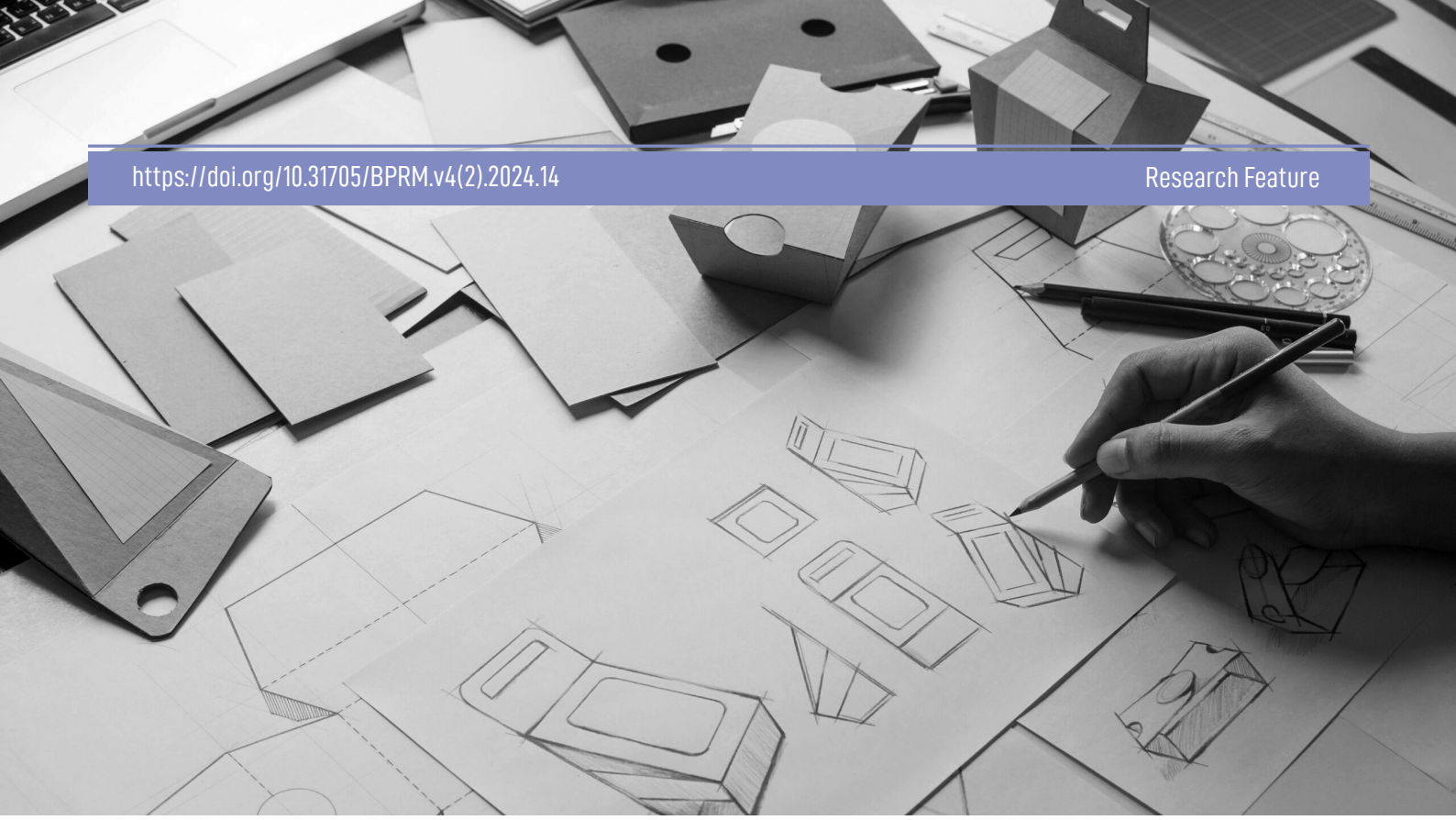
https://doi.org/10.31705/BPRM.v4(2).2024.14 Research Feature



Innovative Packaging Design:
Enhancing SME Competitiveness in Export Markets

Sri Lanka offers a wide range of printing, prepress, and packaging services, supporting major export sectors through high-quality packaging materials such as tea cartons, garment tags, and labels. These services are pivotal in meeting global consumer demands, showcasing the packaging sector's capacity to align with international standards. Product packaging is not only a functional necessity but also a marketing tool that attracts consumers, communicates brand identity, and influences purchasing decisions [1], [2], [3].

