

## Challenges of MSMEs in India

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### Abstract

**Purpose:** To do primary research on the MSME challenges and impeding factors, which are derived from literature study (secondary data) on the subject. There are numerous literatures on MSME challenges, most of them being expert opinion, people speak, Government and Industry data, academic study etc. Very few are primary research. This paper focuses on literature research to derive the salient factors (challenges) to MSMEs. These factors have been further subjected to primary research through questionnaire-based survey using Likert scale. Hypotheses formulated and statistically tested to derive concrete results.

**Scenario Brief:** The Micro, Small and Medium Enterprises (MSMEs) are industry's innovation engine, and a pillar of economic development for India, so as any other developing / developed nation. It contributes to industrial production, employment generation, GDP growth, regional development, export earnings, economic diversification, social stability and indigenous self-reliance. The first part of this paper is exploratory research which aims to present the role of MSME in the Indian economy. This vibrant sector also faces a number of challenges despite various initiatives taken by the Government. The literature review explores various problems and challenges faced by the MSMEs. It reveals problems of finance, marketing, technology, human resource, operations, export potential, lack of strategic management, financial literacy, talent retention based on secondary data. Difficulty to acquire timely funds for working capital needs, complicated documentation, lack of consultancy support, need-based research programs, lack of the latest technological skills, low ICT literacy, lack of motivation, presence of high employee attrition, poor-quality products, lack of foreign quality certifications, inefficient logistics, poor bargaining power, informational and infrastructural gaps, complicated laws, policy uncertainty, etc. are some such problems. Some of these salient factors have been put to primary research-based tests in order to establish the truth. Some efforts have also been made to suggest remedial options.

**The Research Outline:**

**Business Problem:** MSME potential to propel the Indian industrial growth has not been as much as desired.

**Research Problem:**

- (1) Study the published literature on MSME challenges in India in order to identify and analyse the impeding factors.
- (2) Obtain primary data on the afore impeding factors for hypothesis-based test/ analysis.

**Research Objective:** Identify the impeding factors, if any, for MSME growth through literature review, conduct primary research and analysis using statistical techniques.

**Research Questions:** A set of research questions were formulated and served to 51 persons from the target MSME industry segment to respond in a 5-level Likert Scale. The uncorrelated stratified random sample responses were quantitatively analysed for their acceptance/ rejection.

**Statistical Method:** Z-test was applied to test our hypothesis-based test statistic with an acceptance threshold or confidence level of 95% (1- $\alpha$ ) i.e. significance level ( $\alpha$ ) of 5%.

**Factors:** The impeding factors (challenges) impacting growth and success of MSMEs in India for defence electronics, are assessed from literature review as:

- (a) Low-cost financing
- (b) Competitive technology and Transfer of Technology (ToT)
- (c) Skilled manpower and their retention
- (d) Stable and consistent market
- (e) Export facilitation

**Originality/ Value:** Over 200 recent publications (< 7 years) on the subject has been studied. Most of them give isolated and disjointed expert views and opinions. This study gathered views of a wide range of stake holders across policy makers, industry stalwarts, research agencies, government officials, investors etc., through a stratified random market survey and analysis to highlight some of the salient impediments to MSMEs in India for defence electronics. Population survey based primary research established the facts. The results are expected to be of interest to the Government, Policy makers, MSMEs, Industry, and the members of the eco-system and economists.

**Findings:**

- [1] Lack of financing is a major handicap for MSME's business prosperity
- [2] Availability of concurrent technology is a predominant factor for growth of MSMEs
- [3] Availability of adequately skilled manpower is a challenge
- [4] Market information and demand forecast are very crucial parameters for growth of MSMEs
- [5] Export and domestic sales both are primary focus of MSMEs

**Keywords:** MSME, Innovation, Technology, Self-Reliance, Skill, Training, Certification, Market, Export promotion.

## Introduction

Govt of India, Ministry of MSME (AR-2022) states 'The Micro, Small and Medium Enterprises (MSME) sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last five decades. This is a low-investment sector with high location mobility and operational flexibility. It contributes significantly in the economic and social development of the country by fostering innovation, entrepreneurship and generating

large scale employment opportunities at comparatively lower capital cost, next only to agriculture. MSMEs support large industries as ancillary units and this sector is a significant contributor of the industrial development of the country. The MSMEs are present and expanding in across sectors of the economy, producing wide and diverse range of components, systems, products and services to meet demands of both domestic as well as global markets. The MSMEs in India are serving a critical role by generating large employment opportunities at relatively

lower capital cost than larger industries as well as through industrialization of semi-urban, rural and backward areas, thus, enhancing regional equilibrium, ensuring more equitable distribution of national income, financial mobility and wealth. Government runs various welfare and promotion schemes aimed at financial assistance, infrastructure development, technology assistance and upgradation, skill

Revised MSME Definition:

Revised Classification applicable with effect from 1st July 2020 <a href="https://msme.gov.in/know-about-msme">https://msme.gov.in/know-about-msme</a>			
Composite Criteria: Investment in Plant & Machinery/equipment and Annual Turnover			
Classification	Micro	Small	Medium
<b>Manufacturing Enterprises and Enterprises rendering Services</b>	Investment in Plant and Machinery or Equipment: Not more than Rs.1 crore and Annual Turnover ; not more than Rs. 5 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.10 crore and Annual Turnover ; not more than Rs. 50 crore	Investment in Plant and Machinery or Equipment: Not more than Rs.50 crore and Annual Turnover ; not more than Rs. 250 crore

development and training, enhancing competitiveness and market assistance of MSMEs’.

