ENHANCING BRIGHT GAS MARKET PENETRATION THROUGH BRIGHT GAS SCANNER APPLICATION: A STRATEGIC DECISION ANALYSIS OF PT PERTAMINA PATRA NIAGA (C&T)

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ABSTRACT

This new solution to the LPG (Liquefied Petroleum Gas), especially Non-PSO LPG distribution, management and transformation, the Bright Gas Scanner application is an innovative, PT Pertamina Patra Niaga (C&T) application, includes advanced features, like the QR code-based authentication of products, real-time tracking of deliveries, and notifications of promotional offers to all users registered under the app; thereby enabling the companies to enhance customer, trust and operational efficiency. Although it has great potential, there are barriers to implementation and effectiveness. Some challenges, such as resistance to technology adoption among agents and customers, limited digital infrastructure in rural regions, integration inefficiencies with existing systems, and concerns about data privacy.In relation to the above information, research was conducted using a mixed-methods approach, drawing on primary data from interviews with internal and external stakeholders, such as employees and agents alongside secondary data from company reports and literature. Internal organizational strengths and resources are measured using analytical frameworks, such as VRIO and Value Chain analysis; external factors are analyzed using PESTEL and Porter's Five Forces frameworks. This information is boiled down into a SWOT analysis which is used to identify challenges and develop strategic recommendations. Particularly, acting to bridge digital literacy gaps, improving infrastructure to ensure better connectivity and maximizing integration of Bright Gas Scanner with distribution and inventory systems are burning issues to solve around adoption barriers, it's propose a phased implementation roadmap balancing high-and low-hanging fruit, from targeted methods like incentivizing businesses with training programs and promotional advertising campaigns, to long-term strategies like range upgrades and Systems Integration improvements. This extensive approach has also paved the way for a comprehensive strategy to integrate the capabilities of the Bright Gas Scanner with PT Pertamina Patra Niaga's strategic objectives, and as such provides a road towards sustainable growth, greater operational efficiency and better competitiveness in Indonesia's Non-PSO LPG market.

Keywords: Non-PSO LPG, Bright Gas Scanner, PT Pertamina Patra Niaga (C&T), QR Code Authentication, Digital Transformation

INTRODUCTION

Liquefied Petroleum Gas (LPG) plays an important role in Indonesia as a fuel for domestic and industrial needs. LPG, which was offered as an alternative to kerosene under the government's Kerosene to LPG (LPG is a mixture of propane and butane) conversion programme started in 2007, is now the main cooking fuel for households. This change was driven by a desire to be less dependent on a more expensive and less effective source of energy that is also worse for the environment, kerosene. The program conversion is in line with basic national policies on energy Indonesia which encourages the use of cleaner energy sources and sustainable practices.

