

## PERCEPTION OF FRUGAL INNOVATION PRACTICES AMONG EMPLOYEES IN PAKISTANI SMES

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### ABSTRACT

This study aims to investigate the perception of employees regarding “frugal innovation” strategies in SMEs of Pakistan focusing on differences in demographic profile like age, gender, job roles and firm size, drawing on the sample of 305 respondents from different SMEs of Pakistan, and by employing Analysis of Variance (ANOVA) as the analytical approach, the study reveals compelling findings. For example, the study found, significant differences in perception of frugal innovation between male and female respondents, particularly in terms of frugal functionality and cost, highlighting the need for gender inclusive strategies in SMEs’ innovation efforts. Hence, Policymakers and practitioners should promote sustainable growth and competitiveness in the SME sector by developing targeted and efficient frugal innovation strategies that address the diverse perspectives and priorities of different groups within SMEs.

**Keyword:** Frugal innovation, SMEs of Pakistan, Gender differences, Demographic profile.

### INTRODUCTION

Frugal innovation is described by its emphasis on cost reduction, ease of use, resource optimization, and meeting the demands of bottom of the pyramid customers (Ahuja, 2021). These basic characteristics force SMEs to Develop economical products and services by optimizing processes, emphasizing on core operations, and maximizing resource efficiency (Yousaf et al., 2021a). By fostering frugal innovation, SMEs in Pakistan can efficiently utilize scarce resources, create value with limited inputs, and quickly respond to market demands (Ur Rehman et al., 2024). Frugal innovate empower SMEs to enhance competitiveness, improve productivity, and take advantage of growth opportunities in a frugal and sustainable manner (Rossetto et al., 2023), aligned with the dynamic business environment.

Frugal innovation in Pakistani SMEs can boost frugal product creation and cultivate a culture of creativity and adaptability within these organizations (Lei et al., 2021). SMEs can rapidly respond to dynamic market demands and consumer preferences by focusing on core functionalities. SMEs can enhance sustainability by focusing on resource

optimization, to maximize their limited resources (Zafar & Mustafa, 2017). Moreover, frugal innovation enables SMEs to increase their influence by accessing new markets and promoting economic growth. This strategy boost competitiveness of Pakistani SMEs and enhance country's economic growth by focusing on innovation, efficiency, and market adaptability (Ur Rehman et al., 2024).

Furthermore, frugal innovation facilitates SMEs in efficiently addressing economic challenges, market uncertainties, and resource constraints. SMEs in Pakistan can create cost-effective and innovative solutions to meet market demands by optimizing processes, focusing on essential features, and enhancing resource efficiency (Bhutto, n.d.), this strategy enhances the competitiveness of SMEs. Frugal innovation enables SMEs to stay adaptable, improve productivity, and take advantage from opportunities in a dynamic business environment, aligned with the specific challenges and possibilities in the SMEs (Bhutto, n.d.).

### **Literature Review**

In the present dynamic and competitive business environment, organizations need to gain competitive advantage in order to sustain their market position, increase profit margins, drive business growth, secure customer loyalty, elevate brand recognition, and improve customer satisfaction (Na et al., 2019). Innovation is necessary for competition at both the national and organizational levels as it enhance the economic growth, and competitiveness (Battisti et al., 2020). Lei et al., (2020) and Shafique et al., (2020), found that innovation is key for economic development as well as helps organizations in maintain and sustaining competitive advantage in their respective industries. SMEs in emerging economies face challenges in responding to global innovation trends due to limited knowledge and technology (Yousaf et al., 2021b). In addition, SMEs play a significant role in "innovation management". Thus, different research has emphasized on the importance of innovation and collaboration for SMEs in emerging and developing economies to improve their competitiveness (Kaminski et al., 2008; Lewandowska & Cherniaiev, 2022).

Specifically, organizations in developing and emerging markets have limited financial resource that restrict their capacity to spend on research and development, hence organization become unable to compete globally. As a result, businesses have been forced to reassess their innovation strategies, that give rise to idea of "frugal innovation" (Dost et al., 2019; Pansera, 2018). Frugal innovation, a trending notion, is seen as the future of innovation management. (Khan, 2016). Frugal innovation captures the eye of academic researchers after the work of Zeschky et al., (2011) "Frugal innovation in emerging markets," regarded as a pioneer in field frugal innovation. The term "frugal innovation" was not widely known until Zeschky et al.'s (2014) study "Frugal innovation in emerging markets," which is considered as one of the pioneers of frugal innovation. Frugal innovation refers to a company's ability to innovate while facing resource constraints to produce cost-effective, sustainable, and user-friendly products or services that focus on core functionality. Rossetto et al., (2023) highlighted three dimensions of frugal innovation: frugal functionality, frugal cost, and frugal ecosystem.

