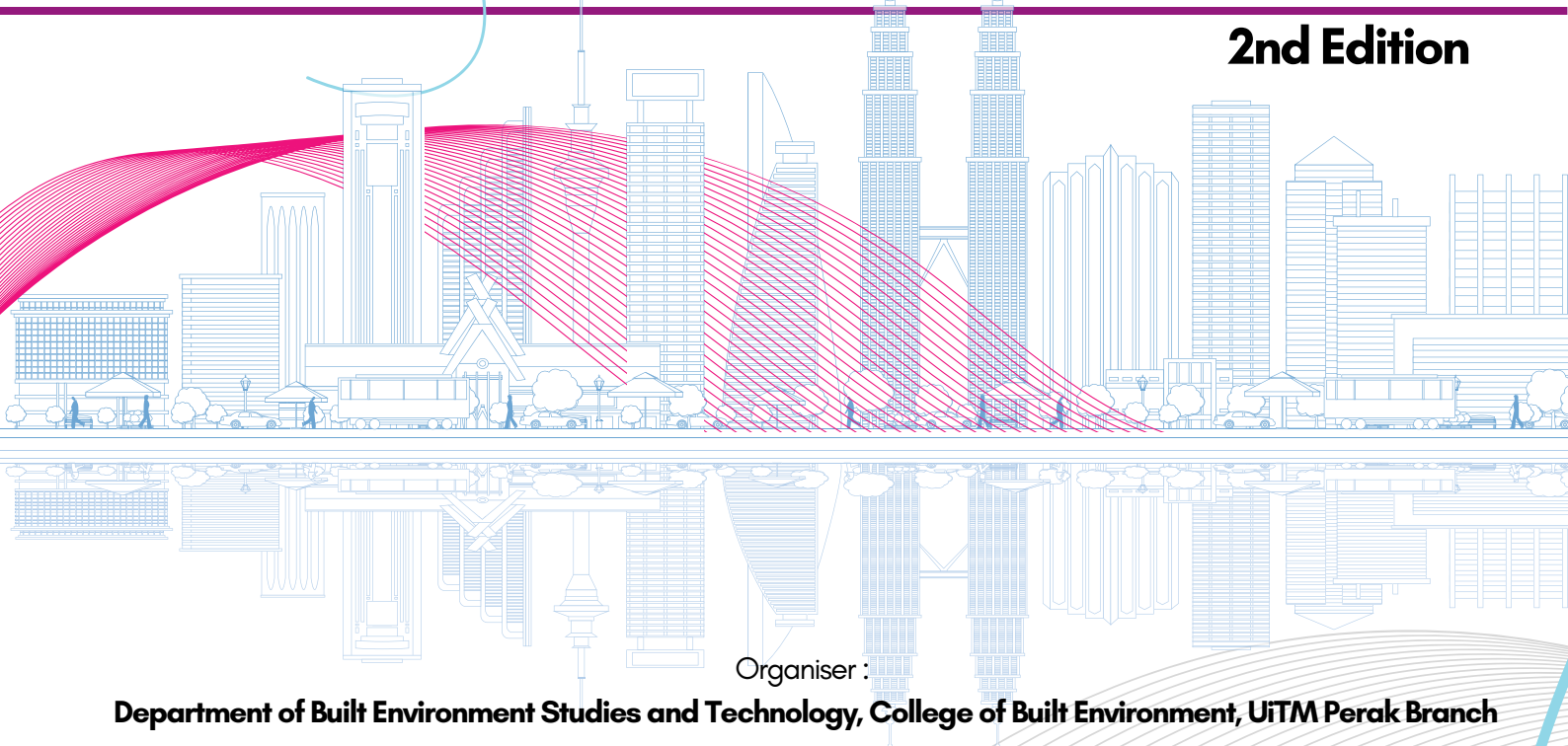
Cawangan Perak

e - Proceedings



Proceeding for International Undergraduates Get Together 2024 (IUGeT 2024)
"Undergraduates' Digital Engagement Towards Global Ingenuity"

2nd Edition



Organiser :

Department of Built Environment Studies and Technology, College of Built Environment, UiTM Perak Branch

Co-organiser :

INSPIRED 2024. Office of Research, Industrial Linkages, Community & Alumni (PJIMA), UiTM Perak Branch

