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## **Information and communication technology adoption in small and medium enterprises: Post COVID-19 mantra of success**

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### **Abstract**

**Purpose:** The purpose of the study is to understand the effect of COVID-19 pandemic on SMEs and to discuss and offer various information and communication technology solutions to affected SMEs.

**Design/Methodology/Approach:** This study is based on literature review on the effect of COVID-19 pandemic on small and Medium Enterprises and application of various technologies by SMEs in overcoming the problems. The researcher collected secondary data from various secondary sources like Research papers, case study material, books and report.

**Findings:** The study investigated the factors like lay off, health issue, poor business operations, jobs at risk and closure of SMEs due to COVID 19 and adoption Social media tools, e-commerce and m-commerce applications and Industry 4.0 technologies to overcome pandemic uncertainty. These technologies are benefitting SMEs in gaining competitive advantage and sustain in a market.

**Keywords:** COVID-19, SMEs, ICT, adoption of technologies

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### **Introduction**

The small and medium enterprises are playing a significant role in socio economic development of nation. SMEs are contributing in generating highest employment to skilled, unskilled and semiskilled people of semi urban, urban and rural part of the country, they are contributing in maintaining regional balance by spreading its operation in semi urban and rural areas, they are promoting the economic well-being of under developed or non-developed areas, they are utilizing underestimated or non-used local/ indigenous resources for the production of product or service, etc. Satpathy and Rani (2017) <sup>[31]</sup> study says that the micro, small and medium enterprises are considered as the major supporting factor of economy and a growth engine of India as well as other nation. Misra (2020) <sup>[37]</sup> article published in The Indian Express says that the lakhs of abandoned workers of major part of the country shared that lockdown of COVID 19 was the most terrible decision for their personal and professional life.

According to Venkatesh and Mithiah (2012) SME is contributing significantly and this segment an important role in development of economy and nation at large but the adoption of information and communication technology is at very poor stage, up gradation of technology is one of the important task for the socio economic development of the country. Lawson and Samson (2001) <sup>[16]</sup> study says that the organization which are in position to link technological strategies with business and innovation strategies, are competent enough to bring innovation by adding values in their product or service.

According to Gupta and Nanda (2015) <sup>[13]</sup> to enhance competitiveness of the organization by adopting technologies in various business functions. Chan, Teoh and Pan (2018) <sup>[3]</sup> finding are revealing that the suitable digital technology adoption is leading to enhancement in competitiveness, efficiency, output and performance of the organization. The application of

technology in SMEs can be useful for solving various problems faced during COVID-19 pandemic. SMEs can be recovered their losses during pandemic by adoption of information and communication tools / applications like Online websites, e-commerce like Alibaba, Amazon, ebay, jingdong etc, Social and professional media like Whatsapp, Facebook, Telegram, Youtube snapchat, LinkedIn, Zoom, Google Meet etc. Advanced Technologies can give competitive advantage to all sizes of the organizations. Few technologies are changing the business environment are Robotics, Artificial Intelligence, Cloud Computing, Internet of Thing, Drone technologies etc.

SMEs are getting competitive advantage of flexibility in required changes, cost effectiveness and efficiency in production by adoption of Industry 4.0. Because of these benefits SMEs are showing interest in adoption of Industry 4.0 technologies. Apart from benefits of such technologies, SMEs are facing certain problems like, skills, knowledge and finance.

### **Objectives of the Study**

1. To Study how SMEs are affected due to COVID-19 pandemic.
2. To discuss post COVID 19 solutions for SMEs through Technology adoption.

### **Literature Review**

#### **Problems of SMEs due to COVID-19 Pandemic:-**

According to Drucker (1994) <sup>[30]</sup> novel strategic approach for SMEs should be in position to triumph over the effect of the epidemic since SMEs have been terribly affected financially because of their limited resources and expertise in managing various business functions.

