Civil Engineering Dimension
https://ced.petra.ac.id

Maximizing Land Potential: A Highest and Best Use Analysis for Serviced Apartments in Bali

Limantoro, N.J.[1] and Anastasia, N.[2]*
[1] Civil Engineering Department, Faculty of Civil Engineering and Planning, Petra Christian University
Jl. Siwalankerto 121-131, Surabaya 60236, INDONESIA
[2] Finance & Investment Program, School of Business & Management, Petra Christian University
Jl. Siwalankerto 121-131, Surabaya 60236, INDONESIA

DOI: https://doi.org/10.9744/ced.27.2.152-166

Article Info:
Submitted: Jan 08, 2025
Reviewed: May 25, 2025
Accepted: Aug 11, 2025

Keywords:
serviced apartments,
highest and best use,
property development.

Corresponding Author:
Anastasia, N.
Finance & Investment Program,
School of Business & Management,
Petra Christian University
Jl. Siwalankerto 121-131, Surabaya
60236, INDONESIA
Email: anas@petra.ac.id

Abstract

Bali, renowned as a global tourist destination, faces increasing demand for modern and flexible accommodations catering to both tourists and digital nomads. This study explores the development potential of a 1,000 m² plot in Sanur, Bali, into a serviced apartment using the Highest and Best Use (HBU) method. Legal, physical, financial, and market feasibility analyses proposed a layout with 45.1% apartment units, 54.9% supporting facilities, and 33.6% green spaces. A 12-year cash flow projection demonstrates financial viability, with an Internal Rate of Return (IRR) of 18.71%, a Net Present Value (NPV) of IDR 23.442 billion, and a discounted payback period of 11.39 years. This study shows that serviced apartments offer sustainable land use, aligning with market demand while delivering optimal economic returns. This development also supports Bali's growth as a modern residential hub and reinforces its reputation as a dynamic global tourist destination.

INTRODUCTION

The island of Bali, recognized as one of the world's premier tourist destinations, continues to experience significant growth in its tourism and economic sectors. According to DestinAsian's report, Bali has been re-awarded as "The Best Island," reinforcing its reputation as a magnet for global tourists [1]. Beyond attracting conventional tourists, the trend of digital nomadism—individuals working online—has increased the demand for long-term accommodations in Bali [2]. The Bank Indonesia report indicates a significant rise in apartment rental demand, with the Commercial Property Demand Index (CPDI) reaching 296.06 by the end of 2023 [3]. This phenomenon suggests that Bali, particularly promising areas like Sanur, presents optimal opportunities for property development, such as serviced apartments.

To identify the optimal property development, the Highest and Best Use (HBU) analysis is employed as a research approach. HBU focuses on four main criteria: legally permissible, physically possible, financially feasible, and maximally productive [4]. From a legal standpoint, this study will consider zoning regulations and the Regional Spatial Plan (RTRW) applicable in Bali, specifically under Denpasar City Regional Regulation Number 8 of 2021 [5]. Meanwhile, the physical aspect includes analyzing the size, shape, and potential of the land plot in accordance with the apartment planning concept [6].

The financial aspect of HBU emphasizes economic feasibility through cash flow and capital budgeting approaches [7]. Market projections in the Sanur area show a 52% growth in the Commercial Property Supply Index (CPSI) in

Note : Discussion is expected before November, 1st 2025, and will be published in the "Civil Engineering Dimension", volume 28, number 1, March 2026.
ISSN : 1410-9530 print / 1979-570X online
Published by : **Petra Christian University**

2023, indicating an increased attractiveness for property investment in this region [3]. The maximally productive analysis evaluates the highest potential revenue from property development, minus the necessary construction and operational costs [8-12].

A plot of approximately 1,000 m² on Sanur Kauh Area, Sanur, South Denpasar, holds significant potential for development into a serviced apartment based on environmental factors, accessibility, and market trends. However, comprehensive research evaluating similar land uses with the HBU method in Bali, particularly in the context of sustainable-oriented property development, is still limited. An HBU analysis encompassing legal, physical feasibility, financial benefits, and maximum productivity can provide a more in-depth and strategic planning foundation. This research aims to bridge this gap by offering data-driven recommendations to support sustainable growth in Bali's property sector.

LITERATURE REVIEW

Highest and Best Use

The Highest and Best Use (HBU) concept, developed by economist Irving Fisher and popularized by Grasskamp in the 1970s, plays a crucial role in property assessment. HBU analysis refers to the most productive use of a property that is legally permissible, physically possible, financially feasible, and capable of generating the highest value [13]. This method involves identifying the optimal use of land or an existing property based on four main criteria: legality, physical feasibility, financial feasibility, and the ability to maximize productivity [4].

HBU analysis can be applied to both vacant land and existing structures. For vacant land, the focus is on exploring potential land uses that comply with zoning regulations and market demand. For developed properties, the analysis assesses whether renovation, adaptation, or even demolition is necessary to maximize the property's potential [7]. This evaluation considers four critical factors: utility (how well the property meets market needs), demand (market desire for the property), scarcity (level of competition in the market), and effective purchasing power (economic capacity of the target market to buy) [7-9].

When evaluating the highest and best use of vacant land, the analysis may include potential future developments. In such cases, the appraiser might be required to estimate the land's market value based on either a hypothetical scenario where the proposed construction already exists as of the present date, or a future-oriented scenario assuming the improvements will be completed by a specific future date. In both situations, the appraiser assesses the property's value as if the planned developments are in place. These assumptions rely on data-supported conclusions indicating that the improvements are likely to be completed and accepted by the market at the relevant time [13].

Highest and Best Use Principle

Aspect One: Legally Permissible

In the legally permissible analysis of HBU, assessors ensure that the land use complies with existing legal regulations. According to KPSPI (2018), this aspect includes two main elements: zoning and building codes [13,14].

Zoning refers to land classification according to the Regional Spatial Plan (RTRW), such as residential, commercial, or public facility zones. Building codes encompass restrictions like Building Setback Lines (GSB), Building Base Coefficient (KDB), Floor Area Coefficient (KLB), and maximum building height. For example, in Bali, building height is limited to 15 meters based on Denpasar City Regional Regulation 2021 Number 8 [5] and Bali Provincial Regional Regulation 2023 Number 2 [15]. Compliance with these legal aspects ensures the feasibility and legality of land use in property development.