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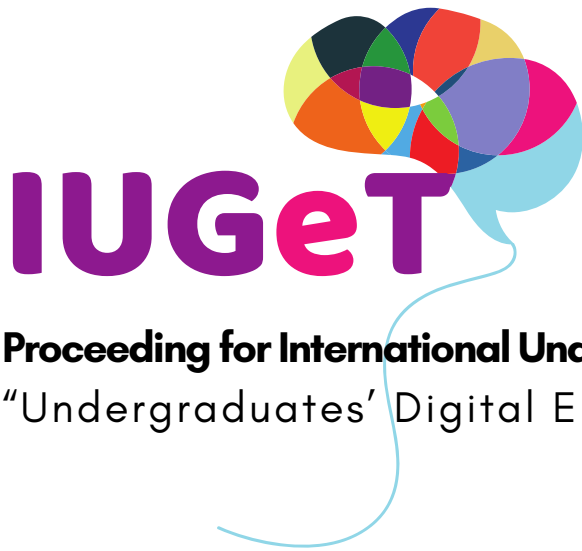
Universitas Sebelas Maret

Universitas Tridianti (UNANTI)

Publication date :

November 2024

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Perpustakaan Negara Malaysia

Cataloguing in Publication Data

No e- ISBN: 978-967-2776-42-0

Cover Design: Muhammad Anas Othman

Typesetting : Arial

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AQUA HEAVEN RESORT & WATERPARK (SUSTAINABLE URBAN PLANNING: DESIGNING SMART DEVELOPMENT WITH ENVIRONMENTAL CONSCIOUSNESS)

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Abstract

Aqua Heaven Resort and Waterpark is a mixed-used development with the concept of sustainable urban planning that aims for the implementation of smart and modern technology as well as to preserve the quality of the environment through sustainable practices. This resort consists of mixed types of development which are chalets and the waterpark, shop lots, restaurant, etc. The proposed site is in Sitiawan, Perak which is surrounded by many residential areas. Since the existing supply of recreational parks is not as many as the residential, this development of the resort and waterpark truly could give a big potential to the developers. The additional interesting innovations that are related with sustainable urban planning like the invention of the QR code keyless smart door, waterproof smart wristband and electric bicycle charging platform could enhance the whole operation of the resort, also could expand the investment return of the project in the future.

Keywords: *sustainable urban planning, recreational, mixed-use development*

1. INTRODUCTION

Aqua Heaven Resort and Waterpark located at Sitiawan, Perak is a mixed-use development with the concept of **sustainable urban planning**. "Aqua" refers to the waterpark element that emphasises the recreational and aquatic features of the development, meanwhile "Heaven" suggests a peaceful and relaxing atmosphere that is ideal for the overall environment of the resort. Aqua Heaven Resort and Waterpark are developed due to the location of proposed land being more to residential areas. Based on the market research and a simple literature review, there were about 62,646 units of residential in Manjung but there were only a few recreational parks that are totally different from this development which are nature park like Tua Pek Kong Paya Bakau, beach like Pantai Teluk Senangin and ecological park like City Mangrove Park.

Aqua Heaven is an eco-world recreational resort waterpark that harmoniously blends recreation, relaxation and commerce into a captivating destination. This mixed-used development is a unique blend of recreational and commercial spaces promises to redefine the concept of modern living, providing dynamic environment where leisure meets convenience in a picturesque setting since it prioritises the enhanced urban smart design as well as promoting long-term environmental sustainability. Ultimately, sustainable urban planning aims to create places where people can live healthy, prosperous lives while respecting and preserving natural resources and ecosystems for future generations.

The implementation of a few interesting innovations into this development is correlated with the concept of sustainable urban planning which could enhance the overall process and operation of the resort as well as could bring convenience and enrich the quality of life to the visitors and guests. The additional smart technology system to the overall system of chalet and other buildings in the resort and the smart safety measure application and equipment are important and should be practiced for every development of the resort and waterpark since the system is more reliable, more helpful, more safe and could promote efficient and effective production of works.

2. LITERATURE REVIEW

Every development must go through a comprehensive process that is planned as a guidance for the creation of the final product or system. The process of development of a building involves the journey starting from designing the concept until the completion of the whole development. The general process of development includes several activities such as conceptualisation, feasibility studies, planning and design, cost estimation, contractor selection and building construction until it is completed and ready to be handed over to the client (Marzukhi et al., 2020).

Land development of every nation is dependent on the economic condition and social development that created the pressure of demand. The theory of 'highest and best use' of land must be practiced since the maximisation of land with the addition of sustainable urban development could fulfill economic, social and environmental needs which provides the balance between growth and the urbanisation changes. (Zhou et al., 2017)

Every project stakeholder or developer targets to produce a successful development project to achieve the maximize profit and satisfaction of the client. In Malaysia, the project development will undergo several planning processes or also known as project life cycle comprising pre-development stage, construction stage and post construction stage. Abdullah et al. (2011) highlighted that planning approval is crucial to be obtained since the legislation in the planning process includes the laws, guidelines and procedures in the country are quite extensive and precise.

