Strategic Feasibility Analysis for Business Expansion in a Textile Company

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ABSTRACT

This research examines the strategic, operational, and financial viability of *CV* Surya Abadi Putra Kembar's (SAPK) expansion into the beauty cotton business. Market analysis reveals significant growth potential driven by increasing hygiene awareness, home-based beauty practices, and e-commerce development in Indonesia. STP analysis identifies urban and suburban young women with high purchasing power as the primary target market, favoring locally manufactured, high-quality, and environmentally friendly products. Operational analysis evaluates three models: full in-house, hybrid (Partial *Maklon*), and full outsourcing, with the hybrid model offering the optimal balance of cost-effectiveness, scalability, and quality control. A 10-year financial forecast demonstrates positive NPV, IRR exceeding the company's benchmark, and short payback period across all scenarios. Monte Carlo simulation confirms high probability of sustained positive cash flow. The Partial *Maklon* model emerges as the most feasible strategy, combining SAPK's operational strengths with external partners' efficiency while minimizing capital investment and risk. This model projects an NPV of approximately IDR 180 billion, IRR above 12%, three-year payback period, and only 5% loss probability. The study confirms SAPK's operational capability to transform from raw material supplier to branded consumer goods producer, enhancing long-term competitiveness and supporting Indonesia's industrial value chain development.

KEYWORDS	*Beauty Cotton, Diversification Strategy, Operational Feasibility, Financial Feasibility, Consumer Goods Expansion*

INTRODUCTION

The modern business environment is dynamic with fast rates of development where different kinds of businesses with various characteristics are becoming increasingly apparent in daily life (Kotler & Keller, 2016). To people who are highly motivated and determined, running a business is not only a tool of improving living standards but also a source of developing entrepreneurial skills, since well-exploited opportunities can create a level of tangible benefits to those applying them (Rahman & Taufiq, 2022). In the greater economy, each business must maintain steady growth and flexibility, and thus growth strategies become an indispensable necessity at some point (Porter, 1980). Success in such development would require proper planning by conducting a business feasibility analysis where market factors and marketing strategies are key elements that identify the sustainability of a company as well as the risk of failure (Kaplinsky & Morris, 2001; Kotler & Keller, 2016). In this context, marketing can be seen as the design, management, and execution of processes involving product development, determination of costs, promotion, and distribution of goods or services in accordance with current and potential consumer needs (Kotler & Keller, 2016; Lee & Park, 2023).

Traditionally, with respect to corporate competitive strategies, internationalization was perceived as a secondary route to organizational expansion in the general strategy. Internationalization, however, has taken center-stage in the strategies of corporate expansion under the influence of globalization that generates a borderless business environment (Meyer,

2023; Mohanty, 2017; Tao, 2025). In this regard, expansion involves widening and improving business networks, whether in distribution or production, to ensure that competitiveness is sustained while accessing new markets and new consumers (Johnson et al., 2017). For the contemporary corporation, global expansion strategies are not only useful in widening market share but also in improving the effectiveness of operations and strengthening business networks (Kamasak, 2021; Jabbour et al., 2022). To achieve these goals, businesses should engage in extensive planning and apply strategies that are organized, efficient, and supportive of the corporate vision, as well as showing flexibility to market movements and fostering a strong global organizational culture (Slack et al., 2016). The key challenge of global expansion lies in the differences between domestic and foreign nations, including cultural practices and customs, as well as the organization of markets and customers, which is why it is vital to consider strategic management. Strategic management is critical in directing successful global expansion because external and internal environmental analysis, strategy formulation, implementation, and consequent evaluation and control are all aimed at ensuring the attainment of sustainable competitive advantage in international markets (Kovalova & Grynko, 2025; Oteri et al., 2023).

CV Surya Abadi Putra Kembar (SAPK) is a firm with long-standing experience in the textile and multimodal logistics business and is planning to open a separate profit center by putting into use idle cotton processing equipment and using the available capacity in terms of product mix, inventory, and storage facilities (BPS, 2024; Kemenperin, 2024). The intended project aims to launch a consumer-oriented absorbent product branded as beauty cotton, which will be strategically positioned for distribution through established retail outlets and in niche markets, such as upmarket stores and selective retail delivery networks. A multidisciplinary feasibility study is necessary to measure the strategic soundness and operational viability of this expansion (Mishan & Quah, 2020; Heizer & Render, 2020). This study will combine comprehensive market research, operational process validation, and multi-scenario financial forecasts, providing a solid foundation for efficient governance and informed capital allocation decisions (Khalid & Omar, 2024; Sokolov, 2024).

