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Revitalization of Titi Papan Station: A High-Tech Architecture Approach to Integrating Heritage and Modernity

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Abstract
Revitalization of the Titi Papan Station building located in Titi Papan, Medan Deli sub-district, Medan City, is designed for the development of national railways which is scheduled until 2030. Titi Papan Station is one of the stations located on the Medan-Belawan crossing with inactive status. In addition, Titi Papan Station is one of the cultural heritage buildings from the Dutch colonial era that needs to be preserved by revitalizing the building because physically the Titi Papan Station building is no longer suitable for use and is no longer in accordance with the function of the building. The application of High Tech Architecture in conservation buildings is generally not solid but the application of High Tech Architecture at Titi Papan Station will be designed as o Revitalization, Railway Station, High Tech Architecture ne unit but does not eliminate the historical value of cultural heritage buildings. The use of new materials at the station with the aim of following the development of increasingly advanced technology but still applying patterns to the old building of Titi Papan Station so that the identity of the building is not lost

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Introduction

Railway is one of the most important and influential modes of transportation in the development of mass transportation in Indonesia. With the increasing needs in human activities, the process of modernization and development of facilities and infrastructure must be improved both in terms of quality and quantity. In accordance with Law No.13/1992 on railways, trains are a mode of transportation that has its own characteristics and advantages. Trains are very efficient in transporting large numbers of passengers and goods, as well as energy saving and space saving. Trains also have a high safety factor and low levels of environmental pollution, making them more efficient than other modes of transportation [1].

Railways have advantages for commuters, especially in the context of urban railways, due to their transportability and reliability. Trains have proven to be a reliable mode of transportation, with punctuality being particularly important for these services. Rail is also very efficient in terms of fuel consumption, both in terms of the number of passengers it can carry and the distance traveled, when compared to other modes of road transportation. The table below shows a comparison of fuel energy consumption per kilometer for Pnp

Table 1 Fuel Energy Consumption/KM Comparison

Mode of Transportation	Transport Volume	Fuel Energy Consumption/Km	Fuel Energy Usage/Pnp
Train	1500 org	3 liter	0,0020
Bus	40 org	0,5 liter	0,0125
Mobile	5 org	0,1 liter	0,0200

Source :North Sumatra Provincial Railway Master Plan, 2022

In addition, the choice of transportation mode is influenced by factors such as transportation services, travel costs, travel time, accessibility, and qualitative attitudes, including comfort, security, and safety. These attitudes are related to people's preference to switch to rail mode [2]

To increase public interest in switching to rail transportation services, it is very important to meet the quality of service at the train station according to user desires. Users of commuter train services need to know the facilities provided at the train station to plan their trip from their place of

origin to their destination [3]. The revitalization of Titi Papan Station on the Medan-Belawan route is expected to increase community mobility and accessibility to encourage increased economic growth in the Medan Deli area. In addition, the government has a policy of revitalizing Titi Papan Station to reduce the burden of road congestion as one of the modes of mass transportation that has high potential as fast, safe, comfortable, and timely mass transportation.

On the other hand, Titi Papan Station is a cultural heritage building in Medan City in accordance with Medan City Regulation No.2 of 2012 so that Titi Papan Station needs to be maintained and preserved so that the historical value of the station building is not lost [4]. The application of High Tech architecture in revitalizing Titi Papan Station aims to integrate contextual and sustainability elements, with the intention of maintaining the historical value of the building which has the status of a cultural heritage, as well as utilizing modern technology to improve the function and comfort of the station, so as to produce harmonization between historical heritage and technological advances in the design and use of the facility.

Methodology

This research uses a descriptive qualitative approach to describe in depth the real conditions in existing buildings. By conducting direct surveys on existing buildings and in-depth interviews with related parties. Researchers try to thoroughly understand the characteristics, quality, and relationships between activities that occur in buildings and around buildings. Qualitative research is an approach that aims to describe in depth and comprehensively a social phenomenon as it is in the field, through descriptive and narrative data collection, this research will produce a rich and deep understanding of the meaning and context of the phenomenon [5].

In addition, an in-depth literature review on railroad regulations was also conducted to gain a more comprehensive understanding. The source of data in this research is in the form of library research, which is to inventory and study library data, in the form of laws and regulations, literature books, journals, and official local government documents including electronic information (internet) regarding railways. A qualitative approach was chosen because it allows researchers to explore more details from the data obtained, such as the perceptions and experiences of stakeholders.5. Conclusion. It is the last section in the AIM (RAD) C model. It summarizes some information of the research finding and discussion.

