

Footwear as product-service systems: Toward sustainable alternative consumption scenarios

Sameer Mittal^{1,2}  | Muztoba Ahmad Khan³  | Vinod Yadav⁴  | Milind K. Sharma⁵

¹Institute of Management, JK Lakshmipat University, Jaipur, India

²Unit of Information and Knowledge Management, Tampere University, Tampere, Finland

³School of Business, Carroll University, Waukesha, Wisconsin, USA

⁴Department of Mechanical Engineering, Manipal University Jaipur, Jaipur, India

⁵Department of Production and Industrial Engineering, Faculty of Engineering and Architecture, MBM University, Jodhpur, India

Correspondence

Sameer Mittal, Institute of Management, JK Lakshmipat University, Jaipur, Rajasthan, India.
Email: sameer.bansu@gmail.com

Abstract

The existing footwear ecosystem is not environmentally friendly and thus poses a threat to sustainability. In this article, our objective is to take a product-service systems approach to propose alternative footwear consumption scenarios from a sustainability viewpoint and investigate the perspective of Indian consumers toward the proposed scenarios. To this end, we initially conducted a comprehensive literature review to explore alternative consumption scenarios in the realm of fashion products. This step led to the development of 10 alternative footwear consumption scenarios that focus on maintenance and repair, takeback, assembly, customization, personalization, advice and consultancy, rent, sequential share, swap, and functionality. Next, we adopted the focus group interview methodology to investigate the perception of Indian consumers toward the 10 alternative footwear consumption scenarios, which can inform the footwear industry's product development, marketing strategies, and sustainability initiatives. Our results indicate that while the participants found the consumption scenarios to be interesting and practical, they feel that the proposed scenarios may prove to be more feasible for comparatively expensive footwear products because of the associated logistics costs. Furthermore, the participants pointed out a few cultural as well as hygiene-related issues that may hinder the adoption of certain alternative footwear consumption scenarios.

KEYWORDS

alternative consumption, circular economy, consumer perception, footwear, product-service systems, sustainable development

1 | INTRODUCTION

While footwear products primarily exist to protect one's feet, the footwear industry has evolved into a style- and fashion-based one (Ayode et al., 2013; Shah, 2018). The significance of footwear has evolved to the extent that today one's identity is defined by the kind of footwear one wears (Tehan et al., 2019). Consequently, the global footwear demand has increased significantly over time. In 1950, on average, each person consumed one pair of footwear annually, which

then increased to 2.6 pairs per person in 2005 (Staikos & Rahimifard, 2007a), and presently, it is three pairs per person (Industry Insights, 2020). Since 2010, global footwear production has increased by 21.2% to 24.3 billion pairs in 2019 (World Footwear Yearbook, 2020), and the market is expected to grow by 3.38% every year from 2023 to 2027 (Statista, 2022).

Such a huge demand for footwear products is attributed to several reasons, such as an increase in the per capita income in both developed and developing economies (Felton, 2018), rapid changes in

Abbreviations: PO-PSS, Product-oriented product-service systems; PSS, Product-service systems; RO-PSS, Result-oriented product-service systems; UO-PSS, Use-oriented product-service systems.

footwear fashion (Luca & Loghin, 2016; Majima, 2008), demand for designer shoes (Felton, 2018), and reduced lifecycle of the footwear due to the high responsiveness to consumer demands (Staikos & Rahimifard, 2007b). Another reason for such an increased demand is that consumers, especially in developing countries, often do not consider the environmental perspective when purchasing fashion goods such as footwear (Baier et al., 2020; Bernardes et al., 2018), and the footwear preference is primarily based on price, style, and personal comfort (Luca & Loghin, 2016).

On average, one pair of footwear releases approximately 12.87 kg of CO₂ during its lifecycle (Cheah et al., 2013; Chu, 2013; Kirchain et al., 2015). In 2016, the footwear industry's greenhouse gas emissions amounted to 700 million metric tons (Statista, 2023). Every year, approximately 300 million pairs of footwear are discarded (Shah, 2018), and most of the footwear waste ends up in landfills (Staikos & Rahimifard, 2007a). Footwear waste can be broadly classified into two categories. First, when the footwear reaches its end of life and cannot be used any further, and second, when the footwear has a remaining useful life, but the consumer is not using it. Footwear wastes include complex chemical compound, glue, rubber, and substances like ethylene-vinyl acetate that can take up to thousand years to decompose (Farhoud et al., 2018) and consequently "have severe environmental impacts in the form of pollutants leaching into the soil, emissions to the atmosphere and impacts on surrounding ecology" (Van Rensburg et al., 2020, p. 1).

Given the reliance on a linear "take-make-dispose" model, the footwear industry poses serious threats to the environment and calls for more environmentally sustainable consumption and business models for footwear products. Even though the existing scientific studies acknowledge the waste arising when footwear reaches its end-of-life (Staikos & Rahimifard, 2007a; Van Rensburg et al., 2020), the extant literature does not consider any evidence regarding how to develop consumption scenarios around footwear that has a remaining useful life. In this context, Product-Service System (PSS) business models have the potential to offer alternative consumption scenarios in the form of renting, sharing, swapping, redesigning, upgrading, and repairing strategies (Tukker, 2004). These strategies promote product quality and longevity, engaged consumption, customer satisfaction, and non-ownership practices that reduce redundant consumption, waste, dependence on natural resources, and ultimately environmental impact (Heiskanen & Jalas, 2003; Tukker, 2004). In the past, such models were proposed from the perspective of industries such as clothing (Armstrong et al., 2015). However, PSS business models have yet to be proven viable in the footwear industry. Although Hernández Pardo et al. (2012) suggest that integrating the PSS approach in the footwear industry can lead to sustainability, the scientific literature lacks evidence on whether PSS-based alternative consumption scenarios have the potential to replace a significant volume of purchases and therefore can bring economic benefits for businesses while also securing environmental benefits. A recent study has also suggested that consumer attitude and perception toward PSS offerings in the fashion industry are critical to the success of fashion-oriented PSS (Camacho-Otero et al., 2019). In this context, it is important for

business organizations to better understand the alternative consumption scenarios relevant to the footwear industry and the consumer perception of those scenarios. Only one study in literature deploys PSS approach in the context of footwear (Confente et al., 2015). However, this study (Confente et al., 2015) was performed to identify barriers and enablers when a PSS is deployed to enhance footwear value. To the best of the authors' knowledge, no studies have explored the consumer perspective when it comes to alternative footwear consumption scenarios, such as better maintenance practices, take-back offers, renting, leasing, and sharing footwear that has a useful life.

As a first step to address this research gap, the objective of this study is to identify alternative consumption scenarios that are relevant for footwear products and then explore the consumer perspective associated with these scenarios. Based on this objective, we pose the following two research questions.

- RQ1: What are the potential alternative footwear consumption scenarios that may bring economic benefits to businesses, while also securing environmental benefits?
- RQ2: What is consumer perception of potentially viable alternative footwear consumption scenarios?

