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An Investigation on Micro, Small, And Medium-Sized Enterprises and Technological Innovation

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Abstract
According to this paper, Micro, Small and Medium Enterprises (MSMEs) in India, require technological innovation. According to estimates, the industry is experiencing constant expansion in job creation and production. Technological innovation is necessary to survive in an open and competitive economy like India's. Effectively implementing and using the latest technology has been shown to help improve the performance of the MSME sector. However, the industry is unable to update its technology as often as the market requires due to lack of government funding and skilled workers. Attention should be paid to increasing investment in technology and manpower to improve product quality and meet market demand. Better/improved working conditions, training, and occupational health and safety programs will help boost labor productivity and employability, technological advances and innovations, and the availability of affordable credit/financial options will help to promote the production and effective use of capital. Nevertheless, it is important to remember that capital should be used to supplement labor. Field research and in-depth interviews with entrepreneurs in the MSMEs were conducted to collect the data required for the study. A total of 200 business owners were contacted at their workplaces or factories to learn about technology investment trends in the small engineering industry in Chhattisgarh.

Keywords: Technological Innovation, MSME, Investment

1. INTRODUCTION

In many nations, the existence of MSMEs is essential for economic development. Globalization, fierce rivalry, and the information and knowledge revolution have assimilated into the environment. The ownership structure, high labor intensity, unbalanced development, and balanced dominant areas are frequently used to categorize MSMEs. MSMEs are responsive to environmental changes and adaptable. SMEs also tend to have competence in particular fields, are less bureaucratic, and are more flexible in their decision-making. The ability of MSMEs to adapt and be creative within constraints is a crucial characteristic. The adoption of new technologies has the potential to have a big impact on the nation's sectors, particularly economic development and growth. MSMEs must incorporate technology into their daily operations. Technology can be seen as an investment made in a company to gain a competitive advantage. Technology adoption can give businesses a competitive edge over their rivals. The adoption of technology by MSMEs, however, has not received much research attention. The purpose of this study is to review the body of literature on technology adoption in MSMEs and to identify areas for further research.

1.1.Technology and Innovation in MSMEs

For Micro, Small, and Medium Businesses to expand and succeed, technology and innovation are essential (MSMEs). These are some strategies MSMEs can use to take advantage of technology and innovation.:

- Automation: MSMEs can use technology to automate time-consuming and repetitive procedures, freeing up staff to concentrate on other crucial responsibilities. Moreover, automation can boost efficiency and productivity, resulting in reduced costs and higher profitability.
- Digital Marketing: MSMEs can use digital marketing techniques to showcase their goods and services to a wider audience. MSMEs can benefit from digital marketing by increasing their brand awareness, client engagement, and sales.
- E-commerce: MSMEs can offer their goods and services online through e-commerce platforms, creating new markets and revenue streams. E-commerce can assist MSMEs in lowering expenses related to managing inventory and physical locations
- Cloud computing: Without the need for costly gear and infrastructure, MSMEs may use cloud computing to obtain software, storage, and computing power on-demand. MSMEs may scale their operations and lower their IT costs with the use of cloud computing.
- Innovation: MSMEs can promote innovation by funding R&D, developing new goods and services, and enhancing already existing ones. Innovation may assist MSMEs in standing out from rivals, generating new sources of income, and enhancing customer happiness.
- Collaboration: MSMEs can work together to exchange information, resources, and best practices with other companies, academic institutions, and trade groups. MSMEs can benefit from collaboration by gaining access to new markets and innovations, cutting expenses, and increasing their competitiveness.

MSMEs can successfully use technology and innovation to boost growth. MSMEs can increase efficiency, save costs, boost revenue, and boost market competitiveness by embracing new technology and innovating.