Aspect Two: Physically Possible

Determining the physically possible aspect in HBU involves assessing the property's physical characteristics that can affect its asset value. This assessment refers to the land's ability to support the desired land use [4]. Factors influencing the physical aspect include:
The size and shape of the land play a crucial role in determining development efficiency. Regularly shaped plots, such as rectangular or square configurations, are generally more favorable for development compared to irregularly

shaped ones. These regular shapes minimize construction complexity, reduce costs, and maximize the functionality of the land, making them an ideal choice for efficient property development [4].

Topography is another important factor influencing property development. Land contours, natural drainage, and scenic views contribute significantly to both the comfort of occupants and the structural feasibility of buildings. A well-considered topography ensures stability, proper water management, and an aesthetically pleasing environment, enhancing the overall appeal and usability of the property.

Utilities and infrastructure are fundamental to the feasibility of land for property development. The availability of essential services such as electricity, clean water, telecommunications, and waste management systems is critical to supporting the daily activities of property users. Without these facilities, the land may be less practical or desirable for development.

Finally, location and accessibility greatly impact the property's attractiveness and value. A strategically located property with easy access to public facilities, business centers, and recreational areas is highly appealing to potential users. Conversely, properties in less favorable locations, such as near dead-end roads or intersections considered inauspicious by feng shui principles, may experience reduced desirability and value. Together, these factors collectively shape the feasibility and success of property development projects.

Market Analysis

Before discussing about financial aspects, first important step is to analyze market analysis. Market analysis is the process of evaluating the demand and supply conditions of properties based on specific characteristics. This process requires relevant and accurate data to support a comprehensive property assessment [16]. There are three main methods in this analysis.

First, cost approach determines a property's value by calculating the total expenses involved in its development, including land acquisition, construction, and any depreciation of the building. Second, sales comparison Approach evaluates the property by comparing it to similar properties that have recently sold, considering factors like location, condition, and timing of transactions. Lastly, the Income Approach estimates value based on the future income the property is expected to generate, making it especially relevant for commercial properties like hotels and restaurants, where higher income potential leads to greater value. Together, these approaches provide a comprehensive framework for property valuation across various contexts.

Additionally, residential market movements heavily depend on buyers and sellers, divided into the buying-selling market and the rental market [17]. After conducting market analysis, which provide the foundational insights necessary for the next phase, the financial analysis becomes the third major step in the HBU analysis.

Aspect Three: Financially Feasible

Income analysis aims to evaluate the financial feasibility of a property investment by measuring cash flows from investment activities [18]. Various capital budgeting methods are used to ensure the project yields optimal results:
Payback Period: Calculates the time needed to recover the initial investment through annual income [19].
Discounted Payback Period: Considers the time value of money by discounting future cash flows to present value to calculate the investment's payback period [19].
Net Present Value (NPV): Measures the difference between the present value of future net cash flows discounted and the initial investment [20]. A positive result indicates a viable investment that can enhance company value.

$$\mathrm{NPV} = \sum_{n=0}^{n} \frac{\mathrm{CF_n}}{(1+\mathrm{i})^n} - \mathrm{C_0} = 0$$

Internal Rate of Return (IRR): Determines the interest rate at which the present value of estimated incoming cash flows equals outgoing cash flows [20]. If IRR exceeds the interest rate, the investment is considered profitable.

$$\mathrm{NPV} = \sum_{n=0}^{n} \frac{\mathrm{FCF_n}}{(1+\mathrm{IRR})^n} - \mathrm{I_0}$$

Profitability Index (PI): Indicates the ratio between the present value of future cash flows and the initial investment, focusing on profitability relative to initial investment costs [20].

$$\text{PI} = \frac{\text{PV of Cash Inflow}}{\text{Initial Investment}}$$

Aspect Four: Maximally Productive

The next analysis stage is maximally productive, calculated from the property's value based on the residual value from the company's net income and terminal value at the end of the cash flow prediction period minus the building investment value [7,9].

$$\text{Land Value per square meter} = \frac{\text{Property Value} - \text{Building Value}}{\text{Total Land Area}}$$

Apartments

According to Government Regulation 2021 number 13, apartments are multi-family housing structures consisting of multi-story buildings divided into individual residential units, equipped with shared facilities, shared utilities, and shared land ownership [21]. Apartments are classified by height into low-rise, mid-rise, and high-rise categories. [22,23].

Low-rise apartments, up to four floors, are typically found in suburban areas, offering eco-friendly designs, spacious layouts, and open green spaces, ideal for a tranquil and community-oriented lifestyle. Mid-rise apartments, with five to twelve floors, are common in urban areas with growing populations, combining suburban charm with urban convenience and accessibility. High-rise apartments, exceeding twelve floors, are usually located in premium areas like Central Business Districts (CBDs), offering modern amenities, stunning views, and unparalleled access to city life. Together, these apartment types meet diverse housing needs, balancing practicality, connectivity, and luxury.

The proposed development for the site will adopt the concept of a low-rise and fully furnished apartment comprising three typical floors and one ground floor. The design emphasizes adequate cross-ventilation to enhance air circulation while fostering a sense of privacy, harmony, and exclusivity. The main objective is to provide a space that seamlessly integrates professional activities with recreational opportunities, offering convenience and a balanced lifestyle. The development also reflects a strong desire to maximize control over the aesthetic and physical quality of the building, ensuring a high standard of design and user comfort [24].

METHODS

This research adopts a mixed-method approach, combining field surveys, market analysis, and competitor studies to evaluate the feasibility of developing the land as a serviced apartment. This method utilizes data from observations, interviews, and supporting documents to provide a systematic and accurate depiction of the studied topic [25]. The research object is a land plot of approximately 1,000 m² in Sanur Kauh, South Denpasar, with existing buildings as shown at Figure 1. As outlined in Table 1, the research indicators are grounded in the Highest and Best Use (HBU) framework, which comprises four key criteria: (1) Legally Permissible, (2) Physically Possible, (3) Financially Feasible, and (4) Maximally Productive. These dimensions collectively guide the assessment of the most suitable and economically optimal use of the property.

