Eduvest – Journal of Universal Studies
Volume 5 Number 2, February, 2025
p- ISSN 2775-3735- e-ISSN 2775-3727

CONSUMER ADOPTION OF VIRTUAL REALITY IN INDONESIA THROUGH LENS OF DIFFUSION OF INNOVATION THEORY AND TECHNOLOGY ACCEPTANCE MODEL

Regianto Wisnuseputro[1], Dina Dellyana[2]
School of Business & Management, Institut Teknologi Bandung, Indonesia [1,2]
Email: regianto_wisnuseputro@sbm-itb.ac.id, dina.dellyana@sbm-itb.ac.id

ABSTRACT

This research explores the prospective adoption of Virtual Reality technologies in the Indonesian consumer market by identifying key factors and constructs that influence the consumer adoption in Indonesia. The study considers the successful efforts of Virtual Reality technology manufacturers to create consumer-level hardware within the price range of household electronic devices. In this case, we measure the willingness of the Indonesian mass consumer market to adopt this technology. Quantitative survey analyzed using the combined framework of Diffusion of Innovation Theory and Technology Acceptance Model is used for this study. The study concludes that Observability and Social Influence are the major factors of new technology adoption in the Indonesian consumer market, among others. In general, Indonesia consumer market has good attitude towards future Virtual Reality technology adoption. Therefore, it is recommended that any attempts to capture the Indonesian market by Virtual Reality manufacturers consider these factors. A Go-To-Market strategy applying the learnings from this study is also provided within this study.

KEYWORDS *Virtual Reality, Market Survey, Technology Innovation, Diffusion of Innovation, Technology Acceptance Model, Go-To-Market Strategy*

INTRODUCTION

In October 2021, Facebook rebranded to Meta, driven by founder Mark Zuckerberg's vision of the "Metaverse," a digital connectivity space emphasizing immersive experiences through VR technology. Zuckerberg described the metaverse as enabling a feeling of presence, allowing users to connect and interact virtually in ways limited only by imagination (Clayton, 2023). Dubbed "Web3," this concept promised a virtual realm where individuals engage as avatars, fueling speculative trends and bold corporate strategies aimed at dominating the metaverse. However, despite billions invested, the 2022 launch of Meta Horizons was met with widespread criticism due to outdated visuals and a poor user interface, leading to a

How to cite: Regianto Wisnuseputro, et al (2025). Consumer Adoption of Virtual Reality in Indonesia Through Lens of Diffusion of Innovation Theory and Technology Acceptance Model. Journal Eduvest. 5(2): 1995-2014
E-ISSN: 2775-3727

70% drop in Meta's stock prices and shaking NFT and blockchain markets dependent on metaverse promises (Yang, 2022). Amid this, advancements in VR and AR technology gained momentum, with devices like the Oculus Quest 2 lowering costs and making VR accessible to mainstream consumers, marking a significant step for immersive technologies in the evolving digital landscape (Robertson, 2020).

Virtual Reality (VR) is a simulated environment that replaces users' sensory inputs with virtual ones through devices like VR headsets equipped with visual displays and audio speakers. Additional tools, such as body-tracking devices, haptic feedback suits, and tracking treadmills, further enhance this immersive experience by allowing users to interact with the virtual environment using their physical body, effectively creating a sense of virtual presence that transcends reality (Yasar & Sheldon, 2024). This technology is envisioned as a core driver for future internet interactions, often referred to as the Metaverse or Web3. The roots of VR can be traced back to the 1968 "Sword of Damocles" system developed by Ivan Sutherland, which paved the way for gradual advancements in immersive computing technology (Van Krevelen, 2010).

Over the years, VR technology has transitioned from experimental prototypes to consumer-friendly devices. Oculus, founded in 2011 by Palmer Lucky, initially targeted developers and enthusiasts with high-cost experimental kits but gained momentum after being acquired by Meta, which integrated VR into its Metaverse plans. Major players like Microsoft and Apple have also entered the market, with Windows Mixed Reality headsets and the Apple Vision Pro, respectively. While high-end VR devices are utilized in commercial sectors for training and presentations, consumer-grade devices cater to gaming, social applications, and fitness. Recent developments in standalone VR devices, such as the Oculus Quest series, Pico series, and Apple Vision Pro, have enabled broader use cases, from creative applications to virtual tours, making VR more accessible and versatile across various segments.

Indonesia, with its emerging economic power and tech-savvy demographic dominated by Millennials and Gen Z, demonstrates high internet penetration at 79.5% in 2024, primarily concentrated in urban areas (APJII, 2024). The adoption of technology, including Virtual Reality (VR), is growing, driven by middle-class consumers known for embracing new trends and entertainment systems. The affordability of VR devices, such as the Oculus Quest 2, priced lower than gaming consoles, makes mass adoption in Indonesia plausible. However, the market faces challenges, including limited public awareness, lack of coordinated market penetration by major VR brands, and cautious consumer behavior toward new technologies. While initial interest is evident through online and offline sales channels, achieving widespread adoption requires targeted Go-To-Market

strategies. With over 270 million people, Indonesia represents a vast untapped market for VR, offering significant potential for manufacturers and driving future integration of Web 3.0 technologies, as seen in initiatives like SBM-ITB's metaverse collaboration.

This research seeks to explore the adoption of Virtual Reality (VR) technology in Indonesia by addressing key questions about the mass-market perception, significant drivers of adoption, and effective Go-To-Market (GTM) strategies for VR devices. The objectives include identifying factors influencing consumer adoption and formulating a general GTM strategy for contemporary VR products. The study focuses on consumer-level VR adoption, emphasizing general use cases like gaming, entertainment, and productivity, while excluding high-end industrial or experimental VR applications. Limited to the Indonesian market, the research offers generalized insights through quantitative surveys, with findings and recommendations applicable broadly rather than tailored to specific brands or segmented markets. It does not delve into the Metaverse or Web3 applications, requiring separate studies for deeper exploration of blockchain technologies and advanced VR use cases.