1.2.Business Model Innovation Effectiveness

Business model innovation is a radical adjustment of the principles by which a company develops, delivers and captures value. Foss and Saebi (2017) reviewed 150 peer-reviewed scientific articles on BMI published between 2000 and 2015, summarizing findings and research directions for 'mainstream' BMI. I was. Their research explores internal (strategies, capabilities, etc.) and external (technical, regulatory, stakeholder needs, etc.) that drive BMI (scope, novelty) along with expected outcomes (financial performance, innovation capacity, cost savings).) reveals the precursors of Emerging as cognitive structures, influences at the macro, corporate, or micro level moderate this process (Foss & Saebi, 2017) 1. Structures act as learning processes for iterative analysis and experimentation in response to changing environments. Or respond to external technical and regulatory changes (eg, Zott and Amit, 2008; Teece, 2010). (e.g. Chesbrough, 2010; McGrath, 2010; De Reuver et al., 2017). In our opinion, these help refine previous theories of gradual NPD adjustments of internal resources, showing that it is not the other way around (Markides, 2008; Christensen et al., 2016). Companies in 'traditional' industries have created new business models that have achieved supernatural gains despite the lack of government regulation or in the face of significant technological advances. These new business models are accelerating massive industry disruptions that go far beyond responding to changes in the market and business environment and developing new products. This includes actively developing and implementing entirely new ways for management to do business. A typical high-tech start-up or growth company is destined for a global market different from the major drivers of industry change mentioned above (Sarja, 2016). Moreover, we do not

fully understand what underpins his BMI for entrepreneurial organizations and how these drivers and challenges differ from those faced by established companies (Foss & Saebi, 2017). According to a recent empirical study (Bouwman et al., 2016), only 15% of SMEs in Europe are familiar with common BM techniques such as CANVAS, STOF, Visor and BM Cube, but of them 37% are in BM innovation. Different tools are used, but their scope and sophistication are limited compared to the method-based BM toolset. Over 50% of small businesses hire BMI consultants. This may help explain the surprisingly high intake of BM by the SMEs studied.

1.3.Challenges and Barriers in Technology Adoption before Indian MSMEs

When it comes to implementing new technology, micro, small, and medium-sized businesses (MSMEs) in India face a number of difficulties and constraints. Here are some typical difficulties and impediments that Indian MSMEs face.:

- Lack of Awareness and Knowledge: Lack of awareness and knowledge of new technologies is a key problem for MSMEs in India. Many small business owners are unaware of the advantages of modern technologies. Also, they might not have access to knowledge about the most recent technical advancements.
- High Cost of Technology: Another significant hurdle for MSMEs in India is the high cost of implementing new technologies. Many MSMEs have tight budgets and might not have the money to buy pricey machinery and software.
- Restricted Access to Capital: It could be difficult for MSMEs in India to obtain financing for new technology investments. Without a track record, banks and other lending organizations could be reluctant to provide financing to small enterprises.
- Infrastructure and Connectivity: Infrastructure and connection provide difficulties for many MSMEs in India. The adoption of new technology can be hampered by inadequate transportation infrastructure, unstable power supplies, and poor internet access.
- Skilled Manpower: Another major issue facing MSMEs in India is a lack of skilled people. The skills and knowledge required to deal with new technology may not be provided via the education and training systems. Also, it could be challenging for MSMEs to obtain competent employees in some areas where skilled individuals are scarce.
- Reluctance to Change: Some MSMEs may be reluctant to adopt new technologies due to a lack of understanding, apprehension about change, or the conviction that current practices suffice. This opposition may prevent the adoption of new technologies and restrict these businesses' ability to thrive.

There are a number of obstacles and hurdles that Indian MSMEs must overcome in order to adopt new technology. It will take a combination of government policies, public-private partnerships, and education and training activities to address these issues.

1.4.Research Problem

Notwithstanding the important role that micro, small, and medium-sized firms play in economic development, these businesses frequently face resource constraints, including a lack of access to innovation and technology. Examining the difficulties and possibilities MSMEs confront in adopting and utilizing technological innovation for sustainable growth and competitiveness is necessary.