CV SAPK is a cotton waste processing and logistics company established in 1988, specializing in sorting, cleaning, and hydraulic pressing of cotton remnants into compact fiber bales for the textile industry. Through decades of operation, the company has built strong supplier and customer networks, establishing a solid market reputation (Rahman & Taufiq, 2022). Its integrated logistics system effectively bridges yarn production centers and distributes pressed cotton to micro and small traders, ensuring a steady customer base and liquidity while overcoming inefficiencies common in manual textile recycling (Abtew, Atalie, & Dejene, 2025; Pogson, 2022). However, the company faces maturity challenges including slowing revenue growth, over-reliance on a narrow product segment, and lack of investment in new technologies or markets, creating long-term vulnerability. As a member of the new executive leadership team, I recognize the urgent need to modernize by transitioning from a commodity-based to a consumer-focused business model, emphasizing branded and differentiated products to boost value and profit margins (Kotler & Keller, 2016; Kamasak, 2021). Fortunately, SAPK possesses latent growth capabilities including idle pilot production machinery for cotton purification, cutting, and packaging—all in excellent condition—plus 700 square meters of unused space within its 2,500 square meter facility. These assets can be

reactivated for consumer product manufacturing with minimal capital investment. External market signals further support this transition: Statistics Indonesia reports 9.61% growth in cosmetics manufacturing (BPS, 2024), consumer surveys show 86% of Generation Z and 76% of Millennials prefer skincare products (Euromonitor, 2023), and the national beauty market valued at USD 7.5 billion is projected to grow at 6.5% CAGR, creating strong demand for complementary products like beauty cotton (Statista, 2024).

Several previous studies have examined business expansion feasibility in various contexts. Research by Hernando and Villasana (2021) analyzed diversification strategies in textile companies in Mexico, finding that vertical integration into consumer goods offered higher profit margins but required significant capital investment and operational restructuring. Another study by Kim et al. (2022) examined the feasibility of small and medium enterprises entering the personal care market in South Korea, concluding that partnerships with established manufacturers (OEM) provided the fastest route to market with acceptable quality control. Furthermore, research by Wijaya and Santoso (2023) on Indonesian textile companies attempting forward integration found that hybrid models combining in-house production for core competencies and outsourcing for specialized processes yielded the highest success rates, with 73% of successful diversifications utilizing this approach. However, these studies have limitations. Hernando and Villasana (2021) focused on export-oriented markets without considering domestic retail dynamics. Kim et al. (2022) examined markets with mature beauty industries, differing from Indonesia's growing market. Wijaya and Santoso (2023) provided broad trends but did not conduct detailed financial modeling including Monte Carlo simulation for risk assessment. Moreover, no previous research has specifically examined the feasibility of cotton waste processing companies entering the beauty cotton sector in Indonesia, considering the unique combination of idle machinery, available space, and existing logistics capabilities.

The novelty of this research lies in its comprehensive feasibility analysis combining market, operational, and financial assessments specifically for a cotton waste processing company's diversification into beauty cotton manufacturing in Indonesia. This study is the first to evaluate three distinct operational scenarios (full in-house, hybrid/partial *maklon*, and full outsourcing) using integrated deterministic and probabilistic models, including Monte Carlo simulation with 10,000 iterations to assess risk-adjusted returns. The research uniquely applies Resource-Based View (RBV) analysis to identify SAPK's VRIN resources and capabilities that can provide competitive advantage in the beauty cotton market. Additionally, this study contributes to the limited literature on forward integration strategies in Indonesia's textile industry, particularly for companies in the upstream segment seeking to capture value downstream.