RESEARCH METHOD

This study adopts a quantitative research design to investigate consumer perceptions and market attitudes towards Virtual Reality (VR) adoption in Indonesia. Using a survey-based approach, the research aims to identify significant factors driving VR adoption and formulate a suitable Go-To-Market strategy. The survey, conducted through Google Forms, targeted the middle-class demographic in the Greater Jakarta and West Java regions, with a sample size of 280 respondents determined using Slovin’s formula. The questionnaire was structured around the TAM-DIT framework, incorporating constructs like Relative Advantages, Compatibility, Complexity, and Social Influence to gauge user attitudes and future usage intentions.

Data collection leveraged a Likert-scale questionnaire distributed through various channels, ensuring a diverse respondent pool while maintaining ethical standards such as data privacy and voluntary participation. The demographic focus on middle-class, tech-savvy individuals was intentional to capture the most relevant consumer insights for VR technology adoption. Statistical analysis methods, including Partial Least Squares Path Modeling (PLS-PM), were employed to examine relationships between constructs, supported by internal reliability checks like Cronbach’s Alpha and Composite Reliability, ensuring the robustness and repeatability of the findings.

The results are presented through quantitative tables, cross-tabulations, and visual models illustrating relationships between constructs. These findings aim to

uncover key insights into the factors influencing VR adoption and provide actionable recommendations for market entry strategies. By analyzing demographic trends and construct interrelations, the study highlights the potential for VR technology to gain traction in Indonesia, emphasizing the importance of addressing consumer perceptions, usability concerns, and social influences to drive widespread adoption.

RESULT AND DISCUSSION

Quantitative Survey PLS-PM Analysis

Validity and Reliability Checking

The validity and reliability of the data gathered during the survey were evaluated using Cronbach's Alpha and Average Variance Extracted. Results indicated some issues with the Compatibility and Complexity constructs, specifically below standard values. The Compatibility construct showed an outlier due to indicator CB5, which questioned respondents about experiencing Virtual Reality sickness—a phenomenon that some may not have encountered. Therefore, this question was removed from the dataset to improve the results. For the Complexity construct, a low Cronbach's Alpha led to the removal of indicator CX2, which related to respondents' perception of the ease of setting up a Virtual Reality device, as responses varied based on individual experience or hearsay.

After data revisions, the Compatibility construct showed improvement, with Cronbach's Alpha, Composite Reliability, and Average Variance Extracted exceeding the required thresholds. However, the Complexity construct still showed indecisive results. Despite removing the question about the difficulty of setting up a Virtual Reality device, the Cronbach's Alpha did not reach the ideal value, and Composite Reliability slightly dropped below the standard. Although the Average Variance Extracted improved, it remained slightly above the minimum required. These outcomes suggest that the Complexity construct's relevance for future research may need further evaluation.

Meanwhile, the Fornell-Larcker criterion shows a good Discriminant Validity (Hair et al., 2016) where each of its outer loadings towards itself (see the diagonal values highlighted in the following table) is the most significant compared to loadings of itself towards other constructs, supporting its Discriminant Validity.

Table 1. Fornell-Larcker criterion

	ATT	CB	CX	FU	OB	PEOU	PU	RA	SI
Attitude	0.866								
Compatibility	-0.088	0.894							
Complexity	0.405	-0.213	0.796						

	ATT	CB	CX	FU	OB	PEOU	PU	RA	SI
Future Usage Intention	0.736	-0.038	0.277	1.000					
Observability	0.464	0.061	0.349	0.433	1.000				
Percieved Ease and Use	0.749	-0.180	0.626	0.563	0.406	0.849			
Percieved Usefulness	0.674	-0.193	0.628	0.496	0.389	0.796	0.848		
Relatives Adventages	-0.193	0.889	-0.309	-0.128	0.025	-0.312	-0.310	0.883	
Social Influence	0.663	-0.135	0.611	0.449	0.546	0.685	0.720	-0.228	0.821

PLS-PM Analysis of DIT-TAM Framework

After reviewing the Validity and Reliability elaborated in the previous section, we can move into the core of the analysis: the PLS-PM Analysis of the DIT-TAM Framework model.

The raw survey data is inputted into the DIT-TAM framework within the PLS-PM software such as Smart PLS. The result is the loading factor for each question for each of the constructs that serve as the nodes of the analysis framework.

These loading factors represent the influence of the values of each of the question results towards the construct it serves under. For example, a low loading factor value means that the particular question score does not influence the construct combined score very much. Meanwhile, a high loading factor means that the particular question highly influences the combined score of the construct it belongs to. A negative loading factor means that the question's score inversely affects the combined score of the construct, where if the question score goes up, the combined score of the construct goes down.

Constructs that only have one question tied to it have loading factors of 1, indicating that it is the question is the sole influence of the construct in particular.

Figure 1. PLS-PM Loading Factor in DIT-TAM Framework

From Figure XX we can ascertain the relationships in the form of loading factors between each construct within our DIT-TAM framework. Each arrow between constructs represents the Hypothesis relationship which has been discussed in previous chapters.