1.5.Research Objectives

- To investigate the various types, sources, and interactions of technological innovation that MSMEs use, including process innovation, product innovation, and digital innovation.

- To look at how open innovation, co-creation, and other forms of collaborative innovation might help MSMEs improve their innovation outcomes and capacities.
- To investigate the difficulties and opportunities presented by technological innovation for MSMEs in various industries and areas, as well as the methods they use to meet these difficulties and take advantage of these opportunities.

1.6.Research Hypothesis

Null hypothesis (H0): There is no significant relationship between technological innovation and the success of micro, small, and medium-sized enterprises (MSMEs).

Alternative hypothesis (H1): Technological innovation has a positive impact on the success of micro, small, and medium-sized enterprises (MSMEs).

2. LITERATURE REVIEW

The performance of MSMEs is positively impacted by technological innovation, according to Kurniawan, Nugroho, and Wibowo (2020). The study found that innovation is crucial for the survival and expansion of MSMEs since it increases productivity, competitiveness, and profitability.

Bala and Garg (2021) noted a number of obstacles to innovation in MSMEs, including a lack of funding, a lack of knowledge and information access, opposition to change, and a shortage of trained labor. According to the report, activities and policies focused at removing these obstacles may aid in fostering innovation in MSMEs.

According to Prajapati, Singh, and Jain (2019), technology adoption significantly influences innovation in MSMEs. The study found that MSMEs are more likely to engage in innovation activities and have higher company performance when they adopt new technology.

In their 2020 study, Lohrke, Lindner, and Gilge examined how open innovation may help MSMEs innovate. The study discovered that MSMEs can gain access to new information, resources, and ideas through open innovation, which involves working with external partners like clients, suppliers, and research institutes.

The effect of governmental policies on innovation in MSMEs was researched by Ali and Yasin in 2019. According to the study, government initiatives including financial support, technical help, and regulatory frameworks are very important in encouraging innovation in MSMEs.

In 2019, Ezeuduji and Ibrahim looked at how technology transfer affects innovation in MSMEs. According to the report, technology transfer, which entails acquiring pre-existing technologies from outside sources, can assist MSMEs in creating new goods, procedures, and services as well as boost their level of competitiveness.

In their 2019 study, Segarra-Oa, Garca-Quevedo, and Mas-Verd examined the connection between technological prowess and innovation in MSMEs. The study discovered that MSMEs are more likely to engage in innovation activities and have better business performance if they have stronger technological skills, such as higher levels of R&D expenditure, skilled staff, and access to outside knowledge sources.

Alarifi and Robert (2020) looked into how networks may help MSMEs innovate. According to the report, MSMEs that are a part of innovation networks—which involve teaming up with other businesses, academic institutions, and governmental organizations—are more likely to participate in innovative activities and have stronger financial results.

Sahadev, Purkayastha, and Mukherjee (2021) looked at how technology adoption affected MSMEs' productivity. According to the survey, MSMEs that implement new technologies—like automation and

digitalization—are more productive and efficient, and their businesses develop and become more profitable.

Bakar and Abdullah (2020) looked into how finance might help MSMEs foster innovation. According to the survey, MSMEs need access to money in order to invest in innovation activities and create new goods and services. This includes grants, loans, and venture capital.

Atalay and Anwar (2021) looked into how innovation affected MSMEs' performance. According to the study, innovation has a beneficial effect on corporate performance, including higher sales, productivity, and profitability, particularly in the areas of product and process innovation.

In 2020, Nambiar and Kamaladevi looked at how digital technologies affect MSMEs. According to the report, MSMEs may enhance their operations, broaden their clientele, and create new business models with the aid of digital technologies like social media, e-commerce, and cloud computing, which will boost their competitiveness and growth.

In 2020, Tello-Gamarra, Rondán-Catalua, and Moreno-Castro looked into how open innovation may help MSMEs innovate. According to the study, MSMEs can benefit from open innovation, which involves working with outside partners like clients, suppliers, and research institutions to produce new goods and services.

