



RESEARCH ARTICLE

Exploring the Impact of Marketing Mix Products Transformation Strategies in Glove Manufacturing Industries: A Case Study

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ARTICLE INFO	ABSTRACT
Received: Apr 24, 2024	<p>The research study seeks to design a range of gloves that conform to the strict WHO guidelines required to challenge other local and international glove manufacturers. In this respect, by detailing strategic initiatives that are essential and are used successfully by leading Malaysian glove manufacturers, this research aims to establish the critical reference frame for managing these challenges and leveraging strategies in global healthcare markets. With the drastic increase in the usage of examination gloves during the COVID 19 threat caused by latex and nitrile powder-free gloves new manufacturers enhanced production capacities proposed crucial impacts on price dumping in the global healthcare sector. Under these competitive dynamics and to continue to operate profitably with high ASPs, the realignment of product portfolios within the glove industry will have to consider alternative strategies to ensure business sustainability in the long term. This research work is aimed at examining the effects of these factors on Kossan Rubber Industries Berhad, which is one of the most popular Malaysian companies producing gloves and belonging to the 4 major companies in this industry. In this paper, engaging in this SWOT analysis through papers and dailies and reviewing the annual reports of Kossan, the paper looks to evaluate its position and prospects within the industry for a successful strategic forecast in the international context.</p>
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INTRODUCTION

In the past years, especially with the Covid 19 pandemic, many new glove companies in Malaysia expanded their production very rapidly and consequently some were involved in price dumping especially in healthcare sector (Kazancoglu et al., 2023). For combating this high-level international rivalry, maintaining factory operations and the manufacturing cost for efficient competitive price positioning, the idea of product diversification or transformation has become crucial for continued business viability in the context of gloves specifically, and other sectors more generally, in the long run as identified by Ong and Lee (2024). They have a critical role in defining the 4Ps that make up the marketing mix, the Product, the Price, the Place (Distribution), and the Promotion. Marketing communication and product quality: The change in the glove manufacturing industries' marketing mix intends to highlight issues related to transformation strategies that may affect the company (Haibao & Haque, 2023). This paper aims to discuss the following research question: What is the role of digital transformation in organizations' strategic renewal process? In the context of strategic renewal, organizations are using digital transformation (Carroll et al., 2023). Some of these changes include the transformation of using new technologies in improving business models as well as collaborations and organizational culture (Sirajuddin et al., 2023). However, the dynamism in

advertising and sales promotions has been seen to have implications on spillovers in umbrella branding, buyer attitude and behavior (Liu et al., 2023). This seems especially so in the light of advancements in the industrial age and most noticeably in the era of big data where manufacturing enterprises stall transmute their management practices; this makes it keen to assess and advance these very practices (Virginia, et al., 2023). Green switch in manufacturing is smoothly unfolding and there is growing consciousness about sustainability and green transformation and upgrading studies in the manufacturing sector (Govers & van Amelsvoort, 2023).

Moreover, the activities of the Malaysian firms like Top Glove, the world's largest glove maker, point to practices and factors like leadership, organizational structure, and employee satisfaction in the industry making (Cabral and Marques, 2023). Due to such issues, the food industry is experiencing renewed considerations about glove usage and its potential risks in causing adverse health effects (Latex Allergies and Food Industry by: Fazal-e-Hasan et al., 2023). The relationship between manufacturing and market strategies is an effective way to explain how certain organizations can be flexible and competitive, with significant emphasis on the manufacturing organization's ability to integrate the strategic plans of production with markets (Ifedi et al., 2024).

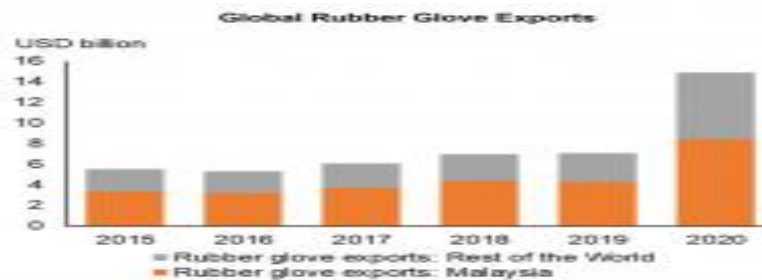
Further, there is apprehension about the quality and durability of medical gloves; not least in terms of its emergence in relation to the public health threats and supply chain issues observed during the COVID-19 pandemic (Fatma Sonmez Cakir et al., 2021). When it comes to manufacturing changes, the digital technologies equally the application of speedy and flexible approaches for improving the quality of manufacturing products, decreasing the cost of products, and increasing the efficiency of production systems is becoming crucial (Al-Sabi et al., 2023). Two, the correlation between resources of intellectual capital and financial performance adds to the argument the need to channel resources and allocate resources strategically within the manufacturing industries. Also, the actual eco-efficiency of rubber glove products and the consequences of the industrial revolution 4.0 We observe the current level of competitiveness, a highly interesting area for development and improvement within the industry (Rubio-Andrés & Abril, 2024). Based on these advancements in the context of marketing mix, this research intends to examine the role of product transformation strategies in the glove manufacturing industries with a focus on the field study of selected cases (Khalil et al., 2022). It is hoped that through the exploration of the different dimensions of digital transformation initiatives, environmental LE, market conditions, and quality factors this research aims to shed some light on the methods of improving competitiveness and sustainability of glove manufacturing businesses.