With the above strong attributes about MSMEs as part of National growth engine in the backdrop, the promotional measures and unresolved challenges that MSMEs face, would be researched.

MSME Promotion Schemes:

Some of the prominent promotion schemes are highlighted here:

Major MSME Promotional Schemes in India			Source: Govt of India, Min of MSME, AR 2021-22
Sl.	MSME Scheme Name	Purpose	
(A) Scheme for Credit and Financial assistance to MSMEs			
1	Prime Minister’s Employment Generation Programme (PMEGP)	Financing: The maximum cost of the project/ unit admissible under manufacturing sector is Rs.25 lakh and under business/service sector is Rs.10 Lakh	
2	CREDIT GUARANTEE TRUST FUND FOR MSEs (CGTMSE) - Provision of Collateral Free Credit for MSMEs	Collateral free lending to Micro and Small Enterprises through banks and financial institutions	
(B) Schemes for Skill Development and Training			
3	A Scheme for Promotion of Innovation, Rural industrialization and Entrepreneurship (ASPIRE)	Create new jobs, promote entrepreneurship culture, Facilitate business solutions, and Promote innovation	

Major MSME Promotional Schemes in India		Source: Govt of India, Min of MSME, AR 2021-22
Sl.	MSME Scheme Name	Purpose
4	Entrepreneurship and Skill Development Programmes (ESDP)	<b>Programme Details:</b> Entrepreneurship Awareness Programme (EAP): 1 day Entrepreneurship-cum-Skill Development Programme (E-SDP): 6 weeks Advance E-SDP: 6 + 1 week Management Development Programme (MDP): 1 week Advance MDP: Customised
(C) Schemes for Infrastructure Development - Support through Cluster Approach		
5	Scheme of Fund for Regeneration of Traditional Industries (SFURTI)	Clusterization, Group Marketing, Technology & Innovation promotion, PPP through soft, hard and thematic interventions. Project specific financial assistance up to Rs.5cr
6	Micro and Small enterprises Cluster Development Programme (MSE-CDP)	Common issues redressal, Capacity Building, Create / upgrade Infrastructure Facilities, Set-up Common Facility Centres (CFCs), Promote Advanced & Sustainable Manufacturing Technologies

Major MSME Promotional Schemes in India		Source: Govt of India, Min of MSME, AR 2021-22
Sl.	MSME Scheme Name	Purpose
(D) Scheme for Marketing Assistance		
7	Market Development Assistance (MDA) Scheme	A flexible, growth stimulating and artisan-oriented Market Development Assistance (MDA) Scheme
(E) Scheme for Technology Upgradation and Competitiveness		
8	MSME Champions Scheme	1. MSME-Sustainable (ZED), Zero Defect Zero Effect practices 2. MSME-Competitive (Lean), implementation of Lean Tools and Techniques 3. MSME-Innovative (for Incubation, IPR, Design and Digital MSME)
(F) Other Special Schemes for the MSMEs		
9	The National Scheduled Caste and Scheduled Tribe Hub	Special Credit Linked Capital Subsidy Scheme (SCLCSS), Capacity Building Training programs for skill / entrepreneurship, development and distribution of toolkits, Special Marketing Assistance Scheme (SMAS), and part/full reimbursement of fees paid to Govt. institutions/ schemes
10	Scheme for Promotion of MSMEs in North East Region and Sikkim	Financial assistance for setting up new and modernization of existing Mini Technology Centres
11	Energy Efficiency Schemes	Introducing energy efficient technologies and enhancing the use of identified technologies in the clusters

### Literature Review – a chronological presentation: (Theme: MSME Challenges)

There are over 200 recent publications (< 7 years) on the subject. Salient ones have been included in the references list of 117 selected literature at the end of this paper. Endeavour is made to present the extract of literature summary on MSME challenges here. The major impeding factors have been selected, for further stratified random survey in linear Likert scale

amongst all categories of MSME stake holders for the primary research:

Lakshmi Iyer, Tarun Khanna and Ashutosh Varshney (2011) in their literature “Caste and Entrepreneurship in India” examined the impact of caste differences in entrepreneurship using an entirely different metric of economic development i.e., the ownership of enterprises across the country. They found that the OBCs appear to be making significant progress in playing an important entrepreneurial role. By 2005, OBCs share in enterprise ownership and employment generation is very much in line with their population share, having risen significantly since the 1998 wave of the Economic Census. Study also found out that members of the Scheduled Castes and Scheduled Tribes are under-represented in the ownership of enterprises and firms owned by SCs and STs are smaller on average than firms owned by non SCs/STs.

Ashok Kumar Panigrahi (2012) brings out that structured training and development for augmenting the manager’s knowledge and awareness about risk management can help in scientific and systematic handling of risks in MSMEs. MSMEs provide significant contribution to India’s manufacturing output, employment opportunities, and exports. MSMEs face difficulties in production and marketing of their products. Lack of proper infrastructure facilities, access to low-cost financing, stiff competitions, recruitment of skilled manpower are few of the challenges. Robust risk evaluation and mitigation is much needed in case of MSMEs because of their small size and lack of professional management personnel. Some risks specific to MSME sectors are related to their constitution, inadequate margins, fund mobilization, lack of technological advancement, low collection in account receivables, high employee attrition, microfinance, bank lending, collateral security arrangements, etc.