Table 2. 1 PLS-PM Hypothesis vs Result Table

Marking	Hypothesis	Result	Check
H1	Users' Perceived Usefulness (PU) is positively related to their attitude toward the Virtual Reality devices.	+0.202	YES
H2	Users' Perceived Ease of Use (PEOU) is positively related to their attitude toward the Virtual Reality devices	-0.358	NO
H3	Users' Attitude/Behavioral Intention (AT) is positively related to their attitude toward the Future Usage Intention of Virtual Reality devices	+0.732	YES
H4	Relative Advantages (RA) is positively related to Perceived Usefulness (PU) of Virtual Reality devices	-0.002	NO
H5	Relative Advantages (RA) is positively related to Perceived Ease of Use (PEOU) of Virtual Reality devices	+0.033	YES
H6	Compatibility (CB) is positively related to Perceived Usefulness (PU) of Virtual Reality devices	+0.024	YES
H7	Compatibility (CB) is positively related to Perceived Ease of Use (PEOU) of Virtual Reality devices	-0.095	NO
H8	Complexity (CX) is negatively related to Perceived Usefulness (PU) of Virtual Reality devices	+0.095	NO
H9	Complexity (CX) is negatively related to Perceived Ease of Use (PEOU) of Virtual Reality devices	-0.009	YES
H10	Observability (OB) is positively related to Perceived Usefulness (PU) of Virtual Reality devices	+0.528	YES
H11	Observability (OB) is positively related to Perceived Ease of Use (PEOU) of Virtual Reality devices	+0.480	YES
H12	Social Influence (SI) is positively related to Perceived Usefulness (PU) of Virtual Reality devices	+0.396	YES
H13	Social Influence (SI) is positively related to Perceived Ease of Use (PEOU) of Virtual Reality devices	+0.465	YES

The study examined various hypotheses related to the adoption of Virtual Reality (VR) technology in the Indonesian market. Hypothesis H1, which assumed a positive relationship between Perceived Usefulness (PU) and Attitude (AT) towards VR adoption, was confirmed, indicating that the Indonesian market values the usefulness of VR technology. Hypothesis H2, suggesting that Perceived Ease of Use (PEOU) positively affects Attitude (AT), was debunked, as the negative relationship showed that consumers expect VR to be difficult to use, but this

expectation still increased their adoption attitude. Hypothesis H3, which linked Attitude (AT) to Future Usage Intention (FU), was strongly confirmed, suggesting that a positive attitude towards VR increases future adoption intent. Conversely, Hypothesis H4, assuming that Relative Advantages (RA) positively influences PU, was debunked, indicating that consumers do not view VR's advantages over existing devices as significant.

Further analysis confirmed several other hypotheses. Hypothesis H5, linking Relative Advantages (RA) to PEOU, was confirmed with a slight positive relation, showing that consumers acknowledge the impact of RA on ease of use. Hypothesis H6, which suggested that Compatibility (CB) influences PU, was confirmed, though the relationship was limited. Hypothesis H7, assuming Compatibility (CB) affects PEOU, was debunked, reflecting the difficulty consumers associate with VR adoption, even when compatible with existing devices. Hypothesis H8, linking Complexity (CX) to PU, was debunked, suggesting that more complex VR technology is perceived as more useful by consumers. Hypothesis H9, assuming Complexity (CX) negatively impacts PEOU, was confirmed with a minimal relation. Additionally, Hypotheses H10, H11, H12, and H13, all related to Observability (OB) and Social Influence (SI), were confirmed, with strong relationships showing that exposure to VR usage and social circles significantly influence perceptions of its usefulness and ease of use.

Go-To-Market Strategy Formulation

Considering factors and key-takeaways from the quantitative survey from the descriptive results, cross-tabulation results, and PLS-PM relationships, we can formulate an idealized Go-To-Market Strategy specific for VR technology adoption in Indonesia consumer market. In this strategy, we do not bias towards any specific brand or platform, but rather we consider ourselves marketing a new theoretical VR product called "Brand-X". In application, this Go-To-Market strategy for this theoretical brand can be used by other major existing brands and platform if they wish to reinitiate their Go-To-Market efforts in the Indonesian consumer market, by adjusting and adapting their current product offerings and marketing strategies based on the insight gathered by this research.

The steps used in the formulation of this strategy will follow the methods recommended in "GTM (Go to Market) STRATEGY" by Gowda in JETIR journal (Gowda, 2019) as mentioned in previous chapters.

Figure 2. Go-To-Market Steps (Gowda, 2019)

Define the Target Market

The first step is to define the target market. The target market is Indonesia, specifically Indonesian consumer market. Here we can discuss the PESTEL situation of Indonesia, and then define our target market persona using insights gained from the quantitative survey of this research.

PESTEL analysis can be used to understand the general setting of the Indonesian market. We need to define each factor within the PESTEL framework which are Political, Economic, Social, Technology, Environment, and Legal aspects within the Indonesian market.

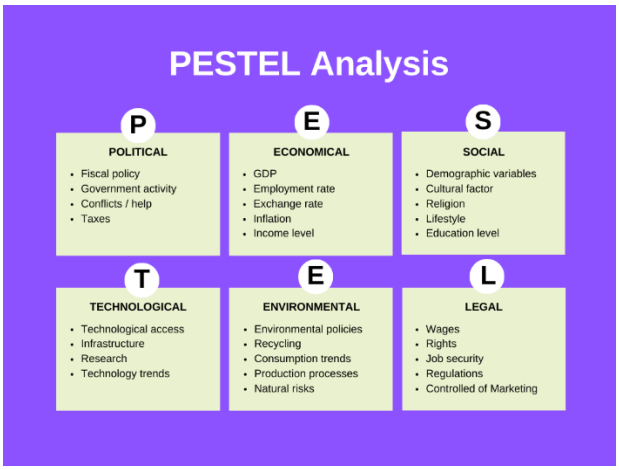

Figure 3. PESTEL Framework (Alam, 2024)