In the Bachelor of Design (Hons) program at the Department of Integrated Design, University of Moratuwa, undergraduates specializing in Media and Communication Design are trained to address these demands. As part of their third-year Packaging Design Project, students collaborate with Small and Medium-sized Enterprises (SMEs) under the guidance of the author. This article summarizes insights from a pilot survey conducted with seven SMEs in the Spices, Essential Oils, and Oleoresins sector, identifying key requirements for packaging design. The study also highlights the impact of prototype designs created by students and their potential to transform SMEs' packaging requirements.

Collaborative Process and Student Engagement

Seven SMEs registered with the Sri Lanka Export Development Board (EDB) participated in this project, which involved 24 students working in small teams. Each team engaged in unstructured interviews with SME representatives through field visits and discussions, identifying specific packaging requirements and constraints. Prototypes developed from this process were tested, refined, and

presented to SMEs and the EDB, demonstrating the potential of design-led interventions to enhance product competitiveness.

Key Findings on SME Packaging Requirements

The study revealed four primary considerations in packaging design: appearance, protection, functionality, and cost.

Appearance: SMEs prioritized packaging designs that combined innovative forms and engaging surface graphics to stand out on shelves. For example, student teams developed several prototypes. Figure 01(a) a triangular package for cinnamon sticks, divided into three parts for easy stacking and featuring a luxurious finish to attract consumer attention, while ensuring the glass bottle for cinnamon powder remains safe; (b) an organizer for 12 pyramid tea bags, designed for a monthly intake (three bags per week), promoting user convenience and routine maintenance; and (c) a 30-stick cinnamon pack with two sets of 15 airtight sticks, preserving aroma and freshness while providing a compact and functional design. These prototypes effectively addressed SMEs' needs for innovative, functional, and visually appealing packaging.

Protection: Ensuring packaging durability was a primary concern for SMEs, with a focus on safeguarding products from environmental hazards, physical stresses, and microbial contamination. For instance, as shown in Figure 02(a), this hexagonal structure enhances stability and load-bearing capacity during transport, outperforming traditional cuboid packaging. Designed for on-the-go use, it includes eight components: five primary packaging packs and secondary packaging elements—an outer cover, lid, and tray—ensuring product safety and user convenience. For fragile products, student experiments were conducted on buffer packaging to ensure product safety.

Functionality: SMEs emphasized convenience features such as easy opening and resealing mechanisms, product visibility, and dispensing aids. Innovative student solutions included tear tapes (Figure 02-a) and transparent windows (Figure 01-a) in resealable pouches, allowing consumers to view products while maintaining freshness. Reusable packaging options were also explored, fostering brand loyalty and supporting sustainability objectives. For example, Figure 02(b) showcases a geometric dispenser package designed to fit comfortably in the hand and mimic the texture of scraped cinnamon bark. This value-added package features dual dispensing options—large and small openings for precise sprinkling or splashing of cinnamon powder as recipes require. Additionally, the design allows for repurposing as salt and pepper containers or decorative items, enhancing sustainability and consumer appeal.

Cost: SMEs prioritized cost-effective packaging that balances innovation with affordability and scalability. Student designers addressed this by proposing solutions that optimize materials, dimensions, and functionality to minimize expenses while maintaining quality. For example, Figure 02(c) demonstrates a cube-shaped package designed for efficient stacking and transport, reducing logistical costs. Its reusable design allows consumers to repurpose the package for storage, extending its lifecycle and adding value. Similarly, Figure 03(b) showcases a package with seven separators and a simple locking mechanism, ensuring organized use and minimizing material waste. These designs exemplify how thoughtful packaging can achieve cost efficiency without compromising functionality or consumer appeal.

Impact of Student Prototypes: The student teams produced over 30 innovative packaging prototypes, each addressing specific SME requirements. While some designs required further refinement for full implementation, they served as valuable examples of creative solutions with potential for future adoption. Several prototypes were featured at the EDB's National Packaging Center exhibition, inspiring other exporters and showcasing the possibilities of thoughtful packaging design.