Putta, M. and Satyanarayana, G. (2013) in their article “socio-economic background of women entrepreneurs in Ananthapuram district” stated that most of the women entrepreneurs in the study area belong to general category. The Scheduled Castes and Scheduled Tribes together constitute only 14.33% of total entrepreneurs. Women entrepreneurs are more in the 46 to 60 years age group. The women graduates are less

than 12%. Professional degree holders are barely 6%. It is pertinent to mention that nearly 87% have some amount of debts. The study reveals that the educated women are more attracted towards entrepreneurship.

Vinisha Bose (2013) in her literature "A Analysis of Women Entrepreneurship Development Programmes in state of Kerala" studied the functioning and limitations of government initiated Entrepreneurship Development Programs (EDP) in Kerala. Study is based on field survey of 50 women entrepreneurs who participated in the entrepreneurship development programmes conducted by government agencies. It was found that most of the respondents attended the training were not as keen on entrepreneurship development skills as to avail loan from banks on the basis of training certificates. It was found that many of the women candidates even after completing EDP training successfully couldn't kick-start their own ventures due to altogether different reasons like lack of reasonable follow up support from institutions, narrow mindedness of women, heavy documentation and procedural requirements and poor technical skills. Some trainees who started their venture eventually gave it up.

Arvind Kumar Singh, et. al. (2014) studied the role of entrepreneurs in the development of MSME business given the prevailing challenges faced by the MSME sector. After stating some of the key highlights of the MSME sector, the study discussed the major promotion initiatives undertaken by the Govt of India to revitalize the sector. It highlights that the small business endeavours act like the nursery of entrepreneurial and managerial talent. The problems faced by such practicing entrepreneurs of the MSME sector and assistance provided by the Government are also discussed. The government can help MSME sector by providing R&D support, innovation initiatives, access to foreign technologies, Transfer of Technology from indigenous R&D agencies, assistance from large systems integration firms, e-governance, and e-procurement etc.

M. Chandraiah, et. al. (2014) highlights that the growth of modern MSMEs is a rewarding attribute of Indian economic development. MSMEs face a number of challenges in the credit sourcing, raw material availability, design, packaging, storage & preservation,

infrastructure, skilled manpower, etc. but still MSMEs has been able to survive economic downturn and recession because of its ingenuity, resilience, innovation, and adaptability. Government policies of pre-1991 era, new small enterprise policy of 1991 and comprehensive policy package of 2000 have been discussed along with the recent challenges.

W.G Bonga (2014) analyses the challenges faced by MSMEs in the globalization of their products and suggests some implantable strategies, which may be employed at individual, cluster, state and national levels. It also recommends a simplified policy framework, good governance, affordable low-interest finance, good infrastructure, and access of foreign market information to help MSMEs in the promotion of their exports. Major challenges in the way of increased export as emerged are lack of adequate finance, insufficient market research and analysis, inability to comprehend competitive conditions, lack of procedural knowledge and experience to enter a foreign market, unfamiliar export procedures, etc. Timely Government assistance, initial focus on few selected niche markets, realistic demand projections, understanding employment policies and reduction of regulatory burden are some of the suggestions.

Vilas Z. Chauhan (2014) in his literature "Fostering Dalit Entrepreneurship through Social Change and Economic Liberalisation" studied the strong bond between economic liberalisation, social change, and caste-based entrepreneurship. He highlighted some hard facts related to Dalit entrepreneurship. The study found out that a rise in the number of Dalit millionaires, driven in part by newer economic freedom; is not necessarily a sample representation of the broader swathes of the Dalit (SC/ST) population. Such under-representation appears to exist even in states with very progressive policies towards Dalits (SCs and STs), in states where OBCs have made considerable progress in enterprise ownership, and also in urban areas where outright discrimination is lower than in rural India. These findings reveal that "Caste Does Matter!" because of the caste system people born into specific groups, trades or castes are unable to escape from the stigma of their Dalit background or their native origins.

Ashu Katyal, et. al. (2015) delves on the role and impact of HR operations and systems in MSMEs. HR functions and activities are often neglected by many MSMEs but it is always in the interest of any company to focus on HR development and management with positive intent. The HR intervention areas which should be closely examined are job analysis, job security, training, and performance appraisal. MSMEs lack resources to 'market and advertise, compensate highly and train' as compared to larger organizations. The study recommendations provide innovative strategies to deal with various HR interventions in the area of recruitment, employee engagement, motivation, empowerment, retention, job security, workforce diversity, etc.

Bilas S. Kale (2015) has done a detailed study of the MSMEs operating in Maharashtra to establish that MSMEs help to create jobs, minimise unemployment, poverty and achieve socio-economic growth in the state. MSMEs catalyse inclusive and balanced growth of the economy by creating demand for goods and services. This sector reduces social imbalances and leads to foster sustainable growth and development.

Dr. Gisha P. Mathai (2015) conducted exploratory research to analyse the major challenges of the Indian MSMEs and also provided valuable suggestions for improvement. The author claims that the MSME sector is like the spine of the nation providing the second largest employment opportunities next to agriculture. Some of the major problems are related to lack of bank credit, affordable interest rates, arranging Bank Guarantee as collateral, competition from MNCs, poor infrastructure, unavailability of raw materials, lack of advanced technologies, lack of marketing channels and forecast, lack of skill development program and complex labour laws. The author suggests that determination of technological needs, mutual exchange of technologies, the constitution of a panel of consultants, awareness programs, sufficient availability of credit and relaxation in labour laws can lead to catalysing growth and development of Indian MSMEs.