Figure 1. Location of the Assessed Land

Table 1. Research Indicators Based on HBU Analysis

Number	Variable	Indicator
1	Legally Permissible	a. Zoning *b. Building Code*
2	Physically Possible	a. Land Size & Shape b. Public Utilities c. Accessibility
3	Financially Feasible	a. Market & Financial Analysis - Income & Expenses b. Investment Decision Criteria - *Net Present Value* (NPV)
4	Maximally Productive	Highest Land Value

Sensitivity Test

Sensitivity analysis is a financial tool employed to examine how variations in key input variables—such as occupancy rates, interest rates, or construction costs—can influence analytical outcomes, including project value, cash flows, or profitability [13]. Sensitivity testing is an analytical technique used to assess the impact of changes in specific variables on calculation results such as NPV or IRR. This method helps identify variables with the greatest impact and reduces risks caused by uncertainties [26]. In relation to the Highest and Best Use (HBU) analysis, which seeks to identify the most optimal and economically viable use of a property (within legal, physical, and financial constraints), sensitivity analysis plays a crucial role due to the following reasons:

1. Assessing uncertainty and risk: Real estate values are highly sensitive to market shifts such as land prices, construction costs, and rental rates. Sensitivity analysis helps determine how resilient HBU outcomes are to these fluctuations.
2. Evaluating alternative scenarios: It enables the testing of different use options by analyzing how each scenario responds to changing market assumptions, aiding in the comparison of feasibility and stability.
3. Supporting data-driven decision-making: By exploring a range of possible outcomes, sensitivity analysis equips investors or developers with the insights needed to make informed and risk-aware strategic decisions.

RESULTS AND DISCUSSION

The land located in Sanur Kauh, Sanur, South Denpasar, spans 1,000 m² as per its land certificate. This area is designated for residential use within the commercial and service zone category K-2, with the following Building Code regulations as shown at Figure 2 and Table 2 [5].

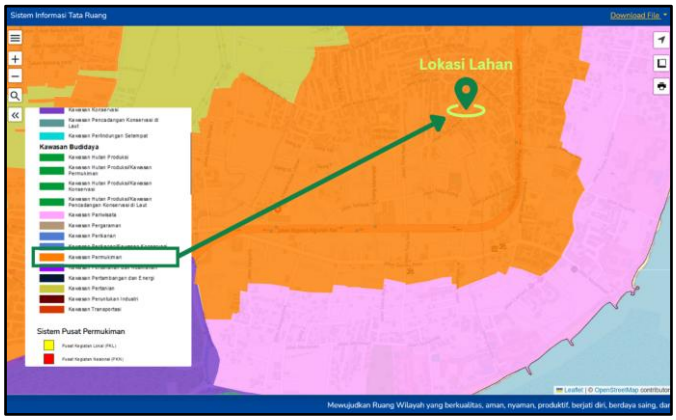

Figure 2. Location of the Land Based on Denpasar South RDTR Map [27]

After passing the legal aspect, the next step is to assess the land from a physical standpoint. The site analysis evaluates the feasibility of land development based on several factors outlined in Table 3. This assessment ensures that the location is suitable for development into a serviced apartment by identifying both positive and negative aspects that may impact the planning and design of the apartment building. The existing conditions of the land, including its physical characteristics and surroundings, will play a crucial role in determining the overall success of the development.

Table 3 presents nine key physical-aspect parameters, each rated on a 1–5 scale according to the accompanying remarks. We classify total scores as follows: 9–18 = Poor suitability, 19–27 = Fair suitability, 28–36 = Good

suitability, and 37–45 = Excellent suitability. With a total of 34 out of 45, the site falls solidly within the "Good" band (28–36). This reflects its strategic proximity (100 m) to Jalan Bypass Ngurah Rai; a regular, rectangular 1 000 m² parcel with an optimal 1:3 width-to-depth ratio; and a relatively flat contour enhanced by mature vegetation that ensures microclimatic comfort. Noise levels remain low despite nearby traffic, and all essential utilities—electricity, water, and waste disposal—are readily available. Convenient access via a 5 m lane and close ties to public amenities and tourist centers further underscore the site's readiness for a serviced-apartment development that demands both privacy and efficient, well-served land.

Table 2. Building Code at the Land Location

Commercial & Service Zone (K-2)	
Building Setback Line (GSB)	min. 0.5 road width + 1 meter
Building Base Coefficient (KDB)	max. 65%
Floor Area Coefficient (KLB)	max. 3.25
Green Base Coefficient (KDH)	min. 15%
Building Height	max. 15 meters

However, despite its advantages, the site also presents certain limitations. Its location adjacent to residential housing reduces the potential appeal of the apartment views, aside from the existing greenery. Additionally, the southeast-facing orientation necessitates careful design of building facades and spatial layout to optimize sunlight exposure while minimizing heat gain. The relatively narrow road (approximately 5 meters wide) and limited access to public transportation may also affect convenience, making private vehicles a more practical option. Nevertheless, with thoughtful planning and design strategies, these constraints can be addressed, and the site remains well-suited for development.

Table 3. HBU Analysis Based on Physical Aspects

Parameter	**Very Poor**	**Poor**	**Average**	**Good**	**Very Good**	**Remarks**
Point	**1**	**2**	**3**	**4**	**5**	
Site Location				✓		Site is within proximity 100 m from Bypass Ngurah Rai Street
Land Size & Shape					✓	Land is elongated, rectangular with a 1:3 ratio
Land Boundaries & Contour			✓			Bordered by residential houses/villas and faces own villa & restaurant areas
Sunlight Exposure			✓			Faces southeast and receives sunlight on all building sides
Accessibility & Traffic Density			✓			Road access through a lane from Bypass Ngurah Rai Street, passing residential houses with a road width of approximately 5 meters
Views & Vegetation				✓		Area has many large trees providing good shading
Noise Levels					✓	Site has good tranquility as it is not near public facilities like schools, mosques, churches, etc.
Utilities				✓		Road access has electricity lines and government provided DSDP for waste disposal
Public Facilities			✓			Close to hospitals, KEK Sanur area, tourist centers & entertainment venues
Total			**12**	**12**	**10**	**34**

Source: Authors, Case Study, criteria are ranked as follows: 1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = excellent

After passing through the physical aspects, the next step is market analysis, which is conducted before the financial analysis to understand the market conditions surrounding the site location and determine market segmentation. In market segmentation, the analysis is separated into four key aspects: competitor analysis, market segmentation, SWOT identification, and positioning

To begin with, competitor analysis focuses on identifying the strengths and weaknesses of competing businesses in the market. Bali, as a prime tourism destination with popular spots like Sanur, Kuta, Seminyak, and Denpasar City,

is seeing ongoing development of residential accommodations, including apartments. Developing serviced apartments offers flexibility for both monthly and daily rentals. Consequently, the competitor analysis includes both direct competitors (other apartments) and indirect competitors (nearby 4-star hotels).