In order to address these research questions, we adopted a focus group interview approach as it allows for an in-depth exploration of participants' views and preferences. The group dynamic fosters diverse perspectives and stimulates interaction, enabling a comprehensive understanding of consumer perceptions (Rabiee, 2004).

This study's potential contributions lie in providing a deeper understanding of alternative consumption scenarios relevant to the footwear industry and the consumer perception toward these scenarios. This study can also provide business organizations with a better understanding of the potential economic benefits associated with PSS-based alternative consumption scenarios while securing environmental benefits. Furthermore, the study can also contribute to the scientific literature on the PSS approach by exploring the viability of PSS-based alternative consumption scenarios in the footwear industry. The study can provide insights into consumer attitudes and perceptions toward PSS offerings in the fashion industry and can guide the footwear industry toward a more sustainable future.

The remainder of this paper is organized as follows. Section 2 presents the literature review related to the research question. Section 3 describes the methodology used in this study. Section 4 presents the results of this study. Section 5 presents a discussion. Finally, Section 6 presents the conclusions, limitations, and future work arising from the current study.

2 | LITERATURE REVIEW

This section provides a synthesis of existing research on PSS, with a focus on their application in the fashion industry. Furthermore, this section provides an overview of the Indian footwear sector and its adoption of PSS business models related to footwear.

2.1 | Product-service systems

PSS is the transition from offering pure products to offering pure services (Barquet et al., 2013; Tukker, 2004). Broadly, PSS may be classified under product-oriented, use-oriented, and result-oriented models (Figure 1). Below, we discuss the different types of PSS (Tukker, 2004) business models.

Product-Oriented PSS (PO-PSS)—This is the traditional model where the focus is toward selling the product. Once the product is sold, it is owned by the consumer. However, products are bundled with after-sales services as well as providing advice and consultancy related to the product. Various means of offering PO-PSS include maintenance and repair, takeback, participatory or customized designs, and offering advice and consultancy related to the efficient use and optimization of the product. Such a PSS motivates consumers to use products in a responsible manner, thus enhancing the lifecycle of the product. It also enables manufacturers to gain insights into consumer issues and concerns related to the product. Ultimately, this approach contributes to the development of sustainable products by increasing their lifespan, reducing landfill waste, and promoting consumer product reuse (Goffetti et al., 2022; Moro et al., 2020). However, as ownership of a product belongs to the consumer, accessing information about how customers use the product becomes difficult, making innovation a challenge. For the same reason, manufacturers may not be incentivized to extend the product's useful lifespan (Moro et al., 2020; Tunn et al., 2021).

Use-Oriented PSS (UO-PSS)—Here, the objective is to sell the functionality of the product by means of renting, pooling, or sharing, rather than selling the product itself. In this case, the product is owned by the manufacturer; however, the product use is maximized by extending the lifecycle of the product and reuse of the materials. For example, Furlanco, an Indian-based furniture manufacturer, is renting/leasing the furniture to its consumers, while taking care of the furniture maintenance. In this scenario, the manufacturer looks forward to developing products and materials with a long lifecycle, and multiple users can use the product throughout its lifecycle (Moro et al., 2020). Thereby, inclining itself toward sustainability. The UO-PSS requires high initial investment, and the payment will depend on how frequently the product is being used (Moro et al., 2020; Tunn et al., 2021). Similarly, there might be a very specific market that

would be interested in the product offered using a UO-PSS (Catulli & Reed, 2017).

Result-Oriented PSS (RO-PSS)—These are the advanced versions of the PSS where the manufacturer sells the functional result or competence of the product, rather than the product itself. Here also, the ownership of the product remains with the manufacturer. For example, Xerox kept its photocopying machine at its consumer's place; however, the consumer was paying for the number of photocopies. Here also the manufacturer looks forward to developing products and materials with a long lifecycle (Tukker, 2004). Furthermore, RO-PSS eases the collection of product-use information, as there is greater contact with the customer (Moro et al., 2020), thus, leading to product-related innovations, better performance, and a more satisfied and loyal customer. However, the barriers faced while offering RO-PSS pertain to designing and identifying a mechanism to make customers pay for the solution(s), longer payback periods, and reckless use of product by the consumers (Moro et al., 2020).

Overall, these strategies promote product quality and longevity, engaged consumption, customer satisfaction, and non-ownership practices that reduce redundant consumption, waste, dependence on natural resources, and ultimately the environmental impact (Alblooshi et al., 2022; Moro et al., 2020).

2.2 | PSS in fashion industry

Table 1 summarizes the alternative PSS-oriented fashion scenarios presented in scientific literature. There are some similarities between fashion products, that is, clothing, footwear, sportswear, handbags, luggage, watches, and jewelry (MGFI, 2018) when it comes to consumer mindsets and business models. Therefore, during our literature search, we looked for clothing, footwear, sportswear, handbags, luggage, watches, and jewelry-oriented PSS available in the literature. We identified only eight relevant studies that presented alternative fashion consumption scenarios (Table 1). The studies were published between the period 2015 and 2021. Surprisingly, all eight studies presented scenarios oriented toward clothes and garments. Only one study has considered sportswear-related PSS scenarios for Houdini, a sportswear manufacturing company (Holtström et al., 2019). Moreover, in five studies (Armstrong et al., 2015; Armstrong et al., 2016; Holtström et al., 2019; Johnson & Plepys, 2021; Lang & Armstrong, 2018) consumers were interviewed from developed economies like the United States, Finland, and Sweden, whereas, in two studies (Pal, 2016; Stål & Jansson, 2017), the PSS providers were interviewed. Finally, Dos Santos et al. (2019) conducted a literature review of clothing PSS scenarios.

2.2.1 | Maintenance and repair

Five out of the eight studies identified from scientific literature used maintenance and repair-related PSS to encourage reuse and recycling. The focus in the maintenance and repair related scenarios was to sell

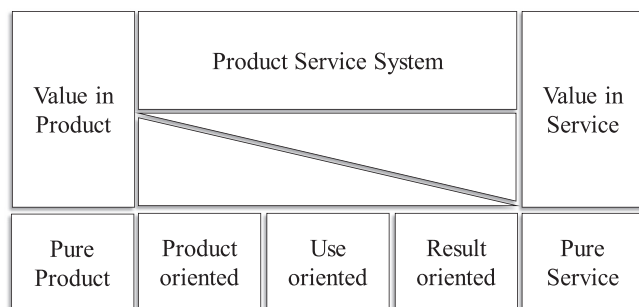


FIGURE 1 Product-service system (adapted from Tukker, 2004).

TABLE 1 Sustainable fashionable PSS mentioned in scientific literature.