Result and Discussion

Revitalization

Revitalization comes from the Latin word vita (life) and the prefix re-, meaning the process of bringing something back to life. In a regional context, revitalization refers to the ability of an area to survive and thrive, usually to empower areas that have been in decline due to economic expansion, social pressures, or new suburban development [6].

Railway

Railways is a unified system consisting of infrastructure, facilities, and human resources, as well as norms, criteria, requirements, and procedures for the implementation of railway transportation. In addition, a train is a means of railway transportation with motive power, either running alone or coupled with other railway facilities, which will or are moving on railways related to train travel. Railway infrastructure consists of railway lines, railway stations, and railway operating facilities to enable the operation of trains [7].

Station

Station is a place where trains depart and stop to serve the boarding and disembarkation of passengers and/or loading and unloading of goods and for the purposes of railway operations, and at the station can carry out business activities to support railway transportation. Stations are places where trains stop and depart, unload and transport passengers and goods, as well as places where trains cross, and follow/follow [8].

Cultural Heritage

In accordance with UU RI No. 11 of 2010 concerning Cultural Heritage, cultural heritage is an immaterial cultural heritage in the form of objects, buildings, structures, sites, and areas on land and/or in water that need to be preserved because they have important values for history, science, education, religion, and/or culture [9].

Objects, buildings, and structures can be proposed as Cultural Heritage if they meet the following criteria :

1. At least fifty years old;
2. Represents a style period of at least 50 years;
3. Has significance for history, science, education, religion, and/or culture;
4. Has cultural values to strengthen the nation's personality.

High Tech Architecture

High tech generally means the use of high technology, but its meaning is broader as technology continues to evolve to more sophisticated levels. The concept was born out of 20th century modern thinking, with the application of industrial materials, as outlined in the book High Tech: The Industrial Style and Source Book for the Home by Joan Kron (1978), which shows how to utilize industrial products for home needs. In architecture, the term high tech became popular in the 1970s, referring to advanced technology applied to buildings, as seen in the Georges Pompidou Center in Paris (1972-7) by Renzo Piano and Richard Rogers, which featured glass, metal, and a network of transparent structures and service elements outside the building [10].

Project Description

The location of the revitalization design is located on Jl. KL. Yos Sudarso, Titi Papan, Medan Deli District, Medan City, North Sumatra. The location is the existence of Titi Papan Station which is no longer active. The location is in a medium-density residential area and an industrial area.

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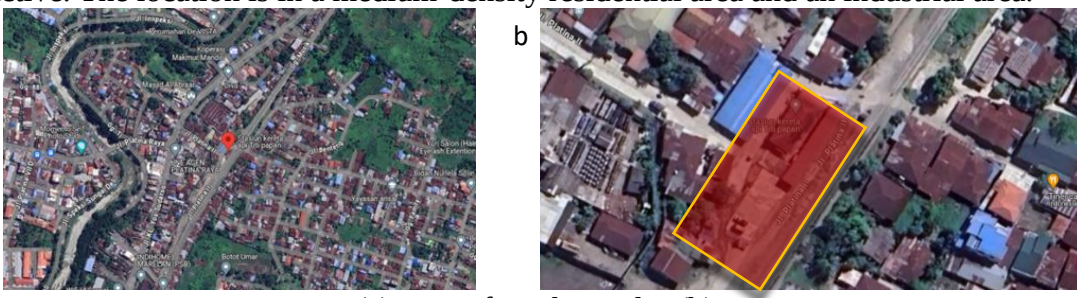

Figure 1 (a) Map of Medan Deli ; (b) Location.

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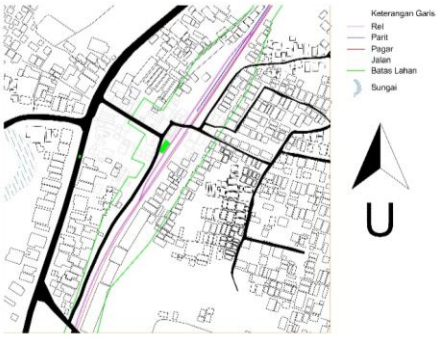

Figure 2 Land Boundary of PT. KAI

Region Boundaries

Table 2 Region Boundaries

Direction	Boundaries
North	Vacant Land
East	Truck Parking
West	Residential Areas
South	Market

Figure 3 Region Boundaries

Mass Concept

This concept of mass composition explores the integration of high tech architecture with old buildings surrounded by modern structures. This combination aims to create a dynamic and innovative space, while preserving the historical and cultural value of the old building. The application of cutting-edge technology and materials combined with the aesthetics of old buildings, produces a functional, aesthetic, and sustainable space.