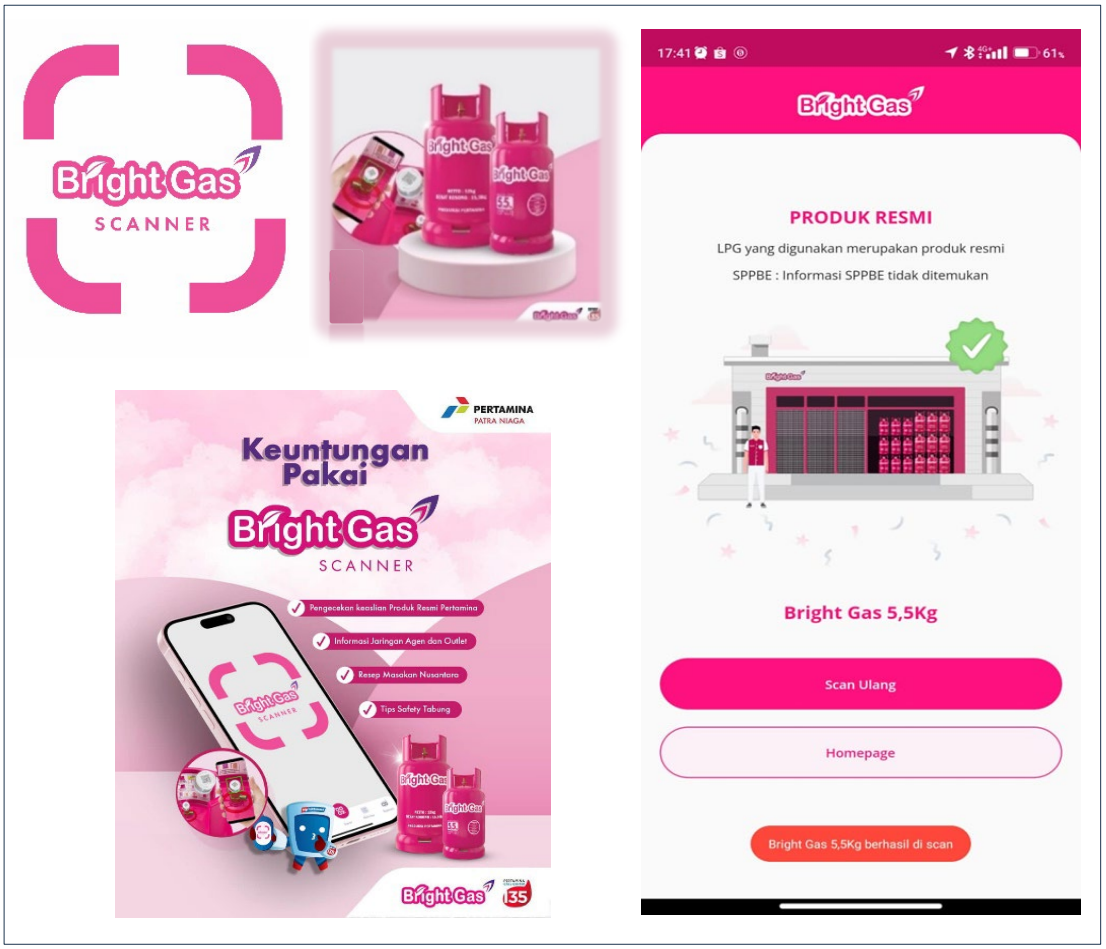
Pertamina runs an integrated energy business that encompasses all phases from upstream to downstream. Through the Decree of the Minister of SOEs on June 12, 2020, Pertamina's priority is more directed to managing Pertamina's portfolio, creating synergies in the group, business development and supporting national strategic programs.

PT Pertamina (Persero) through its subsidiary PT Pertamina Patra Niaga (C&T) serves as the backbone of the distribution and availability of LPG throughout the country. Pertamina sells both a Public Service Obligation (PSO) LPG (subsidized for lower-income households) and a Non-PSO LPG — also known as the Bright Gas product line — which is marketed to middle-to-upper-income consumers. Besides, Bright Gas has additional features on the security side such as double-spindle safety valves and other anti-leakage technology, thus, introducing high quality products to consumers. By creating both PSO and Non-PSO LPG, Pertamina demonstrates its commitment to optimizing both social welfare and market-based developments, ensuring energy reaches all people while also fostering commercial growth.

In response to the demands of modern consumers who value product originality and convenience, PT Pertamina Patra Niaga (C&T) launched the Bright Gas Scanner application. The mobile application enables users to confirm the authenticity of Bright Gas cylinders by scanning a QR code placed on the cylinder. After scanning, users are directed to product details, as well as confirmation that the cylinder is genuine, providing an added level of security for consumers. This innovative solution is in line with Pertamina's strategy to improve customer experience by integrating technology to provide consumers with a trusted, efficient way to ensure product safety and quality. Features of the app not only better customer satisfaction but also strengthens brand loyalty, addressing a major concern product authenticity.

Although LPG is successful in penetrating the domestic energy market, there are various challenges that Pertamina faced on how to increase market penetration, especially with Non-PSO LPG products such as Bright Gas. Challenges: Logistical challenges in remote areas; price sensitive consumers; competition from other energy sources such as electricity and biogas. Further, from the 5.5 kg and 12 kg Non-PSO LPG despatches till December 2024, only about 72% of the annual targets have been achieved. Despite this, Pertamina is confident that continuous innovations, especially through digital tools such as Bright Gas Scanner, can overcome these obstacles and make LPG a strategic part of Indonesia in terms of energy and sustainable development. Based on the information, Pertamina has developed the Bright Gas Scanner application to verify the authenticity of Bright Gas cylinders. Using a smartphone camera, the app scans the cylinder's QR code and compares it to a database of authentic Bright Gas cylinders. If authentic, the app confirms the cylinder is safe for use; if counterfeit, it displays a warning.