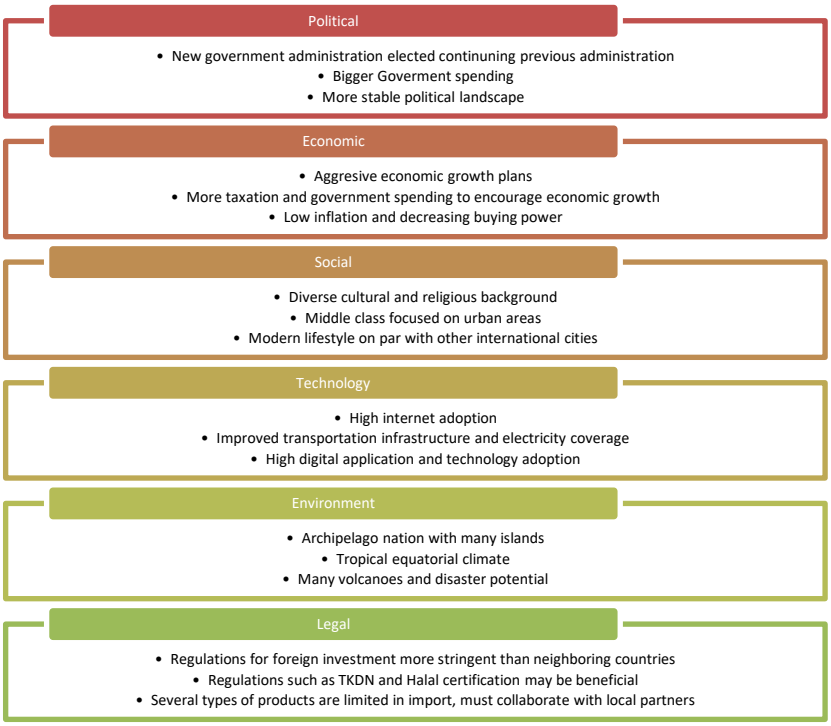

Figure 4. Indonesia PESTEL Summary

Apart from PESTEL situation of the Indonesian consumer market, we also need to determine the customer persona of the intended target market of VR technology adoption. Key highlights from the quantitative survey of this research reveals that some demographic groups are more highly enthusiastic about VR technology adoption, indicated by their higher-than-average User Attitude and Future Use Intention. These include Middle-Class income Male (compared to Female), those familiar with video games (Gamers), and owners of more than 2 daily technology devices.

From this insight, Customer personas have been created to represent distinct segments in the VR technology market. The first persona, Gamer Galih, targets mainstream male gamers who are moderately tech-savvy, frequently watch technology reviews on social media, and are familiar with the benefits of VR for gaming immersion. They are regular gamers and often purchase gaming peripherals online or in physical stores, typically from the lower-middle to high-middle income brackets. The second persona, Simmer Samuel, represents racing and flight simulation enthusiasts, usually upper-middle-class males who invest heavily in simulation peripherals. They are hardcore gamers with significant buying power, highly knowledgeable about VR technology, and often early adopters of VR devices, although this segment is small due to its niche and high commitment requirements. Lastly, Casual Connie represents casual, typically female technology consumers who have a moderate interest in gaming and average to high technology usage. This persona includes middle-income individuals who may not be very tech-savvy but could be swayed by customer education and marketing efforts to increase their engagement with VR. This group is more likely to adopt VR for entertainment applications, like streaming services, and would benefit from lower pricing to facilitate mass adoption and peer influence.

Value Proposition

The second step is to define the value proposition. Here we can define the intended values and traits that our proposed product shall have, based on inputs and findings gathered from the quantitative survey of this research. We can also define the Porter's 5-Powers metrics for this type of product in the Indonesian market.

As gathered from the survey PLS-PM analysis, the Relative Advantage construct plays a minimal or even ambiguous role in influencing the Perceived Ease of Use and Perceived Usefulness. While clear definitions of the features and use cases of the proposed VR technology products needs to be well defined, we need to consider that this factor is not a key factor in mind of the Indonesian consumer.

The ideal value proposition for a theoretical "Brand-X" VR device in the Indonesian market should prioritize affordable pricing, compact and mobile form,

and fulfilling most VR use-cases. Based on survey responses, VR technology is still perceived as expensive, so pricing should be kept low to increase sales and adoption, thus enhancing Observability and Social Influence. To achieve affordability, lower-cost materials and reduced specifications should be used while maintaining a comfortable VR experience. The device should also be compact, lightweight, and standalone, similar to the Meta Quest series, to increase visibility and usage. Additionally, it should cover a wide range of VR applications, including gaming, fitness, social, and work-related functions, without requiring excessive high-end specifications. This strategy contrasts with previous attempts like Google Cardboard and Samsung VR, which were limited in use cases. A key cautionary example is the Apple Vision Pro, which, despite its premium features, failed due to its high price and limited use-cases, leading to low adoption.

The Porter's 5-Powers of VR technology in Indonesia should also be considered. Porter's 5-Powers (Porter, 1979) can be used to analyze the competitive environment of an industry. In this specific case, we will apply it to VR technology adoption in Indonesia consumer market.

