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PROCUREMENT PROCESS IN MICRO, SMALL, AND MEDIUM ENTERPRISES: CASE STUDY BY USING BUSINESS CANVAS MODEL

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Abstract

Procurement process is an important function in any business. According to the studies 60 to 70% of the cost is involved in materials cost component. Many Micro, small and medium enterprises not aware of the procurement process in detail and most of the time they are procurement materials on spot purchase instead of three months in advance and most of the organizations do not have procurement planning. For this purpose we have conducted a field research for micro, small and medium enterprises in India to understand the present procurement process by using business canvas model and their business complexity while procuring the materials and analysed 34 companies starting from engineering, manufacturing, food processing and printing works and compiled the data, value proposition, pros and cos of company business process and improvement measures are discussed in this research paper.

Key words. Procurement Strategy, Competitiveness, Design Thinking, Business Canvas Model

1. INTRODUCTION

Micro, Small and medium enterprises are backbone of Indian economy. This sector contributes 30% of GDP and making critical role for achieving 5 trillion economy India is the 5th largest economy improved from 10th position in 2014 to 5th position in this year want to become 3rd largest by 2030. India GDP aiming 5 trillion economy micro small and medium enterprises will contribute 1 trillion by 2028. The Government of India initiated production linked incentive schemes to create value chain which helps MSME sector to scale up their operations. MSME contributes 30% of the workforce and 50% of the exports. 16,000 to 17,000 companies' turnover is above 100 crores. According to the National Sample Survey (NSS) MSME sector has been creating 11.1 crore jobs. According the NSS Survey 2015-16 manufacturing sector has been creating 360 lakhs jobs, trade creates 387 lakhs and service sector creates 362 lakh jobs. In order to improve MSME competitiveness Government of India initiated to focus on access to credit, upgradation of technology, equity inclusion, adoption of green technology and improvement of procurement process and digitalization of their business process. Credit Guarantee Fund Trust for Micro Small and Medium enterprises an amount of Rs.9,000 crores in the corpus starting from April 2023. According to the Government of report for INS Vikrant, Navy 500 MSME's are involved and 12,000 people in ancillary industries working with NAVY to develop INS Vikrant (Economic Survey 2022-23). To achieve self-reliance government of India initiated Product Linked Incentive Schemes approximately 3 lakh crores and creating 60 lakh employment generation which is about 17 to 20 percent in manufacturing sector between FY12 and FY20. Indian MSME sectors in textiles, engineering, pharmaceuticals, chemicals and apparels has strong manufacturing capabilities. Opportunities emerging from new business verticals like renewables, aerospace and hi tech semi-conductors as India transition in green and sustainable future. Indian MSME sector lagging the best practices of procurement process, high cost of capital and creation of value chain. The following table 1. Shows the MSME classification in India with effective from 1st July 2020.

Table 1. Classification of Micro, Small and Medium Enterprises

Classification	Micro	Small	Medium
Manufacturing and Services	Investment in Plant and Machinery or Equipment up to Rs.1 crore and Annual Turnover does not exceed Rs. 5 Crore	Investment in Plant and Machinery or Equipment up to Rs.10 crore and Annual Turnover does not exceed Rs. 50 Crore	Investment in Plant and Machinery or Equipment up to Rs.50 crore and Annual Turnover does not exceed Rs. 250 Crore

2. DESIGN THINKING

Design thinking is a process where organizations are used to solve problems and innovative solutions (Brown, 2008). This process can be applied for development of new products and services wide range include selling solar panels to booking in hotels online. The process involves understand the problem, wide range of possible solutions, prototyping and testing (Rebecca Linke (MIT, September 14, 2017). The main essence of design thinking is human centric approach and user specific. The foremost step in design thinking is the empathy study where the research has to understand inherent feeling of the end user. There are four stages are involved in design thinking process. (Esther Han, HBS Online, 18th January 2022).

1. **Clarify:** This is the first stage to understand the problem and come out with best solution. In this stage we can collect the facts and gathering information. Once observations are

collected next step is frame insights based on the facts and data.