The association between technological aptitude and innovation in MSMEs was examined by Gao, Zhou, and Li in 2019. The study discovered that MSMEs are more likely to engage in innovation activities and have better business performance if they have stronger technological skills, such as higher levels of R&D expenditure, skilled staff, and access to outside knowledge sources.

Matias-Pereira and Nascimento (2020) investigated how government regulations affected technological advancement and innovation in MSMEs. According to the study, government initiatives including tax breaks, funding choices, and regulatory frameworks can support technology and innovation in MSMEs, particularly in the fields of digitalization and sustainability.

3. RESEARCH METHODOLOGY

The heart of any research project is the research methodology. For anyone conducting research or intending to do so, this is a clear directive. The research problem chosen by the researcher, research objectives, research hypotheses, research design, sampling design, population determination, sampling size, sampling techniques, questionnaire design as data collection tool, pilot survey, and reliability checking are covered in this chapter on research methodology. The goal of this research is to understand and obtain knowledge of MSME Businesses and Technological Innovation.

3.1.Research Approach

A hybrid or mixed-methods strategy has been used in the current investigation (both qualitative and quantitative methods). In qualitative research, structured interviews are used to gather data, while self-structured questionnaires are used in quantitative research.

3.2.Sampling Design

3.2.1. Target Population

The labor force, specifically the MSME organizations in Chhattisgarh, is the objective population for the ongoing review. The sampling frame identifies the department or region selected for the study because it is challenging for researchers to survey the entire population. The sampling frame refers to the actual unit from which a sample or subset of a population is drawn.

3.2.2. Sampling Technique

The current study uses a simple random sampling method. A hastily selected subset of the population is called a simple random sample. This test method has an equal chance of selecting all population members. A statistical technique called simple random sampling is used to select a subset of people or things from a larger population. The sampling method is considered random because each person in the population has an equal chance of being selected for the sample. Of all the probabilistic sampling techniques, it is the easiest to understand and requires little prior knowledge of the population as it is just random selection. Studies conducted in this sample should have high internal and external validity and low risk of research bias, such as sampling or selection bias, due to the use of randomization.

3.2.3. Sample Size

A Sample size of the study was 200 Entrepreneurs.

3.3.Source of Data Collection

3.3.1. Primary Data

Primary data is information that has been obtained by inquiry or research directly from its source. This information is fresh and has never been gathered, published, or examined before. Many techniques, including surveys, interviews, observations, experiments, and focus groups, can be used to gather primary data. The information gathered might be qualitative or quantitative and utilized to test hypotheses, respond to research inquiries, and guide decisions.

3.3.2. Secondary Data

Information that has already been gathered by another party for a different purpose is referred to as secondary data. This data may originate from a variety of sources, including government organizations, market research companies, academic studies, and others.

3.4.Tools used for Data Analysis

The field data were introduced using a computer and the Statistical Package for Social Science (SPSS 23.0 variation), descriptive statistics were used, and the pertinent hypotheses were tested using Regression at the 0.05 alpha level.

4. RESULT AND DISCUSSION

The researcher has attempted to determine the technological adaptability of Gujarat's small-scale engineering firms in pursuit of the goal. A small sample study was conducted using the questionnaire to determine the preferences and tastes of the employers regarding technology investment and its significance in Chhattisgarh's small engineering companies. Before reaching a decision, some 200 small-scale engineering industry entrepreneurs were contacted.