Location where study was conducted			Finland		Finland and United States		Sweden	Sweden	United States	
#	PSS Name	Sustainability aspect	Description	Finland	Finland and United States	Dos Santos et al., 2019	Holtström et al., 2019	Johnson & Plepys, 2021	Lang & Armstrong, 2018	Stål & Jansson, 2017
1	PO Maintenance and repair	Reuse and recycle	Provide free repair and maintenance service for the purchased clothing for a period	X	Armstrong et al., 2015	Armstrong et al., 2016	X	X	X	X
2	PO Takeback	Recycle	Discount coupons in exchange of old clothes and garments	X		X				X
3	PO Participatory/customized design	Product attachment	Building garments by assembling clothing components at store/online	X		X			X	X
4	PO Advice and consultancy	Information and awareness	Enhancing garment utilization through expert advice	X	X	X			X	
5	UO Renting	Enhance utilization	Renting clothes and sportswear for a fixed period	X	X	X	X	X	X	X
6	UO Sequential sharing	Enhance utilization	Fashion library organizes timeshare rental of clothes and sportswear	X		X	X	X	X	X
7	UO Swapping	Enhance utilization	Provider organizes place for swapping two clothing items	X	X				X	X
8	RO Functionality	Enhance utilization	Functionality of the garment	X		X				

cloth and garments with free services such as repair, tailoring, and alterations for a fixed period.

2.2.2 | Takeback

Three studies considered offering the takeback of clothes and garments for a discount coupon that can be used by the consumer during the next shopping trip from the store. The authors suggested that the takeback scenarios encourage recycling and reselling of clothes and their fibers. One study (Stål & Jansson, 2017) also considered different scenarios in which takeback of footwear and discounts were considered within the same brand and among different brands. Likewise, some studies (Armstrong et al., 2015; Dos Santos et al., 2019) have discussed the takeback of footwear with the intention of selling those again as used products.

2.2.3 | Participatory or customized design

Five studies suggested customers' involvement in the design of their clothes. This involvement can be in the form of customers going to stores and assembling different parts (Armstrong et al., 2015) or using online configurators and technology (Pal, 2016). Here, the focus is on product longevity through customer attachment to the product.

2.2.4 | Advice and consultancy

Four studies also proposed the use of expert advice and consultancy to enhance the longevity of the product. The advice and consultancy helped consumers wear the same piece of cloth or garment by following the latest fashion. Advice related to appropriate maintenance of footwear is also provided to the consumers. This scenario ensures product longevity through awareness of the use of footwear.

2.2.5 | Renting

Seven studies suggested renting clothes. During renting, customers can get paid access to cloth or garments for a fixed period. Renting improves product utilization as it is accessed by multiple users.

2.2.6 | Sequentially sharing

Seven studies also suggested sequential time sharing of clothes or garments. An individual can submit various contracts for sequential sharing. Each contract consists of multiple clothes and users. Sequential sharing also improves product utilization because the product is accessed by multiple users simultaneously.

2.2.7 | Swapping

Four studies focused on clothes swapping scenarios. During swapping, a provider organizes swapping events and customers can swap clothes. Swapping improves product utilization.

2.2.8 | Functionality

Two studies focused on the functionality of clothing or garment products. In this scenario, the provider is responsible for meeting all the needs of the consumer, such as style, size, theme, and logistics. The customer pays for the number of hours they wear cloth. The functionality scenario ensures product utilization.

2.3 | Footwear-related PSS adopted in India

To the best of authors' knowledge, the scientific literature does not mention any footwear-related PSSs that are used in India. However, there are some established footwear brands and emerging start-ups that are using PO-PSSs motivated alternative scenarios such as maintenance and repair, as well as assembly and customization, to promote sustainability within the Indian footwear ecosystem. Devram Footwear, for instance, operates as a third-party provider of shoe maintenance and repair services. Brands like Nike and Reebok offer customers the option to assemble their own shoes, providing an extra pair of laces and allowing consumers to choose their desired combinations, thereby increasing the utilization of footwear. Similarly, Murtle footwear based in India makes sandals and provides multiple straps that are modular in nature, enabling consumers to modify their footwear with ease. Talons D' is another company that is allowing its female consumer to customize their shoe on their online platform by integrating different parts of the shoes.

2.4 | Indian footwear industry

In 2018, India produced 23 billion pairs of footwear and ranked second (after China) in the global production of footwear (World Footwear Yearbook, 2019). Among these, 95% of the footwear items produced in India and 11.7% of the total globally produced footwear pairs are consumed by the Indian domestic market (Sahoo, 2019; Showcasing Strength of Indian Footwear Industry, 2017; World Footwear Yearbook, 2019) whereas the remaining 5% is exported to other countries. The per capita consumption rate of footwear in India is 1.66 pairs which is third after China and the United States (Sahoo, 2019), and India will soon become the second highest consumer of footwear (Gupta, 2017). To serve the massive footwear demand of the domestic and the global market, India presently has over 15,000 footwear manufacturing units (Sahoo, 2019) and employs around 1.10 million workers (Showcasing Strength of Indian Footwear Industry, 2017). Besides, the turnover of the Indian footwear industry is around

6.71 M USD; this includes 4.3 M USD for the domestic market and around 2.41 M USD for the exports (Sahoo, 2019). The Ministry of Commerce and Industry has established 14 Footwear Design and Development Institutes (FDDI) across India to facilitate footwear industry-related research, education, and consultancy. Realizing the overall growth of the footwear ecosystem in India, this study explored Indian consumers' perceptions of alternative sustainable footwear consumption models.

3 | METHODOLOGY

As illustrated in Figure 2, a focus group interview approach (Rabiee, 2004) was adopted to study the perception of Indian consumers toward alternative footwear consumption scenarios. A set of potential alternative scenarios was developed based on the findings from the initial literature review. Questionnaires were developed, and

eligible focus group participants were recruited. Focus group interviews were conducted online, where participants expressed their views and preferences regarding the proposed scenarios. The collected data, both qualitative and quantitative, were analyzed to gain insights into consumer perceptions.

Our initial literature review from Section 2.2 served as a foundation toward the development of potential alternative consumption scenarios. Although our search did not uncover any PSS-inspired alternative consumption scenarios specific to footwear products, we formulated hypothetical scenarios for footwear based on existing scenarios for other fashion products. The different PSS scenarios considered in our study, along with the associated sustainability perspectives found in current literature, are presented in Section 2.2.

A rigorous methodology inspired by previous research has been employed to identify eligible respondents (Armstrong et al., 2015). The identified Indian consumer respondents were fashion-savvy people who purchased footwear more often and had the habit of keeping multiple pairs of footwear. Various steps were taken to identify the respondents. First, existing social media pages and groups of footwear savvy people were explored on platforms such as Facebook, Instagram, and Twitter. Second, the research team visited and called on different footwear retail outlets and shops located in different parts of India. Eligible respondents were contacted through calls, emails, and texts on social platforms regarding their potential participation and interest in the research. Third, the snowball sampling method was employed to extend the respondents involved in the study with the help of the respondents that were identified earlier. Fourthly, since female consumers purchase more footwear than men (Lang et al., 2013; O'Cass, 2004), a majority of our focus group participations identified as female.