Competitor apartments and hotels are analyzed based on facilities such as swimming pools, spas, communal areas, co-working spaces, gyms, green spaces, restaurants, terraces, and laundry services to benchmark the facilities to be offered in the apartment development. Additionally, rental price data and occupancy rates are used to determine the apartment's rental price and occupancy levels.

In this case study, four serviced apartments with similar market segmentation located in different areas such as Kuta, Denpasar City, and Sanur are selected as Competitors A, B, C, D. Meanwhile, 4-star hotels in Sanur City are selected as Competitors E, F, G, H, and I. This is illustrated in Table 4 and Figure 3.

Figure 3. Locations of Competitor Serviced Apartments and Hotels

Table 4. Facilities, Rental Prices, and Occupancy Rates of Competitor Serviced Apartments

Fasilitas	Serviced Apartments				4 Stars Hotels				
	A	B	C	D	E	F	G	H	I
Swimming Pool	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spa	✓		✓			✓	✓	✓	✓
Co-Working Space	✓	✓				✓	✓		
Gym	✓	✓							
Green Space Environment / Terrace	✓	✓	✓	✓	✓	✓	✓	✓	✓
Restaurant	✓	✓		✓		✓	✓	✓	✓
24-h Security System	✓	✓	✓	✓	✓	✓	✓	✓	✓
Parking Area	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laundry Services			✓	✓	✓	✓	✓	✓	✓
Monthly Rent / sqm (*thousand Rupiah*)	208,3	193,3	440,7	190,2	-	-	-	-	-
Daily Rent / sqm (*thousand Rupiah*)	-	-	-	-	27,4	21,7	22,5	26,0	19,0
Occupancy Rate (%)	70	75	80	68.5	65.5 **) 4 Stars Hotels average Occ. Room Rate (%) in Bali per 2015 – 2019 [28]				

Based on Table 4, most competitors have swimming pools, green areas, and 24-hour security systems. Facilities like co-working spaces and gyms are trending among digital nomads, providing easy access for work and exercise. These facilities offer a complete ecosystem for consumers. After conducting competitors analysis, it is crucial also to conduct detailed market segmentation to help business categorized the population based on various criteria, to enable deeper understanding of the target market and tailoring strategies to meet with their needs.s

The highest and best use of the vacant land is evaluated based on the assumption that proposed developments will be completed and accepted by the market, either now or in the future. Given the indirect competition from apartments and hotels, the analysis focuses on serviced apartments, which offer flexible rental terms and meet current market demand and owner concept.

Market segmentation involves grouping the population based on geographic, socio-demographic, psychological, and behavioral criteria to effectively understand the target market [29]. Bali, as an international tourist destination, has a large market potential, especially with the increasing interest of foreign tourists working as digital nomads. According to Bali Province BPS, the number of foreign tourist visits reached 5,273,258 in 2023, nearing pre-pandemic levels [28]. Most foreign tourists come from Asia (excluding ASEAN), Europe, and Oceania, staying for more than 12 days with average expenditures exceeding USD 1,700 per visit. The dominant occupations of these tourists are professionals (36.64%) and managers (18.89%), making them a potential segment for housing providers like apartments [30,31].

In addition to foreign tourists, domestic tourists play a significant role in supporting Bali's tourism sector. In 2023, the number of domestic tourists reached 10 million, a 22.66% increase from the previous year. However, domestic tourists tend to stay for short periods, 2–3 days, with a pattern of moving between locations [28]. The differing characteristics between domestic and foreign tourists need to be considered in marketing strategies and facility development on the land.

Bali's economy also plays a crucial role in the project's financial analysis. According to Bank Indonesia data, the accommodation and food services sector shows an average growth rate of 6.62%, higher than the macroeconomic GDP growth rate of only 5.96% per year. Meanwhile, Bali's inflation rate averaged 2.96% per year during 2015–2019. This data strengthens market attractiveness and supports realistic financial projection calculations for this project [32].

Table 5. SWOT Identification for Development Location

Internal / **External**	***Strengths***	***Weaknesses***
	1. Good service management with experience in various hotels 2. Located near Bypass Ngurah Rai street 3. Located in an area with low noise levels and access to various public facilities.	1. The road at the site is relatively small, about 5 meters 2. Part of the site is shaded by western sunlight 3. The site has limited parking areas
Opportunities	**SO Strategies**	**WO Strategies**
1. Development of Special Economic Zones called "KEK" in Sanur, especially the International Hospital attracting foreign workers and patients 2. Significant growth in the number of digital nomads in Bali due to the Indonesian government's issuance of digital nomad visas 3. The site is not densely populated and is close to main roads, making it easily accessible	1. Target the main market segment of foreign and digital nomads (S1,2,3; O1,2,3) 2. Combining living spaces with co-working areas, meeting rooms, and swimming pools, you get everything you need in one place. It's designed to help you live comfortably, work efficiently, and enjoy your free time. (S1,2,3; O1,2,3)	1. Plan building facades and rooms facing north, east, and south to attract foreign consumers (W2; O1) 2. Utilize western sunlight as an open garden area for evening gatherings (W,2; O1,2)
Threats	**ST Strategies**	**WT Strategies**
1. Numerous indirect competitors like hotels, villas, or homestays offering similar facilities 2. Many developments in Sanur area offering newer concepts and more competitive prices 3. Bali's tourism sector not fully recovered and global movement uncertainties	1. Promote with attractive discounts and facilities initially (S1; T1,2) 2. Maintain service quality and regular building maintenance to ensure customer satisfaction (S1,3; T1,2)	1. Enhance service quality through training and provide opportunities for consumer satisfaction (W1,3; T1,2) 2. Upholding service quality by conducting training and providing opportunities for customers to give feedback and suggestions (W1; T1,2)

Bali has significant potential to boost tourism revenue, especially from foreign tourists supported by the E33 visa policy that allows extended stays of up to 10 years [3]. In addition to regular tourists, professional and digital nomads represent an emerging and valuable market segment. These travelers typically stay longer and spend more, indicating

low price sensitivity. On the other hand, domestic tourists who remain essential in maintaining hotel and apartment occupancy tend to have shorter visits and are more responsive to price, reflecting higher price elasticity. Understanding these behavioral differences allows for more effective pricing and service strategies, positioning apartments as a versatile option that caters to diverse tourist needs and supports Bali's ongoing post-pandemic growth.