LITERATURE REVIEW

The literature review on the effects of marketing mix product transformation strategies in glove manufacturing industries calls for research from several fields related to strategic management, sustainability, innovation and emerging areas of evaluation of performance in organizational settings. et al. thus discusses key factors that have influence over export performance, underlining the value of theoretical and methodological approaches toward the analysis of the business of exporting and marketing internationally (Chiarini et al., 2020). This perspective is vital to globe manufacturing firms with aspirations of advancing market penetration and achieving increased competitiveness through various transitions. Green manufacturing initiatives and their application toward the realization of Industry 4. 0 has become one of the priorities of research focusing on as (Carla Gonçalves et al., 2020) has noted. Their systematic review aims to provides a roadmap on how sustainability could be incorporated into sustainable manufacturing with special reference to technological complexity, where sustainable manufacturing and technology share a symmetrical relationship. Information of this kind is relevant for glove makers that would like to combine execution of change initiatives with environmental responsibility and resource conservation objectives (Lopes de Sousa Jabbour et al., 2018).

According to trade statistics, the Malaysian rubber glove exports had a massive rise in the year 2020 with a total export of USD 8.4 billion, which was double that of the previous year, and Seventh Heaven was responsible for facilitating most of this amount. AMRO's Annual Consultation Report for Malaysia (2020) acknowledged export diversification where rubber gloves stood out to ensure best performance and greatly helped Malaysia to cover weaknesses originating from the pandemic affecting traditional and resource-based manufacturing exports. The rubber-related value chain typically consists of three segments: upstream, midstream, and downstream of different forms of work may help in understanding the dynamics of work-related stressors and well-being more comprehensively (Simon et al., 2022). Upstream deals with the growth of rubber plantations and latex gathering, midstream entails manufacturing of semi-processed rubber goods and downstream deals with the production of value-added rubber products. The Malaysia rubber industry in the upstream and midstream segment falls under the colonial roots that began during the early period (Buadit et al., 2023). Transitioning to the downstream segment, this segment began to become popular in the late 1980s especially due to the HIV/AIDS crisis elevating demand for latex gloves (Picconi et al., 2024). Endeavoring local companies collaborating with public research and development institutions introduced new ideas, including developing allergy-free latex medical gloves and automation of production lines that boosted the production rates to considerable percentages (Chilakamarry et al., 2022).

Currently, Malaysia exports rubber gloves with the growth rate rising rapidly over the last decade, with the glove exporting taking half the total export of rubber products (Mohamad and Zainuddin, 2021). As the rubber glove manufacturing sector flourished, this industry is today a vital one within the Malaysian economy given the financial results released (Hailong et al., 2022). Malaysia currently controls slightly over two thirds of the global export market, leaving competitors such as Thailand in the rearview mirror at 17 percent and China with a mere 10 percent (Anderson et al., 2024).



Source: Global Trade Atlas Database, AMRO Staff Calculation

Malaysia has strong production capacity and recently manufacturing gloves experienced increased capital investment which places the manufacturers in a strategic position to meet growing demand. Malaysia was estimated to have manufactured 240 billion gloves last year to provide 70 percent of the market demand as well as more expansions from well-established players and newcomers to the industry to capitalize on expanding demands.