The instructions and questions asked during the focus group interviews were inspired by previous research (Armstrong et al., 2015). First, the different PSS scenarios were explained to consumers, and their views and comments were recorded. Additionally, on a Likert scale of 1–7 (where 1 = *strongly disagree* and 7 = *strongly agree*), their opinions were received using the following two statements:

1. This scenario was practical.
2. I am interested in shopping based on this retail concept.

We made sure that all the participants considered rating the scenarios from the perspective of how practical and how much interested they would be if the scenario is offered. Practical was from the perspective of the feasibility of the proposed scenarios, whereas interest deals with readiness to purchase if the scenarios are available in retail concept, thus, reducing the chances of a potential bias. Depending on the participant's preference, the focus group interview sessions were organized online using Zoom, Skype, Microsoft Teams, or Webex. The focus group consisted of people of the same age group, and interviews were conducted with each focus group. The focus group interviews were conducted with six age groups and a total of 138 participants. The different age groups were 16–24, 25–32, 33–

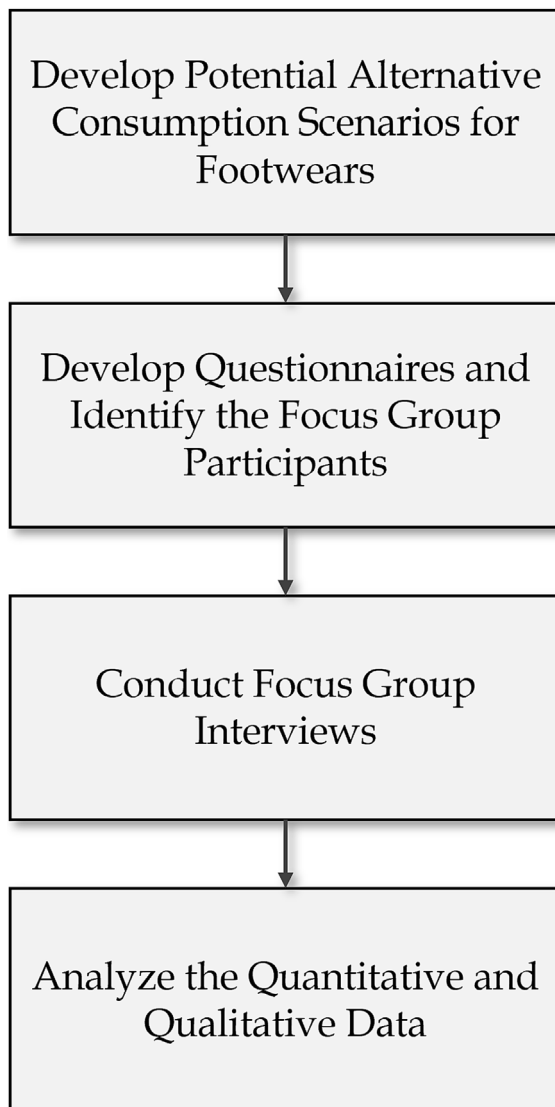


FIGURE 2 Flow diagram for the research methodology.

40, 41–48, 49–56, and 57–64. Each focus group consisted of a minimum of 7 and a maximum of 13 participants. For analysis purposes, the focus groups were classified by age: A (16–40, $N = 54$) and B (41–64, $N = 84$). On average, each respondent owned 25 pairs of footwear. The maximum number of footwears owned by a respondent was 45, whereas the minimum number was 18. These respondents represented the population because additional respondents only marginally added to the findings, and thus, the theoretical state of data saturation was achieved (Suddaby, 2006). After explaining each scenario, we asked them various questions, such as “What do you like about this scenario? What appeals to you? What do you do not like in this scenario? Are there changes or modifications that may be made to this idea that might make more beneficial to you?”

The members of the research team took notes during the focus group session, and these notes were expanded by referring to data from the recorded video calls. A focus group interview discussing all the proposed scenarios took approximately 3–4 h. Finally, transcripts were prepared using the various themes of the collected data. Transcripts were analyzed during this step. The collected data were both qualitative and quantitative in nature. MS Excel was used to analyze quantitative data, whereas manual screening was used to analyze the themes identified with the help of qualitative data (Mittal et al., 2020).

The identified themes are discussed in Section 4.3. Three members of the research team analyzed the data individually, and finally, the results were finalized based on a discussion of the individual analysis.

4 | RESULTS

This section presents the proposed alternative footwear consumption scenarios (Section 4.1), an analysis of the quantitative survey results illustrating the levels of interest and practicality associated with the scenarios (Section 4.2), and an exploration of consumer perceptions regarding these scenarios (Section 4.3).

4.1 | Alternative footwear consumption scenarios

Based on the alternative fashion scenarios identified in Section 2.2, we developed PSS scenarios for footwear. We split the participation/customized design (Table 1) scenario into assembled, customized, and personalized (Table 2) scenarios. The assembled scenario focuses on the DIY aspect, where consumers visit the footwear store and assemble the modular parts of the footwear. By contrast, in customized

TABLE 2 PSS scenarios footwear.

#	Description	Scenario
1	Maintenance and repair	Person A visits the showroom of her favorite footwear brand to purchase a pair of footwear ... she is also offered a complimentary footwear maintenance and repair service with a fee.
2	Takeback	Person B visits a footwear showroom ... where, based on the wear and tear of her used pair of footwear, she can get up to 30% discount on her new pair of footwear ... she can also get a discount coupon that she can avail for other merchandise items of the same brand.
3	Assembled	Person D visits a footwear shop ... where she can assemble the different parts of footwear on her own ... she can also get some modular parts ... to use her footwear for sports activities as well.
4	Customized	Person E is visiting the online platform of a footwear company ... she can configure different parts of the footwear on the platform ... she would be receiving the footwear within two weeks of placing the order.
5	Personalized	Person F visits a footwear showroom of an international brand located inside a shopping mall ... she gets her feet 3D-scanned ... after 15 days she would be able to collect her personalized 3D-printed shoes from the showroom ... she is aware that the material of the 3D-printed shoes can be recycled again for printing new shoes.
6	Advice and consultancy	Person G visits a footwear showroom where after paying an extra fee she will receive footwear advice and consultancy services from the experts ... after every one month for a period of 3 years she can visit the showroom to learn how she can maintain her footwear in a better way to look trendy ... she will also receive texts and emails for an efficient footwear use, these texts and emails will also suggest footwear care during adverse weather conditions.
7	Renting	Person H visits a footwear showroom where she can get a leased pair of footwear for one year ... during this year the provider takes care of the maintenance of the footwear.
8	Sequential sharing	Person I visits a footwear showroom where she can subscribe herself with a footwear package ... the footwear package is for one year and includes 15 footwear items that she can choose online to wear ... there will be 9 more consumers with whom she has to share the footwear ... before subscribing to the footwear package, the footwears present in the package will be displayed in the showroom and on the showroom's website ... a pair of footwear will be given to the consumer based on first-come first-serve and the provider will be taking care of the footwear maintenance.
9	Swapping	Person J visits the website of a footwear store ... she finds that she can exchange her footwear with an available pair of footwear within the same range ... she must pay only for the handling cost and the shipping cost.
10	Functionality	Person K visits a footwear store ... she plans to get footwear for six hours during her wedding ... she knows that she will not be wearing the same set of footwear again.

footwear, consumers can use an online configurator to make their shoes. Finally, in personalized footwear, consumers can go to the footwear store and use technologies like 3D-scanning and 3D-printing to get high-precision footwear with recycled components.