Saud Ilahi (2015) conducted a survey to bring out the problems of MSMEs in New Delhi and also gave suggestions to provide them with a better conducive environment. A survey of 100 entrepreneurs revealed that the lengthy

procedure of securing finance is the major problem. Majority of MSMEs refrain from incurring large marketing expenses. Majority of the MSME participants did not attend any Entrepreneurship Development Programs (EDPs). Other significant problems relate to the availability of proven technology, technical infrastructure, sales and marketing forecast information, skilled labour, design, standardization, etc. Some of the suggestions are: to encourage EDP participation, easy loan process and procedures, government assistance, technology initiatives and a curb on corrupt practices.

Meeravali Shaik, et. al. (2017) established that although MSME sector has shown a positive impact on employment generation and fixed assets growth in recent years but it still faces a number of challenges such as lack of timely credit, high-interest rate financing, high cost of credit, difficulty in procurement of raw material and components, problems in storage and preservation and design, low technology levels, lack of skilled manpower, inadequate infrastructure, and test facilities etc. It suggested the government to adopt integrated policy with efficient governance for the MSME to help the sector increase its productivity and contribute to economic growth.

Suhail Mohammad Ghose (2017) conducted primary research over 200 exporters of the handicraft industry established in and around Noida, to understand the perceived challenges regarding the globalisation of their MSMEs. Unstructured questionnaires are used to explore their sales methods adopted, competition profile, export markets, and challenges associated with export. It established that the UK and France are the largest export markets, direct export sales and personal contacts are the most common and effective sales strategy. Lack of infrastructure is found to be the topmost concern while exporting to global markets. The biggest challenges are related to export subsidies, export promotion and market awareness. The study recommended that export-related subsidies are most crucial to the MSME exporters due to the tough price competition in the international market.

Syamala Devi Bhoghanadam, et. al. (2017) analysed the available literature on various challenges faced by the Indian MSMEs and divided them into external and internal factors.

The study also provided a action matrix in which all the challenges are divided into external issues, environmental challenges, socio-cultural aspects, financial matters, marketing initiatives, HR and skill development issues, and infrastructure availability.

Devendra Naik. B (2017) in his literature "Entrepreneurship Among Marginalised Groups in Karnataka: An empirical study of Scheduled Castes with particular reference to Shivamogga City" examined the role of motivational factors as well as financial support by scheduled castes development corporation in their endeavour for entrepreneurship development and identified the challenges faced by SC entrepreneurs. The study was based on data gathered through personal interaction, discussion and non-participative observation method in 5 districts of Shivamogga city. It was observed that only a small proportion of respondents (21 %) was able to secure bank loans sanctioned as some of them reported: Banks ask for guarantee. It was observed that SC entrepreneurs are unaware of the schemes, lack working capital leading to shortage of input raw material, cannot achieve competitive price for their products and do not get skill training from corporation.

Sonia Mukherjee (2018) analysed a specific type of industry (coir) with respect to its export trend for five years. The major reason for its declining export competitiveness was found to be the absence of appropriate technology. She concluded that higher investment in advanced technology and R&D, higher usage of the digital platform, adoption of 'transfer of technology', higher focus on skilled personnel, improved availability of low interest finance and liberal trade regulations can improve its global competitiveness. The study also included an in-depth analysis of the several promotional measures implemented by the Government of India for the technological development of Indian MSMEs.

Vinay Pal Singh & Hari Om Gupta (2018) in their literature "Women Entrepreneurship in Rural India - A bang for the buck in economic growth" emphasised the present status of women entrepreneurs, plus their valuable contribution in achieving sustainable economic growth of rural areas of India. They also highlighted the main hurdles faced by women entrepreneurs such as lack of education, male dominated society, social barriers, shortage of

funds and many others. They suggested some strategies to empower women like good quality infrastructure, good financial services, assorted vocational training programs and supportive policy by the government.

Kumar & Kumar (2018) identified that challenges of MSMEs are both external and internal. They are related to production, safety, lack of adequate working capital, inaccessibility of test infrastructure, shortage of raw material, and competition etc. They surveyed 25 MSMEs and observed that there was no correlation between educational qualification/ age and challenges faced by MSME. They deduced that labour laws need to be accordingly amended. They also observed that most of the MSME entrepreneurs are not aware of the government schemes.

Rakesh Rathore and Aditi Mathur (2019) in their research titled "A study on role and prospects of micro, small and medium enterprises in India" find that many factors, which impact the performance of the Micro, Small, and medium enterprises in India include marketing, finance, human resource, Technology and Infrastructure. They also state that inadequacy of structured human resource training is a major constraint in the growth of the MSMEs. Skill training is very essential. Human resource is one of the most vital growth indicators for organizations today. They also bring out that finance is a major problem for MSMEs in India. Technological progression becomes a problem only because firms lack enough capital. Marketing is also a significant contributor. The MSME owner's struggle in the initial year to make an visibility of their entrepreneurial life to gain quality contacts and make their name in the market. They bring out that non-availability of skilled manpower and experienced managerial and entrepreneurial capability at affordable cost near the location of enterprises is a huge challenge for the MSMEs in India. The major challenges which spoil the growth of MSMEs in our country relate to lack of capital and credit conveniences. Formal and timely access to credit is a vital factor to development and growth of enterprises.