Company Background: Kossan Rubber Industries Berhad

Kossan Rubber Industries Berhad is an established rubber glove manufacturer based in Malaysia founded in 1979 which has grown to become one of the prominent players in global glove industry. Being a leading producer of latex and nitrile gloves, Kossan Berhad operates within various industries that include medical, food and production industries among others as observed by (Anderson et al., 2024). This company is much of the time known for its commitment to offering the highest quality innovative glove solutions that meet high quality standards (Narayanan et al., 2023). Being one of the largest companies around the globe, Kossan Berhad daily avail itself to expanding its operations as well as maintaining high standards within the subsector (Gereffi et al., 2022). The

primary activities in an industry involve cutthroat competition on the basis of cost-leadership and they operate with very slim profit margins, intense production standardized processes (Khadim et al., 2021).

For instance, Kossan Berhad's microbial growth media products are used in over 190 countries, showing the organization's vast global operations (Shakya et al., 2021). The company holds several certifications such as ISO 13485:ISO 2003, EN ISO 13485:2012, ISO 13485:2003-CMDCAS & ISO 9001: 2008 have been depicted below to illustrate their concern towards quality & compliance. Moreover, Kossan Berhad is one of the icons in the list of companies in the Kuala Lumpur Stock Exchange, which further solidifies its place in the financial market as a mighty and reliable provider of goods and services (Duangnee, 2020).

Financial Performance of the Company

Kossan Rubber Industries Bhd is expected to face a tough operational environment due to the supply glut in the glove industry with the oversupply, leading to industry consolidation and capacity rationalization that will continue to depress its profitability (Osman et al., 2024). The glove manufacturer foresees that the arduous operating environment will persist into the 2H24, as per a filing with Bursa Malaysia (Sen and Das, 2024). Long-term glove demand outlook remains positive amidst these present market challenges due to the continued hygiene awareness and stringent regulations by the medical and industrial sector," it added (Senathirajah et al., 2023). This was thanks to stronger cost control and lower raw material prices during the period. Kossan earned a net profit of RM40.97 million for the third quarter that ended on September 30, 2023, a significant improvement above the RM23.26 million reported in the same quarter the previous year (Shah et al., 2024). However, because of reduced revenue from all divisions, including gloves, which had a 30.8% decline in revenue due to a poorer average selling price and sales volume the group's revenue fell 28% year over year to RM403.48 million in 3Q22. In 2022, the group's earnings per share were 0.91 sen, while in 2021 they were 1.61 sen. Kossan reported a net profit of RM13.42 million so far this year, down from RM159.36 million during the same period in 2022 (Lim et al., 2023; Yi et al., 2018).

Glove worldwide market share

Market Analysis and Economic Outlook: Heading into 2024, global industries face ongoing macroeconomic challenges with expectations of a slowdown in global growth to 2.9% in 2024, below the historical average between 2000-2019 of 3.8% (Gunasegaran *et al.*, 2024). Specifically, advanced economies are anticipated to experience slowed economic growth rates. This deceleration can be attributed to policy changes in response to recent inflation spikes (Francis et al., 2023). Although inflation rates are projected to decrease in the coming years, they are expected to remain notably higher than observed in the past two decades (Suuronen *et al.*, 2024). The rubber glove sector is one of the industries experiencing stress from the heightened challenges in the current environment (Annathurai et al., 2023). While challenges remain, stabilized raw material prices and normalizing input costs have created a more conducive environment for margin improvements in the industry (Wijesuriya et al., 2024). One notable result of the COVID-19 pandemic was a wave of new entrants tapping into high Average Selling Prices (ASPs) for rubber gloves. This led to an oversupply of gloves, exerting downward pressure on the profit margins of established industry players as restrictions eased and demand leveled off (Patrawoot et al., 2021). The situation was further complicated by Chinese manufacturers increasing market share using cost advantages such as scale and lower energy costs, keeping ASPs low and competition fierce. Despite efforts to rationalize capacity, this oversupply persists and influences market conditions (Mikatavage et al., 2020).

A significant outcome of the pandemic was the increased demand for health and hygiene-related products, driving long-term growth in the rubber glove industry, particularly in emerging markets with lower hygiene awareness (Thep-On et al., 2022). This demand also escalates with the aging

global population and rising life expectancies, particularly within the healthcare sector. The depreciation of the Malaysian Ringgit against major global currencies has had mixed impacts on local glove manufacturers, presenting cost challenges but enhancing sales margins due to predominant USD-denominated sales (Hill et al., 2024). In the modern industrial world, rubber gloves are used far beyond traditional healthcare environments, including in construction, mining, chemicals, pharmaceuticals, electronics, food and beverage, and automotive industries, supported by stringent health, safety, and quality regulations (Preece et al., 2021). Despite macroeconomic challenges documented in 2023, including higher energy prices and competitive pressure from Chinese manufacturers, there remain opportunities for growth and operational efficiency enhancements (Albiajawi et al., 2021). While revenue declined in FY2023, efforts to manage plant operations and optimize resource utilization have ensured a firm financial foundation and readiness to capitalize on future growth prospects within the business segments, particularly within the Gloves division (Creta et al., 2021).