4.2 | Survey results

The quantitative results of the focused group interview including mean and standard deviation of practicality and interest for each scenario are presented in Table 3. The respondents thought that all the scenarios were practical, and they would be interested in shopping from such scenarios, as the average ratings were 5.47 and 5.34, respectively, for practicality and interest on a Likert scale of 7. Similarly, the respondents were able to relate these scenarios with the business models of other products, and what could be the advantages and limitations of the proposed scenarios. This shows that the proposed scenarios were well received by the consumers, and in the future, the footwear manufacturers and providers can develop their business model(s) around the proposed scenarios.

It was also identified that the age-group 16–24 thought that these scenarios were practical (6.3), and they will be interested in shopping from it (5.73) if these scenarios are available in the market. On the other hand, among all the age groups, the age-group 57–64

thought that these scenarios were comparatively less practical (5.01), and they were least interested (4.96) in shopping from these scenarios. However, there was not a huge difference in the perspective of the different age groups. An independent sample *t*-test is used to check the statistically significant difference between the groups A (16–40) and B (40+). Group A found scenarios 6 Advice and Consultancy ($p = .0043$) and 11 Functionality ($p = 0.0085$) to be more practical than the older age group. *T*-test also revealed that group A was more interested in scenarios 4 assembled ($p = .010$) and 10 swapping ($p = .0042$) than group B. Scenarios 2 take-back, 5 personalized, and 10 functionality were considered more preeminent scenarios by all age groups in terms of both practicality (6.61, 6.05, and 6.45) and interest (6.89, 6.24, and 6.39), respectively. On the other hand, scenarios 6 advice and consultancy, 7 renting, 8 sequential sharing, and 9 swapping were identified as the least preferred scenarios with comparatively lower average values of practicability (5.68, 5.50, 3.68, and 4.42) and interest (4.26, 4.03, 4.21, and 4.80).

4.3 | Consumer perception toward the proposed scenarios

The qualitative results of the focused group interview including the themes discussed for each scenario are presented in Table 4.

TABLE 3 Quantitative results.

#	PSS scenarios		Age-groups						Overall mean	SD
			16–24	24–32	33–40	41–48	49–56	57–64		
1	Maintenance and repair	Practicality	6.83	5.00	5.33	4.00	6.63	4.38	5.36	1.24
		Interest	6.83	4.83	5.83	3.57	6.75	4.75	5.35	1.32
2	Takeback	Practicality	7.00	6.33	6.50	6.43	6.75	6.75	6.63	0.50
		Interest	7.00	7.00	6.67	6.71	7.00	7.00	6.94	0.31
3	Assembled	Practicality	6.5	4.00	6.50	5.57	4.50	4.50	5.26	1.16
		Interest	7.00	6.00	6.33	5.86	5.63	5.63	6.02	0.77
4	Customized	Practicality	6.33	4.83	6.83	6.57	5.75	5.75	6.01	0.91
		Interest	4.33	4.17	6.67	6.00	5.25	5.25	5.00	1.08
5	Personalized	Practicality	6.67	6.33	6.33	6.29	5.5	5.75	6.15	0.77
		Interest	6.33	6.33	5.67	7.00	6.13	6.00	6.36	0.71
6	Advice and consultancy	Practicality	7.00	5.83	6.17	5.29	6.00	4.75	5.84	0.93
		Interest	5.33	4.00	3.33	4.43	4.75	4.13	4.53	0.86
7	Renting	Practicality	6.00	5.50	5.50	5.71	5.00	5.63	5.56	0.73
		Interest	5.00	3.83	3.83	4.57	4.00	3.50	4.18	0.75
8	Sequentially sharing	Practicality	5.67	3.67	3.67	3.71	3.88	2.75	3.89	0.96
		Interest	4.33	3.83	3.83	5.57	4.25	3.50	4.30	0.91
9	Swapping	Practicality	4.33	4.83	4.83	4.71	4.13	3.88	4.45	0.72
		Interest	5.17	5.33	5.33	5.14	4.63	3.75	4.80	0.90
10	Functionality	Practicality	6.67	6.83	6.83	6.43	6.25	6.00	6.50	0.69
		Interest	6.00	6.83	6.83	6.57	6.00	6.13	6.31	0.64

TABLE 4 Themes discussed with the respondents.

#	Description	Sustainability aspect	Applicable (expensive/economical)	Cultural issues	Hygiene issues	Merged with other scenarios	Can be offered by manufacturer/store
1	Maintenance and repair	Enhance footwear useful life	Both expensive and economical footwear	Availability of cobblers	-	Yes	- Footwear manufacturers offer DIY kits and third party. - Manufacturer offers through third party
2	Takeback	Enhance footwear useful life; recycling	Both expensive and economical footwear	Lack of second-hand shops	-	Yes	- Footwear stores offer discounts on expensive footwear. - Economical footwear can be sold to second-hand footwear shops.
3	Assembled	Belongingness with the product	Expensive footwear	Doubt over ease of assembling	-	-	Single brand footwear stores
4	Customized	Belongingness with the product	Expensive footwear	Online shopping might not show the actual color and texture	-	-	- Single brand footwear stores - Customize at footwear store
5	Personalized	Belongingness with the product	Expensive footwear	Long delivery time	-	-	Single brand footwear stores personalize at stores
6	Advice and consultancy	Informed utilization of footwear	Both expensive and economical footwear	-	-	Yes	- Footwear manufacturers offer general guidelines through videos, blogs - Third party experts provide suggestions toward style and fashion
7	Renting	Enhance utilization	Expensive footwear	Negative social image of wearing second-hand items	Spread of infections	-	Footwear stores mention exact price
8	Sequential sharing	Enhance utilization	Both expensive and economical footwear	Negative social image of wearing second-hand items	Spread of infections	-	Footwear stores as multiple brands of footwear are offered
9	Swapping	Enhance utilization	Expensive footwear	Negative social image of wearing second-hand items. Doubts about online shopping	Spread of infections	-	Both manufacturer and stores as online
10	Functionality	Enhance utilization	Expensive footwear		Spread of infections	-	Footwear stores helped by third party for logistics and designing

4.3.1 | Maintenance and repair

Overall, the respondents liked the idea of maintenance and repair services, as it can enhance the footwear's useful life. The respondents also suggested that for expensive footwear, some DIY kits can be

provided to the customer for maintenance and repair of their footwear. The respondents also suggested that the maintenance and repair services can be complimentary, as they do not want to pay any extra fee. Additionally, the duration of maintenance and repair services may not be very long, as some of the respondents did not intend

to use the footwear for longer than 3 years. Furthermore, some participants suggested that cobblers are economically available in India. As a result, visiting the footwear store for repair and maintenance of comparatively economical footwear might be more time consuming than getting it repaired by a nearby cobbler. If footwear manufacturers offer this scenario, they can outsource it to a third party, and owing to the costs of logistics, repair and maintenance can be provided for expensive footwear only. However, when it comes to the repair and maintenance of sportswear or trekking shoes that require skilled personnel, they are more willing to visit the store. The respondents also suggested that this scenario can be bundled with other proposed scenarios.