Figure 1 : Bright Gas Scanner Application



This research will concentrate on an in-depth analysis of Pertamina Patra Niaga's internal and external capabilities, focusing on the strategic development of digital tools to enhance brand awareness and increase LPG sales. Research aims to study major action in the LPG distribution process from production to end user consumption and to identify the areas where the efficiency can be improved. Moreover, it will chart out the roles of employees, agents, and partners within the value chain to gauge their influence over the reach of a product and satisfaction of customers.

This research only covers the assessment of the direct users of Bright Gas Scanner, namely agent and PT Pertamina Patra Niaga (C&T) employees who developed the application. This research excludes broader market participants and regulatory changes outside of Pertamina's influence. This limitation serves to define the scope so that the findings related specifically to the internal strategies and operational practices of your institution that is Pertamina Patra Niaga (C&T).

Table 1 : Contrast between PSO LPG and Non-PSO LPG

Feature	PSO LPG (Subsidized)	Non-PSO LPG (Non Subsidized)
Price	Lower, government subsidized	Market-driven, higher price
Target Audience	Low-income households, small businesses	Middle-to-upper-income households, businesses, industries
Cylinder Sizes	3 kg	5.5 kg, 12 kg, 50 kg
Distribution	Restricted, with eligibility criteria	Widely available without restrictions
Government Role	Heavily involved through subsidies and regulation	No direct government involvement in pricing
Usage	Domestic use for cooking and small businesses	Domestic, commercial and industrial use

RESEARCH METHODOLOGY

a. Primary Data

Primary data was obtained from interviews with 11 respondents, including 4 internal stakeholders and 7 external respondents.

Table 2 : The List of Respondents

No.	Respondents	Profile
1.	PT Pertamina Patra Niaga (C&T) Employees	4 respondents: - Vice President - Sales Area Manager - Sales Branch Manager Gas - Gas Retail Sales
2.	NON-PSO LPG Agents	7 respondents: - Non-PSO LPG Agents