Internet based or information technologies were flourishing before hitting COVID 19 pandemic. In order to control this pandemic condition Government had declared lockdown. During lockdown, business of world's economies started changed to electronic platforms. Remote working, teleconferencing, internet and mobile application, online medical service, e commerce, online payment and online marketing brought world regions closer in starting of 2020.

According to Sen Gupta (2020) [38] digital technologies can be played a very significant role for various industries to not just survive, but to thrive. He added that industries the world would be emerged out of the pandemic crisis and supply chain, employee engagement, working capital, etc would be major focal points, which require enormous usage of technologies. Especially consumer product industry, along with retail, will have to promote digital technologies in order to meet the changing buying behavior of customer due to pandemic crisis.

The COVID 19 pandemic is causing various kinds of crisis like health, economic recession, trade, investment pattern, growth rate and employment generation and this pandemic condition is affecting the accomplishment of sustainable development goals of the United Nation. The International Trade Centre is observing how this pandemic is affecting MSMEs with special focus on small organization of developing and under developing nation.

McKinsey (2020) recent study in Europe on effect of COVID 19 epidemic explores that most of the jobs are at risk and found that at least two of three SME jobs are in risk. In Australia, SMEs are accumulating around 68% of jobs and all such jobs are in risk. Campion *et al.* (2020) study says that many COVID 19 frontier healthcare professional and COVID recovered patients face disgrace and discrimination at workplace and in society. Such public health crisis may change the health ecosystem. According ILO (2020) the COVID 19 impact would be rise in unemployment of 5.3 million and 24.7 million, showing that sustaining in business would be difficult for SMEs.

According to Bartik *et al.* (2020) survey represents that 43% of responded SMEs are already closed and three quarters of SMEs say that they have only two months or less cash reserve to run business. ITC (2020) survey says that two third of micro and small businesses are affected badly due to COVID 19 pandemic and one fifth show that the risk of being closed permanently with in coming 3 months. Mckinsey (2020) study says that approximately 25 to 36 % of small enterprises could be closed down permanently in first few months of pandemic. The survey report of Federation of Small Business (UK) shows that 41% of small firms are already closed and 35% are in terror of not able to reopen again.

**Table 1**

Sr. No.	Author	Parameter	Impact on SMEs
1	Bartik, A.W., Bertrand, M., Cullen, Z., Glaeser, E.L., Luca, M., & Stanton, C. (2020)	Lay off	1. Layoff and closure of the small business. 2.Many small business became financially fragile and are expecting economic support from CARES( Corona virus Aid, Relief and Economic Security)
2	J. Campion, A. Javed, N. Sartorius, M. Marmott(2020)	Health Issues	Many COVID 19 frontier healthcare professionals and COVID recovered patients face disgrace and discrimination at workplace and in society. Such public health crisis may change the health ecosystem.
3	Mckinsey (2020)	Jobs at Risk	Recent study in Europe on effect of COVID 19 epidemic explores that most of the jobs are at risk and found that at least two of three SME jobs are in risk. In Australia, SMEs are accumulating around 68% of jobs and all such jobs are in risk.
4	ILO(2020)	Business Operation	The COVID 19 impact would be rise in unemployment of 5.3 million and 24.7 million, showing that sustaining in business would be difficult for SMEs.
5	Bartik <i>et al.</i> (2020);ITC (2020);	Closure of SMEs	1. The survey represents that 43% of responded SMEs are already closed and three quarters of SMEs say that they have only two months or less cash reserve to run business. 2. The survey says that two third of micro and small businesses are affected badly due to COVID 19 pandemic and one fifth show that the risk of being closed permanently with in coming 3 months.

#### **Adoption of Technology: Post COVID 19 solutions for SMEs**

The technology adoption is one of the most efficient strategy to solve the problems of SMEs which are affected due to COVID-19 pandemic. Technologies like digital tools, information and communication technologies, Social media, e-commerce, Technology 4.0 and other advanced technologies can play a very significant role in overcoming the problems of COVID-19 affected SMEs.