4.3.2 | Takeback

It was found that all respondents had a few pairs of footwear that were less or never used. Some respondents also suggested that takebacks for comparatively economical footwear in return of cash can happen in second-hand stores, whereas expensive footwear can be taken back by the manufacturer or store. Takebacks will ensure easier collection and recycling/refurbishment of footwear as compared to when footwear comes back through complicated reverse supply chain. As a result, the respondents thought that it would be great if they could get some value from such pairs of footwear as a discount on a new pair of footwear after returning those old pairs. Some respondents also thought that this scenario could be merged with the other proposed consumption scenarios and presented in the revised business models. Here, the parameter for checking wear and tear and the corresponding discounts can be mentioned explicitly. Similarly, the open-box pair of footwear provides more discounts than the pairs of footwear used. Further, the respondents suggested that they could get discounts on other footwear brands when the footwear store offers takeback.

4.3.3 | Assembled

The respondents liked the idea of changing modular parts of footwear and thought that the use of various modules can help in providing distinct and trendy looks. Similarly, respondents also suggested that they could change the color of the footwear to suit the event by using modules to assemble the footwear. Additionally, the respondents also suggested that shipping and packaging footwear modules would be easier. Overall, the respondents thought that the same pair of footwear with various modules can be used during various events such as trekking, jogging, casual wear, and party wear. However, respondents also thought assembling might be difficult for some people, and the process of assembling could further reduce the life of the footwear. Moreover, they suggested that the design and manufacturing costs of footwear with modular parts could be higher. Therefore, the assembly option could make a business case for expensive footwear.

4.3.4 | Customized

The respondents suggested that belongingness with customized footwear can lead to a longer footwear life. Respondents liked this scenario as they found online shopping convenient. Moreover, this scenario will also help in making footwear for people with foot-related disorders. However, during online shopping, they are not able to understand the texture and color of footwear. Therefore, they suggested that they would prefer to visit the showroom to try sample footwear and then customize their footwear at the showroom itself. While customizing and configuring footwear in the showroom, customers can also ask questions to showroom staff. Moreover, respondents also thought that efforts to facilitate footwear customization would further increase the price of the footwear. Likewise, the respondents were also concerned about the long time it might take to deliver footwear.

4.3.5 | Personalized

The respondents agreed that 3D-scanned and 3D-printed personalized footwear would be an amazing option, as they would obtain a designed footwear based on their own choice of color and footwear design. Similarly, at times, standard footwear does not support the anatomy of individuals who suffer from foot-related disorders; therefore, personalized footwear can help in such scenarios. Likewise, the recycled material used in this scenario was appreciated by the respondents. Some respondents also suggested that the technology involved in such scenarios would be more practical for expensive footwear. However, a few respondents also argued that this scenario would be more feasible when 3D-printing becomes more economical. The respondents also suggested that the 3D-printed footwear sample can be available in stores for consumers. Finally, in this scenario, the respondents were concerned about the long time it might take to deliver footwear.

4.3.6 | Advice and consultancy

The respondents liked this scenario because they thought that it could lead to sustainability from the perspective of increasing the life of footwear through informed use of footwear and making them look trendy. The respondents also suggested that advice and consultancy may be complementary to the purchase of every footwear, and that they do not want to pay an extra fee to receive expert advice. Furthermore, such advice may be more relevant to trekkers and people who travel more frequently across different terrains and geography. Moreover, the respondents also suggested that footwear brands and experts can upload videos and blogs on the web regarding the events when a pair of footwear can be worn, and better use of footwear so that interested consumers can go through them. Additionally, the respondents suggested that this scenario could be offered for both expensive and comparatively economical footwear. Furthermore, the

respondents thought that this scenario may also be merged with all other scenarios.

4.3.7 | Renting

The respondents thought that this scenario will help in increasing the utilization of footwear and is relevant for people who like to follow fashion and keep multiple pairs of footwear. However, they also suggested that the exact footwear rental cost may be mentioned. Some respondents also thought that this scenario is more relevant for children of growing age. Further, the respondents were also concerned about hygiene issues and infections like COVID19 that can spread while wearing footwear that has already been used by someone else. Moreover, this scenario will allow more consumers to wear expensive footwear. In addition, according to the respondents, footwear in trend might be rented for a higher price as compared to the footwear that is not in trend. Furthermore, for trekking shoes, the rental period may be further shortened to 3–6 months. Respondents also thought that the latest design footwear could be rented to the elite consumers, and later they could be rented to other consumers at a comparatively lower price. Some consumers also suggested that they were personally ready to wear rented footwear; however, they would not like society to know that they were wearing rented footwear.

4.3.8 | Sequentially sharing

The respondents found this scenario to be cost effective and sustainable because they could wear multiple pairs of footwear without owning them. The respondents also thought that this scenario is not suitable for people who follow footwear trends, and therefore, they like to own multiple pairs of footwear. As a result, sequential sharing of footwear may not always guarantee the availability of their preferred pair of footwear. Additionally, the respondents also argued that all footwear in the package may not be equally attractive, and there might be more than one consumer who would like to wear the same pair of footwear. Similarly, respondents were also concerned about the hygiene and cultural issues, and who would be responsible for the logistics and maintenance involved in this scenario. Overall, as this scenario offers multiple footwear options to select from the respondents suggested that this scenario could work for both expensive and comparatively economical footwear.

4.3.9 | Swapping

The respondents found this scenario to be sustainable because they would be able to enhance the utilization of footwear. Additionally, the respondents also thought that this scenario could be useful when consumers were bored with the same set of footwear and planned to swap their footwear that was in good condition with a new pair of footwear from the store. This scenario provides some value to the

money that they have already spent on the new and unused footwear which the consumers have not used. Furthermore, the respondents were concerned that it might be difficult to find footwear of the same price available for swapping. Moreover, according to the respondents, it would be easier for footwear stores to provide footwear swaps, and the stores can offer swaps among different brands. Likewise, owing to logistics concerns, this scenario seemed more practical for expensive footwear. Furthermore, some consumers were concerned about the hygiene and cultural issues they might face because of wearing used footwear.

4.3.10 | Functionality

The respondents found this scenario to be practical for expensive footwear that must be used during important events. Thus, this scenario would be able to increase the utilization of footwear, and consumers would be able to wear expensive footwear without owning it. However, the respondents were also concerned about the issues related to logistics and the availability of properly sized footwear when required. Similarly, they wanted to know how providers guaranteed hygiene issues. Although they are interested in getting footwear from this scenario, owing to social norms and cultural issues, it would be culturally difficult for them to wear such footwear. This scenario can be offered by footwear stores, and third parties can assist with logistics as well as designing footwear based on the theme of an event.