Frugal functionality refers to the company's ability to identify and prioritize core functionality to achieve durability and ease of use. Frugal cost refers to a

company's ability to significantly remove the materials cost and offer cost-effective products or services (Rossetto et al., 2023). Shared sustainable engagement is a business strategy that emphasis on forming partnerships with community stakeholders to develop innovative solutions mitigating social and environmental challenges, while boosting environmental sustainability in production, innovation, and operations(Rossetto et al., 2023). These facets of frugal innovation are widely recognized as most reliable measures (Rossetto et al., 2017, 2023; Ślęzak & Jagielski, 2018).

### **Objectives of the Study**

The study throws light to achieve the following objectives.

- To analyze the perception about frugal innovation in SMEs of Punjab Pakistan.
- To understand the difference of perception about frugal innovation in SMEs regarding demographics.

### **Materials and Methods**

This study considered the population of supervisory staff employed in SMEs of Pakistan. 260 SMEs were selected using convenience sampling technique. The SMEs are selected based on staff count criterion in compliance with State Bank of Pakistan regulations from three major cities of large province Punjab. A sample of 305 supervisor staff from different departments of SMEs was selected through convenient sampling and targeted through a personal interview or via questionnaire. This sample included respondents with different demographic profiles employed in different departments of SMEs.

### **Instrument**

A questionnaire was prepared with two sections. The first section has seven items related to the demographics of employees. This demographic section contained questions about gender, qualification, respondent role, industry type, and location. The second section was for measuring perception of frugal innovation in the SMEs. Perception of Frugal innovation was measured using 10 item scale developed by Roseeto et al (2022). Five points Likert scale ranging from "Strongly Disagree=1" to "Strongly Agree=5" was utilized to gauge the response. Reliability and validity were assessed using alpha values (Table 1). To ensure precision and accuracy of data and elimination of any

anonymous reservations related to confidentiality, each participant was personally acquainted with the purpose of the study.

**Table 1: The Reliability Estimates of statements**

Dimensions	Statements	Alpha Values
FI1	<i>“In the Development of products/services, your company has assigned great importance to core functionality rather than additional functionality”.</i>	0.827
FI 2	<i>“In the Development of products/services, your company has assigned great importance to ease of use of products/services”</i>	0.799
FI 3	<i>“In the Development of products/services, your company has assigned great importance to durability of the products/services”.</i>	0.727
FI 4	<i>“In the Development of products/services, your company has assigned great importance to solutions that offer “good value” products”.</i>	0.855
FI 5	<i>“In the Development of products/services, your company has assigned great importance to significant cost reduction in the operational process”.</i>	0.885
FI 6	<i>“In the Development of products/services, your company has assigned great importance to savings of organizational resources in the operational process”.</i>	0.838
FI 7	<i>“In the Development of products/services, your company has assigned great importance to rearrangement of organizational resources in the operational process”.</i>	0.727
FI 8	<i>“In the Development of products/services, your company has assigned great importance to efficient and effective solutions to customers’ social/environmental needs”.</i>	0.81
FI 9	<i>“In the Development of products/services, your company has assigned great importance to environmental sustainability in the operational process”.</i>	0.697
FI 10	<i>“In the Development of products/services, your company has assigned great importance to partnerships with local companies in the operational process”.</i>	0.845

The mean score of frugal innovation was calculated. One way ANOVA was used to check whether the mean score of frugal innovation dimensions was significantly different on the basis of age, qualification, industry type, and respondent role of supervisors in SMEs (the demographic variables). Significant value less than 0.05 suggests that there is significant difference among different group of variables in accordance with a particular statement.