One of the primary objectives of SWOT analysis for a company is to maximize profits and minimize losses and issues arising from external threats [7,9]. A SWOT analysis with a matrix helps map the development of land that aligns with the property's strengths/weaknesses and opportunities/threats from the external environment as shown in Table 5.

After conducting SWOT analysis, the next step is product positioning. Positioning is a method to create a unique differentiation in the consumer's mind, thereby establishing a superior brand image compared to competitors. This aims to increase the likelihood of the product being chosen by the target consumers.

Tables 6 and 7 present the evaluation results of the case study product against competitor apartments and hotels. The evaluation aims to compare the development product with competitor products and determine its market position. The assessment uses a rating scale of 1 (very poor) to 5 (very good) based on the criteria in Table 8.

Based on the positioning results against competitor apartments and 4-star hotels, as shown in Figure 4, the criteria used for positioning include location, accessibility, surrounding area, apartment facilities, building design, and building quality. The land positioning score is 4.5, which is high compared to competing apartments, with the most dominant criteria being building quality differences and modern building designs with Balinese characteristics. Compared to 4-star hotel competitors, the apartment scores mid-level because its location is less strategic and accessibility is lower than hotel competitors.

Table 6. Market Positioning with Competitor Serviced Apartments

Competitors	Location	Accessibility	Surrounding Area	Fasilitas Apartemen	Building Design	Building Quality	Rp/Month/Sqm	Point of Correlation
A	3.5	4	3.0	3.0	3.5	3.5	208,333	3.4
B	3	4.5	4.5	5.0	4.5	4.0	193,319	4.3
C	3	4	5.0	3.0	5.0	5.0	440,680	4.2
D	5	4.5	5.0	3.0	4.5	4.0	190,180	4.3
Location	3.5	4.5	4.0	5.0	4.5	5.0	282,600	4.4

Table 7. Market Positioning with Competitor Hotels

Competitors	Location	Accessibility	Surrounding Area	Fasilitas Apartemen	Building Design	Building Quality	Rp/Day/Sqm	Point of Correlation
E	3.5	4	4.0	3.5	4.5	3.5	27,431	3.8
F	4	4	4.0	4.5	4.5	3.5	21,671	4.3
G	4.5	4.5	4.5	5.0	5.0	5.0	22,478	4.9
H	4.5	4.5	4.5	4.0	4.0	5.0	26,055	4.2
I	5	5	5.0	4.5	4.5	4.5	19,057	4.6
Location	3.5	4	4.5	5.0	4.5	5.0	26,100	4.5

After completing the four steps of market analysis, next step is the financial analysis. The market analysis directly informs the financial analysis by offering key data on market conditions, customer segmentation, and competitor dynamics, which are essential for accurate financial projections. Financial analysis is conducted after assessing the legal and physical aspects [3]. This analysis utilizes capital budgeting methods, including Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period, and Discounted Payback Period, all calculated based on cash flow projections. These projections are derived from the site's development plan.

The location will be developed into a serviced apartment using a green building concept. The apartment consists of three typical floors and one ground floor with 21 units, divided into three types based on competitor surveys in the surrounding areas. The ground land area is allocated 66.7% for buildings, while 33.3% is used for green areas. The leasable area includes 21 apartment units, totaling 45.1%, while the remaining 54.9% comprises non-leasable areas (fitness, pool, co-working, management, etc.) as shown in Table 9. Additional assumption & collected data supporting this analysis is presented below in Table 9. Rent is composed of two major factors which is short-term

rent & long-term rent which is also based on competitor's customer behaviour by ratio of 1:2 respectively. Occupancy rate and occupancy escalation rate are collected based on interview & visit at competitor's apartment, rent escalation and inflation data is acquired through Bank of Indonesia's website from 2019-2023. Figure 5, illustrates the building layout on the site which complies with the Building Code criteria applicable in Sanur, South Denpasar.

Table 8. Product Positioning Assessment Standards

Criteria	1	2	3	4	5
Location					
Local road type	✓				
Adequate infrastructure (PLN, PDAM)		✓			
Access road width ± 5m			✓		
Collector road type				✓	
Arterial road type					✓
Accessibility					
Easy to access		✓			
Non-congested traffic			✓		
Near public transport & main roads				✓	
Far from noise					✓
Surrounding Area					
Street lighting	✓				
Not too close to airports, and places of worship		✓			
Near tourist / entertainment areas			✓		
Near hospitals, education areas				✓	
Near economic zones					✓
Apartment Facilities					
Electricity & Water	✓				
Housekeeping		✓			
Garden, Swimming Pool, & Gym			✓		
Co-Working Space & Meeting Area				✓	
Restaurant, Spa					✓
Building Design					
Differentiated unit types		✓			
Modern style with Balinese elements			✓		
Open space / balcony				✓	
Spacious unit types					✓
Building Quality					
No ceiling leaks		✓			
New & well-maintained buildings (robust structure)			✓		
Neat architectural & interior finishing inside/outside units				✓	
Use of high-quality materials					✓

