Impact of Artificial Intelligence on Next-generation Startups

A. R. Swami

Assistant Professor,
Daparment of Computer Science and
Computer Application,
Dattajirao Kadam Arts, Science and Commerce
College, Ichalkaranji (Maharashtra, India)
E-mail: akshayswami99@gmail.com

V. S. Kumbhar

Assistant Professor,
Daparment of Computer Science,
Shivaji University,
Kolhapur (Maharashtra, India)
E-mail: vsk_csd@unishivaji.ac.in

Abstract:

Machine learning and artificial intelligence (AI) are rapidly emerging technologies gaining traction in the business world and eventually in startups. Various industries, including startups, have already found ways to incorporate Artificial Intelligence into their operations. Artificial Intelligence (AI) has become an integral part of our daily lives and impacts humans, society, and business. The use of artificial intelligence in startups may result in a business process that is more precise, faster, and less expensive and ultimately atomizes the business process. An entrepreneur who employs artificial intelligence in marketing tactics may see a better response from the audience, gain a competitive advantage, and ensure long-term success. In conjunction with business process renovation and reengineering, innovative marketing concepts can transform businesses. It also provides solutions to complex tasks, which aids in the rapid expansion of startups across the globe. This paper discusses the overall impact of Artificial Intelligence on small and medium-sized businesses.

Key Words: *Artificial Intelligence, AI, Startups, Emerging Information Technology*

1. Introduction:

According to recent reports, Artificial Intelligence (AI) is rapidly altering the business landscape. Every day, technology becomes more powerful and more easily accessible. As a result, businesses of all sizes are increasingly incorporating artificial intelligence solutions into their operations. As interest in artificial intelligence continues to grow, an increasing number of startups are focusing their efforts on developing new AI products and services [1]. Artificial intelligence has made significant strides forward and improved significantly [2]. Applied Artificial Intelligence is gradually but steadily expanding the corporate sector and simplifying the lives of executives in large

corporations. Artificial intelligence (AI) is being used to improve profitability while also gaining a competitive advantage continuously. AI is something that not only well-established organizations can benefit from; many startups are looking for every advantage that can be exploited in today's digital environment, utilizing AI to expand their businesses and profit from their efforts [3].

2. Purpose of startups:

Startups are possibly the most exciting type of business because they provide a unique opening for global influence and growth. Many individuals could only dream of this possibility a few decades ago. Artificial Intelligence (AI) automates jobs and enables new services worldwide through low-cost computer power, cloud computing services, big data expansion, and breakthroughs in machine learning (ML) and associated processes. AI can alter and enhance the way governments, corporations significantly, and individuals offer services, collect information, and plan and operate [4].

Though, startup traditions create mixed opinions. It is observed that some people are enthusiastic about startups, and few may not support the startups. Hence Startups are habitually a target for unfounded arguments. The propaganda around them is easy to identify as wishful thinking or falsehood. As a result, many wrong assumptions regarding startups have emerged. This is because the startups thrive on hope. Entrepreneurs in the startup world construct fantasies about how the future may look and then strive to make these ideas a reality. They have a strong belief that they can have an impact and that their activities will have repercussions that will lead to the creation of a business [5].

In the startup environment, a business that's still in the idea phase can potentially have a tremendous impact in the upcoming five years – will have a turnover of a billion dollars. There is a lot of unnecessary propaganda around startups. People who have worked in the startup scene for a long time often suffer from such propaganda. They are doing what they are supposed to do because they believe in future gains [6].

3. Need of Artificial Intelligence in Startup:

Artificial intelligence the art of teaching computers how to "think." coding and programming. Artificial Intelligence (AI) is a computer or computer-controlled function of a computer that usually performs tasks that humans perform because it requires human intelligence and judgment. The theory and development of computer systems capable of performing tasks that typically require human intelligence, such as visual recognition, speech recognition, decision-making, and translation between languages [7].

Artificial Intelligence is rapidly being employed in startups to build cost-saving systems and procedures, saving them money while gaining a competitive advantage. AI is being utilized in

startups to address unique difficulties while launching a business. This involves developing a solid client base, recognizing the vast quantity of data accessible, and exceeding sales and productivity targets. Startups today have access to more sophisticated tools and software to assist them in achieving consistent and sustainable development through the use of AI technologies [8].

At the startup level, some of the advantages of AI include the rapid discovery of patterns in large amounts of data, rapid visualization and analytics, improved product design, the delivery of precise insights, and many others. These advantages are predicted to bring about new service levels, increased profit, business expansion, improved efficiency, and cost structures [9]. Innovation, knowledge, and entrepreneurship are the three elements that drive Economics deals with dynamic processes causing qualitative transformation. This paper uses these forces as a foundation to explore the success of AI algorithms, investigate their deployment commercially, and research investors, entrepreneurial activities, and ultimately the worldwide market.

Many firms are actively utilizing artificial Intelligence (AI) to transform the manufacturing process, provide better and more innovative services to clients, and change the way businesses function. The traditional link between manufacturing facilities and human resources is shifting as products and services have become totally digital. AI will become product components such as capital and labour and enhance productivity. The new technology will also significantly influence startups' competitive standing. Investing in AI cuts expenses and boosts the competitive edge of innovative enterprises. AI is now undergoing substantial changes in terms of innovation. Instead of coming from global corporations in the past, innovation today comes in big numbers from research institutes, internet platforms, and startups [10].