#### **Social Media tools adoption in SMEs:**

Kumar and Ayedee (2018) study says that social media applications are helping organization to increase the visibility in target market and also in earning goodwill by giving confidence to customer about product or service. Various studies say that majority of customers are using social media account for making buying decision in

developed and developing economies of the world. The marketing communication tools and techniques are helping customers to have better connect with company and its offering 24\*7. According to Liguori and Pittz (2020) Small business should be well equipped with company website and social media network to communicate changes made in business process or functions. Small business should understand that COVID 19 pandemic is an opportunity to serve the interests of their loyal or regular customer. Palacios Marques *et al.* (2015) study says that the resource based perspective of organization offers base for the linkage between usage of social media and value creation for SMEs. Hajli (2013) study says that social media is helping those who are seeking information about product and services offer by organization. This information about product and services are enhancing the buying behavior of customers. Nisar and

Whitehead (2016) study concluded that social media is one of the most significant marketing communication channel which help SMEs in performing various business functions like Advertising, public relation, product branding, customer care service etc.

Trainor, Andzulis, Rapp, & Agnihotri (2014) researchers concluded that the adoption of social media tools are enhancing the capabilities of SMEs to improve their performance.

**Table 2**

Sr. No.	Authors	Parameter	Benefits of Social Media adoption
1	Kumar and Ayedee (2018)	Social Media Usage	Social media applications are helping organization to increase the visibility in target market.
2	Liguori and Pittz (2020)		Small business should be updated with their services to serve their loyal customer in this pandemic.
3	Palacios Marques <i>et al.</i> (2015)		The resource based perspective of organization makes basic foundation for the link between usage of social media and value creation for SMEs.
4	Trainor, Andzulis, Rapp, & Agnihotri (2014)		The adoption of social media tools are enhancing the capabilities of SMEs to improve the performance
5	Nisar and Whitehead (2016)		Social media is one of the most significant marketing communication tool which helps in solving various business problems.

**E- Commerce application adoption in SMEs:** E commerce is providing various kinds of services like to communicate, collaborate, buy and sell products and services by adopting various internet based platforms like website, digital marketing, online market, search engines like google etc. Company displays their business and product or service related information on online platforms and facilitates customers in buying decision making. MacKay *et al.*, (2004) <sup>[23]</sup> and Pearson & Grandon (2006) <sup>[28]</sup> study say that in order to maintain competitive advantage, SMEs have been started adopting e commerce tools. E-Commerce applications are helping SMEs to grow in competitive business environment. Tan *et al.* (2007) <sup>[34]</sup> study says that China's Central Government is promoting the adoption of e commerce on priority but according to study of Molla and Licker (2005b) internal organizational factors are the major barriers of e-commerce adoption. Fillis *et al.* (2003) found that SMEs may earn competitive advantage by adoption of e-commerce and can

be achieved improvement in performance and have a well-connected access to target market. Macchion *et al* (2017) <sup>[17]</sup>; Melen Hanell *et al.*, (2019) study says that Small retailers are sharing rapid growth in business by capturing foreign market place with the help of e commerce or digital tools. McKinsey (2020) <sup>[24]</sup> conducted worldwide survey of adoption of e-commerce tools during COVID-19 pandemic. Study found that online grocery shopping in Brazil and South Africa, kerbside pick UP from restaurants in France, Germany, Italy, United Kingdom and United States increased by more than 50%. According to Mint (2018) the demand and supply match of product or service is the fundamental criteria for sustaining the strategic position in competitive market.

Alibaba, Amazon, Flipkart etc are few of the reliable names in the e commerce industry, which provides various kinds of services like custom clearance, foreign exchange etc. to Small and Medium enterprises(SMEs).

