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FEASIBILITY AND STRATEGIC ANALYSIS OF MARKET ENTRY FOR 3D MAPPING SERVICES IN INDONESIA'S EMERGING SECTOR

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Abstract

Global advancements in mapping technology contrast with Indonesia's limited adoption, which remains concentrated in mining and government. As revenue from these sectors declines, PT Geo Indonesia must diversify. This qualitative study examines the feasibility of entering alternative sectors using stakeholder interviews and secondary data. Findings identify three market segments: traditional sectors with slowing demand, emerging engineering sectors facing constraints, and high-potential creative sectors. Analysis reveals favorable external digitalization trends and strong internal technical expertise, despite gaps in marketing and human resources. Application of Porter's Three Essential Tests confirms that diversification into 3D mapping is attractive and synergistic. The study recommends a dual targeting strategy: prioritizing the creative industry for rapid penetration while building long-term engineering capabilities in architecture, property, and oil and gas. This research provides practical guidance for PT Geo-Indonesia's diversification and market entry strategies in the geospatial sector.

Keywords: 3D mapping, Diversification, Market Entry, Geospatial Services.

INTRODUCTION

Geospatial data is one of the critical pillars in today's information-driven world. About 80% of all data developed today are estimated to be spatial (Bossler et al., 2010). This data emanates from a high-precision, elaborate array of technologies focused on data collection, analysis, interpretation, and management of the Earth's surface. Some of the important technologies in this field include UAVs, GNSS, Total Stations, Remote Sensing, and Terrestrial Laser Scanners. These tools provide the raw data that GIS subsequently processes and analyzes in order to integrate various types of spatial information, including terrain, infrastructure, and population distribution, onto comprehensive maps. This integration enhances the establishment of patterns and greatly assists decision-making across many professional fields..

Recent studies emphasize that geospatial technology is significantly expanding in its applications. For example, using GIS-based minimum 3D modeling in construction safety planning results in decreased danger risks via early recognition systems. Additionally, 4D modeling and GIS systems can aid in recognizing appropriate construction sequences to guarantee safety (Herman & Řezník, 2015). The application of Building Information Modeling (BIM) combined with Geographic Information System (GIS) in infrastructure management further strengthens project delivery in a faster and more efficient manner throughout the project life cycle as well (Gao et al., 2020). In mining projects, spatial analysis using GIS systems has been productive for determining mineral resource reserve, managing environmental concerns, or overall mine planning purposes as well (Ang et al., 2023; Choi et al., 2020). Thus far, all such applications have made significant progress in project monitoring within Architecture, Engineering, Construction, or Government projects.

Though these conventional markets have been developed, the adaptation of 3D mapping technology has been faster in other international markets such as sports, entertainment, heritage, and event infrastructure. When it comes to the movie industry, there is the application of 3D scanning in digital set creation, for instance, 75mm Studio utilized 3D laser scanning in match-moving for large-scale projects such as Squid Game and Kingdom for Netflix. Additionally, theme parks and entertaining institutions apply 3D geographical mapping to create virtual or augmented reality. Finally, heritage institutions apply 3D mapping to digitize heritage sites for purposes of restoration.

Even with such global presence, there still exist various countries, and Indonesia is not exempt, that show limited use of the more refined 3D geospatial offerings. The situation represents an imbalance of vulnerability as the new sectors of the economy become reliant on geospatial knowledge for sustainability and security. The market is evolving from the supply of geographical information to the supply of high-end 3D services that entail analysis and transformation. The research assesses the feasibility of entry into the new sectors for PT Geo-Indonesia.

PT Geo-Indonesia has established itself as an authorized dealer of best-in-class surveying and mapping technology, including Total Stations, GNSS systems, and Laser Scanners. However, during extensive year-end meetings, it was realized that performance had stagnated. For instance, in the years between 2020 and 2024, the projects that the company worked on were highly concentrated in traditional industries like mining and government-led construction. Although mining projects peaked in 2022 with more than 170 projects, the trend then clearly began to decline, signaling a saturated market. Therefore, the leadership indicated the need for immediate corporate action to diversify the business in order to make it long-term sustainable.