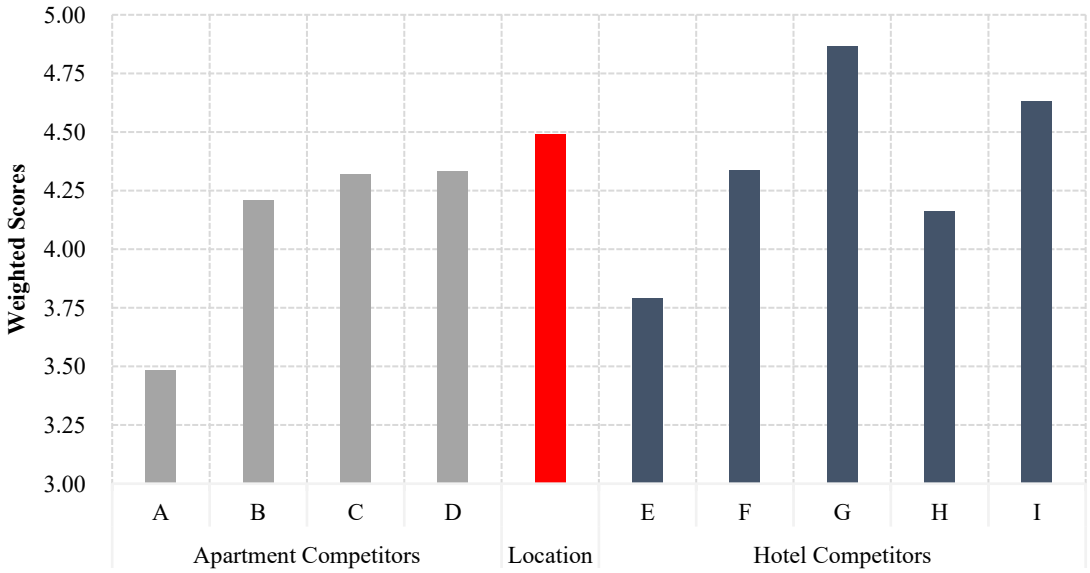

Figure 4. Market Positioning Based on Competitor Apartments

Table 9. Propersional Land Area and Building Area

Description	Area	%
Land Area (m^2)	**1,000**	
Green Open Space (GOS) Area		33.7%
Building Base Area		66.3%
Total Building Area (M2)	**2,296**	
Unleaseable		
Fitness, Pool & deck, Co-working		11.7%
Management & others		32.3%
Unit corridor		10.9%
Leasable – 21 unit		45.1%
Financial Assumption & Collected Data		
Monthly Rent Rate (per sqm)	282,600	
Daily Rent Rate (per sqm)	26,100	
Daily Rent : Monthly Rent Composition	1 : 2	
First Year Occupancy Rate (Daily / Monthly)	66% / 73%	
Occupancy Escalation Rate (every two years)	1.00%	
Rent Escalation (every two years)	6.62%	
Inflation (%)	2.96%	
Discount Rate / MARR	11.20%	

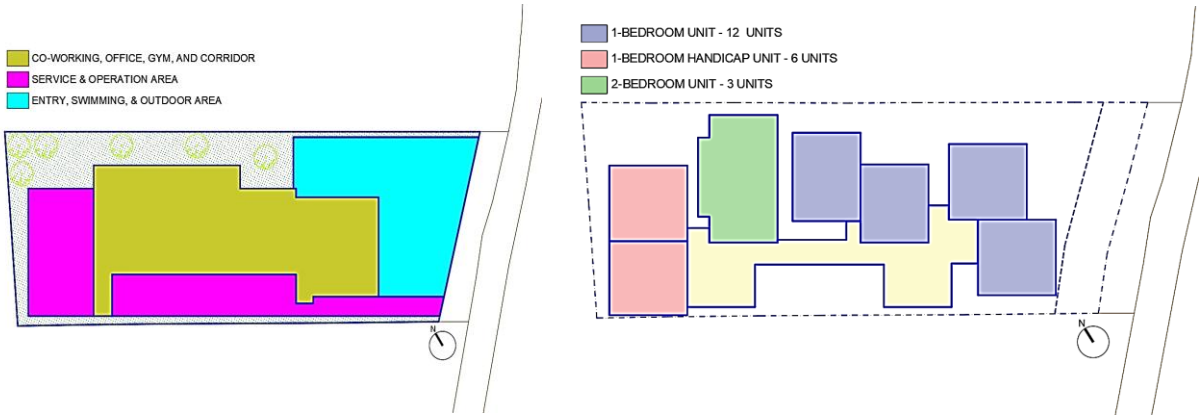

Figure 5. Illustration of Ground Floor and Typical Apartment Floor Plan

Based on Table 10, the financial analysis shows favorable results, with a positive Net Present Value (NPV > 0) and an Internal Rate of Return (IRR) exceeding the Minimum Attractive Rate of Return (MARR). The total estimated project cost is approximately IDR 37 billion, and the discounted payback period is calculated at 11.39 years. This relatively extended payback period is primarily due to the characteristics of the serviced apartment market, which relies heavily on both domestic and international tourist activity, as well as competition in Bali—particularly in the Sanur area. Although this figure slightly exceeds the national average payback period for serviced apartments in Indonesia, which is around 10 years, the project remains financially viable given its positive NPV and strong IRR, especially when supported by effective management and strategic marketing.

Table 10. Financial Analysis of the Apartment Development Case Study

	Values (in Rupiah)
Total Project Cost	37,778,580,583
Total Revenue	175,059,067,965
Yearly IRR	18.71%
NPV @11.2% / tahun	23,442,281,038
Payback Period	11.00 years
Discounted Payback Period	11.39 years

After addressing the legal, physical, and financial aspects, the next critical step in the Highest and Best Use (HBU) analysis is assessing the land's maximum productivity. This stage involves evaluating the potential economic output that the proposed development can generate. In this case, the land is designated exclusively for the development of serviced apartments, making it unnecessary to consider alternative uses. Consequently, the assessment excludes property value comparisons or alternative investment scenarios and instead focuses on the projected performance of the proposed development.

The estimated value of the property upon completion is approximately IDR 60 billion. This figure reflects the anticipated revenue-generating potential based on current market trends, demand, and operational efficiencies. Furthermore, the initial land investment, valued at IDR 6 billion (as shown in Table 11), highlights the relatively low entry cost of the project. These figures emphasize the significant potential for profitability and reinforce the feasibility and attractiveness of the proposed serviced apartment development.

Table 11. Land Productivity (Property Value)

Description	Value (in Rupiah)
Property Value (PV Cash Flow)	60,791,942,556
Land Value	6,500,000,000

Sensitivity Analysis

After completing the four HBU analysis stages, sensitivity testing is conducted on several independent variables in the land development cash flow analysis. The dependent variables analyzed are Net Present Value (NPV) and Internal Rate of Return (IRR). Sensitivity testing is performed with ±20% deviations on independent variables. Table 12 shows that the independent variable discount rate has the most significant impact on NPV but does not affect IRR, as IRR is not influenced by the discount rate. Based on Table 12, the sensitivity analysis demonstrates that the project is most vulnerable to changes in occupancy increment, even within a narrow ±2% range. This variable causes the steepest decline in both NPV (-53.5%) and IRR (-18.8%), indicating that even minor shifts in occupancy growth can significantly affect financial viability. Capitalization rate also shows substantial influence, with up to ±38.5% change in NPV and ±10.4% in IRR, emphasizing the importance of exit assumptions. Occupancy levels in apartment and hotel components also meaningfully affect both metrics, reflecting the project's dependence on market absorption. In contrast, the investment factor moderately impacts outcomes, suggesting cost control is relevant but not as critical as demand-side factors. Overall, the analysis underscores that revenue-related assumptions, particularly occupancy are more sensitive than cost parameters, and thus require careful attention during feasibility assessment. From the table, it can be concluded that the most influential independent variables are occupancy increment, discount rate, capitalization rate, and occupancy rate.