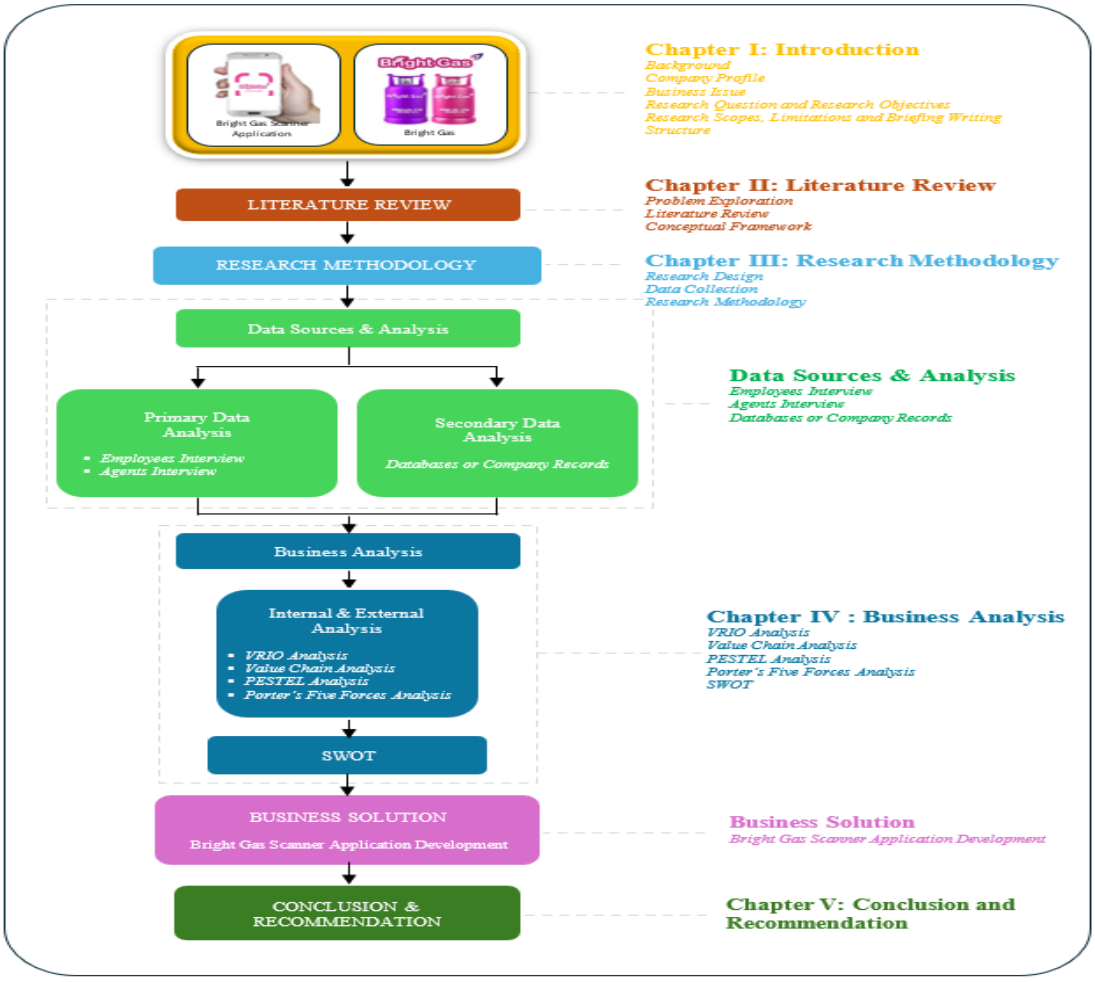
b. Secondary Data

The secondary data used internal company reports, performance logs, providing context and empirical insight related to the Bright Gas Scanner application implementation as well as it's potential to boost market penetration for PT Pertamina Patra Niaga (C&T), such as IDE 3618 Celestia-CSLS Pertamina 2024, 2024 C&T Retail LPG Sales Realization and other relevant reports.

c. Analytical Frameworks

This research uses VRIO, Value Chain analysis, PESTEL and Porter's Five Forces, and of course all boiled down into a SWOT discussion of the strategic impact of the Bright Gas Scanner's. These frameworks were chosen based on their applicability in analyzing digital transpformation efforts in developing markets (Azhar et al., Hermawan et al., 2023).

Figure 2 : Research Design Framework



In order to inform analysis and learning from the findings, analysis begins with interview data, which includes perspectives and experience. Drawing on our qualitative insights, will assess the current and future influence of Bright Gas Scanner using systematic frameworks. Analysis will determine the conflicts, strengths and areas of improvement necessary to build market penetration.

RESULTS AND DISCUSSION

Being the largest energy distributor in Indonesia, Pertamina is well positioned to reach markets across urban and rural areas. With its vast logistics infrastructure and a traditional market network, the company provides an excellent context in which to explore how digital solutions can be integrated into traditional distribution systems.

1. Internal Findings:
   a. Operational Benefits: Improved transparency, real-time stock tracking, and reduced counterfeit risks.
   b. Challenges: Connectivity issues, QR scanning delays, and insufficient user training.
   c. Recommendations: Introduce offline functionality, predictive analytics, and improve app navigation.

2. External Findings:
   a. Usage Trends: The most frequently used features are QR code verification and stock monitoring.
   b. Satisfaction: Agents value product authenticity and safety, but require better technical support.
   c. Recommendations: Simplified app design, offline usability, and personalized notifications for promotions.

Table 3 : User Satisfaction

No.	Aspect	Internal Respondents	External Respondents	Details
1.	Satisfaction with QR Code Safety	90%	85%	QR Code verification builds user, trust and ensures the safety of products.
2.	Ease of Use	80%	70%	The app is generally user-friendly but requires better tutorials for new users.
3.	Operational Support	80%	75%	Stock tracking and reordering functionalities simplify workflows for stakeholders.

Table 4 : Challenges Faced

No.	Aspect	Internal Respondents	External Respondents	Details
1.	Connectivity Issue	60%	65%	Weak internet delays, QR Code scanning and app responsiveness in remote areas.
2.	Technical Glitches	50%	50%	Users report occasional crashes or slow loading speeds during updates.
3.	User Education	40%	45%	New users need more onboarding resources and simplified app navigation.

Table 5 : Frequently Used Features

No.	Aspect	Internal Respondents	External Respondents	Details
1.	QR Code Verification	85%	90%	Ensures product authenticity and safety.
2.	Stock Monitoring	80%	85%	Helps track gas availability and prevents shortages.
3.	Reordering	75%	70%	Streamlines the process of replenishing inventory efficiently.