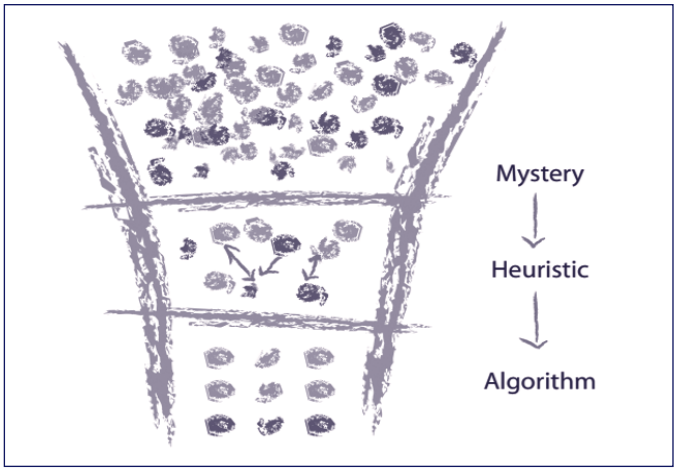
2. Ideate: In this stage systematic investigation of innovative ideas that the problem solution you have identified.

3. Develop: In this stage involved possible solutions from the ideas generated in the second stage which includes prototyping, testing, experimenting and concept viability

4. Implement: In this process starting testing and identifying results and strategies for implementation of new ideas.

The main advantage of design thinking is process for innovation. According to the Roger Martin's three stage funnel involved ideas to be organized, various choices are made and situations can be improved.

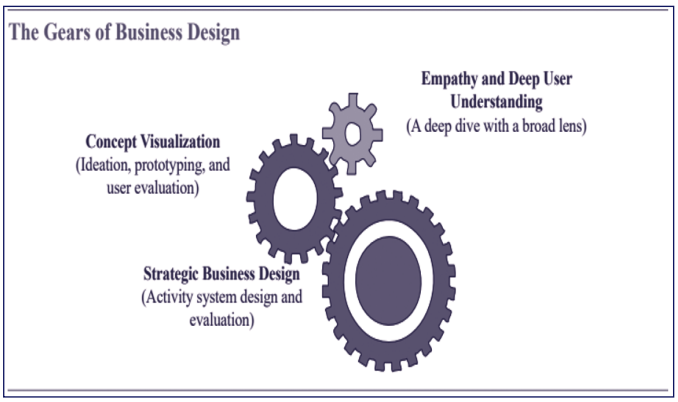
Fig. 1. Knowledge Funnel



(Source: Roger Martin, 2009, The Design of Business: Why Design thinking is competitive advantage, Harvard Business School)

According to Heather Fraser Design thinking can be used in the design of strategies and business models to create economic and human value and improve organizational performance. According to author there are three stages of gears of business design: Deep understanding of the business, Concept visualization and Strategic business design as shown in the Fig.2.

Fig. 2. The Gears of Business Design (Source: Heather Fraser, 2009, Designing business: New Models for Success, Design Management Review)



Gear 1: Deep Understanding of the user: The first step is deep understanding of the customer and their business entity.

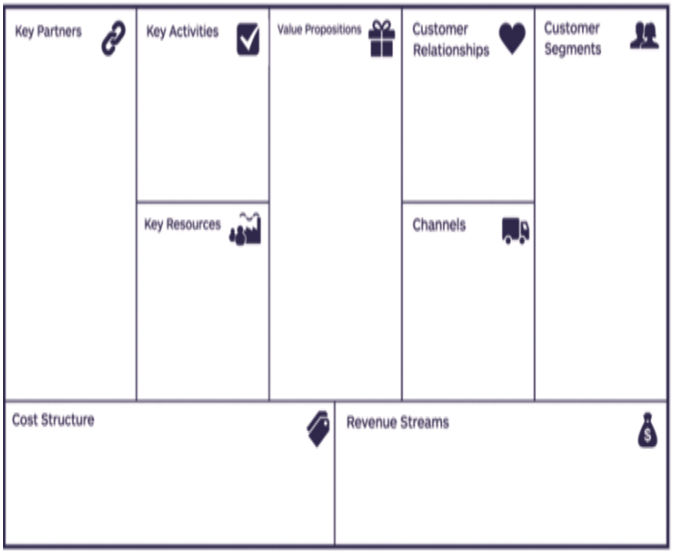
Gear 2: Concept Visualization; In this stage we have to understand possibilities not constraints criteria for innovation and multiple prototyping concepts can be developed.

Gear 3: Strategic Business Design: Well, defined, user inspired solutions align with the broad ideas. At this stage identifying the drive for successful solutions, prioritize the activities and deliver the strategies.

3. BUSINESS CANVAS MODEL

The Business model canvas relates to strategy development. It involved nine blocks answers the questions about who is your customers, what the value created by you for your customers, how the revenue will be generated from your business and what are the costs involved in your business. Who is your customer segments, what are your key resources and key activities and channels of distribution. The following fig.3 shows the business canvas model.