Table 12. Summary of Sensitivity Testing in Cash Flow Analysis

Description	Deviation	NPV		IRR	
		Decre. Effect	Incre. Effect	Decre. Effect	Incre. Effect
Discount Rate (%)	±20%	48.5%	-38.25%	0.0%	0.00%
Cap Rate (%)	±20%	38.5%	-25.68%	10.4%	-8.03%
Investment Factor	±20%	25.3%	-25.28%	13.9%	-12.06%
Occupancy Rate					
Apartment Comp.	±20%	-29.1%	29.1%	-10.4%	9.7%
Hotel Comp.	±20%	-35.6%	35.6%	-12.9%	11.8%
Occupancy Increment	-2% to +2%	-53.5%	17.8%	-18.8%	5.4%

Discussion

The site design planning for the serviced apartment development has considered SWOT analysis and positioning to establish the appropriate market segment, primarily targeting foreign tourists and digital nomads. Pricing, housing types, and development planning have been adjusted to existing market conditions. The three HBU aspects (legal, physical, and financial) have been met. Legally, the development plan complies with the Bali Provincial Regional Spatial Plan (RTRW) and applicable regulations, with land ownership status using Building Use Rights (SHGB). The physical aspect shows that the chosen location is strategic, with good accessibility, low density, and minimal noise, making it ideal for developing a serviced apartment.

The project's feasibility has been evaluated through the lens of the four HBU dimensions: legal, physical, financial, and maximally productive. Legally, the development adheres to Bali's Regional Spatial Plan (RTRW) and relevant zoning regulations, with land ownership secured through Building Use Rights (SHGB), ensuring long-term legal compliance. Physically, the site offers significant advantages, including excellent connectivity to infrastructure, a low-density surrounding environment, and minimal noise levels. These factors collectively position the site as highly suitable for a serviced apartment, enhancing its appeal to the identified target markets.

From a financial perspective, the project shows substantial promise, though it requires a moderate timeframe for returns to materialize. The financial analysis projects an Internal Rate of Return (IRR) of 18.71%, a positive Net Present Value (NPV), and a payback period of approximately 11.39 years, which collectively affirm the investment's potential viability. However, a deeper look through sensitivity analysis reveals that this feasibility is not without its conditions. The analysis identifies several key variables, most notably occupancy rates, discount rates, capitalization rates, and the initial investment amount as having substantial leverage over the project's financial performance. Among these, occupancy rates emerge as the most critical driver of risk. Even modest declines in occupancy can lead to sharp reductions in projected revenue, destabilize cash flows, and ultimately erode returns. This finding emphasizes the importance of precise market absorption forecasts and proactive risk mitigation strategies during both planning and execution stages.

From a maximally productive perspective, the development optimizes land use with 45.1% allocated for apartments, 54.9% for supporting facilities, and 33.6% for green space, ensuring both profitability and sustainability. The projected property value of IDR 60 billion, against a land investment of IDR 6 billion and a total project cost of IDR 38 billion, demonstrates substantial economic potential. Overall, the HBU analysis confirms that the project is viable, with promising returns if risks are managed and market needs are addressed.

CONCLUSIONS

Based on the Highest and Best Use (HBU) analysis for the land in Sanur Kauh, Sanur, South Denpasar, it can be concluded that this location holds good potential for developing a serviced apartment. Legally, the site complies with the Regional Spatial Plan (RTRW) designated for the commercial and service area category K-2. The land's physical aspects are also supportive, with easy access to public facilities and main tourist attractions. The targeted market segments are foreign tourists and digital nomads interested in working and vacationing in Bali with relatively low living costs.

Site planning and financial analysis show positive results, with a serviced apartment development scenario featuring an IRR of 18.71% and a positive NPV of IDR 23.442 billion. This scenario includes various apartment unit types and adequate space composition, including 33.7% green open space. With an 11-year payback period and a discounted payback period of 11.39 years, the project demonstrates feasible return potential. Sensitivity testing also indicates that changes in occupancy rates and initial investment values will significantly affect operational cash flows, providing developers with insights into risks and impacts that may arise.

This research contributes theoretically by expanding the application of the Highest and Best Use (HBU) framework within the tourism property sector, particularly in the development of serviced apartments. By integrating legal, physical, market, and financial dimensions, the study demonstrates how HBU analysis can be effectively adapted to dynamic market contexts. It also responds to the shifting preferences of emerging segments such as digital nomads, who value flexibility, connectivity, and access to green spaces—features that are increasingly essential in positioning tourism properties for long-term success.

From a practical standpoint, the findings provide developers with strategic insights for designing projects that align with both market demand and financial feasibility. The incorporation of sustainability elements, such as green open spaces, is shown to enhance the attractiveness and competitiveness of developments, particularly in lifestyle-oriented destinations like Bali. These features not only appeal to environmentally conscious consumers but also add long-term value by improving marketability and supporting branding efforts tied to sustainable tourism.

Most critically, the sensitivity analysis offers developers a deeper understanding of risk exposure, particularly in relation to occupancy rates and initial investment levels. These variables are shown to have a disproportionately high impact on key financial indicators such as NPV and IRR. As a result, developers are encouraged to adopt flexible investment strategies, conduct rigorous market assessments, and prepare adaptive planning scenarios. This approach not only improves financial resilience but also supports Bali's broader ambition to position itself as a sustainable, high-value destination that integrates economic growth with environmental responsibility.