PS Reddy and KR Yaraswi (2020) in their literature "Problems and Issues of Micro Small & Medium Enterprises (MSMEs) in Krishna District of Andhra Pradesh" summarized that for MSMEs, lack of funding sources and financing

has always been considered as major barriers. Globally, 85% i.e. 365-445 million MSMEs lack a total credit shortage of  $\approx$ US\$2.1 trillion and US\$2.5 trillion. In India,  $\approx$ 51 million MSMEs face a mammoth credit shortage of  $\approx$ \$400 billion. The aggregate credit demand of India for MSMEs is  $\approx$ INR 450 billion. The financing issues include weak creditworthiness, poor economic base of the MSME entrepreneurs, scarcity of capital, high cost of credit, inadequate financial means and resources, insufficient loan amounts and timely credit availability, low level of financial markets and poor business governance.

Srirang K Jha and Ashish Kumar (2020) conclude in their literature that the MSMEs are facing an unusual crisis in recent times due to Covid-19 pandemic in terms of suspended operations, supply-chain disruptions, labour shortage, cash flow crunch, lower demands for goods and services, among many other recurrent problems posing challenge to the sector. The MSME sector, is the backbone of the economy that provides 32% of GDP, 25% of employment, and 45% of exports. The Rs.3 trillion line of credit for loans available today without collateral is still inadequate. The MSME experience, indicates that lenders are generally not supportive in extending loans without collaterals. The Government, PSUs and the leading Private Sector Companies owe them as much as Rs 5 trillion, which has resulted in a round-robin situation in which they do not have the resources to pay wages or meet fixed costs on electricity, rent or interest during the lockdown period. Another view is that MSME owners have a good appetite for taking risk. That is why they jumped into business instead of being a salaried employee. Besides indomitable risk abilities, these smart entrepreneurs have also learnt the tricks of organizing resources for their business operations. Unlike popular belief, these resilient MSME entrepreneurs have not depended on bank credit too much.

D.K. Nema, Pushpa Suryavanshi, and Toran Lal Verma (2021) conclude in their research that lack of finance for working capital and capital Investments, lack of marketing Opportunities, infrastructure, unavailability of skilled labour, and stringent Govt rules and regulations are the major challenges of MSMEs in India.

Koppala Venugopal, Saumendra Das (2022) in their research paper titled "Assessment of

operational functions affecting on the micro and small enterprises' sustainability " conducted deep primary research through direct population survey and proved that Marketing, Technology and Financial competence have significant and positive impact on success of MSMEs and are supported at 5% significant level (95% level of confidence). Similarly, Government support to MSMEs and Entrepreneurial orientation have significant and positive impact on success of MSMEs and both is supported at 5% significant level. Entrepreneurial orientation is another significant parameter relating to success of MSMEs.

#### Literature Summary

The afore literature survey and many other unquoted literatures listed in references, equivocally bring out that the following aspects remain a challenge for MSMEs:

- a) Financing
- b) Technology
- c) Skilled manpower
- d) Market
- e) Export

Accordingly, hypotheses have been formulated around these themes for the conduct of primary research, through stratified random survey of a pre-designed questionnaire over a large stake holder population (> 50) of MSMEs.

#### Primary Research

##### The Research Outline:

**Business Problem:** MSME potential to propel the Indian industrial growth has not been as much as desired.

##### Research Problem:

- (1) Study the published literature on MSME challenges in India in order to identify and analyse the impeding factors.
- (2) Obtain primary data on the afore impeding factors for hypothesis-based test/analysis.

##### Research Objective:

- (1) Identify the impeding factors, if any, for MSME growth through literature review



(2) Primary research through Likert scale-based questionnaire survey over a large stratified, random population and statistical analysis to derive inference

**Research Questions:** A set of research questions have been formulated and served to 51 persons from the target MSME industry segment to respond in a 5-level Likert Scale. The uncorrelated stratified random sample responses were quantitatively analysed for their acceptance/ rejection.

**Statistical Method:** Z-test was applied to test our hypothesis-based test statistic with an acceptance threshold or confidence level of 95% ( $1-\alpha$ ) i.e. significance level ( $\alpha$ ) of 5%.

### Hypotheses Formulation

From the literature review, the key factors / attributes coming in the way of success of MSMEs are identified and hypotheses formulated for test. The null hypotheses and alternate hypotheses (to test) are stated below:

Hypothesis 1 (Theme: Financing)

H10(null hypothesis): Lack of financing is not a major handicap for MSME's business prosperity

H1a(alternate hypothesis): Lack of financing is a major handicap for MSME's business prosperity

Hypothesis 2 (Theme: Technology)

H20: Availability of concurrent technology is NOT a predominant factor for growth of MSMEs

H2a: Availability of concurrent technology is a predominant factor for growth of MSMEs

Hypothesis 3 (Theme: Skilled Manpower)

H30: Availability of adequately skilled manpower is not a challenge

H3a: Availability of adequately skilled manpower is a challenge

Hypothesis 4 (Theme: Marketing)

H40: Market information and demand forecast are not so crucial parameters for growth of MSMEs

H4a: Market information and demand forecast are very crucial parameters for growth of MSMEs

Hypothesis 5 (Theme: Export)

H50: Export is not a primary focus of MSMEs like domestic sales

H5a: Export and domestic sales both are primary focus of MSMEs

Hypotheses Test Procedure

Research methodology adopted is based on 'method of survey questionnaire'. Survey data is collected from relevant stake holders through G-docs, e-mail, and personal meetings.