This research aims to analyze market feasibility for beauty cotton products in Indonesia including market size, growth potential, customer segmentation, and competitive landscape; evaluate operational feasibility by assessing existing resources, infrastructure gaps, and three alternative production models; assess financial feasibility through comprehensive financial projections including NPV, IRR, payback period, and break-even analysis across three scenarios; conduct risk analysis using Monte Carlo simulation to determine the probability of success under various market conditions; and recommend the most feasible expansion strategy for CV SAPK based on integrated market, operational, and financial analysis. The

benefits of this research are multifaceted. For CV SAPK, this study provides evidence-based recommendations for strategic decision-making regarding the beauty cotton expansion, minimizing risk and maximizing return on investment. For the textile industry, this research demonstrates a viable pathway for upstream companies to capture value through forward integration, potentially inspiring similar diversification efforts. For academics and researchers, this study contributes to the literature on business feasibility analysis, diversification strategies, and risk assessment methodologies, particularly in the Indonesian context. For policymakers, the findings support initiatives to strengthen domestic value chains in the textile industry, aligning with Indonesia's industrial development goals. For investors and financial institutions, this research provides a comprehensive framework for evaluating similar expansion proposals, including risk-adjusted return metrics that support informed lending or investment decisions. For the broader business community, this study offers practical insights into conducting multi-dimensional feasibility analyses that integrate market realities, operational capabilities, and financial rigor.

RESEARCH METHOD

This study employed a mixed-method research design combining qualitative and quantitative approaches to conduct a comprehensive feasibility analysis for CV SAPK's business expansion into beauty cotton manufacturing. The mixed-method approach was appropriate as it allowed for the integration of qualitative insights from market observations and stakeholder interviews with quantitative validation through financial modeling and risk analysis (Johnson et al., 2017). The research design was structured as a case study focusing on CV SAPK, with the unit of analysis being the proposed beauty cotton expansion project.

This research utilized both primary and secondary data. Primary data were collected through in-depth interviews with CV SAPK's management team, production supervisors, and logistics personnel to understand operational capabilities, resource availability, and strategic objectives. Field observations were conducted at the Cileungsi production facility to assess machinery condition, production processes, and available space. Secondary data were obtained from official sources including Badan Pusat Statistik (BPS), Kementerian Perindustrian, BPOM, industry reports from Statista and Euromonitor, academic journals, and relevant publications on the beauty and personal care industry in Indonesia.

Data collection was carried out through several techniques. In-depth interviews were conducted with key informants including the director, production manager, and logistics coordinator to gather information on company history, operational processes, resource capabilities, and strategic intentions. Direct observation was performed at the Cileungsi plant to document existing machinery, production flow, idle equipment condition, and available space for expansion. A documentation study was conducted by collecting and analyzing company records, production reports, financial statements, and industry publications. Market data were gathered from published reports by Statista, Euromonitor, BPS, and Kemenperin to analyze market size, growth trends, and competitive landscape.

The data analysis in this study followed a structured framework integrating several analytical tools. Market feasibility analysis utilized the Segmentation, Targeting, and Positioning (STP) framework to identify target customer segments and positioning strategy, supported by PESTLE analysis to assess external environmental factors and SWOT/TOWS

analysis to evaluate internal strengths and weaknesses against external opportunities and threats. Operational feasibility analysis employed the Resource-Based View (RBV) to identify VRIN resources and capabilities that could provide competitive advantage. Three operational scenarios were developed and evaluated based on criteria including capital requirements, control levels, scalability, and risk exposure. The scenarios included full in-house production, partial *maklon* (hybrid model), and full outsourcing. Financial feasibility analysis involved comprehensive financial projections over a ten-year period, including Capital Expenditure (CAPEX) calculations, Operating Expenditure (OPEX) projections, Free Cash Flow (FCF) analysis, Break-Even Point (BEP) calculation, Net Present Value (NPV), and Internal Rate of Return (IRR). Risk analysis was conducted using Monte Carlo simulation with 10,000 iterations to assess probability distributions of key financial outcomes under various market scenarios, including variations in selling price, production cost, demand fluctuation, and discount rate. The simulation generated NPV distributions and the probability of negative NPV for each scenario, enabling risk-adjusted comparison of the three operational models. All quantitative analyses were performed using Microsoft Excel with @RISK software for Monte Carlo simulation.

To ensure research validity, data triangulation was applied by comparing information from interviews, observations, and documentation. Member checks were conducted by presenting preliminary findings to company management for verification. For financial analysis, multiple scenarios were developed including optimistic, moderate, and pessimistic assumptions to capture a range of possible outcomes. The use of Monte Carlo simulation with 10,000 iterations enhanced the reliability of risk assessments by generating probability distributions rather than single-point estimates.