Table 6 : Suggestions for Improvement

No.	Aspect	Internal Respondents	External Respondents	Details
1.	Offline Functionality	80%	85%	Essential for low-connectivity areas to access core features.
2.	Predictive Analytics	50%	55%	Helps in stock forecasting and optimizing reordering processes.
3.	Personalized Notifications	50%	55%	Tailored alerts for promotions and stock requirements improve user engagement.
4.	Enhanced Reporting tools	65%	50%	Detailed analysis tools benefit internal stakeholders for decision making.

Figure 3 : User Satisfaction

Figure 4 : Challenges Faced

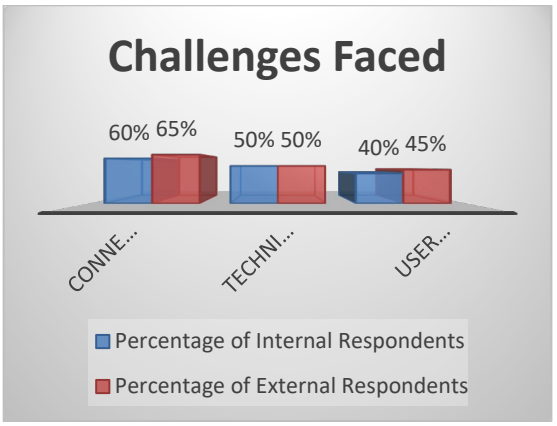


Figure 5 : Frequently Used Features

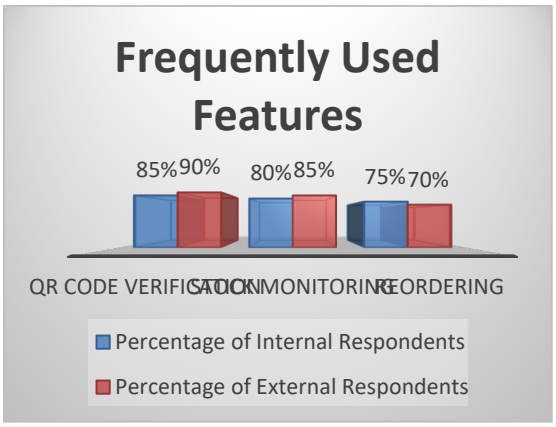


Figure 6 : Suggestions for Improvement

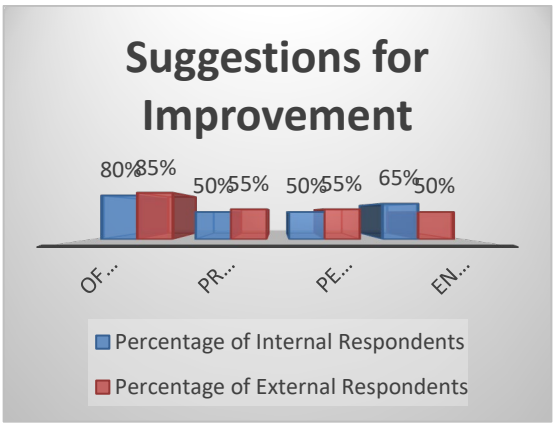


Table 7 : Summary Table

No.	Question	Insights from Internal Stakeholders	Insights from External Stakeholders
1.	How does the Bright Gas Scanner support Pertamina's business strategy?	Improves efficiency of operations, safety of products, and fits digital Transformation agenda.	Provides confidence in products authenticity and builds trust among end-users.
2.	What are the main challenges in implementation?	Connectivity issues, low digital literacy among rural users, and the occasional technical glitches.	Echo similar concerns, with additional emphasis on the need for user education in remote areas.
3.	Which features are most valued?	QR Code verification, stock monitoring, and seamless reordering processes.	Stock monitoring and reordering dominant usage, followed by promotional updates.
4.	What additional features are suggested?	Predictive analytics, offline functionality, and loyalty programs for agents and consumers.	Offline access and better educational tools were emphasized, particularly in areas with limited internet access.
5.	How satisfied are users with application?	Generally satisfied but highlight areas for improvement in connectivity and technical performance.	Overall positive reception, with satisfaction stemming from its ability to save time and ensure product safety.
6.	How do users envision future development?	Integration with advanced technologies like AI and IoT to enhance predictive capabilities and customer experience.	Expect the app to incorporate innovative tools to provide personalized and seamless user experience.