Christensen (2014) stated that property values could change during the urban development process so the municipal planning is important as it could influence the increase of the overall property values. The process of urban development is influenced by various factors including market condition, regulatory frameworks and the interest of different stakeholders involved in the operation. The primary goal of urban planning is to create the sustainable, functional and aesthetic value that meet the needs of current and future residents.

3. MATERIALS AND METHODS

3.1 Site Analysis

We inspected the proposed site on 20 May 2024 which is located in the District of Manjung and Mukim of Sitiawan. The proposed site is a parcel of vacant land which is in Perak. The land is identified as Lot No. PT 50989 and the land area is 5.69 hectares, which is 14.0603 acres. The proposed site is situated along Jalan Lumut. The physical terrain is relatively flat in terrain and on the same level with the frontage of the road, Jalan Lumut. During the inspection we noted that the proposed site is surrounded by many residential schemes like Victoria Cottage, Setia Residence, Taman Selamat, Taman Bunga Ros, Taman Muhibbah, Taman Tok Perdana and Taman Terus Maju.



Figure 1. The view of proposed site



Figure 2. The view of proposed site (Google Maps)

3.2 Design Analysis and Innovation Applied

3.2.1 Development Concept

Aqua Heaven is a mixed-used development of eco-world recreational resort park with the concept of sustainable urban planning that harmoniously blends recreation, relaxation, and commerce into a captivating destination. Additionally, a thoughtfully designed commercial building anchors the development, offering a variety of amenities such as shops, restaurants, and offices, catering to both residents and visitors alike.

For the design planning, the plot ratio of 60:40 is used to determine the intensity of land usage of the proposed site and the total amount of the development can be developed on the land. 60% is for the development of the main building and 40% is for the open spaces.

Table 1: Proposed units for Aqua Heaven Resort and Waterpark Development

Proposed units	
60% (Development)	
1. Shop Lot (10 units)	20m x 30m = 600sq.m
2. Restaurant (1 unit)	50m x 50m = 2500sq.m
3. Front Chalet (10 units)	27m x 27m = 729sq.m
4. Back Chalet (10 units)	30m x 30m = 900sq.m
5. Office A (1 unit)	40m x 40m = 1600sq.m
6. Office B (1 unit)	30m x 25m = 750sq.m
7. Main Pool	70m x 70m = 4900sq.m
8. Guard House	10m x 10m = 100sq.m
9. Staff Store (2 units)	25m x 25m = 625sq.m
10. Equipment Store	30m x 25m = 750sq.m
Proposed units	
40% (Open Spaces)	
1. Surau (1 unit)	40m x 40m = 1600sq.m
2. Electric Substation (1 unit)	30m x 30m = 900sq.m
3. Water Tower	75m x 75m = 5625sq.m
4. Sewage Plant	35m x 35m = 1125sq.m
5. Pool Filtration Room	25m x 25m = 625sq.m



Figure 3. Inspiration Layout for Resort and Waterpark



Figure 4. Aqua Heaven Resort and Waterpark Layout Design

3.2.2 Innovation Applied

● Qr Code Keyless Smart Door

The innovation of QR code keyless smart doors encompasses the development of a secure and user-friendly access system leveraging QR code technology. It also focuses on improving convenience by providing a hassle-free alternative to traditional physical keys and electronic keycards, allowing users to access their doors using their smartphones. Additionally, the system is designed to enable remote access, letting users generate and send QR codes via mobile apps for guests or service personnel from anywhere. Seamless integration with existing home automation and security systems is a key objective, ensuring a unified and efficient access control experience. To ensure reliability, the system will be rigorously tested to function effectively in various environments and conditions, maintaining both performance and security. Traditional locking mechanisms, including physical keys and electronic keycards, often present challenges such as the risk of loss, theft, and unauthorized duplication. These issues can compromise security and cause inconvenience for users. Additionally, managing and distributing access credentials for multiple users or visitors can be cumbersome and inefficient. To address these problems, there is a need for an innovative access control solution that offers enhanced security, convenience, and flexibility. QR code keyless smart doors aim to resolve these issues by providing a secure, user-friendly alternative that eliminates physical keys and traditional keycards, allowing for seamless access management through mobile devices.

● Smart Wristband

The innovation of a waterproof wristband designed for cashless payments and emergency tracking seeks to create a versatile and durable wearable device that excels in both functionality and resilience. This project focuses on developing a wristband specifically for guests that integrates secure, contactless payment technology with real-time GPS tracking and emergency alert features, all while ensuring it remains waterproof and suitable for various activities. The wristband aims to enhance user convenience by allowing seamless transactions without the need for physical cards or cash. Additionally, it improves safety by providing immediate location tracking and emergency notifications to designated contacts or services. The design will ensure the wristband can withstand water exposure and environmental challenges, making it ideal for swimming, outdoor sports, and daily wear.