Fig. 3. Business Canvas Model (Courtesy: Strategyzer)



4. RESEARCH METHODOLOGY

A field study was conducted in India between February 2022 to May 2023 in India to understand the present procurement process. A business canvas model was used to understand the each company business process, business complexity and their delivery mechanism. The study was conducted through interview and take prior appointment with the micro, small and medium enterprises. The turnover of the companies ranging from one crore to 150 crores was evaluated. The various business process owners include engineering, manufacturing, printing business, job work. The manpower working these companies ranging from 20 people to 200 people. The interview is interacted with Business owners, managing partners and managers and supervisors to understand their business very well and decision makers in business. The following table gives the company name, type of business and turnover, value proposition and customer segments.

Table 2: Summary of the Organizations done the study on procurement process.

S.No.	Name of the Company	Type of Business	Turnover (Crores)	Value Proposition	Customer Segments	Category
1.	Optomech Engineering, Hyderabad	Optical Measurements, Engineering Metrology, Light engineering company	10	1.Latest Vision Technology 2.Automated Inspection 3.Optical Measurement software	1.Pharma 2.FMCG 3.Pesticide 4.Lubricant	Small
2.	Tool Tech, Hyderabad	Manufacturing of Dairy equipment and water plants	5	1.Customiztion 2.Design 3.Competitive Price 4.Quality	1.Dairy 2.Food Processing 3. Distillery	Micro
3.	AOF Filtrations Systems, Hyderabad	Manufacturing of all types of filters for water and oil application.	10	1.Customization 2.Variety 3.Design 4.Quality	1.Cement 2.Pharma 3. Power Plant 4. Engineering	Small
4.	Cosmos, Pune	Manufacturing of lifts for construction and form work	100	1.Customization 2.Quality 3.Design	1.Contractors 2.Consturction manufacturers	Medium
5.	Bunty Surgical, Hyderabad	Manufacturing of Hospital beds and other accessories for Hospitals	10	1.Customization 2.Consistent Quality	1.Hospitals 2.Dealers	Small
6.	Vanguard, Hyderabad	Fabrication of Heat Exchangers and Coolers	10	1.Customization 2.Quality 3. Design 4. Service	1.Food 2.Pharma 3. Engineering 4.Defence	Small
7.	High End Fan Manufacture (Company does not want to disclose their name), Bangalore)	Manufacturing of customized Luxury fans	50	1.Luxuray 2.High End 3.Customization	1.Hotels 2.shopping malls 3.Function Halls	Small
8.	Sri Jyotirmoyee Tool Craft, Hyderabad	Manufacturing of CNC components	3	1.Quality 2.Good Manufacturing Capability 3.Trained Manpower	1.Public Sector: BHEL, BDL, ECIL 2.Private: Megha Engineering	Micro
9.	Superior Weldmesh, Nagpur	Manufacturing of wire mesh as per customer orders.	50	1.Accuracy 2.Consistency in quality 3.Customization	1.Contractors 2. Real Estate 3. Dealers	Small
10.	Mill Master Machining, Bangalore	Manufacturing of rice mill machinery and spares	40	1.Customization 2.Quality 3. Trained work force	1.Rice Mill owners 2.Dal and Pulse Mill Owners	Small
11.	Mill Smart Engineers, Hyderabad	Manufacturing and export rice mill machinery	40	1.Customization 2. Quality	1.Rice Mill owners 2.Oil Mill Owners	Small
12.	Ami Polymers, Silvassa	Manufacturing exporting of oils seals, hoses and braided hoses	175	1.In House R and D 2.Customization 3.Quality and Delivery	1.Pharma 2Chemical 3.Engineering 4,Brewveries	Medium
13.	Revaron, Bangalore	Manufacturing of Laboratory equipment	2	1.In House R and D 2. Customization	1.R and D Labs 2.Pharma 3.Engineering	Micro