**Sources of Data:** MSMEs, including those engaged in Defence Electronics as a focus, relevant Government departments, entrepreneurs, R&D personnel, academia, industry associations and leaders, SSIs etc. In order to ensure the best representation of the population in the sample, care is taken to include samples from widest distribution patterns such as

a) Geographical strata for a well distributed representation.

b) Representatives of Micro, Small and Medium enterprises of varied sectors.

c) Vertical specialization coverage as per type of work such as Design, B2P, Marketing, Financing, Production, and Testing specialised Companies.

d) Urban. Semi-urban and SEZ mix etc.

Secondary data from literature and publications formed the benchmark only to formulate the hypotheses of relevance.

Data have been collected in Likert scale:

Refer Table 1: Sample survey question format.

Table 1: Sample survey question format						
<b>Survey Question:</b> Global Transfer of Technology (ToT) in defence electronics is complex						
S	Survey Input	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	Name of Respondent	1	2	3	4	5
1	Respondent 1					
..	.....					

5	Respondent				
1	n (n=51)				

Statistical Method:

Z-Test with Level of Significance ( $\alpha$ ) = 5% has been chosen. This corresponds to 95% level of confidence (C).

If  $z \leq 1.645$  (as per table of area under normal curve for the given confidence level of 95%,  $\alpha = 5\%$ , level of significance); accept null hypothesis. For,  $z > 1.645$ ; reject null and accept alternate hypothesis.

Calculation: Refer Table 2: Test situation and test statistics used for Hypotheses testing.

Xbar computed

$\sum (X_i - X_{\text{bar}})^2$  computed

$\sigma_s$  computed

During statistical treatment, permissible assumptions have been made that  $\sigma_p = \sigma_s$ .

$\mu_{H_0} = 3$  Population mean, by Likert design

$$z = \frac{\bar{X} - \mu_{H_0}}{\sigma_p / \sqrt{n}} \quad \sigma_s = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n - 1}}$$

Refer to Figure 1: Z-Test, Acceptance and rejection regions

Based on a large amount of survey samples (51: i.e.  $>30$  for Z-test) from related stake holders, a test statistic for testing the alternate hypothesis has been developed and tested.

Figure 1: Z-Test, Acceptance and rejection regions

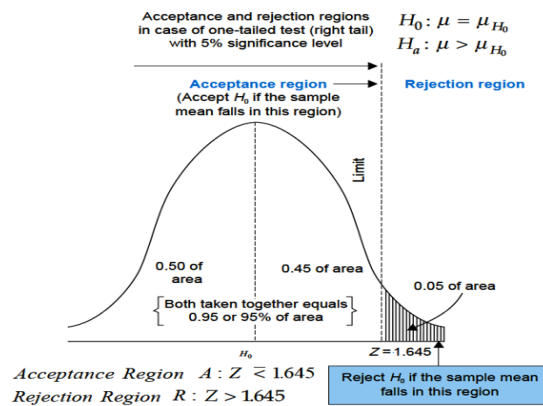


Fig. 9.3

Table 2: Test situation and test statistics used for Hypotheses testing

Table 9.3: Names of Some Parametric Tests along with Test Situations and Test Statistics used in Context of Hypothesis Testing

Unknown parameter	Test situation (Population characteristics and other conditions. Random sampling is assumed in all situations along with infinite population)	One sample
1	2	3
Mean ( $\mu$ )	Population(s) normal or Sample size large (i.e., $n > 30$ ) or population variance(s) known	z-test and the test statistic $z = \frac{\bar{X} - \mu_{H_0}}{\sigma_p / \sqrt{n}}$ In case $\sigma_p$ is not known, we use $\sigma_s$ in its place calculating $\sigma_s = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n - 1}}$

### Hypotheses and Computation Summary

#### Hypotheses statements and results of Z-test

H	Null Hypothesis, $H_0$	Alternate Hypothesis, $H_a$	Z computed	Z threshold	Decision Criteria	Decision
H1	Lack of financing is not a major handicap for MSME's business prosperity	Lack of financing is a major handicap for MSME's business prosperity	3.344	1.645	Reject null if $Z > 1.645$	$H_0$ rejected, $H_a$ accepted
H2	Availability of concurrent technology is NOT a predominant factor for growth of MSMEs	Availability of concurrent technology is a predominant factor for growth of MSMEs	3.409	1.645	Reject null if $Z > 1.645$	$H_0$ rejected, $H_a$ accepted
H3	Availability of adequately skilled manpower is not a challenge	Availability of adequately skilled manpower is a challenge	3.303	1.645	Reject null if $Z > 1.645$	$H_0$ rejected, $H_a$ accepted

H4	Market information and demand forecast are not so crucial parameters for growth of MSMEs	Market information and demand forecast are very crucial parameters for growth of MSMEs	2.943	1.645	Reject null if $Z > 1.645$	$H_0$ rejected, $H_a$ accepted
H5	Export is not a primary focus of MSMEs like domestic sales	Export and domestic sales both are primary focus of MSMEs	2.902	1.645	Reject null if $Z > 1.645$	$H_0$ rejected, $H_a$ accepted

**Analysis:**

Refer to Figure 2: Z-test results on graph.

H1: The null hypothesis that 'Lack of financing is not a major handicap for MSME's business prosperity' has been contested by the alternate hypothesis that 'Lack of financing is a major handicap for MSME's business prosperity'.