Table 8 : VRIO Analysis

No.	Feature/ Resource	Value	Rarity	Imitability	Organization	Competitive Implication
1.	QR Code Verification	Ensures product authenticity and safety, builds trust.	Rare in the LPG industry	Hard to replicate due to secure data integration	Well-organized implementation by Pertamina	Sustainable competitive advantage
2.	Stock Monitoring	Streamlines operations, avoids stock shortages.	Moderately rare, not industry standard	Replicable but requires technical investment	Integrated within supply chain	Temporary competitive advantage
3.	Offline Functionality	Enhances usability in low-connectivity areas.	Rare and highly relevant in remote areas	Hard to replicate without infrastructure	Development in progress	Sustainable competitive advantage
4.	Predictive Analytics	Optimizes inventory and user decision-making.	Rare and innovative in LPG apps	Complex, requires AI and data expertise	Not fully implemented yet	Potential competitive advantage
5.	Personalized Notifications	Improves user engagement and retention.	Common in other industries	Easy to replicate	Partially organized	Temporary competitive advantage

Table 9 : Value Chain Analysis

No.	Activity	Description	Value Added
1.	Inbound Logistics	Efficient stock tracking via QR code and inventory monitoring.	Reduces inventory errors and prevents shortages.
2.	Operations	Simplified ordering process and reordering system through the application.	Optimizes operational workflow.
3.	Outbound Logistics	Facilitates gas delivery scheduling and route optimization for distributors.	Ensures timely and accurate delivery of Bright Gas products.
4.	Marketing & Sales	Uses app features like promotions and personalized notifications to attract customers.	Increases customer engagement and market penetration.
5.	Service	Customer support and educational resources integrated within the app.	Enhances customer satisfaction and retention.
6.	Technology Development	Incorporates AI for analytics and offline features.	Positions Pertamina as an innovative market leader.

7.	Human Resources	Training stakeholders (agents, employees) to use the app effectively.	Increases adoption rates and smoothens operations.
8.	Procurement	Acquires leading QR code technology and back-end systems.	Generates trust and value by the various stakeholders.

Table 10 : PESTEL Analysis

No.	Factor	Description	Impact
1.	Political	Government regulations encouraging clean energy and safety standards.	Positive
2.	Economic	Increasing demand for reliable LPG amid fluctuating oil prices.	Positive
3.	Social	Rising awareness about product safety and convenience among middle-class consumers.	Positive
4.	Technological	Availability of mobile technology and AI enhances app capabilities but requires robust infrastructure.	Mixed (opportunity, challenge)
5.	Environmental	Commitment to reduce environmental risks with safe, genuine LPG products.	Positive
6.	Legal	Compliance with consumer protection and data privacy laws.	Positive but needs monitoring

Table 11 : Porter's Five Forces Analysis

No.	Force	Description	Impact
1.	Threat of New Entrants	High initial investment in technology and logistics poses a barrier to entry.	Low
2.	Bargaining Power of Buyers	Customers demand convenience and transparency, which Pertamina meets through app features.	Moderate
3.	Bargaining Power of Suppliers	Pertamina's dominance in the LPG market reduces supplier leverage.	Low
4.	Threat of Substitutes	Alternatives like electricity and biogas may attract price-sensitive users.	High
5.	Industry Rivalry	Few direct competitors with similar technological solutions; however, competition is growing.	Moderate

Table 12 : SWOT Analysis

Strengths	Weaknesses
Strong brand reputation and customer trust.	Connectivity issues in remote areas.
Advanced QR code verification system.	Navigation challenges for new users.
Operational efficiency through stock monitoring.	Limited adoption of advanced features like analytics and offline functionality.
Comprehensive support for distributors.	Occasional technical glitches, such as loading delays.
Opportunities	**Threats**
Expanding into untapped rural markets with offline features.	Rising competition from alternative energy solutions.