14.	Vardhman Tube Mill, Umbergoav	Manufacturing and exporting Ss pipes and fittings	100	1.Own Mill 2.Consitent Quality 3.competitive rates	1.Pharma 2.Chemical 3.Engineering	Medium
15	Swatch Air Filters, Nagercoil	Manufacturing of Hepa filters and filters for AHU	2	1.Media from SIFA-Italy 2.In House Machining	1.Pharma 2.Engineering 3.Health Care	Micro
16.	X2 Engineers, Rajkot	Manufacturing of Globe, Check and Ball valves	10	1.In House Castings 2. Quality	1.Pharam 2 Chemical 3.Enginnering 4.Food Processing 5.Dairy	Small
17	Ultra Filter Air System, Hyderabad	Manufacturing of Hepa filters, Filters for AHU	18	1.Customization 2.In House Fabrication	1.Pharma 2.Hospitals	Small
18	Omkar Modular, Mumbai	Manufacturing of storage racks for pharma and engineering	6	1.Customization 2.In House fabrication	1.Pharma 2.Engineering 3.IT	Small
19	Sampath Engineering Works, Hyderabad	Manufacturing of lifts for construction sites	3	1.Special purpose 2.Good Service	1.Builders 2.Construction Contractors	Micro
20	Hoffen Plastics, Hyderabad	Manufacturing of Moulds for plastic industry	12	1.Design 2.Customization	1.Pharma 2.Electrical 3.Packing	Small
21	Mekins Industries, Hyderabad	Manufacturing of metal pallets and cage boxes and trollies equipment for Malls and export units	100	1.Customization 2.Good Engineering workshop 3.Trained Manpower	1.Retail Stores 2.Export units 3.Engineering	Medium
22	Maruthi Tooling, Hyderabad	Manufacturing of moulds	1	1.Design 2.Manufactuirng	1.Plastic part 2.Electircal	Micro
23	G V Polytch Pvt Ltd, Hyderabad	Manufacturing of Oil seals, Trunnion shaft bushes	1.5	1.In house design 2.Manufactuirng	1.Power Plants 2.Defence	Micro
24	Veljan Hydriair, Hyderabad	Manufacturing of Hydraulic equipment	100	1.Cusotmization 2. In house R and D	1.Engineeering Companies 2.Export to Thailand	Medium
25	OM Express Print Pack	Contract packing for pharma and engineering	1	1.Cusotomization 2. Service	1.Pharma 2.FMCG 3.Food Processing	Micro
26	HS Containers, Hyderabad	Manufacturing of PVC Drum packing	16	1.Customization 2.Standardization	1.Pharma 2.Chemical 3.Bio Tech	Small
27	Gajanana Cranes, Hyderabad	Manufacturing of EOT cranes and spares	3	1.Design 2.. Customization	1.Engineering 2.Workshops	Micro
28	Crown Industries, Hyderabad	Manufacturing of pouch packing machines and exports	6	1.Design 2.Customization 3.Service	1.Food Processing 2.Dairy	Small
29	Anandsheel Hydrualiks, Hyderabad	Manufacturing and exporting of Hydraulic cylinders and powerpacks	20	1.Qaulity 2. Engineering skills	1.Steel plants 2.Automobile	Small

30	JPS Engineering, Hyderabad	Manufacturing of Pharma machinery	10	1.In house Design 2.Own Engineering workshop	1.Pharma 2. Engineering	Small
31	Gramee Naturals, Hyderabad	Food processing of pulses, oils	15	1.Quality 2.Own Retail stores	1.Directlry to customers 2.B2B and B2C 1.3.E Commerce	Small
32	Jagisa Apperel, Hyderabad	Uniforms, Dress for Schools, Hospitals and factories	1.5	1.Own Skilled Tailors 2.Qaulity	1.Schools, colleges 2.Hospitals 3.Security Agencies	Micro
33	Arow Industries, Hyderabad	Manufacturing of accessories for two wheelers	1	1.Own fabrication shop 2.Quality	Automobile Dealers	Micro

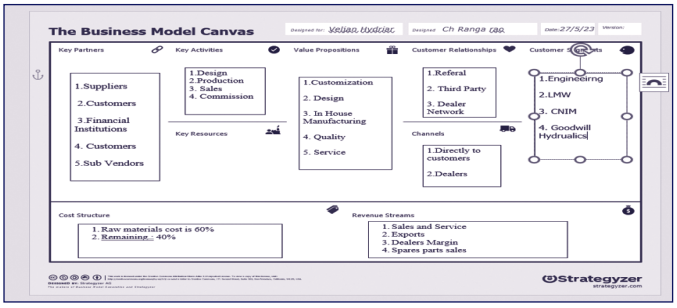
5. DATA ANALYSIS

Many research studies shows that an analysis of procurement process in large organizations has done. But very limited study was conducted in Micro, Small and medium enterprises in India. In order to understand the procurement process and strategy a filed study was conducted in between February 2022 to May 2023 in India. Out of 33 Companies 11 companies in Micro sector, 15 companies are in small category and remaining 7 companies in medium range. Most of the companies are in the Engineering industries. Medium and small organizations are having purchase departments whereas micro enterprises do not have purchase departments and most of cases they are procuring the materials on spot. Most of these companies are customized products and there is no fixed production planning and control and there is no guarantee whether they are getting orders or not due to competition in the market, low negotiating power and most of depends on orders from large organizations. From the filed study the following are the observations drawn from their business perspective.