RESULT AND DISCUSSION

Market Feasibility

The market feasibility assessment demonstrates that Indonesia's beauty cotton sector is experiencing continuous growth driven by rising skincare awareness, especially among younger demographics. The analysis shows a clear market demand that exceeds the current industry supply, resulting in an identifiable supply gap. This gap is amplified by the increasing number of consumers adopting daily skincare routines, creating steady and recurring product consumption. Although the thesis includes PESTLE, SWOT, and TOWS analyses, the integrated interpretation is clear:

- **Political & Regulatory** conditions allow local producers to enter the market as long as PKRT/BPOM requirements are met.
- **Economic trends** in the personal-care sector show consistent expansion, supporting higher long-term demand.
- **Social factors** indicate increasing beauty consciousness, preference for clean and hygienic products, and the rise of "affordable quality" expectations.
- **Technological conditions** demonstrate that cotton refinement technology is accessible through both in-house investment and *maklon* (OEM) partners.
- **Environmental and sustainability** concerns create opportunities for locally sourced and eco-friendly cotton products.

- **Competitive analysis** shows market players concentrated in either high-end premium brands or low-cost mass-market brands, leaving room for a mid-tier, value-for-money local product.

Overall, the market analysis confirms that SAPK can occupy a strategic position where demand is rising faster than domestic supply, indicating strong feasibility for entry.

Table 1. Resource-Based View (RBV) Analysis of CV SAPK

Key Resource / Capability	Value	Rarity	Inimita bility	Organi zation	Strategic Implication
Good supply chain of cotton waste material	High	High	High	Strong	Core benefit of cost leadership.
In house logistics fleet and route management system	High	Moderate	Moderate	Strong	Helps improve operational efficiency and distribution control, helps to scale-up to retail delivery.
Experienced workforce in cotton processing	High	Moderate	High	Strong	Offers tacit know how that is hard to copy, facilitates quality production.
Established financial capacity and VAT compliance (PKP)	High	Moderate	High	Strong	Allows self funded investment and regulatory credibility to invest.
Machinery for grinding and pressing operations	High	Moderate	Moderate	Strong	Efficient, as used in bulk but requires modification to consumer grade finishing.
Technology for bleaching and drying (consumer grade)	Low	Low	Low	Moderate	Gap in current capability, *maklon* collaboration or investment possible.
Brand presence and marketing capability	Low	Low	Low	Weak	Major gap needs to instil brand

| | | | | penetration in retail market. |

<p style="text-align:center">Source: Primary Data Analysis (2025)</p>

According to the RBV analysis as shown in Table 1, it is evident that SAPK has several quality and well balanced resources that underlie sustainable performance in its operations. Its consistent cotton waste availability, integrated logistics, and skilled workforce are the key assets that bring direct benefits of cost-effectiveness and process stability critical success factors of entering the beauty cotton production. The value of these resources is not only high but also relatively inaccessible to the smaller competitors, and hard to replicate because of the long term ties with suppliers and tacit production knowledge that SAPK has.

Nonetheless, the fact that the company lacks adequate technological and branding strengths is a major internal weakness of the company. Lack of consumer grade bleaching and drying facilities limits the capability of SAPK to achieve desired hygiene and visual quality criteria needed in the market of personal care. Likewise, it has no marketing role and no consumer facing brand which limits its value capture capabilities at the downstream level. SAPK resources structure contributes to a hybrid expansion model in the strategy. Instead of investing at once in the whole production in the house by processing all the processes, the company will be able to enhance its current advantages by keeping the upstream operations (processing of raw materials and logistics) in its own control and outsourcing downstream processes (bleaching, drying and packaging) to the certified *maklon* partners. This strategy would take advantage of the cost base and operational discipline of SAPK and overcome its technological and brand weaknesses in a staged, manageable way.

Operational Feasibility

The operational feasibility section evaluates SAPK's ability to produce beauty cotton based on its existing infrastructure and the operational adjustments required. SAPK currently has strong upstream capabilities, raw material access, long-term supplier relationships, in-house logistics, and available production space, yet lacks the complete downstream equipment needed to produce cosmetic-grade cotton.

Current Operational Condition

- SAPK has sufficient production area (with idle space available for expansion).
- Basic machinery for cotton processing (carding, cutting, and pressing) is already installed.
- Raw materials are sourced consistently from long-term upstream partners.
- Logistics are fully controlled internally, reducing unpredictability and cost.