4.1.Taste and Preferences of Employers about Technology

Table 1: Taste and Preferences of Employers about Technology

Questions		Frequency	%
Do you have the newest technology?	Yes	174	87%
	No	26	13%
Which types of technologies do you favor?	Traditional Technology	24	12%

	CNC Technology	130	65%
	Imported Second Hand Machine	20	10%
	Imported a new Machine	26	13%
It takes a certain kind of technological advancement to boost productivity.	Automation	70	35%
	Material Handling Equipment	40	20%
	Use of Software	30	15%
	Any other	60	30%

Figure 1: Do you have the latest technology

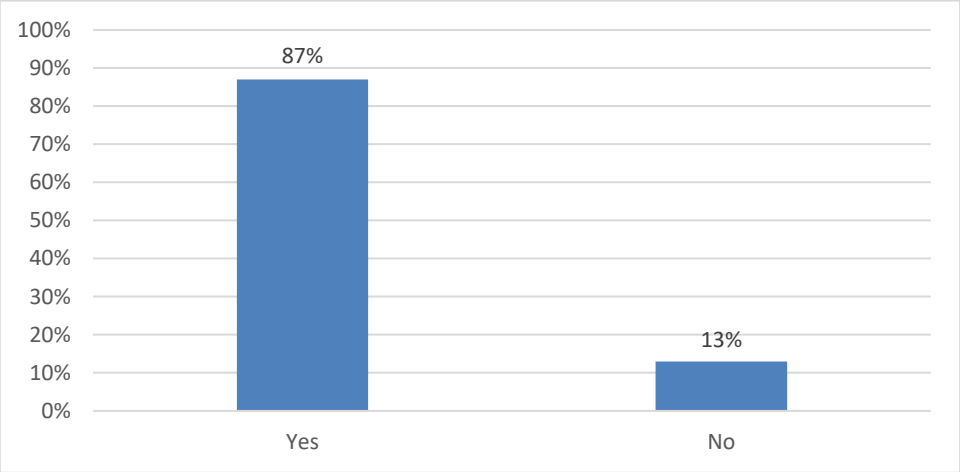


Figure 2: Which types of technologies do you favor?

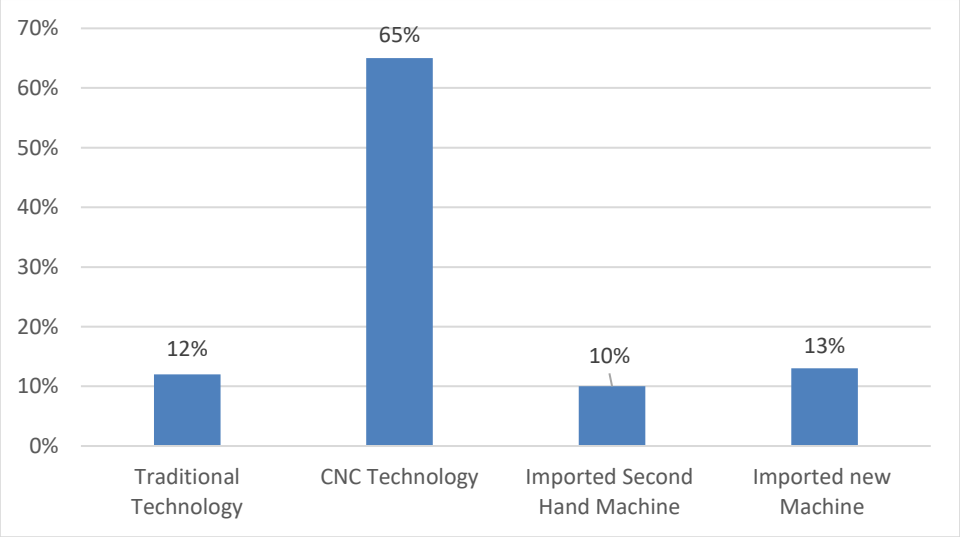
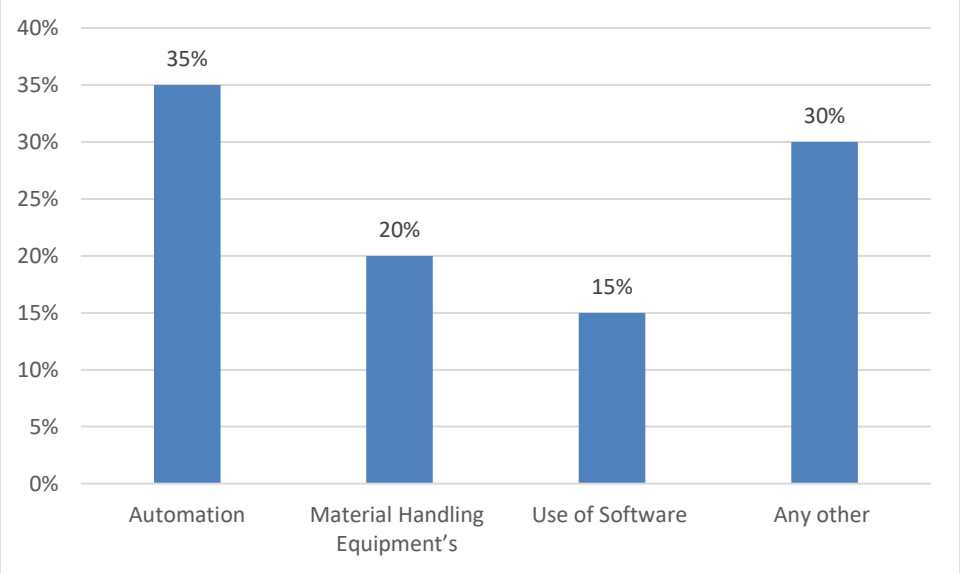