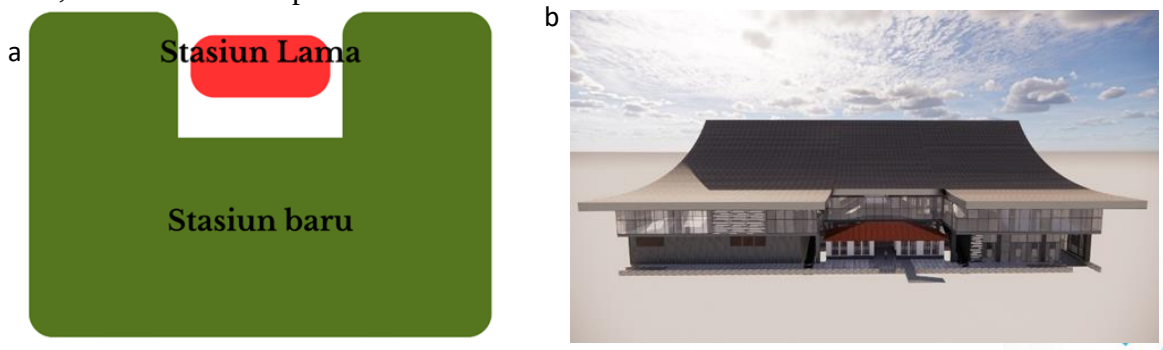

Figure 4 (a) Mass Composition Layout Deli ; (b) Building Perspective.

Basic Concept

The concept of Titi Papan Station Revitalization applies high tech architecture to integrate contextual and sustainable elements, with the intention of preserving the historical value of buildings that have cultural heritage status, as well as utilizing modern technology to improve the function and comfort of the station, resulting in a harmonization between historical heritage and technological advances in the design and use of the facility.

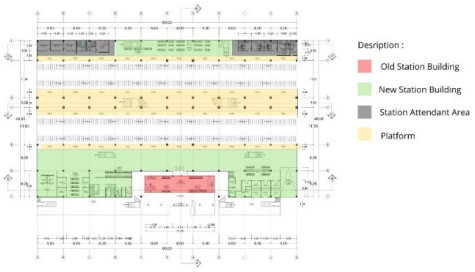

Figure 5 Floor 1

On the first floor, the old Titi Papan Station building retains its original shape and structure to maintain its historical value, but repairs are made to parts that are no longer suitable for use so that they remain functional. In addition, a new building was designed around the old station, adding design elements that reflect the development of modern technology. The new building gives a harmonious impression of modernization, while highlighting the fusion of historical heritage and contemporary architectural innovation.

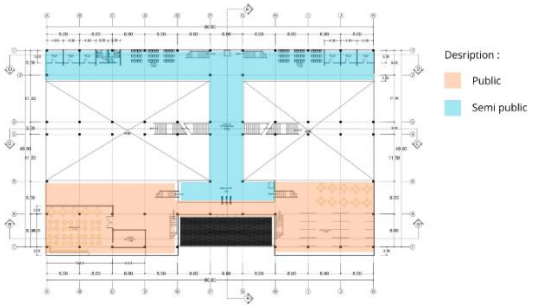

Figure 6 Floor 2

On the 2nd floor, there is a special area designated for MSME players, which is expected to be a forum for local communities to develop their businesses and encourage economic improvement around the Titi Papan Station area. This area is designed with a concept that is easily accessible to the public, so that it can attract more visitors and provide greater economic opportunities for the surrounding community. In addition, this MSME area also has a strategic function as a direct path to the platform, which not only provides convenience for transportation users, but also increases the interaction between economic activity and passenger mobility, creating a more dynamic station environment that benefits all parties.

Facade

The front facade of the Titi Papan Station building is dominated by a gray color that gives a simple yet elegant impression, reflecting a blend of function and aesthetics. The building design specifically emphasizes historical elements while maintaining the original form of the old building which is full of cultural values. The old building is strategically placed in the center of the new building structure, making it an eye-catching focal point and reminder of the station's historical importance as part of the passage of time. In addition, the new building surrounding the old station is designed to depict the rapid development of today's technology, creating a harmonious relationship between the past and the future. This combination not only pays tribute to cultural heritage, but also brings modern innovations that enhance the function and appeal of Titi Papan Station as a relevant transportation facility in the modern era.