SWOT Analysis of Kossan Rubber Industries Berhad

One of Malaysia's top five producers of rubber gloves, Kossan Rubber Industries Berhad ships its products to several nations across the globe. There are possibilities, challenges, weaknesses, and strengths for Kossan Rubber Industries Berhad. The SWOT analysis that follows provides a detailed tabular representation of each component of Kossan Rubber Industries Berhad's SWOT.

	Opportunities	Threats
Strengths	<p>Strength Opportunities (SO) Strategies Leveraging the advantages of Kossan Rubber to strengthen and broaden the market position.</p>	<p>Strength Threats (ST) Strategies Kossan Rubber has two options: enhancing current advantages or examining trends and developing procedures for a two-pronged market penetration strategy.</p>
Weaknesses	<p>Weakness Opportunities (WO) Strategies Constructing plans based on a consumer-focused strategy to marketing and product development.</p>	<p>Weaknesses Threats (WT) Strategies Simply said, Kossan Rubber must exit these markets and concentrate on the possibilities and weaknesses or the strengths and threats sections.</p>

Strength

Strengths are Kossan Rubber's assets and competencies that can be used to create a long-term competitive advantage in the market. Positive aspects of important resources and competencies, such as prior successes, material assets, financial resources, human capital, and operational procedures, are the source of these strengths (Yew et al., 2020). Kossan Rubber has acquired a diverse range of patents and copyrights through innovation and strategic acquisitions, facilitating competitive differentiation across various industry segments in growth strategies, manufacturing, marketing, and strategic planning (Ojha et al., 2020). The company boasts a diverse product and brand portfolio, enabling it to cater to multiple market segments simultaneously, fostering a varied revenue stream and profit mix (Vaníčková and Szczepańska-Woszczyzna, 2020). Having a first mover advantage in several segments allows Kossan Rubber to innovate across growth strategies, manufacturing processes, marketing initiatives, and strategic planning, especially in Finance & Accounting solutions (Islami, Topuzovska Latkovikj, et al., 2020).

As a result of Kossan Rubber's commitment to providing high-quality products and services to its clients, customer loyalty has increased, enabling the business to compete favorably with

multinational corporations in international markets (Abdulwase et al., 2021). Due to the close relationships established with its suppliers and supply chain partners, Kossan Rubber can leverage the knowledge and assets of its supply network to improve its goods and services (Haque et al., 2021). The company is financially sound and can invest in many projects to generate multiple revenue streams and improve critical financial metrics like Return on Sales (RoS) (Lee et al., 2023).

As a regulated player, Kossan Rubber excels in managing regulations and government mandates by creating strong relations with lobby groups and political networks relevant to growth, manufacturing, marketing, and strategic planning (Thomas, 2020). Additionally, Kossan Rubber has implemented several strategies to improve its competitive position and operational efficiency (Islami, Mustafa, et al.). These strategies include investing in new product development for niche applications with high margin realization, identifying growth opportunities in emerging markets, strategic cost optimization, enhancing efficiency in the chemical dosing process through an auto-dosing system, and using an automated ERP system for operational efficiency, progressive digitization of manufacturing processes (Fei et al., 2024). Focus on tailored training programs for employee learning and development, implementation of impactful programs to improve employees' physical and mental well-being, comprehensive occupational health and safety processes to safeguard employees (Kaur et al., 2023). Over 30 years of experience in glove production, an experienced and specialized Research and Development (R&D) team proficient in advanced analytical and testing methods, presence of an in-house R&D Center and independent testing laboratory, in-house Quality Assurance Department, strong collaborative relationships with customers and suppliers, Yayasan Kossan (YK) serving as a foundation for community development, established partnerships with NGOs, schools, and community-based organizations, and a group-wide Environmental Management System and Environmental Policy (Ali and Anwar, 2021). These strategies collectively contribute to Kossan Rubber's competitive advantage and sustainability in the glove manufacturing industry (Ramalingam et al., 2024).