1. **Bargain Power of Suppliers is Low/Medium**. Suppliers in this case are the fabricators which most likely be Chinese electronic manufacturers located in mainland China. They work by contract and deliver the product as ordered, which does not give them much power. They can be easily replaced by ordering to another fabricator if they do not deliver as ordered.
2. **Bargain Power of Buyers is High**. This is due to the fact that VR technology in Indonesia is still not considered an essential "must have" product. Hence the customers retain a lot of power in the buying decision. They may decide to purchase VR products from other brands or decide to not purchase it at all.
3. **Threat of New Entrants**. The threat of new entrant in the VR industry in Indonesia is low. The technology itself needs high commitment and advanced level of technology mastery. Observing global trends, specialized VR product brands are limited in number, due to these difficulties.
4. **Threat of Substitutes is High**. Substitute products for VR technology are existing conventional flat-screen devices. These devices have served the functions required by the typical consumer well either for entertainment, gaming, work and others. Although VR does offer advantage in immersion and unique experience, most use cases of VR can still be fulfilled by conventional devices.
5. **Rivalry is High**. Established VR product offerings from competing big brands are already active in the market. These are global brands with strong resources and expertise, with each brand competing with their strong points. Meta and Apple are two big players that are notable, but there are also other

strong brands such as Sony PSVR, Pico, HTC, PIMAX and so on. Each of their offerings offer strong differentiation, which will be discussed in a following section.

Product Strategy

The third step is to define the product strategy. Here we review existing competitor products currently available in the market, and how the theoretical proposed product will compare to it. We will use SWOT and TOWS analysis and product positioning to determine the ideal positioning of the theoretical "Brand-X" that we are proposing to enter the Indonesian market. We can also define the pricing strategy based on the inputs gathered from the quantitative research done in this study.

Firstly, we need to identify the Strength, Weakness, Opportunity and Threat analysis of our proposed idealized "Brand-X" product. After defining our Internal (S and W) and External (O and T) factors, the TOWS analysis to develop strategies to mitigate can be defined. After a clear strategy has been defined, we can proceed to compare it with the SWOT factors of other comparable existing VR products in the market, namely Meta Quest series, Apple Vision Pro, and Sony PSVR.

BRAND-X PROPOSED VR PRODUCT SWOT ANALYSIS

As defined in the previous section, the value proposition for the idealized "Brand-X" VR device should include affordable pricing, broad use-case and features, and portability. These will be the key differentiator for this product to compete in the market.

This brings some consequences in the weakness sector. The device can be expected to be low quality and low specification, which brings low performance. This is fully to be expected from the low pricing.

Opportunities gathered from the quantitative survey include high Future Use Intention scores from the Indonesian consumer market. The survey also shows potential users from those who respond with low VR Observability and Social Influence. Indonesia also shows high internet penetration and typically high digital technology adoption, which may contribute to the trend of VR technology adoption.

BRAND-X PROPOSED VR PRODUCT TOWS STRATEGY ANALYSIS

The TOWS analysis of the "Brand-X" proposed idealized VR device heavily emphasizes on low-cost and low specifications, targeting mostly entry level users and anticipating the low buying power of the Indonesian consumer market, all points verified by the scoring of constructs discovered within the quantitative survey of this research. Low influence of Relative Advantage construct towards Perceived Usefulness (and in turn, User Attitude and Future Use Intention)

indicates that the Indonesian market is not very concerned on the sophistication of the device's specifications. Pricing of existing VR devices are still considered high by the respondents of question CX3 within the Complexity construct.

This offers several competitive advantages, one that emphasizes on the affordability of the product, the reduced quality and specifications of the product while still maintaining features and use-cases as the competition as much as possible, and also it can avoid direct competition against well-established more sophisticated brands by branding itself as being in a lower market segment. The product needs to embrace the identity of being an entry level product.

Hence the positioning of the product needs to be adjusted according to these concepts. The recommended product positioning within comparable competing consumer-level VR technology devices available at the end of 2024 is approximated in the following figure:

BRAND-X PROPOSED VR PRODUCT POSITIONING

Figure 5. Positioning of "Brand-X" VR Device in Indonesian Market

In the positioning analysis, we include several other VR products such as Apple Vision Pro, Meta Quest 3, Meta Quest 3S, and Sony PSVR2.

Apple Vision Pro emphasizes in high quality and high specifications for a consumer VR technology device. Although it works seamlessly together with other Apple products and can deliver experiences unique to this platform, as mentioned in previous chapters it lacked use-cases compared to its competitors due to the limited apps available in its ecosystem. The product is high on specifications, display quality and build quality (with some questionable design choices such as external battery placement among other things), it is held back by its limited usefulness that puts it somewhat not too far ahead of its closest competition, the Meta Quest 3.

The Meta Quest 3 is currently the backbone of Meta's current VR offerings, comprising of 59% of Meta Reality Labs revenue with 290,164 units sold in Q3 of 2024 according to Meta's Q3 2024 Earnings Call held in October 2024 (https://investor.atmeta.com/investor-events/event-details/2024/Q3-2024-Earnings-Call/default.aspx). With a price point of $499 for its lowest model, it is up to 7 times cheaper than Apple's offering. It offers some of the latest breakthroughs in VR technology, such as hand tracking, pancake lenses and sophisticated sensors. Although it isn't a cutting-edge ultimate VR device (there are professional-grade VR devices with more advanced technology), the Quest 3 managed to bring many advanced features to the consumer level, at a consumer-level price. As mentioned in previous chapters, it is also backed by a well-established software ecosystem and apps selection, giving it some of the most versatile use-cases in the market.

The Meta Quest 3S is a relatively new offering from Meta. It is essentially a downgraded Meta Quest 3 (or an upgraded Meta Quest 2, the previous generation VR device from Meta), retaining most of its functionality while shedding some of its more refined components such as the lenses and advanced sensors. This gave the Quest 3S a starting price of $299.99 (https://www.meta.com/quest/quest-3s). The Quest 3S enjoys the same software support of Meta's ecosystem which gives it a functionality on par with its bigger brother, only with some lower quality and performance.

Sony PSVR2 is an optional VR peripheral in support of Sony's popular game console, the Sony PlayStation 5. It is equipped with some advanced VR technology and good display quality. However, it is hindered by its compatibility with other devices, being a proprietary device solely designed to support the PlayStation 5. This heavily limits the use-cases of this device and deters adoption, especially with a price tag that is comparable to the pricing of the PlayStation 5 itself, the very game console driving it, which also approximates the pricing level of the Meta Quest 3.