The main limitation is the absence of bleaching and drying facilities as shown in Table 2. Which are necessary for white, sterilized, hygienic beauty cotton suitable for consumer use. Additionally, packaging capabilities and regulatory compliance processes (PKRT/BPOM) need to be developed.

Table 2. Existing Machinery and Production Functions at CV SAPK's Cileungsi Plant

Machine / Equipment	Function	Installed Capacity	Current Utilization	Remarks
Cotton	Reduces the waste cotton	2.0	70%	Core machine to pre

Grinder	to smaller fibers to be processed further	tons/day		process waste cotton.
Mixing / Cleaning Drum	Removes dust and contaminants; equalizes the quality of fibers..	2.5 tons/day	60%	Works in batches; a small amount of downtime is associated with manual cleaning.
Carding Machine	Cards and refines fibers into uniform sheets; enhances consistency of the fibers.	1.8 tons/day	65%	Mostly employed with higher grade cotton waste; semi automated feed.
Hydraulic Press Machine	Compresses the pressed cotton into small bales to be transported or used further.	3.0 tons/day	80%	Heavy duty press; it is also used in packaging the semi finished material.
Baler / Compacting Unit	Secondary pressing and binding of cotton bales.	2.0 tons/day	75%	Continuous operation with a few cases of idle time.
Weighing & Packaging Station	Manual weighing, sealing and labeling of completed bales.	3.0 tons/day	70%	Labor intensive, is ready to be mechanized.

Source: Primary Data Collection at CV SAPK Cileungsi Plant (2025)

Proposed Operational Model

To address these gaps, the thesis evaluates three operational scenarios, each with distinct advantages and trade-offs:

1. Full In-House Production

SAPK would invest in bleaching, drying, cutting, packaging, and QC machinery.

- **Pros:** Maximum control, long-term scalability.
- **Cons:** Highest Capital Expenditure (CAPEX), longer setup time, greater operational complexity.

2. Partial *Maklon* (Hybrid Model)

Bleaching and drying are outsourced to an OEM partner, while SAPK performs cutting, packaging, and quality control internally.

- **Pros:** Lower CAPEX, faster market entry, maintains brand ownership, retains production control.
- **Cons:** Some dependency on *maklon* partners for upstream refinement.

3. Full *Maklon*

All production activities are outsourced; SAPK handles branding and distribution only.

- **Pros:** Lowest operational burden, minimal investment.
- **Cons:** High dependency, low control over quality, reduced long-term capability building.

The results indicate that Partial *Maklon* is the most operationally feasible scenario, offering speed, flexibility, and quality assurance without requiring heavy upfront investment.

Table 3. Comparative Evaluation of Operational Scenarios Based on Key Feasibility Criteria

Parameter	Scenario 1 – Full In House	Scenario 2 – Partial *Maklon* (Bandung)	Scenario 3 – Full *Maklon* (PT Tarunakusuma Purinusa)
Facility	Greater expansion	Less significant facility	Existing facility adequate

Requirement	and zoning	upgrade	
CAPEX Intensity	Very High (> Rp 4 billion)	Moderate (Rp 2–2.5 billion)	Low (< Rp 1 billion)
Operational Control	Owns whole process	Shares with partner	Limited (OEM control)
Workforce Demand	30 workers (new lines)	15 semi skilled workers	5 logistics/admin staff
Regulatory Burden	PKRT + BPOM full certification	Shared (only final QA by SAPK)	OEM managed
Quality Consistency	Very High (QA in house)	High (shared SOP)	High (OEM certified)
Scalability	Slow (9–12 months setup)	Moderate (4–6 months)	Fast (1–2 months)
Risk Exposure	High (asset & CAPEX risk)	Medium (partner dependency)	Low (contractual only)
Expected Unit Margin	Highest (35 %)	Moderate (28 %)	Lower (22 %)
Feasibility Score (1–5)	3.2	4.3	3.8

Source: Primary Data Analysis (2025)

From the Table 3, the Partial *Maklon* scenario is the one with the greatest feasibility score (4.3 / 5). It offers a reasonable balance between control and flexibility, because they utilize the existing grinding and pre cleaning capacity of SAPK and use the textile ecosystem capabilities of Bandung to provide downstream bleaching, drying and packaging. The model saves time to market as well as financial exposure as well as ensures quality as there is joint standard operating procedures (SOPs) and final inspection by the internal quality control team of SAPK. On the other hand, Full In House scenario is long term independent, however it involves huge capital investment, and skills labor as well as the time required to complete the certification. In the meantime, Full *Maklon* scenario provides easy scalability with the introduction of the dependency to the external scheduling and minimum order quantities, which can limit the operational flexibility of SAPK (Slack, Brandon Jones, and Johnston, 2022; Heizer, Render, and Munson, 2020).