PT Geo-Indonesia is interested, especially in emerging areas of the world market such as gaming, film industries, and cultural heritage, where advanced geospatial technologies are increasingly being adopted but are largely untapped in Indonesia. An exploratory venture into the entertainment business area for concert construction revealed that although clients were hesitant to purchase costly equipment, they were very responsive to a service-based model. Positive responses and repeat orders from this clientele indicated a new strategic path. This paper explores how PT Geo-Indonesia can start ventures in these areas by educating the market through a service-based geospatial approach to implement the above vision.

LITERATURE REVIEW

The Geospatial Industry

The geospatial industry worldwide is experiencing steady growth every year. As of 2025, the market value for geospatial is estimated to be USD 95.84 billion; by 2030, this will increase to a value of USD 174.44 billion (Mordor Intelligence, 2025). Notably, location-based services within the transportation, retail, and healthcare sectors, as well as emerging technologies such as AI and IoT, are driving this growth. As of now, Indonesia has the largest market within Southeast Asia at 30%, due to initiatives such as the "One Map Indonesia" policy as well as the development of smart cities. Further, the 3D Mapping industry has a forecasted value of USD 22.19 billion by 2032 (Fortune Business Insights, 2025).

Strategic Management and Diversification

Strategic management encompasses a rational and systematic process of commitments, decisions, and actions that must be the goal of a firm for the purpose of attaining strategic competitiveness and superiority. The process is constantly evolving, and it is important for the firms to be proactive and not reactive (Wandebori, 2019). One of the most integral approaches to the strategies of corporations is diversification. The diversification strategy allows for the exploration of new markets and sectors for the purpose of competitiveness (Hitt et al., 2011). The diversification of business can only be successful when there is the sharing of resources and core competencies between the firms.

Porter's Three Essential Tests

Michael Porter's framework for assessing diversification strategy focuses on three critical tests to determine strategic viability. First, the Attractiveness Test establishes that the target industry must be structurally attractive or have the potential to become so and thereby allow firms to gain returns on investment above the cost of capital. The second test, the Cost of Entry Test, is used to decide whether the financial cost, the organizational cost, and the opportunity cost of entering a new industry do not exceed its long-term profit potential. This is according to Porter (1989, 2008). Finally, the third test, the Better-Off Test, determines if diversification yields synergy, a situation where the value of the corporation and the new business unit together is greater than the value each will separately create. Taken together, these three tests provide a sound theoretical basis on which to determine whether or not diversification enhances competitive advantage and long-term corporate performance, as initially proposed by Michael Porter.

Segmentation, Targeting, and Positioning

At the same time, the theory of Segmentation, Targeting, and Positioning (STP) helps to describe how a business can successfully compete in a heterogeneous market. In more detail, according to Kotler & Keller, given the varying needs, preferences, and characteristics, no business can treat its consumers equally. Therefore, in a

business, the market is first differentiated into distinct segments, and certain segments are targeted, with the positioning of products occurring to develop a distinct value positioning (Kotler & Keller, 2012). In B2B markets, for instance, factors such as industry type, size, complexity, and particular service needs are taken into consideration. The STP theory, as explained in {\it Marketing Management}, helps to describe how marketing strategy should be geared towards a business's alignment with particular market and customer value.

METHOD

This study adopts a qualitative exploratory approach to analyze the strategy process for PT Geo-Indonesia (Yin and Cambell, 2018). The framework involves business issue exploration and market, external, and internal analyses to develop a strategic implementation process. A qualitative approach is adopted to analyze the views and perceptions of individuals within a real-life context. The proposed research will use both primary and secondary data. Secondary Secondary Data, from in-depth information was collected from academic journals, industry reports (ASPIG, MAPIN), goverment regulations, and benchmarks from key players in the industry like Leica and Topcon. Primary Primary Data, from structured and unstructured in-depth interviews, using purposive sampling, with thirteen respondents, classified into Decision Makers (Regulatory & Industry), Technology Managers (Vendors & Consultants), and others like Construction, Architecture, Film, and Oil & Gas, and so on, to identify people with in-depth knowledge about the industry. Thematic analysis, a method of analyzing data, was employed to recognize patterns and learn from the data obtained from the interviews. Coding techniques were employed to identify patterns in the data regarding emerging opportunities, challenges, and themes. Triangulation techniques were employed to validate emerging themes from data sources in an attempt to build validity (Denzin, 1978; Patton, 1999).