Based on a large amount of survey samples (51: i.e.  $>30$  for Z-test) from related stake holders, a test statistic for testing the alternate hypothesis has been developed and tested.

The obtained value of  $Z=3.344$  is significantly large than the decision criteria  $Z > 1.645$ , meaning that the null hypothesis is rejected in favour of alternate hypothesis with resounding level of reliability and confidence.

Similar Inference for all other hypotheses has been made and presented (refer to Figure 2)

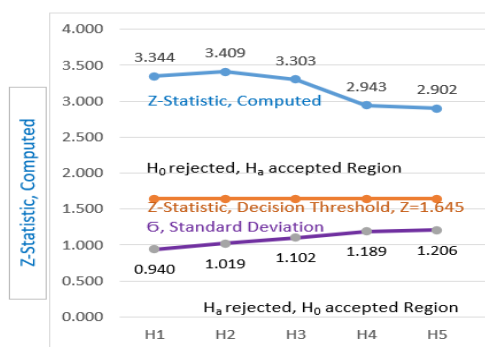


Fig.2: H1 to H5: Five Hypotheses

Hypotheses H1: Theme - Financing: The alternate hypotheses have been found true with a very high degree of confidence. H1 indicates overwhelming responses supporting the view that 'Financing is a major handicap for MSME business prosperity'. The sample standard deviation is lowest in these hypotheses, highlights the least variation of opinion.

Hypotheses H2: Theme - Technology: The alternate hypotheses have been found true with a very high degree of confidence. H2 indicates

overwhelming responses supporting the view that 'Availability of concurrent technology is a predominant factor for growth of MSMEs'. The sample standard deviation indicates fair variation of population opinion.

Hypotheses H3: Theme - Skilled Manpower: The alternate hypotheses have been found true with a high degree of confidence. H3 indicates very good responses supporting the view that 'Availability of adequately skilled manpower is a challenge' for MSMEs. The sample standard deviation indicates larger variation of population opinion.

Hypotheses H4: Theme - Marketing: The alternate hypotheses have been found true with a high degree of confidence. H4 indicates good responses supporting the view that 'Market information and demand forecast are very crucial parameters for growth of MSMEs'. The sample standard deviation indicates a larger variation of opinion.

Hypotheses H5: Theme - Export: The alternate hypotheses have been found true with a fair degree of confidence. H4 indicates good survey responses supporting the view that 'Export and domestic sales both are primary focus of MSMEs'. The sample standard deviation indicates the largest variation of survey population opinion.

Summary of Research Framework: Refer Figure 3

The research publications provided a good overview of Govt initiatives and growth impetus in various forms in a right direction as well as the impediments (see Box 1). We also noted the innovation potential of rapidly growing MSMEs, start-up companies and fast emerging of private industries in conducive growth of GDP is immense (box 2). Hypotheses were framed out for the salient impeding factors (box 3) so that they could be put to test using survey of opinion from a stratified random population

of stake holders. Using statistical techniques, the survey data could be quantified and analysed for acceptance / rejection of hypotheses with certain degree of confidence. The opinion variance was also analysed. The results of all five hypotheses testing correlate and complement each other reasonably well.

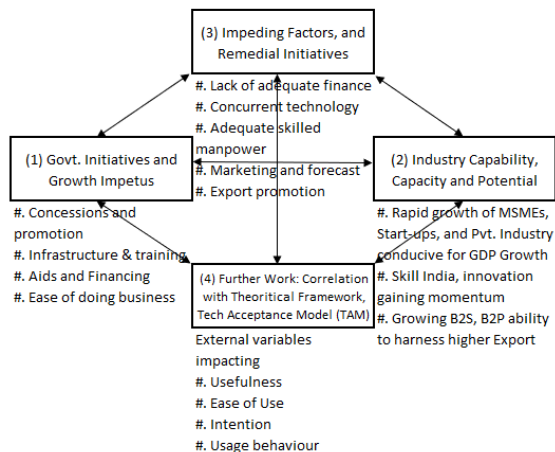


Figure 3

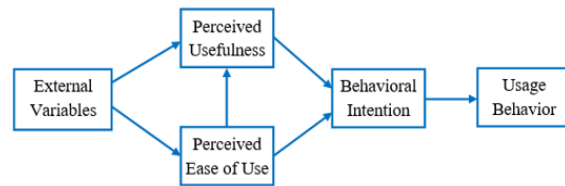
We believe that these inferences, can further be correlated in subsequent work with established theoretical framework (box 4) such as ‘Technology Acceptance Model (TAM)’ or, ‘Unified Theory of Acceptance and Use of Technology (UTAUT)’. TAM and UTAUT are well known theoretical framework and models, which deal with impact measurement of external factors on usefulness, ease of use, user intention, and usage behaviour.

#### Theoretical Premises

Technology Acceptance Model (TAM) is one of the most commonly employed models for research into new technology acceptance, which is one of the important parameters for MSME prosperity. The TAM suggests that when users are presented with a new technology, a number of factors determine their decision about how and when they will use it.

The TAM model deals with two specific beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). Perceived Usefulness is the potential user’s subjective likelihood that the use of a certain system (i.e. the digital India initiatives to access and use available resources in this case) will improve his/her/its action (i.e. MSME action here) and Perceived Ease of Use refers to the degree to which the potential user

(i.e. MSME) expects the target system to be effortless.