Based on question QX3 about Complexity, which discusses the complexity of acquiring VR technology products from the standpoint of pricing, the Indonesian market still considers VR technology pricing high. This is despite the recent

advancements in the reduction of many VR products to the level of typical household electronics. Therefore, pricing becomes a sensitive issue that must be formulated correctly to properly introduce VR technology adoption in Indonesian consumer market.

The ideal "Brand-X" VR device proposed by this research to penetrate the Indonesian consumer market is positioned at a similar functionality level as the Meta Quest 3S, with lower pricing. A device with the same specifications as the Meta Quest 3S, with similar levels of software environment and support, with a lower build quality or even a slightly lower quality display, may work perfectly for this positioning. Within the currently available VR devices in the market, Meta with its Quest 3S is the brand most well-poised to shift its product line into this direction, given if it can lower the specifications and pricing of the Quest 3S slightly more.

Distribution Channel

The fourth step is to define the distribution channels. Here we review existing distribution channels used by currently existing VR brands available in the market, and how the theoretical proposed product should compare to it. We will discuss both online and offline channels, and the recommended channels for our proposed theoretical "Brand-X" VR product.

Currently, different competing VR brands treat their distributorship of their products differently. Some practices that may be tried can be summarized below:

1. Apple has its distributorship outlets available throughout big cities in Indonesia, however, none of these physical storefronts are owned directly by Apple. Apple Vision Pro VR product can also be found through unofficial channels and online stores, with severely marked-up pricing (https://jakartaglobe.id/tech/apple-vision-pro-enters-indonesian-market-via-unofficial-vendors).
2. Meta does not maintain physical outlets in Indonesia, despite the existence of their company entity in Indonesia. However, Meta VR products can be found mostly through online distributors within popular online marketplaces. These online distributors as well as other unofficial partners carry their own name but sell Meta products at competitive prices.
3. Another good practice can be seen from a prominent gaming & simulation peripheral brand, Thrustmaster. Thrustmaster Indonesia has established its own official online store within Tokopedia, one of Indonesia's top online marketplaces. They offer competitive prices and bundling packages of their products. They also sell their products with official gimmicks and bonuses. By establishing this presence, Thrustmaster can distribute its products directly with best price to the customer while increasing their brand presence in the market.

Learning from these best practices we recommend that for our idealized "Brand_X" VR device, we should pursue the following distribution strategies:

1. **Collaborate with local physical store chains** that specialize in technology products such as Erafone. These chains typically specialize in mobile-phone devices, but it will be a good entry point for VR products and a place to physically try the products in store, which is a feature missing within Meta and Apple options in Indonesia.
2. **Establish official online store presence** within popular online marketplaces in Indonesia such as Tokopedia and Shopee. This serves to strengthen the brand name and also reduce cost by minimizing markups from unofficial stores. This official online store can be established with the help of the official offline distributor or independently.

External Marketing

The fifth step is to define the external marketing. This is an important factor according to our survey, considering that two important factors discovered in the survey is Observability and Social Influence. Both these factors influence strongly upon Perceived Usefulness, and eventually User Attitude and Future Use Intention.

Both Observability and Social Influence were given relatively low scores by respondents of this research. This indicates the low level of development of these constructs found within the current market situation. This needs to be remedied by the correct marketing strategy that aims at awareness and market visibility first.

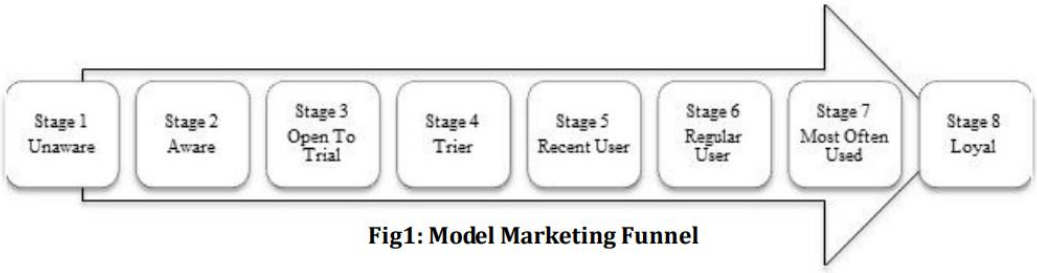

Fig1: Model Marketing Funnel

Figure **Error! No text of specified style in document.**.2 Marketing Funnel Stages (Ahmed & Saikia, 2017)

The first step to figure out the marketing plan is the **Awareness** stage. This involves converting customers who are unaware of the product into awareness. This may be well effective to reach the Casual Connie target market persona. To maximize reach for VR technology adoption in Indonesia, several marketing methods should be employed. Out-of-home advertising, including billboards, banners, and branding on public transportation, is crucial for creating broad visibility and increasing Observability. The campaign should feature popular public figures to further boost its impact. Online advertising through well-known celebrities and influencers, showcasing the fun and easy aspects of VR, is also important for awareness. Product placement in movies and TV shows can normalize

VR usage in daily life, subtly increasing Observability. Additionally, offline marketing events like product launches, roadshows, and promotional activities in high-foot traffic areas such as malls can allow consumers to experience VR firsthand, further boosting its visibility and adoption. These strategies collectively aim to reach a wide audience and enhance the mass awareness of VR technology.