**Results**

**One Way ANOVA To Determine Gender Wise Differences In Mindfulness Perception**

The analysis of frugal innovation perception based on gender utilizing a one-way ANOVA revealed interesting insights. Among the various statements related to frugal innovation perception, significant differences were observed based on gender (refer to Table 2). Each statement reflects a different aspect of frugal innovation, and the responses are rated on a

scale, ranging from 1 to 5 or similar. The F-value from the one-way ANOVA test, which measures the ratio of the variance between groups (in this case, male and female) to the variance within groups. It indicates whether there are statistically significant differences in the responses between male and female participants for each statement. The p-value is associated with the F-value. It indicates the probability of obtaining the observed F-value if the null hypothesis (i.e., no difference between male and female responses) were true. If the p-value is less than a predefined significance level (usually 0.05), it suggests that there is a significant difference between male and female responses for that statement.

Out of the several statements examined, seven specific statements stood out as significantly differing in perception between genders within the SME context in Pakistan. For example, "In the Development of products/services, your company has assigned great importance to core functionality

rather than additional functionality" and "In the Development of products/services, your company has assigned great importance to significant cost reduction in the operational process" both have p-values less than 0.05, indicating significant differences in responses between genders. Conversely three statements with a p-value greater than 0.05 do not have statistically significant differences in responses between males and females.

For example, "In the Development of products/services, your company has assigned great importance to ease of use of products/services" has a p-value of 0.439, indicating that there is no significant difference in responses between males and females for this statement. These results provide insights into how male and female participants perceive and prioritize different aspects of frugal innovation within their companies.

**Table 2:** One way ANOVA to determine Differences depending on Gender

Statements	Male	Female	F	Sig
<i>"In the Development of products/services, your company has assigned great importance to core functionality rather than additional functionality"</i>	3.5	3.9	5.900	0.016
<i>"In the Development of products/services, your company has assigned great importance to ease of use of products/services"</i>	3.46	3.6	0.600	0.439
<i>"In the Development of products/services, your company has assigned great importance to durability of the products/services"</i>	3.96	3.5	6.291	0.013
<i>"In the Development of products/services, your company has assigned great importance to solutions that offer "good value" products"</i>	4.49	4.88	4.517	0.034
<i>"In the Development of products/services, your company has assigned great importance to significant cost reduction in the operational process"</i>	3.42	3.85	5.132	0.024
<i>"In the Development of products/services, your company has assigned great importance to savings of organizational resources in the operational process"</i>	3.23	3.6	3.036	0.082
<i>"In the Development of products/services, your company has assigned great importance to rearrangement of organizational resources in the operational process"</i>	3.99	3.73	4.607	0.029
<i>"In the Development of products/services, your company has assigned great importance to efficient and effective solutions to customers' social/environmental needs"</i>	3.89	4.31	7.420	0.007
<i>"In the Development of products/services, your company has assigned great importance to environmental sustainability in the operational process"</i>	4.26	4.52	3.278	0.071
<i>"In the Development of products/services, your company has assigned great importance to partnerships with local companies in the operational process"</i>	3.45	3.77	6.245	0.013

**One Way ANOVA To Determine Age Wise Differences In Perception About Frugal Innovation**

This table 3 presents the comparison of responses across different age groups regarding various statements related to the perception about frugal innovation within Pakistani SMEs. Out of ten statements of frugal innovation, all statements were found to be significantly differ on the basis of age. To be more precisely, perceptions of SMEs employees were considered to have statistically

significant differences in responses across different age groups. For example, all statements in the table have p-values less than 0.05, indicating significant differences in responses across age groups for each statement. These results provide insights into how different age groups perceive and prioritize various aspects of product/service development within companies. The significant differences across age groups suggest that age may influence individuals' perspectives on these aspects of product/service development.