Opportunity

The company has always concentrated on digitalizing and automating most of its processes to attain better productivity. Consequently, they have also implemented 270 e-learning modules for enriched learning and development options for employees (Capece & Campisi, 2013). The company believes a lot in innovation. To attain a competitive advantage, the company stresses more on the usage of patented products and the process of production (Weerathamrongsak and Wongsurawat, 2013). The company could have identified responsible forestry and sustainable sourcing with adherence to the European Union Deforestation-free Regulation, among others. The GVC Greening Value Chain program has been adopted to ensure enhanced sustainability practices along with the value chain. Better explained is the commitment toward being an active player in the drive to promote responsible practices through membership in the responsible Glove Alliance (Chowdhury et al., 2023). Community engagement is the highlighted aspect of the company's initiatives. Yayasan Kossan (YK) set up community-based events. The company has come up with a program called the YK Digital Aid to distribute digital devices to different kinds of initiatives (Falola et al., 2022). To mitigate the environmentally related worries, the company engaged the carbon accounting system in managing and minimizing its carbon footprint. One of the energy efficiency measures that the company is installing to reduce the impact on the environment while improving its practices and increasing sustainability is an additional 1.14 MWp of solar energy capacity (Roy, 2010).

Weaknesses

On the weak side, five continuous improvement factors need to be advanced to enable superior status in the fierce global competition playground. First, critical talent pool engagement is a must, meaning that an internationally famous headhunting agency should be engaged to hire essential pools of talent in IT and AI transformation that is automated (Ahmed et al., 2024). Secondly, to meet the quality

requirements of customers, there is a need to focus on producing glove products with consistent high-quality levels so that they can be shipped around the world (Fadzil et al., 2023). Finally, adhering to the principles of FIFO will help the company to keep low levels of stock and to always maintain adequate levels of shipment without having too much stock on hand (Ghoncheh et al., 2016). Lastly, the industry always must deal with the issue of a labor shortage in manufacturing gloves, which are very labor-intensive work processes (Tan, 2022). Lastly, with constant pursuit, training is an everlasting activity that presses the need to organize and undertake structured annual training programs across all levels inside Kossan factories.

Threat

Other macro-environmental factors threaten the business model of Kossan Rubber and some external developments, such as shifts in political landscapes, changes in consumer preferences, technological advancements, economic fluctuations, and variations in spending power (Rana et al., 2023).

Specific threats include rising buyer bargaining power, evolving government regulations, industry price stickiness, post-2008 credit concerns, and impacts of income inequality on consumer demand (Folinas et al., 2020). These factors necessitate vigilant monitoring and strategic adjustments for sustained success (Ramalingam et al., 2024).

Porter Five Forces Analysis of Kossan Rubber Industries Berhad

According to Porter Five Forces (1980), studying the Porter Five Forces which examine buyer and supplier bargaining power, threats from new entrants, threats from substitute goods and/or services, and rivalry between current competitors is necessary to understand the industry's structure, life cycle, potential opportunities, and level of competition (Dias et al., 2022). Every force affects the industry, and these impacts have a direct bearing on the strategy of the business. The Porter Five Forces are used by the author to analyze Kossan Rubber Industries Berhad's present market position.



Source: Porter (1980).

Figure 2. Porter Five Forces (1980)

Bargaining power of buyers

Global glove buyers have developed significant negotiating power to buy the product. Due to the Covid-19 outbreak, there has been a sharp rise in the demand for gloves, which has led to orders being placed with Kossan Rubber Industries Berhad (KRI) from both domestic and foreign markets (Haque et al., 2024a). KRI has extended its production and operating hours to create gloves to meet the demand for the order and meet the production units. The quantity of buyers influences what is bought and sold in the marketplaces (Akçagün et al., 2023). The growing number of glove purchasers has given them significant negotiating strength in the glove manufacturing sector (Jing et al., 2023).

Bargaining power of suppliers

A small number of vendors provide raw materials to the KRI, including rubber, chemicals, powder materials for glove inspection, latex, nitrile, etc. This has led to the formation of a modest power of suppliers, who now play important roles in both providing and deciding the quantity of raw materials that are inventoried in KRI's production warehouse (Lan, 2023). The raw material stocks that are available in the markets will be impacted by the suppliers' coalition's decision to raise or fix the price of raw materials (Miao, 2023). As a result, KRI can enter into contracts with its raw material suppliers for predetermined pricing and terms to lower risks and lessen price fluctuations from the suppliers.