1. Their Order processing is complex and long payment cycle
2. They must purchase the items on high cost and low margin and their final products
3. The cost of the materials in the range of 50 to 60%
4. Most of the purchasing done by the owners in Micro category
5. There is no guarantee to get the orders in any calendar year and risk of inventory cost when hold inventory on raw materials
6. Micro and Small enterprises suffered a loss due to Covid 19 and most of them are facing manpower shortage and lack of skilled manpower in time
7. Due to customization there is no uniformity of materials required in their business
8. Introduction of GST impacted their business in micro enterprises
9. All the micro enterprises category registered with Udyam registration portal to get some Government benefits
10. Government of India in recent budget given incentives for Micro, small and medium enterprises to sustain their business loss due to Covid-19 and due to inflation.
11. Out of 33 companies 50% of the companies having purchase department and procurement planning in advance
12. Medium enterprises having better materials planning, procurement in advance when compared to micro and small enterprises
13. Micro and Small enterprises consolidation of demand is not possible to procure due to customization of their products. Medium enterprises having consolidation of demand is possible due to consistent demand of the products. Medium and small enterprises having better Vendor Development process and new supplier development process involved in their new product design to understand their business strategy, we are illustrating one micro enterprise, one small enterprise and one medium enterprise case studies in the following paragraphs by using business canvas model.

Case Study 1: Medium Enterprises: Veljan Hydrair was established in 1965 in fluid power engineering In Hyderabad. The company manufacturing wide range of hydraulic and pneumatic products and components. The company manufacturing Gear Pumps, Hydraulic Valves, Vane units and power packs. The Company employs 500 people and six units in Hyderabad catering to the engineering industries. The clients include LMW, NIM (Thailand), GD Wheeler, Goodwill Hydraulics and UCC. The business canvas model is illustrated Fig.4

Fig.4. Business Canvas Model: Veljan Hydrair



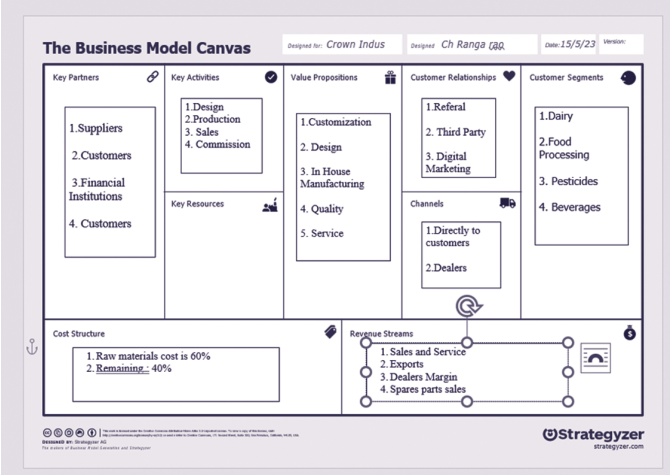
Procurement Process: Veljan Hydrair

The organization has dedicated Purchase department. The organization having 6 factories with decentralized purchase departments. Each unit is look after different materials. Each unit having 1200 items. Each unit purchase yearly 8 to 10 crores worth of materials. The following process the company adopting.

1. Raw materials are steel and castings- Half yearly planning to purchase
2. Packing materials are B class items- Monthly planning
3. Fasteners – C class items- Quarterly purchase plan
4. The company following annual rate contract for B and C class items
5. Common materials price fixed at Head office and shared to all the units to avoid different price for same items. This can be checked by pre audit team before issuing purchase order for common items.
6. Ever three months training will be given to purchase and stores staff.
7. For non standard items sourcing is a problem
8. Each Unit having 4 members of purchase and stores are maintained.

Case Study 2: Small Enterprise: Crown Industries: Crown Industries was established in 2007 at Hyderabad. The company manufacturing pouch packing and filling machines for dairy, food processing, beverages and pesticide industries. The company having 20 to 25 persons working and the turnover is 6 crores. The organization is following the purchase process. The Business Canvas Model was depicted in the Fig.5.