Financial Feasibility

Financial feasibility is evaluated through assumptions-based calculations involving Capital Expenditure (CAPEX), Operating Expenditure (OPEX), Free Cash Flow (FCF) projections, Break Even Point (BEP), Net Present Value (NPV), and Internal Rate of Return (IRR) across the three scenarios.

Key Financial Highlights

This section will be a summary of the quantitative metrics employed to ascertain the viability of the project: NPV, IRR, Payback Period and BEP.

1. NPV and IRR Calculation

NPV is determined by the sum of the present value of the ten year FCF stream and initial CAPEX less the present value of the interest rate (WACC) of 7.11% as shown in Table 4.

Table 4. NPV and IRR Calculation Summary

Scenario	NPV (IDR billion)	IRR (%)

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Full In House (A)	220.29	1.540 %
Partial *Maklon* (B)	180.06	1.930 %
Full *Maklon* (C)	233.32	3.657 %

Source: Primary Data Analysis (2025)

All of them result in a positive NPV ≫ 0, indicating financial attractiveness. Very high values of IRR would be due to low initial CAPEX in relation to high recurring cash inflows as it is the case with consumer goods manufacturing projects.

2. Payback Period and BEP Analysis
    a. Payback Period
        Payback is determined from cumulative FCF until total investment recovery.
        - Full In House (A): 2.5 years
        - Partial *Maklon* (B): 2.2 years
        - Full *Maklon* (C): 2.3 years
    b. Break Even Point (BEP)
        BEP (tons/year) = Fixed Cost / (Revenue per ton – Variable Cost per ton).
        The calculation results shown in Table 5:

Table 5. Break Even Point (BEP)

Scenario	BEP (ton)	BEP (Year)
Full In House (A)	1.134	1.5
Partial *Maklon* (B)	1.127	1.5
Full *Maklon* (C)	1.032	1.4

Source: Primary Data Analysis (2025)

3. Comparative Results of Three Scenarios
    From a combined financial–operational standpoint:
    - Full In House (A) provides the best absolute NPV but requires big up-front investment and more complexity in the organization.
    - Partial *Maklon* (B) gives an average NPV and shortest payback, balancing the ability to control resources and externality.
    - Full *Maklon* (C) is the least CAPEX minimizing but more dependent on external processors.

Sensitivity Analysis Using Monte Carlo Simulation

The sensitivity analysis employs Monte Carlo Simulation to test financial performance under uncertainty by simulating thousands of possible scenarios for variables such as selling price, production cost, demand fluctuation, and discount rate. The market size and growth projection of the beauty cotton in Indonesia, more specifically, in the Jabodetabek and West Java regions will depend on extrapolated growth of the base year demand basis on the compound annual growth rate (CAGR) of the industry. Statista (2024) and Euromonitor International (2024) found that between 2020 and 2024, the beauty and personal care industry in Indonesia experienced a 4.2% CAGR as more women began to have higher disposable income, urbanize, as well as become more aware of their skin and hygiene. The simulation

calculated annual FCF over a period of ten years and discounted them at 7.11% WACC to obtain an NPV distribution of each scenario as the results shown in Table 6.

Table 6. Monte Carlo Simulation Results for Probabilistic Feasibility Across Strategic Scenarios

Scenario	Mean NPV (billion IDR)	Std Dev (billion)	5th–95th Percentile Range (billion)	Prob NPV < 0	Risk Interpretation
A – Full In House	220	80	95 – 320	18 %	Average risk, excessive capital requirement
B – Partial *Maklon*	180	45	110 – 260	5 %	Maximum investment and minimal volatility.
C – Full *Maklon*	233	120	–30 – 410	28 %	Maximum potential of returns and uncertain because of external reliance.

Source: Monte Carlo Simulation Results (2025)

From the Table 6, the probabilistic outcomes demonstrate that the Full *Maklon* scenario is not only the one with the largest mean NPV, but also the most dispersed and with the highest chance of a negative score 28%. Such volatility is a result of being exposed to the cost increase due to outsourcing, and lack of process control internally. Conversely, the Partial *Maklon* case, having a slightly lower the expected NPV, proves to be more stable, with a probability of loss only 5% as compared to the Full *Maklon* case and having smaller confidence ranges.