5 | DISCUSSION

The respondents suggested that all the proposed alternative consumption scenarios are comparatively more sustainable compared to the traditional ways of selling footwear for various reasons such as extending the useful life (scenarios: maintenance and repair, takeback), recycling (scenarios: takeback, personalization), belongingness (scenarios: assembled, customized, and personalized), informed utilization (scenario: advice and consultancy), and enhanced utilization (scenarios: renting, sequential sharing, swapping, and functionality). Furthermore, we identified that sustainability within the footwear ecosystem must also consider factors such as price, style, fashion, and personal comfort and confirmed the findings by a previous study (Luca & Loghin, 2016). The proposed alternative footwear consumption scenarios effectively address these factors alongside sustainability, providing a promising way forward.

Among all the 10 scenarios, the takeback scenario was perceived to be the most practical (6.63) and received the highest interest (6.94) from the respondents. It was considered practical because, from the consumer's perspective, only the footwear needs to be returned to the manufacturer or the store, making it easily compatible with the existing way of selling footwear. Similarly, the high interest may be attributed to the fact that it was the only scenario where consumers could expect to receive any return value (discounts) for their used pair

of footwear. The takeback scenario might also capture the interest of footwear manufacturers in India as it would eliminate the complexities of the reverse supply chain, which involves the footwear being returned to the manufacturer over a much longer period and includes informal actors such as rag pickers (Mont, 2002; Reim et al., 2015).

We found that Indian consumers appreciate the concept of merging scenarios such as maintenance and repair, takeback, and advice and consultancy with other alternative footwear consumption scenarios to enhance the sustainability of footwear ecosystems. These scenarios can be seamlessly integrated with existing footwear business models where direct sales to consumers occur. Importantly, the merging possibilities we propose have not been previously suggested in studies (Armstrong et al., 2015; Armstrong et al., 2016; Holtström et al., 2019; Johnson & Plepys, 2021). The advice and consultancy scenario received an interest rating of 4.53. With the availability of freely accessible videos and blogs on the web, consumers may not be inclined to pay extra for advice on footwear maintenance. Similarly, fashion bloggers and boutiques already provide suggestions on what kind of footwear to wear with specific dresses for different occasions, so consumers may not find it necessary to pay an additional amount.

According to the respondents, all 10 proposed scenarios are applicable to expensive footwear. This is because the logistics expenses involved in offering these scenarios, such as the cost of DIY kits, shipping, interactions with personnel for expert advice, and the use of technology for configurators, 3D scanning, and 3D printing, could increase the overall cost. Consequently, these costs would also increase the price of affordable footwear. Respondents believed that sharing expensive footwear through rental, sequential sharing, swapping, and functionality scenarios could be more cost-effective. Expensive footwear may not be affordable for everyone, but in scenarios like renting, sequential sharing, swapping, and functionality, consumers can use the footwear without owning them. On the other hand, there were four scenarios (maintenance and repair, takeback, advice and consultancy, and sequential sharing) that could be made available for comparatively affordable footwear. For instance, comparatively affordable footwear can be repaired by cobblers for the maintenance and repair scenario, and when not in use, it can be returned to second-hand stores for the takeback scenario. Lastly, in sequential sharing, multiple footwear options are available, making it suitable to have expensive footwear for special occasions, while comparatively affordable footwear can be worn casually. This analysis of logistic expenses and cultural issues was not performed in previous studies (Armstrong et al., 2015; Armstrong et al., 2016; Holtström et al., 2019; Johnson & Plepys, 2021).

Respondents also expressed concerns about hygiene issues related to scenarios like renting, sequential sharing, swapping, and functionality. These scenarios involve sharing and wearing footwear among strangers. Additionally, considering the study was conducted during the post-COVID period, proper hygiene was a significant concern. However, the renting, sequential sharing, and swapping scenarios were perceived as less practical with ratings of 5.56, 3.89, and 4.45, respectively, and received less interest with ratings of 4.18, 4.3, and 4.8, compared to the functionality scenario, which received higher

practicality (6.5) and interest (6.36). This may be attributed to the fact that the functionality scenario is not entirely new in India when it comes to fashion items. Expensive items like lehenga and sherwani, worn by the bride and groom on their wedding day, are already available based on the functionality scenario (Khaire, 2011). Therefore, incorporating footwear into the concept was seen as an extension of wedding attire, without any perceived harm to social image. Previous studies conducted in countries such as Finland, Sweden, and the United States (Armstrong et al., 2015; Armstrong et al., 2016; Holtström et al., 2019; Johnson & Plepys, 2021) did not report hygiene and negative social image issues when it came to sharing garments and clothing. Hence, footwear consumption scenarios can also mention the infection control technology or practices they employ to address hygiene concerns.

Respondents also highlighted various cultural issues (see Table 4) that they might face when getting footwear from the proposed alternative consumption scenarios. Even though these issues affect the feasibility of the proposed scenarios in India, it has not been addressed in earlier studies conducted in countries such as Finland (Armstrong et al., 2015; Armstrong et al., 2016), Sweden (Holtström et al., 2019; Johnson & Plepys, 2021), and the United States. (Lang & Armstrong, 2018). For example, the maintenance and repair scenario for economical footwear has been weakened by the availability of cobblers in India. Similarly, the respondents are willing to return their comparatively economic footwear to second-hand stores. Nevertheless, unlike many developed countries like Finland, there is a lack of second-hand footwear stores in India. Moreover, the respondents are concerned about the ease of footwear assembly in the assembled scenario. The availability of economic labor in India allows the outsourcing of assembling tasks in India (for example, IKEA stores in the Indian market collaborate with third parties). The difficulties in assembling were not evident in studies (Armstrong et al., 2015; Armstrong et al., 2016; Holtström et al., 2019; Johnson & Plepys, 2021) conducted in countries like Finland, Sweden, and the United States.

Both the personalized and customized scenarios involved the use of technology. However, the personalized scenario was considered more practical (6.15) and received higher interest from respondents (6.36), compared to the customized scenario with practicality rated at 6.01 and interest at 5.0. This may be attributed to the fact that the personalized scenario utilized 3D scanning and 3D printing technology to offer highly comfortable footwear. On the other hand, the customized scenario provided an online platform where consumers could configure and build their own footwear. Additionally, in the personalized footwear scenario, consumers had the opportunity to visit the store and view footwear attributes such as color and texture, which were not available on the online platform offered by the customized scenario.

Furthermore, the respondents also had reservations regarding online shopping in customized, personalized, and swapping scenarios. These reservations were based on the understanding of the texture, color, and size of the footwear. However, such reservations were not reported in PSS scenarios proposed in earlier studies (Armstrong et al., 2015; Armstrong et al., 2016; Holtström et al., 2019; Johnson &

Plepys, 2021) conducted in countries like Finland, Sweden, and the United States.