After the Awareness stage is achieved, comes the **Consideration** stage. At this stage, more targeted marketing channels are essential to reach specific consumer personas like Casual Connies, Simmer Samuels, and Gamer Galihs, aiming to increase VR awareness and adoption. Online reviews by influencers, such as GTID or Fitra Eri, are critical for building credibility and engaging tech-savvy consumers. Conversion-focused online ads, including Programmatic Ads, Google Ads, and social media platforms like Meta/Facebook/Instagram and TikTok, should be used to retarget interested customers and encourage purchases. Additionally, micro-influencers on platforms like Instagram and TikTok can help drive the final consideration towards purchase, with agencies managing a large number of influencers to increase reach and effectiveness. These strategies aim to enhance Social Influence and adoption of VR technology.

After the Consideration stage, it is just a matter of which distribution channel is preferred by the customer to make their purchase decision, to **Convert** them into users. Hence the importance of the Distribution Channel selected in the previous section of this report. Online and Offline storefronts must be ready to receive the traffic driven by these external marketing efforts already outlined in the previous points.

Customer Support

The sixth step is to define the customer support efforts. In this section we will review the customer support efforts by existing VR brands available in the market while formulating what needs to be done by the theoretical proposed “Brand X” VR device. We will base this on best practices from existing efforts, while combining it with insights from quantitative survey.

Following best practices that already exist in the market we can define some activities to achieve good customer support for users of this product:

1. **Good Software Ecosystem and App Store**. This is a strong point of Meta Reality Labs, which maintains a vast ecosystem of VR software through its collaboration with software developers. The ease of use of this ecosystem is some of the best in the market, and it minimizes user difficulty. Almost all use cases are supported by the vast selection of applications within this ecosystem. The proposed “Brand-X” VR device should also follow this example and provide a similar level of experience for its users.

2. **Local Customer Service Center and Call Center**. This point has been largely neglected by other VR brand available in the market. Due to the minimum local presence of the brands that sell VR technology in the Indonesian consumer market, there is no clear competent service center and customer service hotline for these devices, which largely rely on their international warranty and the difficulty that comes with it. Official service centers and customer service hotlines should be provided by the idealized "Brand-X" VR device proposed by this report.

Evaluate Success

The seventh step focuses on defining success evaluation by establishing KPIs and objectives for the "Brand-X" VR device launch. The main goal is widespread adoption of VR technology, with KPIs set to evaluate the implementation time and the number of units sold. For context, Meta Reality Labs sold over 290,000 units of the Meta Quest 3 in Q3 2024, which translates to approximately 1 million units annually worldwide. Considering Indonesia's internet penetration of around 70%, the target of 1 million units sold in the Indonesian market represents just 0.53% of the total addressable market (TAM), making this an achievable goal. Even if only half of that target is reached, it would result in a 50% increase in Meta's global sales, yielding a potential revenue of $75 million annually from Indonesia alone. This target will be evaluated at the end of the year.

The launch and marketing activities will be planned over a 12-month timeline. The first three months will focus on establishing local partners, acquiring marketing agencies, event organizers, and brand ambassadors. After preparations, the launch event will occur in the 5th month, followed by roadshow events in major Indonesian cities. Out-of-home billboards will be placed throughout the year, and influencer campaigns will roll out after the grand launch, featuring mega, technology review, and micro-influencers. Nano and micro-influencers will also promote roadshow events. Online advertising campaigns for awareness and conversion will run for the rest of the year. Additionally, budget provisions will cover TV show placements and movie collaborations to further boost visibility and market penetration.

CONCLUSION

The research concludes that while the Indonesian mass consumer market shows a generally positive attitude toward adopting Virtual Reality (VR) devices, challenges remain in enhancing their perception of usefulness and ease of use. The survey revealed low Observability and Social Influence, with many respondents unaware of VR benefits or users within their social circles, creating minimal incentive or pressure to adopt. Additionally, VR technology is perceived as

expensive despite reduced prices, likely due to low awareness or perceived value relative to its cost. Demographic insights suggest that males, middle-class consumers, gamers, and tech-savvy individuals are more inclined toward VR adoption. Future adoption depends on improving Observability and Social Influence, as these factors significantly influence perceived usefulness and, subsequently, user attitude and future use intention.

The study also proposes a tailored Go-To-Market (GTM) strategy for a hypothetical "Brand-X" VR product in Indonesia, emphasizing affordability, compactness, and versatile use cases. Target personas include Gamer Galih, Simmer Samuel, and Casual Connie, representing various market segments. The ideal product should balance cost and features, resembling Meta Quest 3S, but with slightly reduced specifications to lower prices and attract mass adoption. Marketing efforts should focus on increasing Observability and Social Influence, leveraging local distribution channels, and fostering broad appeal rather than technical superiority. If implemented effectively, this GTM strategy could result in significant market penetration and sales, paving the way for broader adoption of VR technology in Indonesia. Further research is recommended to refine constructs like Complexity and address psychological and sociological factors influencing VR adoption.

REFERENCES

Alam, M. (2024). What is Pestel Analysis? definition, benefits and best practices. Retrieved from https://ideascale.com/blog/what-is-pestel-analysis/

Antón-Sancho, Á., Vergara, D., & Fernández-Arias, P. (2024). Quantitative analysis of the use of virtual reality environments among higher education professors. Smart Learning Environments, 11(1). doi:10.1186/s40561-024-00299-5

Bruin, L. de. (2024). Crossing the chasm in technology adoption life cycle explained: B2u. Retrieved from https://www.business-to-you.com/crossing-the-chasm-technology-adoption-life-cycle/

Budiarti, R. P. N., Sulistyani, E., Anggraini, F., Marvyna, H. C., & Manilaturrohmah, M. (2022). Pengenalan Teknologi virtual reality Dan augmented reality untuk Meningkatkan Pembelajaran digital di Pondok Pesantren al Muin syarif hidayatullah. Communautaire: Journal of Community Service, 1(2), 90–97. doi:10.61987/communautaire.v1i2.15