Leveraging AI for predictive analytics and personalization.	Consumer dissatisfaction if technical issues persist.
Increasing customer loyalty through educational campaigns.	Regulatory changes impacting LPG pricing and availability.

b. Solution and Implementation Plan

The Bright Gas Scanner application plays a pivotal role in Pertamina's digital transformation strategy. However, to fully harness its potential, strategic solutions must address operational challenges and improve user experience. The proposed implementation plan ensures a structured approach to refining the application while aligning with Pertamina's broader business goals. The following LPG sales data presented highlights the performance of various LPG products (BG 12 KG, BG 5.5 KG, and LPG 12 KG) for 2024.

Table 13 : Realization of LPG C&T Retail 2024

PRODUK	JAN 2024	FEB 2024	MAR 2024	APR 2024	MAY 2024	JUN 2024	JUL 2024	AUG 2024	SEP 2024	OCT 2024	NOV 2024	DEC 2024	TOTAL YTD
BG 12 KG	2.380	2.163	2.311	2.261	2.668	2.827	3.278	5.467	5.794	6.188	5.853	-	**41.190**
BG 5,5 KG	5.838	5.216	5.778	6.336	5.914	6.075	6.763	6.149	6.012	6.309	5.883	-	**66.274**
ELPIJI 12 KG	23.064	20.975	21.874	21.534	22.282	22.338	24.895	20.493	18.185	19.472	18.511	-	**233.623**
TOTAL LPG NPSO RT	**31.282**	**28.354**	**29.963**	**30.131**	**30.864**	**31.241**	**34.936**	**32.109**	**29.990**	**31.970**	**30.247**	-	**341.087**

**) Data valid until November 30th, 2024*

The provided LPG sales data reflects the performance of three key products: BG 12 KG, BG 5.5 KG, and Elpiji 12 KG. While Elpiji 12 KG consistently dominates in sales volume (233,623 MT YTD), BG 12 KG (41,190 MT YTD) and BG 5.5 KG (66,274 MT YTD) show potential but lag behind. Seasonal fluctuations and regional disparities in sales also indicate opportunities for targeted interventions.

a. Proposed Solutions

The following strategies address the identified challenges and align with Pertamina's goals for market growth and operational efficiency.

Table 14 : Proposed Solutions

No.	Solution	Description
1.	Boosting Sales of BG 12 KG and BG 5.5 KG	These products have relatively lower sales compared to Elpiji 12 KG. Specific marketing campaigns and price bundling strategies can incentivize higher sales.
2.	Enhancing Stock Monitoring and Distribution	Improved stock monitoring through real-time updates will ensure better availability of all product types across retail outlets.
3.	Personalized Customer Outreach	Leveraging customer data to design targeted campaigns that focus on underperforming months and regions.
4.	Technological Improvements	Addressing the connectivity issues to support consistent usage across rural and urban areas.
5.	Expanding Customer Programs	Educating customers about the advantages of BG products compared to Elpiji 12 KG through community programs.

b. Implementation Plan

Table 15 : Implementation Plan

No.	Phase	Key Activities	Timeline	Responsible Parties	Expected Outcome
1.	Phase 1: Analysis	Use sales data to identify underperforming months and regions. Segment customers based on LPG preferences and usage patterns.	Month 1-2	Analytics & Market Research Teams	Clear identification of key regions and customer segments.
2.	Phase 2: Training	Conduct training for agents/distributors on app features and BG product benefits. Provide educational workshops for customers on safe gas usage.	Month 3-4	Training & Communication Teams	Improved agent knowledge and customer trust.
3.	Phase 3: Marketing	Launch targeted campaigns for BG products during low-performing months. Introduce time-limited promotions (e.g., discounts for BG 12 KG).	Month 5-6	Sales & Marketing Teams	Increased sales of BG 12 KG and BG 5.5 KG during campaigns.
4.	Phase 4: Technology	Develop offline functionality for the Bright Gas Scanner. Optimize the app for low-connectivity regions. Add stock and sales analytics.	Month 7-8	IT & App Development Teams	Enhanced app usability and stock tracking.
5.	Phase 5: Monitoring	Track sales performance using real-time analytics. Collect continuous feedback from agents and customers. Adjust marketing strategies based on data insights.	Month 9-12	Analytics, Sales, & IT Teams	Data-driven adjustments for sustained growth.