In addition, the respondents also suggested who can offer an alternative consumption footwear scenario. For example, manufacturers and stores can offer maintenance, repair, and swapping. The manufacturer can offer maintenance and repair by providing DIY kits, and customers can visit footwear stores for maintenance and repair. Since footwear needs to be swapped online, it can be offered by both manufacturers and stores. On the other hand, footwear stores can offer scenarios such as takeback, sequential sharing, and functionality. If footwear needs to be returned to the manufacturer without involving the stores, then the reverse supply chain of the takeback scenario will be complicated because of the involvement of multiple actors, such as ragpickers and logistics companies involved in disposal, whereas the reverse supply chain would be easier if the consumer can return the footwear to store and then the store returns the footwear to the manufacturer. Similarly, the costs involved in the logistics of sequential sharing are more economical when footwear stores offer this scenario. The scenarios assembled, customized, and personalized involve assembling components and tailoring of footwear toward the needs of consumers; therefore, it could be easier for single-brand footwear stores to offer these scenarios. Likewise, personalized scenarios can be offered once the cost of 3D-printing becomes more economical, and they are more often used. The general guidelines of advice and consultancy can be offered by footwear manufacturers, as they do not need to deal directly with customers, whereas footwear styles and fashion can be provided by footwear experts. Finally, the footwear functionality scenario included both footwear stores and third parties. The role of footwear stores is to provide footwear, whereas a third party is involved in logistics and designing the footwear toward the theme of the event.

6 | CONCLUSIONS

The present research focuses on expanding the useful life of footwear that has not yet reached its end of life. We identified that most scientific literature considers alternative sustainable consumption scenarios for clothing and garment products. However, no studies have presented an alternative sustainable approach for footwear consumption. As a result, the current research first identified eight alternative sustainable fashion consumption scenarios proposed in scientific literature. Further, 10 alternative sustainable footwear consumption scenarios were proposed with the help of identified scenarios from the scientific literature. Finally, the perceptions of Indian consumers toward the proposed footwear scenarios were investigated.

Overall, we identified that Indian consumers have shown mixed results regarding PSS-oriented alternative footwear consumption scenarios. For example, the scenarios like takeback, personalized, and functionality received more interest and were more practical, whereas scenarios like renting, sequential sharing, swapping, and advice and consultancy received comparatively less interest and were less practical. This difference was due to the negative social image of using

second-hand items and lack of shops consisting of second-hand items, and hygienic issues with the use of wearing second-hand items. Furthermore, scenarios like assembled, customized, and maintenance and repair received medium interest and were deemed to be medium level practical due to availability of cobblers, doubt over ease of assembling, and concerns over the understanding of texture and color during online shopping.

6.1 | Theoretical implications

The 10 proposed alternative footwear consumption scenarios can serve as a foundation for developing sustainable scenarios for other fashion products, including handbags, luggage, watches, and jewelry. Additionally, the insights gained from our study can help in further aligning the proposed scenarios with the preferences and perspectives of consumers from other developing and developed countries.

6.2 | Managerial implications

Our study serves as a pilot study for footwear stakeholders aiming to make the footwear ecosystem in India sustainable through strategic business changes. The findings offer valuable insights into Indian consumers' attitudes and preferences regarding alternative footwear consumption scenarios, which can inform product development, marketing strategies, and sustainability initiatives within the footwear industry. In the next phase, it would be beneficial to investigate the proposed scenarios from the perspectives of other footwear stakeholders, such as manufacturers, stores, and third-party providers in India.

First, we identified that the Indian consumers like the idea of merging scenarios, such as maintenance and repair, takeback, and advice and consultancy, with other alternative footwear consumption scenarios to make footwear ecosystems more sustainable. These scenarios can also be merged with the existing footwear business models, where the footwear is sold to the consumer.

Second, we identified that because of logistic expenses such as availability of DIY kits, shipping, interaction with experts, and technology involved, all the proposed alternative footwear consumption scenarios are feasible from the perspective of expensive footwear in India. Only three scenarios, namely takeback, advice and consultancy, and renting, are feasible from the perspective of comparatively economical footwear.

Third, we also identified the cultural issues and hygiene issues relevant to the proposed alternative footwear consumption scenarios that are feasible in India. The cultural issues were related to the availability of cobblers, lack of second-hand footwear stores, lack of assembly skills, reservations over online shopping, and social reproach while using second-hand items, whereas the hygiene issues are related to the spread of infections while wearing used or second-hand footwear.

In addition, we identified the stakeholder(s) involved in offering the proposed alternative footwear consumption scenarios from the Indian perspective. As maintenance and repair and advice and

consultancy footwear scenarios do not involve consumer interaction, therefore, these can be offered by footwear manufacturers. The scenarios of takeback, renting, sequential sharing, and functionality involve more interaction with the consumer; therefore, these can be offered by footwear stores. Furthermore, the scenarios assembled, customized, and personalized need consumer interaction and use of technology; therefore, these can be offered by single-branded footwear. Finally, for the customized footwear scenario, they can complement their online store, with a physical outlet that can be offered by both manufacturers and stores or outsourced to a third party.

6.3 | Limitation and future work

Since there were no PSS scenarios available in the literature, the proposed scenarios were derived from PSS fashion scenarios identified during the literature review. In the future, alternative footwear consumption scenarios can draw inspiration from relevant scenarios existing in other fashion products, such as handbags, luggage, watches, and jewelry. Furthermore, despite providing clarifications regarding the meaning of the terms “practical” and “interest” during the focus group interviews, we acknowledge that there may still exist some potential for bias due to variations in how participants interpreted these terms. The following research avenues can build upon our work. First, it is essential to investigate the practicality and interest of the proposed alternative scenarios from the perspective of other stakeholders involved in the manufacturing and supply chain of footwear in India. Additionally, a gamification tool can be developed to identify the most suitable alternative footwear consumption scenario(s). For instance, the practicality of proposed scenarios like takeback should be evaluated considering the viewpoints of other footwear stakeholders. Second, studying the footwear business models proposed in our research with consumers from different countries and cultures is crucial. This approach can shed light on issues related to hygiene, online shopping, and negative social perceptions associated with wearing second-hand items, which are relevant beyond India. By comparing the results, valuable insights into the cross-cultural environment can be obtained. Third, research efforts should focus on overcoming challenges encountered in the proposed scenarios, for example, determining the appropriate percentage of discount offered in the takeback scenario and developing and testing state-of-the-art solutions to address hygiene-related concerns. Overall, the findings of our study, along with future research, will contribute to understanding the technical requirements such as design, production, and material selection, facilitating the development of a sustainable business model that addresses the concerns of all stakeholders involved in Indian footwear manufacturing.

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CONFLICT OF INTEREST STATEMENT

The authors report that there are no competing interests to declare.

ORCID

Sameer Mittal  <https://orcid.org/0000-0002-8334-1446>

Muztoba Ahmad Khan  <https://orcid.org/0000-0002-2668-1057>

Vinod Yadav  <https://orcid.org/0000-0001-6535-609X>

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