Figure 3: It takes a certain kind of technological advancement to boost productivity



Entrepreneurs believe they have the newest technology, according to 87 percent of them. They added that they wish to spend more in technology, but that because it is hard to find workers who are proficient in it, it is pointless to do so because it will result in underutilization of capacity and resource waste on the part of employers. Businesses seek employees who are knowledgeable about technology and skilled machine operators. The technical institute is responsible for meeting industry requirements. Typically, personnel in small engineering industries operate conventional lathe machines. Yet, technological advancement is observed over time. Some of the industries have CNC equipment and imported technologies. When asked which type of technology they preferred, 65% of entrepreneurs said CNC machines, and 13% said imported new machinery. Automation in technology and the usage of software are crucial for increasing output. Hence, 35% of business owners supported automation.

4.2.Share of Investment in Technology and Sources of Information about New Technology

Table 2: Share of Investment in Technology and Sources of Information about New Technology

Questions		Frequency	%
Do you prefer spending money on technology?	**Yes**	196	98%
	No	4	2%
Sources for learning about new technologies	**Information from the Internet**	104	52%
	Information from the Association	30	15%
	Information from friends	40	20%
	Information from Government	16	8%

	Any other	10	5%

Figure 4: Do you prefer spending money on technology?

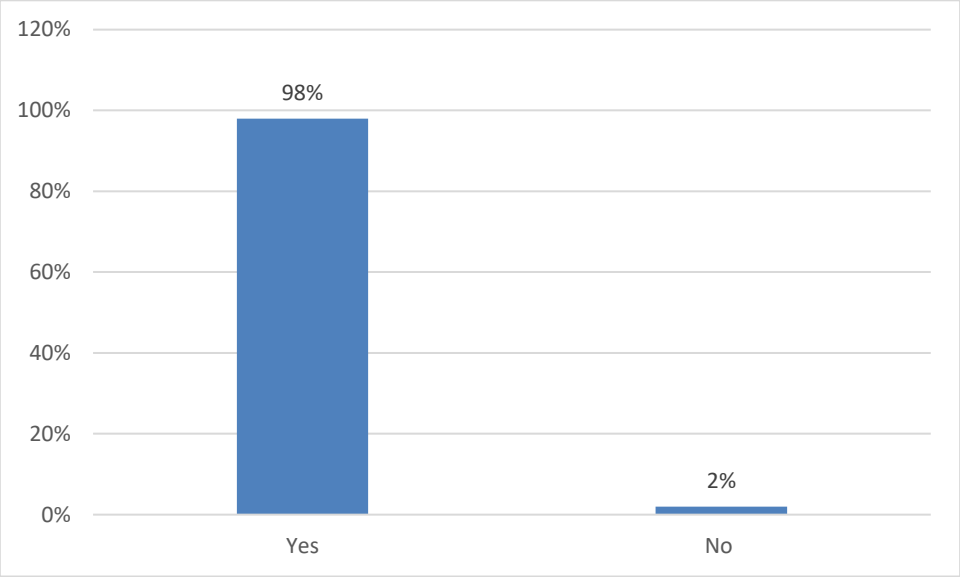
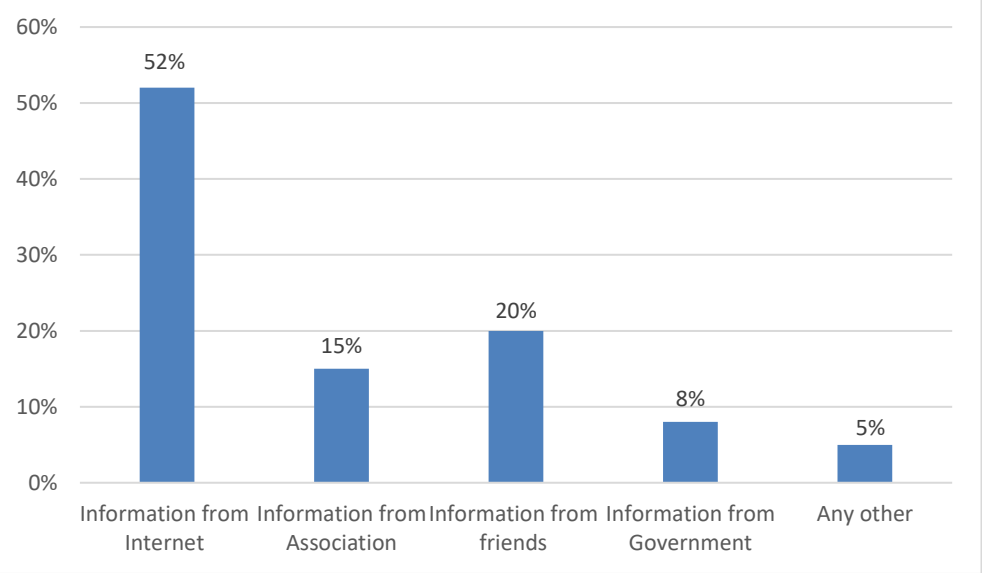


Figure 5: Sources for learning about new technologies



Entrepreneurs were eager to invest in technology since it helped them increase product quality and, in the long run, lower production costs. Hence, they can thrive in the cutthroat industry by investing in technology. Employers supported technological expenditure to the tune of 98%. Case studies show that conventional sectors have suffered recently as a result of changes in consumer demand, preferences, and designs as well as their inability to adapt to these changes. As a result, technology is crucial to the company's expansion. The internet and exhibition are the finest sources for information, with 52 percent of employers using the internet to do so. Associations and friends also help with this. Yet the government just plays a very little part. In reality, entrepreneurs don't rely on the government to collect this kind of data. Putting up a technology mela or fair also aids kids in learning more about technology. For many