Busulwa, R. (2022). Virtual reality (VR), augmented reality (AR), and mixed reality (MR) Primer. Navigating Digital Transformation in Management, 381–392. doi:10.4324/9781003254614-28

Cattan, G., & Mendoza, C. (2021). Virtual reality: Definition and Craze. Retrieved from https://hal.science/hal-03361952v1

Clayton, J. (2023). Metaverse: What happened to Mark Zuckerberg's next big thing? Retrieved from https://www.bbc.com/news/technology-66913551

Elahi, B. (2024). Investigating the educational impact of augmented reality (AR) and virtual reality (VR) applications in teaching industrial and Systems Engineering Courses. 2024 CIEC Proceedings. doi:10.18260/1-2-1132-49034

Fitria, T. N. (2023). Augmented Reality (AR) and Virtual Reality (VR) Technology in Education: Media of Teaching and Learning: A Review. International Journal of Computer and Information System, 04(01).

Huang, J., Sun, P., & Zhang, W. (2022). Analysis of the future prospects for the metaverse. Advances in Economics, Business and Management Research, 211. doi:10.2991/aebmr.k.220307.312

İldaş, Doç. Dr. Görkem. (2022). Metaverse 101: Under The Theory of Diffusion of Innovations. 433-473. İksad Yayınevi

Irham. (2024). Penjualan Apple Vision pro Masih Rendah, Tapi Optimis Masa Depan cerah • jagat gadget. Retrieved from https://gadget.jagatreview.com/2024/08/penjualan-apple-vision-pro/

Jamshidi, M. (Behdad), Dehghaniyan Serej, A., Jamshidi, A., & Moztarzadeh, O. (2023). The meta-metaverse: Ideation and future directions. Future Internet, 15(8), 252. doi:10.3390/fi15080252

Jimenez, J. (2023). Meta Quest 3 Review. PC Gamer. Retrieved from https://www.pcgamer.com/meta-quest-3-review/

Kline, A. R., & Ayer, S. K. (2024). Augmented reality (AR) and virtual reality (VR) in Construction Education: A systematic literature review. Computing in Civil Engineering 2023, 655–662. doi:10.1061/9780784485231.078

Mancuso, I., Messeni Petruzzelli, A., & Panniello, U. (2023). Digital Business Model Innovation in Metaverse: How to approach Virtual Economy Opportunities. Information Processing & Management, 60(5), 103457. doi:10.1016/j.ipm.2023.103457

Mulyani, I. (2022). SBM ITB akan hadir di metaverse, penjualan Lahan Ransverse Resmi Dibuka Untuk Publik. Retrieved from https://www.sbm.itb.ac.id/id/2022/06/01/sbm-itb-akan-hadir-di-metaverse-penjualan-lahan-ransverse-resmi-dibuka-untuk-publik/

Newhart, M., & Patten, M. L. (2023). Reporting quantitative research results. Understanding Research Methods, 456–458. doi:10.4324/9781003092049-103

Park, C. H., Sim, J. S., Chey, M., & Choi, J. (2023). A study on the factors affecting the intention to use the metaverse virtual worlds: From the desire fulfillment and Innovation Diffusion Perspective. Journal of Korea Service Management Society, 24(3), 138–166. doi:10.15706/jksms.2023.24.3.007

Putra, P. M. S. (2024). Prabowo Subianto diharapkan Bisa Meneruskan diplomasi internasional jokowi. Retrieved from https://www.liputan6.com/news/read/5748913/prabowo-subianto-diharapkan-bisa-meneruskan-diplomasi-internasional-jokowi

Ritterbusch, G. D., & Teichmann, M. R. (2023). Defining the metaverse: A systematic literature review. IEEE Access, 11, 12368–12377. doi:10.1109/access.2023.3241809

Robertson, A. (2020). Oculus' new quest 2 VR headset starts at $299 and ships October 13th. Retrieved from https://www.theverge.com/2020/9/16/21427947/oculus-quest-2-facebook-vr-headset-price-release-date-preorder-connect

Roth, E. (2023). Microsoft is discontinuing Windows Mixed Reality. Retrieved from https://www.theverge.com/2023/12/21/24010787/microsoft-windows-mixed-reality-deprecated

Sar. (2022). Erajaya Digital Adopsi KONSEP Ritel Baru, Erafone and more. Retrieved from https://www.indotelko.com/read/1663002562/erajaya-digital-adopsi-konsep-ritel-baru-erafone-and-more

Scott, R. (2024). What is Meta Horizon Worlds? Retrieved from https://www.xrtoday.com/virtual-reality/what-is-meta-horizon-worlds/

Skarbez, R., Smith, M., & Whitton, M. C. (2021). Revisiting milgram and Kishino's reality-virtuality continuum. Frontiers in Virtual Reality, 2. doi:10.3389/frvir.2021.647997

Song, E. (2023). Meta Quest 3 Review. Retrieved from https://sea.ign.com/meta-quest-3/207211/review/meta-quest-3-review

Survey ISP Market Profile 2024. (2024). Survei Internet APJII 2024. Retrieved from https://survei.apjii.or.id/

Yang, M. (2022). Facebook parent meta is having a no-good, horrible day after Dismal Earnings Report. Retrieved from https://www.npr.org/2022/10/27/1131705422/facebook-meta-earnings-stock-price-fall-metaverse

Yasar, K., & Sheldon, R. (2024). What is virtual reality? how it's used and how it will evolve. Retrieved from https://www.techtarget.com/whatis/definition/virtual-reality

Zoho. (2025). Margin of error - definition, usage, and calculator: Zoho survey. Retrieved from https://www.zoho.com/survey/margin-of-error.html