Table 3: One way ANOVA to determine Differences depending on Age

Statements	<25	26-35	36-45	46-55	Above 55	F	Sig
<i>"In the Development of products/services, your company has assigned great importance to core functionality rather than additional functionality".</i>	2.7	3.79	3.52	3.92	3.52	12.840	.000
<i>"In the Development of products/services, your company has assigned great importance to ease of use of products/services"</i>	3.2	2.92	3.49	3.79	3.32	6.819	.000
<i>"In the Development of products/services, your company has assigned great importance to durability of the products/services".</i>	3.7	3.8	3.07	3.43	3.11	11.049	.000
<i>"In the Development of products/services, your company has assigned great importance to solutions that offer "good value" products".</i>	3.6	3.94	3.59	3.7	3.41	5.657	.000
<i>"In the Development of products/services, your company has assigned great importance to significant cost reduction in the operational process".</i>	3.65	3.82	3.53	3.75	3.27	6.994	.000
<i>"In the Development of products/services, your company has assigned great importance to savings of organizational resources in the operational process".</i>	3.4	3.83	3.47	3.26	3.3	2.442	.046
<i>"In the Development of products/services, your company has assigned great importance to rearrangement of organizational resources in the operational process".</i>	4.48	4.02	4.45	4.39	4.2	4.952	.001
<i>"In the Development of products/services, your company has assigned great importance to efficient and effective solutions to customers' social/environmental needs".</i>	3.65	3.35	4.200	4.250	3.77	10.168	.000
<i>"In the Development of products/services, your company has assigned great importance to environmental sustainability in the operational process".</i>	4.2	3.79	4.390	4.480	4.09	6.943	.000
<i>"In the Development of products/services, your company has assigned great importance to partnerships with local companies in the operational process".</i>	3.55	3.17	3.370	3.760	4.45	6.857	.000

**One Way ANOVA To Determine Job Role Wise Differences In Perception About Frugal Innovation**

Table 4 presents the comparison of responses among different levels of employees (Owner, Top, Middle, Lower) regarding various statements related to the frugal innovation in SMEs. Out of ten statements six Statements with a p-value less than 0.05 are considered to have statistically significant differences in responses among different levels of

employees. For example, "In the Development of products/services, your company has assigned great importance to core functionality rather than additional functionality", "In the Development of products/services, your company has assigned great importance to durability of the products/services", and "In the Development of products/services, your company has assigned great importance to savings of organizational resources in the operational process" all have p-values less than 0.05, indicating

significant differences in responses among different levels of employees for these statements. These results provide insights into how employees at different levels within a company perceive and prioritize various aspects of frugal innovation

aspects. The significant differences between different levels of employees suggest that job roles and responsibilities may influence how these aspects are perceived and valued within the organization.

**Table 4:** One way ANOVA to determine Differences depending on Job Role

Statements	Owner	Top	Middle	Lower	F	Sig
<i>"In the Development of products/services, your company has assigned great importance to core functionality rather than additional functionality"</i>	3.86	3.76	3.810	4.120	9.82	0.00
<i>"In the Development of products/services, your company has assigned great importance to ease of use of products/services"</i>	3.67	3.65	3.320	3.250	3.47	0.016
<i>"In the Development of products/services, your company has assigned great importance to durability of the products/services"</i>	3.36	3.35	3.860	3.460	8.6	0.00
<i>"In the Development of products/services, your company has assigned great importance to solutions that offer "good value" products"</i>	3.4	3.17	3.720	3.030	9.09	7.67
<i>"In the Development of products/services, your company has assigned great importance to significant cost reduction in the operational process"</i>	3.87	3.24	3.090	3.620	10.5	1.083
<i>"In the Development of products/services, your company has assigned great importance to savings of organizational resources in the operational process"</i>	3.37	3.63	3.040	4.230	2.88	0.035
<i>"In the Development of products/services, your company has assigned great importance to rearrangement of organizational resources in the operational process"</i>	3.41	3.39	3.65	3.53	3.97	0.09
<i>"In the Development of products/services, your company has assigned great importance to efficient and effective solutions to customers' social/environmental needs"</i>	4.44	3.81	3.610	3.730	19.3	9.151
<i>"In the Development of products/services, your company has assigned great importance to environmental sustainability in the operational process"</i>	4.62	4.22	4.010	4.220	10	2.219
<i>"In the Development of products/services, your company has assigned great importance to partnerships with local companies in the operational process"</i>	3.67	3.51	3.360	3.370	3.68	0.012

**One Way ANOVA to Determine Perception of Employee About Frugal Innovation On Basis Of Firm Size**

This table presents the comparison of responses between small and medium-sized companies' employees regarding various statements related to frugal innovation. Out of 10 statements about frugal innovation aspects, seven statements with a p-value less than 0.05, as displayed in table 5, are deemed to exhibit statistically significant differences in responses between SMEs. For example, *"In the Development of products/services, your company*

*has assigned great importance to core functionality rather than additional functionality"* and *"In the Development of products/services, your company has assigned great importance to durability of the products/services"* both have p-values below 0.05, shows significant differences in responses between SMEs employees for these statements.