REFERENCES

1. DestinAsian, *DestinAsian*, 2024. https://destinasian.com/readers-choice-awards/2024-winners/best-islands
2. Global Intelligence Unit. (2024), *Full Report: Global Digital Nomad*. 2024, (GIU, Editor) https://www.globalcitizensolutions.com/intelligence-unit/reports/global-digital-nomad-report/global-digital-nomad-full-report/

3. Bank Indonesia, *Commercial Property Survey - Quarter 1 2024*, 2024. https://www.bi.go.id/en/publikasi/laporan/Pages/PPKom_Triwulan_I_2024.aspx
4. KPSPI, *Kode Etik Penilai dan Standar Penilaian Indonesia* (8th ed.), Jakarta: Komite Penyusun Standar Penilaian Indonesia Masyarakat Profesi Penilai Indonesia, 2018.
5. Pemerintah Kota Denpasar, *Peraturan Daerah Kota Denpasar Nomor 8 Tahun 2021 Tentang Rencana Tata Ruang Wilayah Kota Denpasar Tahun 2021-2041*, Denpasar, 2021.
6. Akbar, M.R., *Apartemen di Surabaya dengan Pendekatan Arsitektur Bioklimatik*, Thesis, Universitas Atma Jaya Yogyakarta, 2020.
7. Wibisono, C.E., Kwanda, T., and Anastasia, N., *Analisis Highest and Best Use Rumah Tapak atau Rumah Susun di Kenjeran, Surabaya*, Universitas Kristen Petra, 2019. https://dewey.petra.ac.id/digital/view/43719
8. Prawoto, A., *Teori dan Praktek Penilaian Properti* (3rd ed.), Yogyakarta: BPFE, 2015.
9. Widyanto, D.S., Budiman, J., and Anastasia, N., Is Green Concept in Residential Expensive?, *International Journal of Business Studies, 3*(1), 2020, pp. 64-74.
10. Pribadi, I.S., Kesuma, M., and Irawati, M., Commercial Property Development Program If Highest and Best Use Study in Industrial Area SIER Surabaya, *Indonesian Journal of Urban and Environmental Technology, 5*(2), 2022, pp. 160-180.
11. Rahmadanti, D.A., Azis, Y., and Komara, R., Asset Optimization of Baranangsiang Terminal Commercial Area using Highest and Best Use Analysis: A Case Study of Bogor City Government's Asset, *International Journal of Business, Management and Social Research, 5*(2), 2019, pp. 324-337.
12. Utami, N.P. and Utomo, C., Analisa Highest and Best Use pada Lahan Kosong di Kawasan Wisata Ubud, *Jurnal Teknik ITS, 4*(1), 2015, C41-C44.
13. Appraisal Institute, *The Appraisal of Real Estate* (15th ed.), Chicago: Appraisal Institute, 2020.
14. Herradiyanti, M., Utomo, C., and Putri, Y.E., Analisa Penggunaan Tertinggi dan Terbaik (Highest and Best Use Analysis) pada Lahan Pasar Turi Lama Surabaya, *Jurnal Teknik ITS, 5*(2), 2016, D172-D175.
15. Peraturan Daerah Provinsi Bali, *Peraturan Daerah (Perda) Provinsi Bali Nomor 2 Tahun 2023 tentang Rencana Tata Ruang Wilayah Provinsi Bali Tahun 2023-2043*, Bali, 2023.
16. Goddard, G.J., *Real Estate Valuation: A Subjective Approach*, New York: Routledge, 2022.
17. Ratterman, M.R., *Residential Market Analysis and Highest and Best Use,* Chicago, United States of America: Appraisal Institute, 2022
18. Fraser, L.M. and Ormistion, *Understanding Financial Statements* (11th ed.), Pearson Education, 2015.
19. Ross, S.A., Westerfield, R.W., Jordan, B.D., Pandes, J.A., and Holloway, T., *Fundamentals of Corporate Finance* (11th ed.), McGraw-Hill, 2022.
20. Goel, S., *Capital Budgeting* (10th ed.), New York: Business Expert Press, LLC, 2015.
21. Peraturan Presiden, *Peraturan Pemerintah Republik Indonesia Nomor 13 Tahun 2021 Tentang Penyelenggaraan Rumah Susun,* Kementrian Agraria dan Tata Ruang/Badan Pertahanan Nasional, 2021.
22. Paul, S., *Apartments: Their Design and Development,* New York: Reinhold Pub. Co., 1967.
23. International Code Council, *2021 International Building Code (IBC)*, 2021. https://codes.iccsafe.org/content/IBC2021P2
24. Andi, A., Sugianto, S.E., and Lukas, Y.S. (2024), Project Delivery Method Selection Criteria for Building Projects in Surabaya, Indonesia, *Civil Engineering Dimension, 26*(2), 2024, pp. 111-119. https://doi.org/10.9744/ced.26.2.111-119
25. Bungin, B., *Metodologi Penelitian Kuantitatif: Komunikasi, Ekonomi, dan Kebijakan Publik Serta Ilmu-ilmu Sosial lainnya*, Jakarta: Kencana Prenada, 2015.
26. Geltner, D., Miller, N., Clayton, J., and Eichholtz, P., *Commercial Real Estate Analysis and Investments* (3rd ed.), OnCourse Learning, 2014.
27. Pemerintah Daerah Provinsi Bali, *Peraturan Daerah Provinsi Bali Nomor 2 Tahun 2023 Tentang Rencana Tata Ruang WIlayah Provinsi Bali Tahun 2023-2043*, 2023. https://jdih.baliprov.go.id/produk-hukum/peraturan-perundang-undangan/perda/29122
28. BPS Provinsi Bali, *Perkembangan Pariwisata Provinsi Bali Juli 2024*, 2024. https://bali.bps.go.id/id/pressrelease/2024/09/02/717897/perkembangan-pariwisata-provinsi-bali-juli-2024.html
29. Dolnicar, S., Grün, B., and Leisch, F., *Market Segmentation Analysis,* Singapore: Springer Nature Singapore Ltd., 2018.
30. Badan Pusat Statistik, *Statistik Pengeluaran Wisatawan Mancanegara 2019,* Indonesia: BPS RI, 2020.
31. BPS-Statistik Indonesia, *Statistik Pengeluaran Wisatawan Mancanegara 2023 (Vol. 5),* BPS-Statistik Indonesia, 2023.
32. Bank Indonesia, *Laporan Perekonomian Provinsi,* 2024. https://www.bi.go.id/id/publikasi/laporan/lpp/default.aspx?Kategori=bali&Periode=

33. Kementerian Hukum dan Hak Asasi Manusia Direktorat Jenderal Imigrasi, *General Information & FAQ*. https://evisa.imigrasi.go.id/front/faq/34723b14-5760-42e9-8aa8-73f54deb572f