The Bright Gas Scanner application demonstrates significant potential to streamline LPG distribution and enhance customer trust. However, connectivity issues, technical glitches, and low user adoption remain key challenges. The proposed strategies offline access, AI integration, and targeted training address these barriers while aligning with Pertamina's digital transformation goals. By implementing these solutions, it can:

a. Optimize operational workflows through technology.
b. Expand LPG market penetration, especially in underserved rural areas.
c. Enhance user experience and trust, driving long-term adoption and brand loyalty.

Table 16 : Expected Outcomes

No.	Objective	Key Outcome
1.	Improved Sales Performance	Increase in BG 12 KG and BG 5.5 KG sales by 20% within the first quarter of implementation.
2.	Enhanced App Usability	Higher user satisfaction ratings and reduced complaints related to technical issues.
3.	Better Operational Transparency	Real-time stock visibility and improved coordination along the supply chain.
4.	Strengthened Customer Trust	Enhanced perception of Bright Gas products' safety and reliability among end-users.
5.	Market Expansion and Sustainability	Increased market penetration in low-performing regions and improved adoption of Bright Gas.

The analysis that emerges from this research goes beyond Pertamina and serves as valuable lessons for other energy distributors in emerging economies. Major insights center around creating technology solutions that are suited for the local infrastructure context and putting user education first, which is still a critical component in driving adoption. As the digital innovations such as Bright Gas Scanner looks for successful execution, attention must be paid towards the infrastructural and educational hurdles.

Referring to the appropriate literature, like Hermawan et al. (2023), this research indicates that closing connectivity and digital literacy gaps is essential for market penetration. In addition, implementing IoT and AI-driven systems is a good alignment of the modern best practices both in operational efficiency and customer engagement. These tools streamline workflows and establish trust and engagement within end users.

Countries with similar challenges in energy supply can learn lessons from this research, such as:

1. Localized Solutions: Customize digital applications to address infrastructural constraints and cultural differences.
2. Digital Literacy Initiatives: Launching educational campaigns serving to increase end-users and agent adoption of technology.
3. Scalable Integration Models: Create tailored integration roadmaps for phased adoption to smoothly onboard digital tools across diverse regional contexts.

c. Strategic Recommendations:

1. Short-Term Strategies:
   a. Prevent app downtime by implementing offline capabilities.
   b. Revamp app UI for simplicity and UX improvement
   c. Patronize specific training for an Agent and distributor to develop a technical know-how.

2. Long-Term Strategies:
   a. AI-powered analytics for managing inventory and demand prediction.
   b. More awareness campaigns for rural audience to educate themselves in online security.
   c. Use IoT technologies to improve logistical efficiency.

CONCLUSION AND RECOMMENDATIONS

a. Conclusion

In Indonesia, the Bright Gas Scanner application has significant potential to enhance LPG distribution efficiency, product authenticity, and customer trust. However, challenges such as limited infrastructure, low adoption rates in rural areas, and technical issues remain key barriers. Addressing these challenges through technological improvements, targeted marketing, and user training will drive operational efficiency and market growth.

b. Recommendations

This study develops a framework for mapping digital innovations to a strategic objectives' domain, adding to the growing literature concerned with the topic of digital transformation in energy markets. The study, by synthesizing qualitative and quantitative insights provides a replicable model for other emerging markets seeking to mitigate adoption barriers and enhance market penetration.

1. Technological Enhancements
   a. Develop offline functionality and improve app performance for low-connectivity areas.
   b. Integrate predictive analytics for inventory management.

2. Targeted Marketing
    a. Launch regional campaigns and loyalty programs to boost sales, especially during low-performing months.
    b. Educate consumers about the safety and benefits of Bright Gas products.
3. Training and Support
    a. Conduct workshops for agents and distributors on app usage and product promotion.
    b. Implement 24/7 customer support for improved user experience.
4. Operational Optimization: Deploy real-time tools for stock monitoring and dynamic inventory planning.

Additionally, this research reinforces the need for countries to adapt their region and local infrastructure needs to what is appropriate, as well as embrace a complementary user education alongside all digital adoptions, with lessons that can be applied to other countries. Thus, although the insights gained from this study are not exhaustive, they represent a transparent and reproducible pathway for nations pursuing an infrastructure overhaul of their energy transmission systems, emphasizing advanced analytics, community engagement, and logistics innovation. Links local solutions to local problems and builds digital literacy whilst applying technological advancements, ultimately resulting in efficiency, market penetration and sustainability in developing.

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