Refer to Figure 4: Technology Acceptance Model (TAM) by Venkatesh and Davis, 1996

External Variables: In this case of MSMEs in defence electronics, some of these variables are as follows. These variables have been categorised with respect to their relevance:

#### (i) Relevant to ‘Perceived Ease of Use’

- Computer anxiety, computer playfulness, comfort with the application programs
- Reluctance and inertia of transition from traditional mindset to digital India schemes.
- Fear of exposing own information, fear of hacking
- Learning, accepting and adopting various digital India initiatives
- Schemes of registrations and empanelment for getting access to Govt. resources

#### (ii) Relevant to ‘Perceived Usefulness’

- Past experience, inhibition, voluntariness
- Ability to demonstrate result
- Other MSMEs behaviour and their expression of usefulness (neighbour effect)
- Degree of relevance and quality of output (benefit)
- Effort versus benefit

Extensions of TAM theory: TAM has become so popular that it has been cited in many of the research that deals with users’ acceptance of technology (Lee, Kozar and Larsen, 2013). TAM attempts to help researchers and practitioners to distinguish why a particular technology or system may be acceptable or unacceptable and take up suitable measures by explanation besides providing prediction. Even

though TAM has been tested widely with different samples in different situations and proved to be valid and reliable model explaining information system acceptance and use, many extensions to the TAM have been proposed and tested. They are as follows:

- (i) Technology Acceptance Model (TAM) was introduced by Fred Davis in 1986 for his doctorate proposal.
- (ii) The TAM theory was formalised by Davis, Bogozzi and Warshaw, in 1989.
- (iii) The final version of Technology Acceptance Model (TAM) was published by Venkatesh and Davis (1996),
- (iv) Technology Acceptance Model 2 (TAM2), a amplified version of TAM was introduced Venkatesh and Davis (2000) and Technology Acceptance Model 3 (TAM3) by Venkatesh and Bala (2008).
- (v) The Unified Theory of Acceptance and Use of Technology (UTAUT), was published by Venkatesh, Morris, Gordon and Davis (2003)

Some of the most prolific TAM authors include Viswanath Venkatesh, Fred D. Davis, Detmar W. Straub, Elena Karahanna, David Gefen, Patrick Y. K. Chau, Lee, Morris, Kozar and Larsen.

### Further Work:

Factors and Variables for further research work

From the literature study and observations, many other impeding factors for MSME growth and prosperity have come to light. We have only researched and collected survey data on the most prevalent five factors. However, other factors also could be researched in a similar way. Other themes / factors for further research are:

- (a) Effectiveness of Govt promotion schemes.
- (b) Quality of Skill Development Programs
- (c) Availability & adequacy of product prototyping facility
- (d) Adequacy of Test Infrastructure and quality certification

### Research Findings

- [1] Lack of financing is a major handicap for MSME's business prosperity
- [2] Availability of concurrent technology is a predominant factor for growth of MSMEs
- [3] Availability of adequately skilled manpower is a challenge
- [4] Market information and demand forecast are very crucial parameters for growth of MSMEs
- [5] Export and domestic sales both are primary focus of MSMEs

### Conclusion:

Amplification of Research Findings and Additional Findings

- (1) MSME sector is a vibrant and dynamic sector of the Indian economy. It has experienced steady growth in terms of number of new registrations, variety of products manufactured, and employment generation. MSME sector plays a critical role in the economy by contributing significantly to the industrial output, National GDP, regional development, export earnings, and social stability.
- (2) MSME units face a number of challenges despite initiatives taken by the Government. Difficulty to receive timely finance for working capital needs, production, expansion and internationalization needs, lack of consultancy assistance, bureaucratic processes, cumbersome documentation, difficulties of providing collateral, etc. are few of the finance-related challenges.
- (3) Lack of the current technological skills, need-based research programs, non-availability of skilled manpower, low ICT literacy, etc. are few of the causes of technological backwardness of MSME sector.
- (4) Human resources are not effectively trained with efficient and professional skills related to manufacturing, production, finance, accounting, marketing etc. There is a lack of motivation and presence of high employee attrition.

(5) Marketing functions are very challenging for MSMEs. Competitiveness, low-quality products, inefficient logistics, poor bargaining power, informational gap about foreign markets and changing demand patterns are concerns.

(6) The overall environment is not very supportive because of factors like infrastructural gaps, complicated laws, and other socio-cultural issues.

(7) MSME sector can grow many folds in terms of exports if hurdles like lack of foreign quality certifications, complex dispute settlement mechanisms, regularity policy uncertainty, and insufficient export promotion are resolved.

(8) The current study provides a number of suggestions to enhance the growth of the MSME sector. Enhancement of awareness regarding existing support system and facilities, availability of credit for the different type of needs, best international practices, EDPs (Entrepreneurship Development Programs), employee engagement practices, a culture of research and development can help to solve some problems of the very important sector.

(9) The government should control existing corrupt practices, come up with need-based supportive interventions, simplify taxation policies and labor laws, promote E-procurement, enter into trade preferential agreements with potential export markets, etc. large enterprises should be encouraged to help MSMEs as part of their social responsibility.

(10) Low-cost innovative methods should be promoted to improve the quality and competitiveness of production and service rendering.

(11) Availability of supportive infrastructure should be made more accessible.

(12) The export potential of MSMEs should be improved by providing training to entrepreneurs regarding export procedures, export documentation, market research, negotiation with buyers, foreign standards, foreign demand patterns, etc.

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