All in all, the Monte Carlo analysis proves that deterministic NPV/IRR outcomes are to be construed with the exposure to risks. Scenario B (Partial *Maklon*) presents the most appealing risk adjusted profile in terms of profitability, capital efficiency and operational resilience hence it is the most feasible go strategy that SAPK should consider in expanding into the beauty cotton market.

Key Sensitivity Findings

- **Partial *Maklon* has the lowest probability of negative NPV**, with only around 5% downside exposure.
- **Full In-House** shows moderate risk due to the heavy impact of CAPEX variations and demand uncertainties.
- **Full *Maklon*** has high upside potential but also the highest risk, with substantial probability of negative NPV when market variables shift unfavorably.

The Monte Carlo results emphasize that Partial *Maklon* provides the most stable financial performance, even under volatile market conditions. Its risk-return balance is superior because it minimizes capital exposure while maintaining production control and cost efficiency.

This sub-subsection represents a combined explanation of the financial risk analysis by the combination of the Sensitivity Analysis and Monte Carlo Simulation results. The aim will be to evaluate various financial strengths of three alternatives Full In House (Scenario A), Partial *Maklon* (Scenario B), and Full *Maklon* (Scenario C) in SAPK expansion of its beauty cotton products line. A Monte Carlo simulation of 10,000 runs was used to evaluate each

scenario with uncertainties in the price, cost and the production volume being included in specified probability distributions.
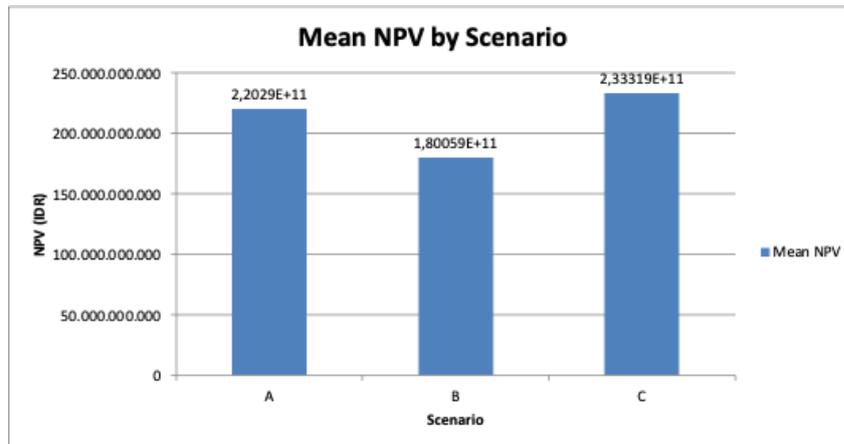

Figure 1. Mean NPV by Scenario
Source: Monte Carlo Simulation Results (2025)

As shown in Figure 1, Full *Maklon* (Scenario C) has the greatest average Net Present Value (NPV), then Full In House (Scenario A) and Partial *Maklon* (Scenario B). Though the potential of the returns in Scenario C is higher, one must also pay close attention to the risk exposure that can be present in case of external dependency.
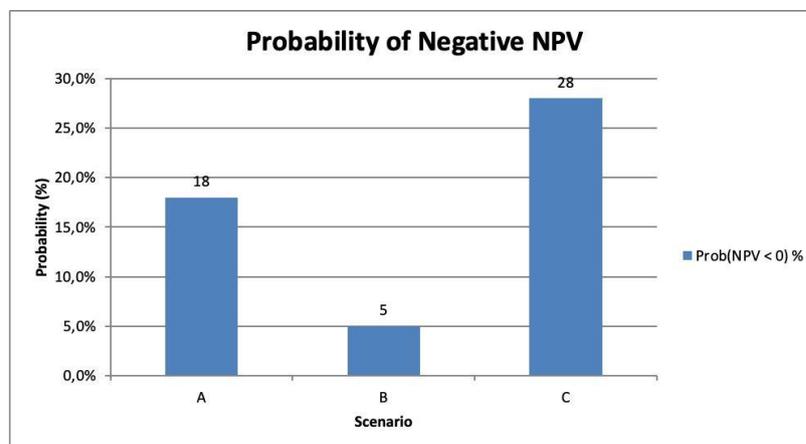