Fig. 5. Business Canvas Model: Crown Industries, Hyderabad



Purchase Process:

1. No Purchase plan
2. Most of the times purchasing on spot market
3. No Purchase procedure
4. The stores having stock of 15 to 20 lakhs worth of materials
5. There is no codification of the materials
6. Materials will be purchased against order from customer
7. Motors and Gear Boxes are in stock
8. Presently the stores having 350 items

Case Study 3: Micro Enterprise; Gajanana Cranes, Hyderabad: The company was established in the year 2008 for manufacturing of EOT cranes starting from 1 Ton to 50 Tons. The present turnover of the company is 3 crores. The company employing 20 people. The company supplying cranes to engineering workshops, Hydraulic Power stations and Steel plants. Business. The following is the purchase process for this company.

1. Most of the items purchases on spot purchases
2. Based on the advanced received from the client materials will be procured
3. No advanced materials planning
4. Consumables, electrodes, tools can be directly purchased from dealers no stock
5. Company facing skilled manpower shortage
6. Thin margin in business and many competitors in the same business
7. Most of the orders coming from good will and repeated customers

6. CONCLUSIONS

Many research studies focussing on large enterprises and very limited study was conducted on procurement process of Micro, Small and medium enterprises. By suing a Business Canvas Model 32 companies' business process survey was conducted in India between February 2022 to May 2023. From the empirical study 50% of the companies not following any purchasing process. Medium Organizations and Small organizations are following purchasing process due to their turnover and good business. Micro Enterprises are not following any purchasing procedures most of the purchasing done through spot purchases which is always 20 to 30% higher than the planned purchases. The reason being most of the orders are customized and there is a risk of inventory cost while holding the materials and there is no guarantee to get the repeated orders due to heavy competition in this bracket and profit margins are also very thin. Most of the small and micro enterprises purchasing can be done by owner himself whereas Medium enterprises are having dedicated purchase team, advanced materials planning and inventory analysis are doing due to their business advantage and more purchasing power and ability to do business when compared to micro and small enterprises.

REFERENCES

1. *Andrew D Pressy, (2009) "Purchasing practices small and medium enterprises: an examination of strategic purchasing adoption, supplier evaluation, supplier capabilities.", Journal of purchasing and supply management.*
2. *Brown T,(2008):" Design Thinking", Harvard Business Review, Vol.86. No.6, PP 84-92*
3. *Ghazi M Magablesh, (2021) "Supply Chain and Covid-19 pandemic a comprehensive framework," European Management Review, Vol.18*

4. *Gaynor, L., Dempsey, H., and White, P. (2018) How Design Thinking Offers Strategic Value to Micro Enterprises, in Storni, C., Leahy, K., McMahon, M., Lloyd, P. and Bohemia, E. (eds.), Design as a catalyst for change - DRS International Conference 2018, 25-28 June, Limerick, Ireland. https://doi.org/10.21606/ drs.2018.434*
5. *IDRIS MOOTEE, CEO, IDEA Culture, (2013), "Design Thinking for Strategic Innovation," John Wile &Sons, USA*
6. *Jeanne Liedtka, Saul Kaplan, (2019) "How design thinking opens new frontiers for strategy development," Strategy & Leadership, https://doi.org/10.1108/SL-01-2019-0007*
7. *Jitesh Takkar(2008), "Supply Chain management in SME's", APJML, Vol.20, No.1.*
8. *Jurong Zheneg (2007), "An Analysis of research into the future of Purchasing and Supply Management", Journal of Purchasing and Supply Management, 69-83*
9. *Rau C, Zbiek A and Jonas JM,(2017), "creating competitive advantage from services: a design thinking case study from the commodities industry service design thinking can provide the tools to help companies design value propositions that meet customer needs and sustain competitive advantage", Research Technology Management, Vol. 60 No. 3, pp. 48-56*
10. *Shan Rajagopal, "Strategic procurement and competitive advantage", International Journal of Purchasing and materials management, Fall 1993.*
11. *Sandro GRAF(2021), " Design thinking for Strategizing?- A Critical Literature Review", Journal of Emerging Trends in Marketing and Management-Vol.1, No.1/2021.*
12. *Seung-Kuk Paik et al.(2009)" Prioritizing Purchasing Development in Small and Medium-sized enterprises", International Journal of Network Management, Vol.3. No.4*

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