**Table 3**

Sr. No.	Author	Parameter	Benefits of e Commerce adoption
1	MacKay <i>et al.</i> , (2004) and Pearson & Grandon (2006)	e-commerce adoption	In order to maintain competitive advantage, SMEs have been started adopting e commerce tools E- Commerce applications.
2	Tan <i>et al.</i> (2007);Molla and Licker (2005b)		China's Central Government is promoting adoption of e-commerce enthusiastically but organizational internal factors becoming barriers.
3	Fillis <i>et al.</i> (2003)		SMEs may earn competitive advantage by adoption of e-commerce and can be achieved improvement in performance.
4	Macchion <i>et al</i> (2017); Melen Hanell <i>et al.</i> , (2019)		Study found that e commerce adoption is helping small business to expand business to foreign countries.
5	McKinsey (2020)		Survey on adoption of e-commerce tools during COVID-19 pandemic found that more than 50% increase in online shopping and online food orders in developed countries.

#### **Industry 4.0 adoption in SMEs:**

The industrial system which is pulling the attention of majority industrial sectors in the world is Industry 4.0. It consists of hardware technologies like wireless, wired network, sensor, industrial robotics, automation and software technologies like data securities machine learning, IoT and cloud computing. Recent decrease in hardware and software as well as mesh networking, which enable SMEs to use low cost solution for gaining competitive advantage in post COVID-19 pandemic. According to study of Lee and Lapira (2013) <sup>[18]</sup>; Gualtieri *et al.* (2018) <sup>[8]</sup> information and communication technology and Industry 4.0 technologies collaboration would make over small

and medium enterprises into smart factories and will give economic competitive advantage. Chen *et al.* (2018) <sup>[4]</sup>; Frank *et al.* (2019) <sup>[7]</sup> studies says that modern manufacturing technologies like high precision machines, reconfigurable production units, 3D printing and others are changing means of production, processes and strategies. According to study of Bakkari and Khatory; Schlegel *et al.* (2017) <sup>[32]</sup>

SMEs are encouraged to achieve sustainable and green field manufacturing by adopting various kinds of Industry 4.0 technologies. Gerner (2020) study found that the Artificial Intelligence based propensity models are helping organizations to identify which segment of customers are showing interest in

buying product or services. Such models are helping organizations to achieve improvement in productivity and effectiveness in sales and business development. According to

Moef, *et al.* (2017) <sup>[25]</sup> the software based technologies like artificial intelligence and big data are helping SMEs in organizing manufacturing function effectively and efficiently.

**Table 4**

Sr. No.	Author	Parameter	Benefits of Industry 4.0 adoption
1	Lee and Lapira (2013); Gualtieri <i>et al.</i> (2018)	Industry 4.0 adoption	Information and communication technology and Industry 4.0 technologies collaboration would transform small and medium enterprises into smart factories.
2	Chen <i>et al.</i> (2018); Frank <i>et al.</i> (2019)		Advanced technologies like high precision machines, reconfigurable production units, 3D printing and others are drastically changing the means of manufacturing.
3	Bakkari and Khatory; Schlegel <i>et al.</i> (2017)		SMEs are encouraged to achieve sustainable and green manufacturing by adopting various kinds of Industry 4.0 technologies.
4	Gerner (2020)		Study found that the Artificial Intelligence based propensity models are helping organizations to identify which segment of customers are showing interest in buying product or services.
5	Moef, <i>et al.</i> (2017)		The software based technologies like artificial intelligence and big data are helping SMEs in organizing manufacturing function effectively and efficiently.

### Discussion and Conclusion

The above research study says that during COVID-19 pandemic, the Small and medium enterprises were one of the most affected business sectors in terms of manufacturing, finance, sales, warehousing, supply chain and human resources related issues. The adoption of Information and Communication Technologies can be minimized the all kinds of business losses faced by SMEs. Various hardware and software based technologies will help SMEs to avoid direct physical contact with various resources of the business. Internet based applications like Facebook, Whatsapp, youtube, Linkedin Online shopping website, e-commerce, m-commerce etc. are playing a significant role connecting with customer more efficiently and effectively. The decision makers of SMEs should consider COVID-19 pandemic is an opportunity to adopt various kinds of advanced technologies and applications for the business.

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