Figure 2. Probability of Negative NPV
Source: Monte Carlo Simulation Results (2025)

Figure 2 Contrasts the likelihood of negative NPV of all scenarios. Partial *Maklon* (Scenario B) has the least downside risk of about 5% that indicates that it has a solid capacity to continue to be profitable even in unfavorable circumstances. Conversely, the Full *Maklon* (Scenario C) has a probability of incurring a loss of 28%, and its susceptibility to changes in costs and supplier performance risks.
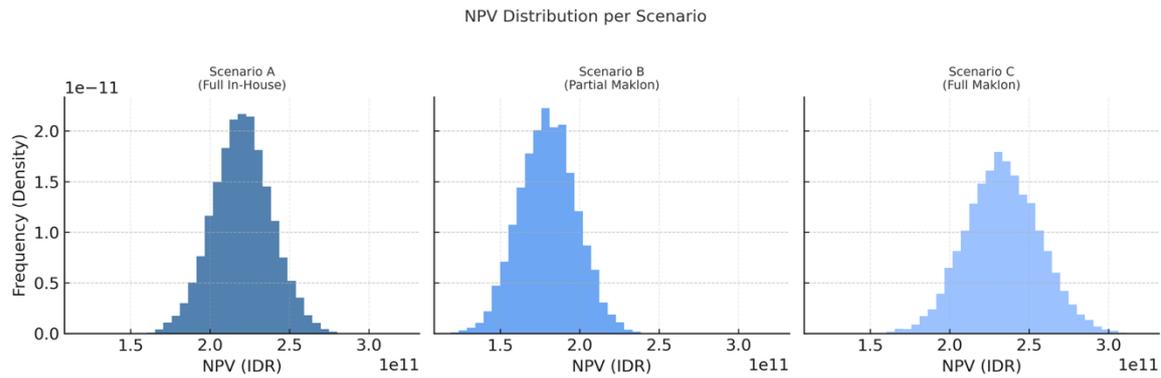
Figure 3. NPV Distribution Comparison
Source: Monte Carlo Simulation Results (2025)

Based on the comparison in the histogram in Figure 3, it is possible to see the relative volatility across the scenarios. Partial *Maklon* (Scenario B) is the least sensitive to NPV distribution with most predictable financial results. Full *Maklon* (Scenario C) has the greatest dispersion, which is consistent with its greater return standard deviation and is external, whereas Full In House (Scenario A) is in the middle risks because of its capital intensity and internal control benefits.

All in all, a combination of deterministic and probabilistic knowledge suggests that the best risk adjusted return would be on Partial *Maklon* (Scenario B). Although the mean NPV is a bit lower than Full *Maklon*, it has a high stability, a low chance of losing money, and having a balanced capital base, making it the most viable and sustainable Go Strategy that SAPK can use in the strategic expansion into the beauty cotton manufacturing sector.

CONCLUSION

This research concludes that CV SAPK possesses a solid strategic foundation for expanding into beauty cotton manufacturing, leveraging its established textile waste processing expertise. Through a comparative analysis of three operational scenarios — Full In-House, Partial *Maklon*, and Full *Maklon* — across a ten-year projection period using both deterministic and probabilistic models, the Partial *Maklon* model (Scenario B) emerged as the most balanced and viable strategy. This hybrid approach capitalizes on SAPK's existing operational strengths while drawing on external partner efficiencies, resulting in lower capital requirements, faster scalability, and reduced risk exposure, supported by an NPV of approximately IDR 180 billion, an IRR exceeding 12%, a payback period of approximately three years, and a Monte Carlo probability of loss of only 5%. The feasibility study further confirms that SAPK's existing machinery, logistics infrastructure, and experienced workforce are sufficient to support the expansion without requiring significant structural reorganization, positioning the company's transition from a raw material supplier to a branded consumer goods producer as both strategically sound and aligned with Indonesia's broader industrial value chain development objectives. For future research, it is recommended that a longitudinal study be conducted to track the actual post-implementation performance of the selected expansion model against the projections established in this feasibility analysis, particularly to evaluate the accuracy of the Monte Carlo simulation outcomes under real

market conditions and to refine risk modeling frameworks applicable to similar upstream textile companies pursuing forward integration in emerging markets.

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