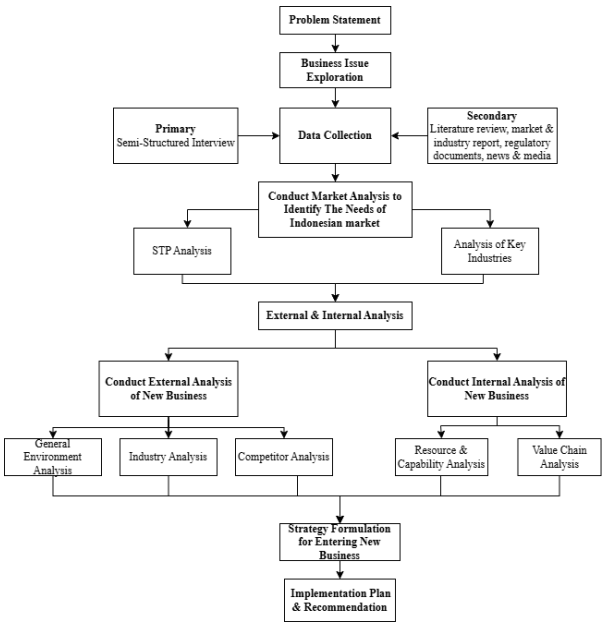

Image 1. Research Framework

RESULTS AND DISCUSSION

This section presents research findings that have been systematically analyzed to evaluate the strategic feasibility of PT Geo-Indonesia diversifying its business model into the 3D mapping services market. The findings presented are a synthesis of primary data obtained through in-depth interviews with 13 industry stakeholders and secondary data from market reports and relevant government regulations. To provide a comprehensive overview, the research results are organized into three main subsections: analysis of current business conditions, strategy formulation based on theoretical testing, and a practical implementation roadmap. The explanation begins with the identification and classification of market segments in Indonesia to determine the most potential areas for growth.

Analysis

Based on an in-depth evaluation of the external environment and internal capabilities of the company to determine the competitive position of PT Geo-Indonesia. Market analysis was conducted by mapping the specific needs of various industries, ranging from the traditional mining sector to the growing creative industry. This evaluation aims to identify market gaps where 3D mapping technology can provide the most significant added

value through an operational cost (OPEX) model for customers. The results of the market variable identification and strategic factor assessment are detailed in the series of tables below (David & David, 2017; Gubanova et al., 2018; Padgett & Mulvey, 2007).

Table 1. Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) Results

Factor Category	Key Strategic Factors	Weight	Rating	Weighted Score
Internal	(S) Exclusive distribution rights	0.12	4	0.48
	(S) Advanced demo unit inventory	0.10	4	0.40
	(W) Critical manpower gap in 3D processing	0.15	1	0.15
	(W) Lack of creative industry network	0.13	1	0.13
External	(O) Rise of 3D content in Film/Gaming	0.16	4	0.64
	(O) BIM Mandates in Gov Projects	0.14	3	0.42
	(T) Economic volatility (IDR/USD)	0.13	2	0.26
	(T) Rapid technological obsolescence	0.12	3	0.36
Total Score				**IFE: 239**
				EFE: 3.07

Table 1, quantifies the internal strengths and weaknesses against external opportunities and threats. The IFE score (2.39) suggests that the company is at an average position internally, primarily pulled down by the lack of specialized human resources. Conversely, the EFE score (3.07) indicates that PT Geo-Indonesia is highly responsive to external opportunities, particularly in the creative and regulatory sectors.