Beyond their creative contributions, the project significantly enhanced students' practical skills, providing hands-on experience that bridged

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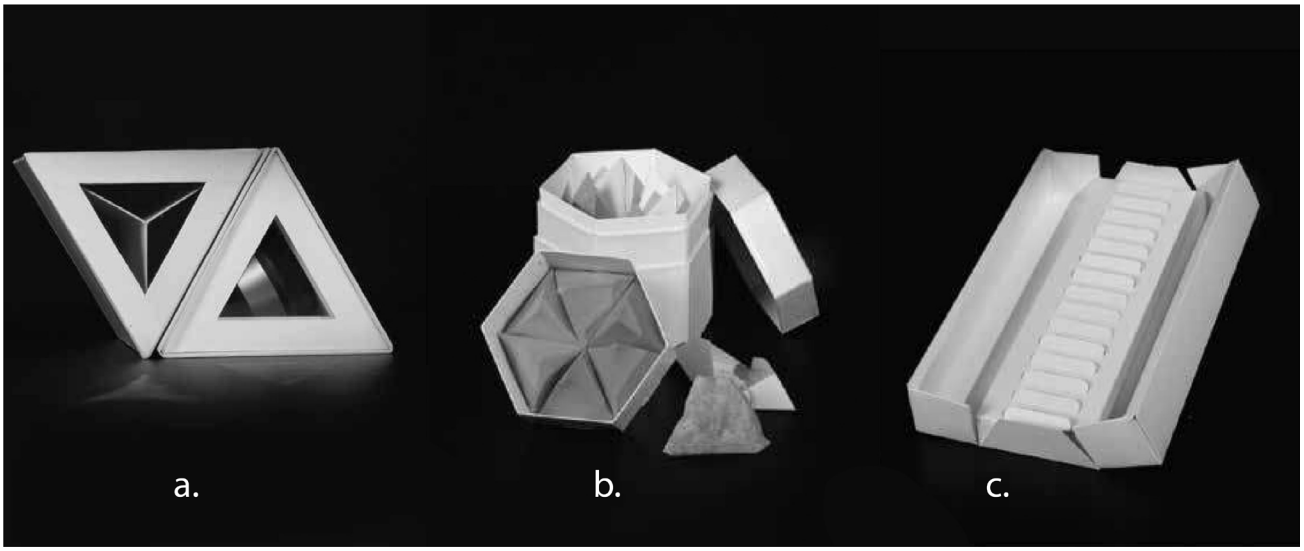

Figure 01 : Prototyped Structural Packaging Design: Enhancing Product Communication and Competitive Differentiation