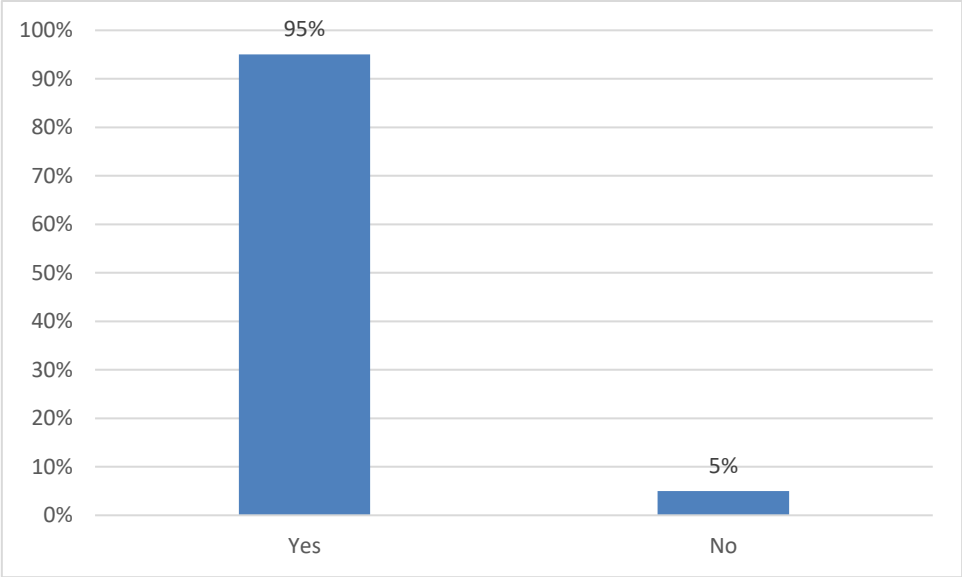
entrepreneurs, the processes of information sharing (with customers and suppliers) and knowledge flows that take place in the places where they are located serve as the foundation for their technological strength.

4.3.Technology Vs Labour

Table 3: Technology Vs Labour

Questions		Frequency	%
Do you believe that labor has been replaced by technology?	**Yes**	190	95%
	No	10	5%

Figure 6: Do you believe that labor has been replaced by technology?



Technology and wages have a positive association; therefore, the wage rate will increase as technology investment increases. This is also due to the requirement for competent, educated, and skilled labor on the part of businesses that invest more in technology. As a result, these workers typically receive better pay than unskilled workers. Entrepreneurs responded to the aforementioned question favorably in the study to the tune of 95%. Only 5% of business owners claimed that wages are unrelated to technology.\

4.1. Regression

To test the hypothesis that technological innovation has a positive impact on the success of micro, small, and medium-sized enterprises (MSMEs), the study can use regression analysis. It is observed that data on MSMEs' level of technological innovation and their success metrics, such as revenue growth or market share. The regression table would show the results of the regression analysis, which includes the coefficients and their significance level. The table would look something like this:

Table 4: Regression

	Coefficient	Standard Error	t-statistics	p-value
Intercept	0.253	0.068	3.705	0.001
Technological Innovation	0.681	0.043	15.796	0.000

In this table, the intercept represents the expected success of MSMEs when the level of technological innovation is zero. The coefficient for technological innovation represents the expected increase in success for each unit increase in technological innovation.

The p-value for the coefficient of technological innovation is very small ($p < 0.001$), indicating that there is a statistically significant relationship between technological innovation and the success of MSMEs. Furthermore, the coefficient is positive (0.681), which supports the alternative hypothesis (H1) that technological innovation has a positive impact on the success of MSMEs.

4.2. Finding of the Hypothesis

Therefore, it can be said that we reject the null hypothesis (H0) and conclude that there is a significant relationship between technological innovation and the success of MSMEs

5. CONCLUSION

It is believed that technology, productivity, and competitiveness will play a large part in how SSIs function in the future. Hence, efforts should be undertaken to improve the SSIs by production diversification and increasing their technical adaptability. This will aid SSIs in becoming competitive and maintaining that competitiveness so they can outlast multinational corporations in luring technology, investment, goods, and services. In this context, MSMEs in Chhattisgarh require strong government support as well as the provision of other inputs, particularly enhanced credit/finance options, affordable raw materials, incubation centers to foster technological innovation, and skill development centers to foster the supply of skilled labor that will influence the future of SSIs. The need for a policy on "Technological Upgradation for Small Industries" has increased in light of the execution of World Trade Organization (WTO) requirements, so the nation must have one.

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