Strategy Formulation

Based on the scores from the IFE and EFE matrices in the analysis section, this position mandates a Grow and Build strategy, focusing on market penetration and product development. The primary strategy formulated is Focused Differentiation, where PT Geo-Indonesia leverages its premium hardware access to offer high-fidelity 3D mapping services that cannot be matched by low-cost competitors. To ensure the viability of entering new sectors, Porter's Three Essential Tests were applied. The Attractiveness Test confirms that the creative industry (film and heritage) is a high-growth sector with low competition for technical geospatial services (Yunna & Yisheng, 2014). The Cost of Entry Test reveals that PT Geo-Indonesia can enter the market with low capital requirements by utilizing existing demo units. Finally, the Better-Off Test proves that the new service unit and the existing distribution business create synergy: the service unit provides a new revenue stream and showcases equipment performance, while the distribution unit provides the service unit with the latest technology (Porter, 1989; Wandebori, 2019).

Table 2. SWOT Matrix Strategic Formulations

Strategy Type	Key Strategic Action	Expected Outcome
S-O Strategy	Use demo units for 'Service-First' pilot projects in film.	Build portfolio without new CAPEX.
W-O Strategy	Recruit VFX and 3D artists to bridge technical gap.	Meet visual standards of creative clients.
S-T Strategy	Promote service-based OPEX models during economic downturns.	Capture clients who cannot afford hardware.
W-T Strategy	Partner with local universities for talent pipelines.	Reduce recruitment and training costs.

Table 2, presents the SWOT matrix, which matches internal capabilities with external trends. The most critical strategy is the W-O Strategy, which focuses on recruiting creative talent to bridge the gap between technical data and artistic requirements. This is the foundation of the "Creative Reality Producer" positioning.

Implementation Plan

The implementation of the new strategy is structured into a three-year roadmap (2026–2028). The plan prioritizes organizational transformation and pilot testing before moving into full-scale market penetration. The implementation covers changes in the marketing mix (7Ps), particularly shifting the "Product" from hardware sales to "Ready-to-Use 3D Assets." The implementation roadmap is structured into three sequential phases over a three-year period. Phase 1, Foundation concentrates on addressing the manpower gaps identified in the strategic analysis through the recruitment of a core team, consisting of a 3D Visualization Artist and a specialized Data Processor. During this phase, the company undertakes pro-bono or discounted pilot projects in the film and cultural heritage sectors to develop a strong creative portfolio and establish initial market credibility. Phase 2, Penetration emphasizes aggressive business development activities, with a strategic focus on expanding market reach through professional associations such as the Indonesian Institute of Architects. Phase 3, Leadership aims to achieve operational excellence and scalable growth, including the potential adoption of AI-driven data processing technologies to enhance efficiency and improve profit margins, thereby supporting long-term competitive leadership.

Table 3. Strategic Implementation Roadmap (2026-2028)

Phase	Focus Area	Key Milestones	Year
Phase 1	Foundation	Recruitment of 3D artists; Pilot projects in VFX.	2026
Phase 2	Penetration	Aggressive marketing to IAI & APROFI; SOP optimization.	2027
Phase 3	Expansion	Scale to regional markets; Introduce AI-data processing.	2028

Table 3, provides the timeline for strategic execution. It ensures a logical progression from building internal capabilities to capturing market share. By the end of Year 3, the service unit is expected to achieve full profitability and become a significant contributor to the company's total revenue.

Table 4. Proposed Marketing Mix (7Ps) for 3D Mapping Services

P Element	Strategy Detail
Product	High-fidelity digital twins, BIM models, and game-ready asset packs
Price	Value-based pricing (per project) rather than cost-plus pricing.
Place	Direct sales and partnerships with creative agencies and architectural firms.
Promotion	Digital portfolio on ArtStation/Behance and workshops with professional associations.
People	Hybrid team of geospatial engineers and 3D creative artists.
Process	Streamlined workflow from field scan to optimized mesh delivery.
Physical Evidence	High-quality 3D case studies and interactive VR/AR demos.

Table 4 outlines the functional strategies required to support the new business model. The shift in Promotion and Physical Evidence is particularly important, as the company must move away from technical data sheets toward visually stunning portfolios that resonate with creative decision-makers.