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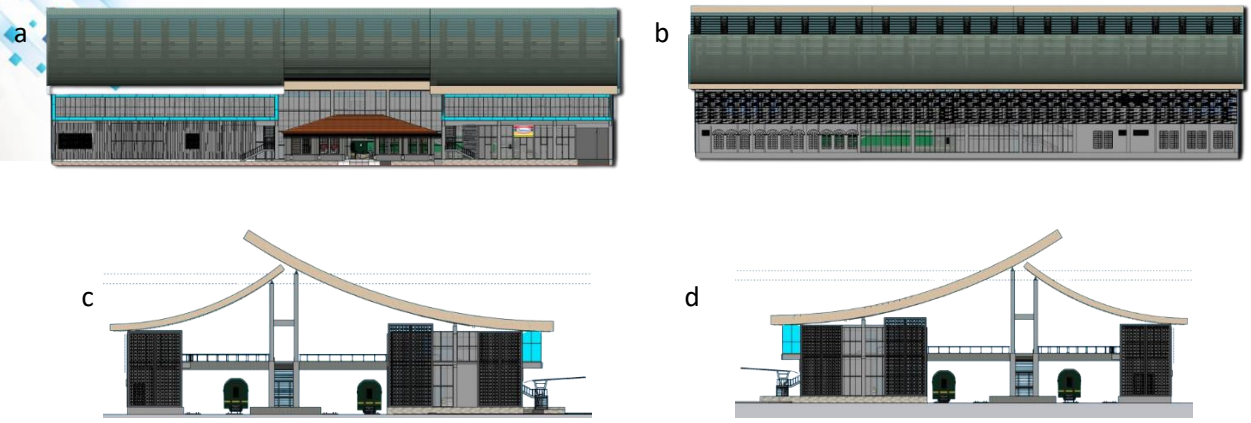

Figure 7 (a) Front View ; (b) Back View ; (c) Right View ; (d) Left View.

Theme Implementation

Table 3 Implementation of Architecture High Tech

ROOM	SITE	SHAPE
A light weight filigree of tensile members : The use of supporting structures that can be maximized as an addition to aesthetic elements in each space	Inside out : Maximizing the shape of the footprint into the shape of the building	A light weight filigree of tensile members : The use of supporting structures that can be maximized as a substitute for ornaments in the building mass
Inside out : The provision of omaments and sculptures whose patterns can be shaped like structural elements in each space	Bright & flat coloring: Combining the type of color with the condition of the site, the use of natural colors, and flat colors can be used as ideas in color selection	Inside out : Highlight structural elements in the building mass
Bright & flat coloring: Tidak Give too many types of colors, just choose several types of bright and elegant colors in each space	Transparancy, layering, & movement : Creating building layering according to the needs that have been analyzed in the space	Celebration of process : exploring the type of structure to become a point of interest in the building mass
Celebration of process : The use of good structural materials in each space to keep the building strong and sturdy		Transparancy, layering, & movement : using glass material to display the space from the inside out and vice versa
Optimistic confidence in scientific cultural : Optimizing the spaces in the building as efficiently and functionally as possible		Optimistic confidence in scientific cultural : Optimizing the façade of the building to make the building look futuristic and still usable in the future

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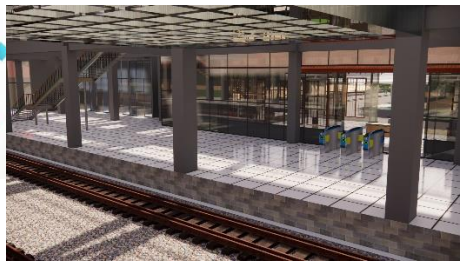
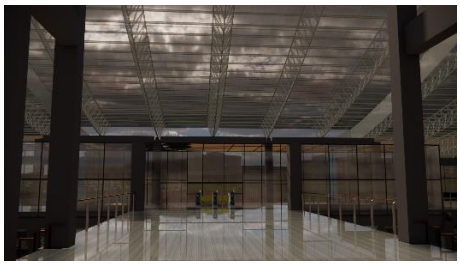

Figure 8 (a) Boarding Pass ; (b) JPO.

Supporting structures are optimally utilized not only to fulfill their technical functions, but also to provide added value in the form of aesthetic elements that enhance each designed space. Various types of structures are explored in depth in order to be able to become a focal point that attracts attention, while giving a strong character to the shape and mass of the building.

In addition, the use of glass materials is strategically designed to create a harmonious visual relationship between indoor and outdoor spaces, giving the impression of transparency and openness that supports a more dynamic spatial experience and blends with the surrounding environment.

Conclusion

Titi Papan Station will be developed into a large class station as part of the modernization of the Indonesian railway system, given the increasing growth and needs in human activity needs. High tech architecture is applied to this design to integrate contextual elements and sustainability, with the intention of maintaining the historical value of buildings that have cultural heritage status, as well as utilizing modern technology to improve the function and comfort of the station, resulting in harmonization between historical heritage and technological advances in the design and use of the facility.

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