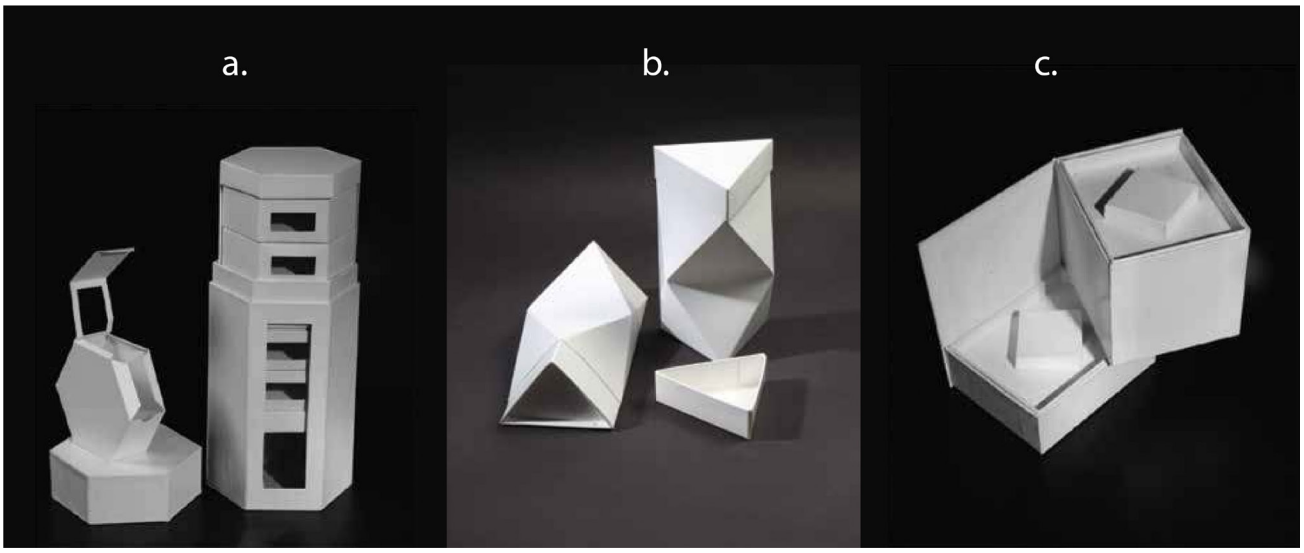

Figure 02: Product Protection Prototype Experiments: Ensuring Stackability and Sealability

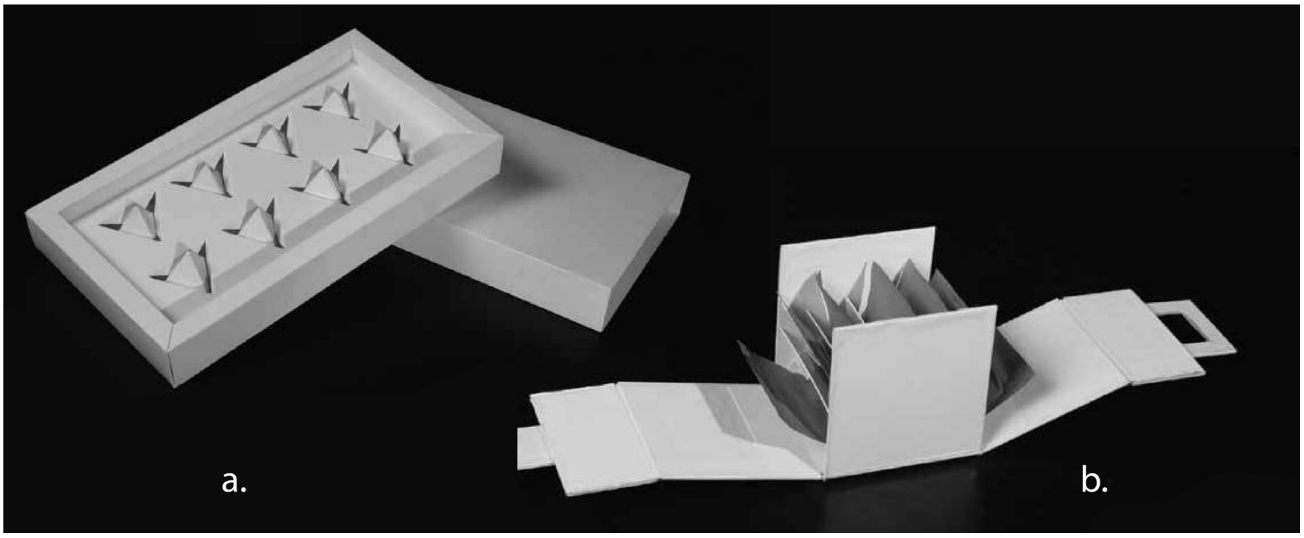

Figure 03: Meeting End User Requirements: Display, Ease of Opening and Closing, Convenience, and Sustainability for Dispensing and Re-use

the gap between academic learning and real-world industry needs. This collaboration not only highlighted the potential of design thinking in addressing SME challenges but also reinforced the importance of aligning theoretical knowledge with practical applications in packaging design.

Conclusion:

This collaboration between the University of Moratuwa and SMEs underscores the transformative potential of design in addressing real-world challenges. By integrating theoretical insights with practical applications, the project not only enriched student learning but also contributed to the growth of the Sri Lankan packaging industry. Prototypes developed in this initiative have already demonstrated their value in enhancing product appeal, reducing costs, and meeting global market demands.

The project's success affirms the critical role of design in fostering innovation and competitiveness in export markets, paving the way for future academic-industry collaborations.

Future Directions

Expanding the scope of this initiative to include Micro, Small, and Medium Enterprises (MSMEs) could further enhance its impact, particularly in empowering smaller businesses to access export markets. Additionally, creating a packaging design template based on inventive approaches—such as modularity, storytelling, and functionality—would provide a quick-reference tool for idea generation, benefiting both students and SMEs.

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