DISCUSSION

The Strategic Transition

PT Geo-Indonesia's transition from a mere hardware distributor to an integrated service provider reflects the global trend of servitization in the technology industry (Han et al., 2020). Findings in this study indicate that the main barriers to the adoption of 3D mapping technology in Indonesia's developing sector are not a lack of interest, but rather the high initial investment costs (CAPEX) and the complexity of operating the equipment. By offering a service-based model, PT Geo-Indonesia effectively removes these barriers, allowing clients in the film or architecture industries to access world-class technology at a more affordable project cost. This strategy not only creates new revenue streams, but also strengthens the trading business unit by demonstrating the real capabilities of

the tools in the field (Cricelli et al., 2022). This move aligns with the Better-Off Test of Porter's Three Essential Tests, as the service unit benefits from immediate access to the dealership's inventory, while the dealership gains a new channel to showcase technology to potential future buyers.

Capturing the Blue Ocean in Creative Industries

The creative industry, such as large-scale film production and game development, has been identified as a Blue Ocean for PT Geo-Indonesia. Unlike the mining sector, which is saturated with price competition, the creative sector seeks high visual quality and data fidelity, which can only be achieved through premium laser scanners such as Leica (Altyntsev, 2021). However, this discussion highlights that the language of communication in this sector is very different. PT Geo-Indonesia cannot simply sell millimeter accuracy; they must sell production efficiency and digital realism. The integration of LiDAR technology into film VFX workflows, as has been done globally in Netflix productions, must be the company's main selling point to differentiate itself from traditional survey providers (Bossler et al., 2010).

Addressing the Manpower Gap for Sustainable Advantage

Internal analysis consistently shows that human resources are both the weakest point and the biggest key to success. To achieve sustained competitive advantage, companies cannot rely solely on sophisticated tools. According to the VRIO framework, sophisticated tools can be replicated if competitors have the capital, but teams capable of combining geospatial expertise with creative aesthetics are very difficult to replicate. Therefore, recruiting 3D artists who understand topology, texturing, and game engines, such as Unreal Engine, is a must. Without this, PT Geo-Indonesia will only produce raw data as a point clouds (Freitas et al., 2025), that has no added value for creative clients (Wandebori, 2019).

Strategic Resilience against Economic Volatility

Economic uncertainty and the volatility of the Rupiah exchange rate against the US Dollar pose a major challenge for import businesses. This discussion emphasizes that the service model provides a financial "cushion" for companies. When exchange rates are unstable and unit sales decline dramatically due to soaring prices, service units can continue to operate using existing demo unit inventory. This creates strategic resilience, whereby companies can maintain business activities and cash flow even when the hardware retail market is sluggish. In addition, the service model allows companies to educate the market during times of crisis, so that when the economy improves, clients already have a high level of confidence to purchase these units (Hitt et al., 2011, 2020).

Synergizing Corporate and Business

Level Strategies The success of this diversification depends on the synergy between corporate-level and business-level strategies. At the corporate level, PT Geo-Indonesia uses underutilized assets (demo units) to create new value. At the business level, a focused differentiation strategy ensures that the company does not get caught up in a price war in the general survey market. The main recommendation in this discussion is for management not to view service units as competitors to equipment sales, but rather as education centers and proof of concept. This symbiotic relationship will strengthen PT Geo-Indonesia's business ecosystem in the future, making it the leader in digital geospatial solutions in Indonesia (Bright, 2022; Porter, 1989).

CONCLUSION

This study comprehensively concludes that entering the 3D mapping services market within emerging sectors in Indonesia represents a highly viable and strategically necessary move for PT Geo-Indonesia. Market analysis indicates that the rapidly growing creative and engineering sectors demonstrate a strong demand for accurate and accessible 3D digital data delivered through an operational expenditure based cost model. In response to these conditions, the findings suggest that PT Geo-Indonesia should adopt a focused differentiation strategy by leveraging its premium brand positioning while addressing internal competency gaps through the recruitment of creative and specialized talent. The successful implementation of this strategy requires a structured three year roadmap that begins with strengthening internal capabilities and executing pilot projects to establish portfolio credibility. By integrating high precision mapping technologies into the workflows of the creative, architectural, and engineering industries, PT Geo-Indonesia can diversify its revenue streams and position itself as a pioneer in the digital transformation of Indonesia's geospatial industry. Ultimately, consistent management support,

particularly in strategic human resource allocation and organizational cultural transformation from a hardware-oriented vendor into a comprehensive solutions partner, will be critical to ensuring long-term strategic success.

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