The results offer insights into how organizations of varying sizes view and prioritize different areas of product development through frugal innovation. Variances between small and medium-sized

enterprises indicate that company size can impact how these elements are viewed and appreciated.

**Table 5:** One way ANOVA to determine Differences depending on Firm Size

Statements	Small	Medium	F	Sig
<i>“In the Development of products/services, your company has assigned great importance to core functionality rather than additional functionality”.</i>	3.41	3.77	5.900	0.016
<i>“In the Development of products/services, your company has assigned great importance to ease of use of products/services”</i>	3.26	3.8	0.600	0.439
<i>“In the Development of products/services, your company has assigned great importance to durability of the products/services”.</i>	3.88	3.25	6.291	0.013
<i>“In the Development of products/services, your company has assigned great importance to solutions that offer “good value” products”.</i>	3.37	3.8	4.517	0.034
<i>“In the Development of products/services, your company has assigned great importance to significant cost reduction in the operational process”.</i>	3.3	3.75	5.132	0.024
<i>“In the Development of products/services, your company has assigned great importance to savings of organizational resources in the operational process”.</i>	3.23	3.35	3.036	0.082
<i>“In the Development of products/services, your company has assigned great importance to rearrangement of organizational resources in the operational process”.</i>	4.09	4.36	5.13	0.034
<i>“In the Development of products/services, your company has assigned great importance to efficient and effective solutions’ social/environmental needs”.</i>	3.72	4.3	7.420	0.007
<i>“In the Development of products/services, your company has assigned great importance to environmental sustainability in the operational process”.</i>	4.14	4.51	3.278	0.071
<i>“In the Development of products/services, your company has assigned great importance to partnerships with local companies in the operational process”.</i>	4.36	4.66	6.245	0.013

**Conclusion and Discussion**

This study examines how frugal innovation is perceived by employees of Pakistani SMEs, with a specific focus on its relevance and challenges in its implementation. Frugal innovation, marked by resourcefulness and efficiency, has great potential for small and medium-sized enterprises (SMEs) in Pakistan to overcome limitations including restricted financial resources and technological infrastructure. However, stakeholders within these organizations have varying perceptions of frugal innovation. The results show the perceptions of different groups within Pakistani SMEs regarding frugal innovation. The analysis conducted using one-way ANOVA explores significant differences in responses based on gender, age, job roles, and size of firm, by

offering crucial insights into how these organizations perceive frugal innovation. Firstly, gender comparison depicts significant differences in perspective of male and female participants regarding several aspects of frugal innovation. Statements regarding frugal functionality and frugal cost highlights significant differences, indicating varying perceptions across male and female participants. This underscores the importance of including gender perspective when creating and executing frugal innovation strategies in SMEs. The analysis across multiple age groups highlights the influence of age on the perception of frugal innovation strategy. The findings emphasize the significance of recognizing age diversity in organizations and customizing frugal innovation strategies to cater to the needs of various age demographics.

Furthermore, comparing different job roles in SMEs reveals significant variation in how frugal innovation is perceived based on their roles and duties. The hierarchical structure of employment effect perception and value of frugal innovation characteristics in SMEs, highlighting the need for inclusive decision-making processes to align with organizational objectives. Lastly, when comparing small and medium-sized enterprises, there are notable differences in how frugal innovation is seen, on the basis of company's size. Organizational size has a substantial impact on frugal innovation strategies.

Overall, the findings provide valuable insights into the intricate dynamics of frugal innovation perception in Pakistani SMEs. Policymakers and practitioners can foster sustainable growth and competitiveness in the SME through frugal innovation strategies that cater the diverse perspectives and priorities of different groups within SMEs.

#### Future Research Direction

The utilizes the empirical data, sourced from the Pakistani SMEs, may possess broader applicability; however, industry-specific characteristics could influence results. Therefore, we encourage future research to explore specific SME sectors, such as sportswear, electric fans, etc. to further validate our findings. Although the study investigates some demographic variables, it is essential to recognize that other factors could also play a crucial role. For instance, the type of industry, and geographical location, can also significantly influences frugal innovation. Future research should consider these multifaceted influences to gain a more comprehensive understanding.

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