An intuitive user interface will be developed to manage payment settings and emergency contacts, accessible through a mobile app or directly from the wristband. Comprehensive testing and compliance with relevant safety and regulatory standards will be integral to ensure the wristband's performance, security, and reliability. Traditional payment methods and emergency response systems often lack integration and versatility, leading to challenges in convenience and safety. Physical cards and cash can be easily lost, stolen, or damaged, while separate emergency tracking devices may not be readily accessible in critical situations. Additionally, existing wristbands and wearables may not offer sufficient durability for water-related activities or extreme conditions, limiting their functionality and user reliability. To address these issues, there is a need for an innovative waterproof wristband that combines the ease of cashless payments with robust emergency tracking features. This wristband must ensure secure, contactless transactions and provide real-time location tracking and emergency alerts, all while maintaining resilience in various environments.

- **Sustainable Practices**

Related with the concept of sustainable urban planning, the development of the recreational resort and waterpark is not only focusing on the application of the modern system only but also prioritising the quality of the environment through the implementation of the eco-friendly practices for the whole operation of the development. To avoid air pollution from vehicle emission and maintain the air quality inside the resort, an electric buggy will be provided to each family of guests for use inside the resort which means all vehicles need to be parked outside. Meanwhile, for energy consumption saving, a device charger platform in the shape of an electric bicycle is invented for the public use in the leisure area near to the main swimming pool. The guests need to cycle to generate the electricity to get their device charged.

3.3 Impact of Innovation

1. Enhanced guest experience

QR code keyless smart doors allow guests can access their rooms and other secured areas using QR codes, making check-in and entry seamless and contactless. This eliminates the need for physical keys and reduces wait times at reception. Guests can wear waterproof wristbands that serve as room keys, payment methods, and access passes to various attractions within the resort. This enhances convenience, allowing guests to move freely without worrying about carrying wallets or keys.

2. Increased Operational Efficiency

Smart doors and wristbands can improve access control for different areas within the resort, ensuring only authorised guests and staff can enter specific zones. This enhances security and operational efficiency. The resort can use data from wristbands to monitor guest movements and preferences, optimising staff deployment and resource allocation.

3. Sustainability and Environmental Responsibility

Implementing eco-friendly materials in the construction and maintenance of the resort reduces its environmental impact, promoting sustainability. Smart doors and wristbands can be designed to use minimal energy, contributing to the resort's overall energy efficiency. Additionally, the resort can adopt renewable energy sources and sustainable practices to further its environmental goals.

4. Marketing and Brand Loyalty

Showcasing cutting-edge technologies can enhance the resort's appeal, attracting tech-savvy and environmentally conscious guests. Waterproof wristbands can be integrated with loyalty programs, offering rewards and incentives for repeat visits, and fostering brand loyalty.

4. CONCLUSION

In conclusion, sustainable urban planning is essential for shaping cities that are resilient, inclusive, and capable of supporting the well-being of both current and future generations. By adhering to key principles such as compact development, mixed land uses, and promoting public and active transportation, urban planners can reduce environmental impacts and foster local economies. Implementing green infrastructure and energy-efficient practices further enhances sustainability by improving air quality, preserving biodiversity, and reducing carbon emissions. Additionally, sustainable water management, waste reduction, and community engagement are critical to achieving social equity and long-term environmental health. Ultimately, the goal of sustainable urban planning is to create vibrant, healthy, and prosperous urban areas that coexist harmoniously with the natural environment, ensuring a sustainable future for all.

5. ACKNOWLEDGMENT

The success of this project is the result of the cooperation of many individuals and organisations, and we would like to say a big thank you to everyone who played an important role. We would like to express our deepest gratitude to Dr. Norazalina Yusnita Binti Abdul Rahman, our course instructor, for her guidance and help which is also provided information and guidance in completing this innovation development project by giving us insightful criticism and guidance that was very helpful to us the quality of our work.

Special appreciation to Dr. Suwaibatul Islamiah Binti Abdullah Sani, who is also the Supervisor of our group, for providing ideas and guidance in completing this innovation development project. Not forgetting also to other friends and family members who continue to give support. We also want to thank each member of our team for their dedication, hard work, and cooperation. Everyone brings a different set of abilities and perspectives to the project, which contributes significantly to overall success. Finally, we want to acknowledge our colleagues' understanding and support. Their support and patience were vital in guiding us through the obstacles of this project.

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Surat kami : 700-KPK (PRP.UP.1/20/1)

Tarikh : 20 Januari 2023

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