Threats of new entrants

There is a moderate to high risk of new competitors entering the glove manufacturing market. This is because the new competitors might make disposable gloves that are only ever used once before being thrown away. It would be less expensive and require less sophisticated technology to manufacture these disposal gloves. Furthermore, the possibility of new competitors offering disposal gloves at lower costs could pose a challenge to market share (Haque et al., 2024b). To increase customers' steadfastness in purchasing KRI gloves, the company must thereby highlight the excellence of its offerings and the positive connotations associated with its brand (Batool et al., 2023). Additionally, KRI can use marketing techniques to draw in new clients and hold onto existing ones.

Threats of substitute products and/or services

Due to the growth and continued use of gloves in several industries, including manufacturing, restaurants, hotels, healthcare, and medical, the rubber glove market is experiencing significant and sustained demand (Darmoe & Ofori-Boateng, 2023). Rubber gloves can also be replaced with different items like vinyl (not for medical usage), cotton gloves for light handling and valeting, cotton/polyester blend gloves for sublimation printing, leather or PVC coated gloves for heavy and metallic chores, etc. (Adetayo et al., 2022). While there are many other kinds of gloves on the market, rubber gloves are the only kind that may be used for medical and healthcare purposes since they have a coating that protects against bacteria and viruses, making them ideal for surgery and general hygiene (Asadi et al., 2023). As a result, there is little risk from competing items.

Rivalry among existing competitors

In the same industry, there are a few rival companies that make rubber gloves: Top Glove, Kossan, Hartalega, Supermax, Rubberex, etc. Competitors possess advanced technology in production, robust financial backing, and cash flow for their businesses. The competitors can create more units than KRI since they have greater facilities and production capability. With a 26% global market share, Top Glove is the biggest producer of rubber gloves (Anastasiu et al., 2020). Nevertheless, as was already said, KRI offers advantages as well. For instance, KRI can gain a competitive edge in marketing and production to compete with rivals because of its skilled management team, robust cash flow, and innovative manufacturing practices (Khorsheed et al., 2024). In this context, the market is influenced by rivalry between current rivals to a low to moderate extent.

Recommendations Moving forward, optimizing operational efficiency is vital in a competitive landscape. Implementing energy management systems and leveraging technology like ERP tools are key enablers in enhancing resource allocation and driving cost savings (Wahab et al., 2024). Through this, Kossan Berhad will modernize the production lines and invest in high-end machinery with growth and improvement opportunities for enhanced competitiveness in the market. It is examples such as these that reflect our being proactive about enhancing operations through the adaptation of sustainable business practices (Ye et al., 2012).

Conclusion: This is noted to transpire notwithstanding the continued setbacks of supply-demand imbalances and consolidation in the glove market, with a relentless drive toward cost efficiency by automation, digital solutions, and the human resources development it touches upon (Wickneswary

et al., 2024). This also underscores efforts toward sustainability since, in both concerns, rising importance is attributed to social and environmental responsibility. Looking forward, long-term views regarding glove demand remain positive, backed by stringent compliance standards and growing awareness about hygiene (Mien et al., 2023). The company has investments in technology, sustainability, and specialized product development that will enable it to take advantage of the opportunities available (Pullangott et al., 2021). Collaborations in further R&D and focus on niche market demands are highlighted for stepping up in future growth (Das et al., 2021).

In summary, although Kossan is aggressively investing in technology, sustainability, and operational excellence, we must recognize that challenges continue to exist in the glove market over the short term (Liaw et al., 2024). With the current supply-demand gap and continuing market consolidation, we envision that Average Selling Prices (ASPs) will likely remain low through FY2024 (Bhaskar et al., 2020). To deal with this, our emphasis will remain on driving cost efficiency with automation, digital solutions, continuous training of workforces, and an endeavor to reinforce management systems (Chawdhury et al., 2022). These steps will be directed at reducing production costs and addressing prevailing workforce issues (Arora et al., 2021). Furthermore, Kossan will keep investing in our sustainability initiatives, bearing in mind that social and environmental responsibility plays a growing role in importance for our customers (Wai et al., 2024). In addition, the long-term demand prospect remains favorable for gloves with more stringent compliance standards and heightened hygiene awareness among people living in Asia and the Middle East for both medical and industrial use (Boro and Stoll, 2022).

Data available on request due to privacy/ethical restrictions

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Ethical Approval: Formal ethical approval has been waived instate this study adhered to the principles of the strict ethical standards. Participation was anonymous, confidential, and voluntary, with informed consent obtained from all participants. There were no biomarkers or tissue samples collected for analysis. Participants had the freedom to withdraw from the study at any point.

Conflict of interest: Authors declare no conflict of interest.

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