The advancements in artificial intelligence is at the heart of the improved performance of all other technologies and the evolution of Industry 4.0. There is plenty of evidence available in the literature that proves that AI technology offers new opportunities that can lead to a remarkable transformation in businesses and the overall business process

Throughout history, innovation has been the primary driver of rising living standards. However, innovation can be troublesome many times because it makes conventional technologies outdated. Cloud computing, the Internet of things (IoT), big data, data science, artificial intelligence (AI), and blockchain are emerging technologies that can generate both winners and losers around the world. Some of these technologies have been around for at least two and a half decades [11], but they were neither mainstream nor feasible for commercial use. However, in recent years, the situation has shifted considerably, and practically every area now uses one or more of these technologies. Many factors contribute to this, including advances in computer technology (high-performance computing, grid computing, and cloud computing), more openness through code

sharing (services such as GitHub, GitLab, and BitBucket), [12] and a significant number of open-source software. At present, the massive applications of these technologies in every industry, including healthcare, vehicles, banking, gaming, environmental monitoring, agriculture, sports, energy management, security, and so on, are altering the way people live, work, and play. Further improvement of these technologies may lead to hyper-automation and hyper-connectivity, the dawn of the Fourth Industrial Revolution [13].

Companies such as Amazon Prime, Netflix, and Hotstar would not exist without their AI-powered proposal engines. Startups seek new AI opportunities in areas like product forecasting, digital shop setups, supply chain management, and consumer purchasing patterns, among others. During the COVID – 19 period, medical services attempted to speed scientific research and vaccine development. India's AI market is valued at $6.4 billion through July - August 2020. The market is reliant on a 26 per cent annual growth rate (CAGR) in construction from 2020 to 2027 [2]. There has been a remarkable growth in technology disruption in India in recent years. The artificial intelligence sector will provide a $ 32 billion potential on its own. Advanced robots already handles 25% of all tasks. This number will rise to 45 percent in the next few years [14].

4. AI Business Ecosystem / Model:

There are three major categories of AI-related technology deployed by diverse startup firms. The first is a set of algorithms, the second is a set of big data technologies, and the third is computing power technologies. Algorithms are used to create natural language processing (NLP) (Natural Language Processing) software. To increase the effectiveness of NLP, machine learning or deep learning models are being developed further. The large data set of technologies encompasses data assessment, storage, management, and analysis tools. Computing power technologies need massive computational power [10] [15].

Open-source software platforms: The majority of technological advancement is dependent on technology that is crucial to the development of other technologies. The same can be said about AI and its open-source platforms. Hadoop, for example, is capable of storing and analyzing incredibly substantial data sets.

Applications of AI developed by startups : Startups are developing various basic as well as commercial applications of AI, such as enterprise, self-driving cars, medicine, virtual assistants, security, robotics, IoT, science, smart home, and legal applications [16], among others for a variety of industries such as medical, transportation, real estate, education, and so on [7]. For example, Alexa, Cortana, and Sirimploy powerful machine learning technology to make suggestions answer questions, and respond to user query to a variety of Internet services [7].

Key Technologies in AI: Entrepreneurs utilize various necessary AI technologies to produce

complex applications, software's, tools, and SaaS. (Software as a Service). The leading technologies are machine learning, deep learning, computer vision, NLP, speech recognition, big data, AI hardware, face recognition, text generation, AI platforms, and cognitive APIs [17].

Impact of AI on startups:

There are roughly 2,727 Artificial Intelligence startups in India as of July 2021 [18]. Many firms are already employing artificial Intelligence (AI) to transform the manufacturing process, provide better and more creative services to clients, and optimize various advantages by altering how businesses function.

5. Literature review:

Sonia N. et al. presented the survey of the top 200 AI startups demonstrating the impact of advanced AI research and innovation on the worldwide market. According to the report, the AI wave has begun, and the hunger for AI development is growing exponentially. AI investment has been steadily increasing over the previous six years and is expected to continue in the future. According to the survey, AI technology is only available in a few parts of the world. This is resulting in a "AI split." Like the digital divide, this separation will exacerbate inequalities in the social, economic, and cultural sectors, resulting in a chasm. Furthermore, software dominates AI, and software is prone to flaws. Some deep learning algorithms/methods form the foundation of AI [7].

Palanivelu observed the qualitative research approach was utilized by the researcher, who conducted semi-structured interviews with 10 different entrepreneurs from ten different enterprises in Salem. The study's primary findings revealed that competitive pressure, media attention, digital maturity, and consumers were the most influential variables in incorporating AI in business. Respondents received different comments on the findings relating to the benefits of incorporating AI in marketing [26]. The main advantages of marketing specialists include increased efficiency, time savings in marketing operations, improved conversion rates, a better grasp of client information, making decisions more viable, and enhancing ROI. insights, improved service, and increased client satisfaction According to the answers, the most difficult obstacle in AI integration is technological compatibility. Respondents also said that having data in place is critical since it is the most crucial aspect of AI, and that AI has made the firm more productive [27]. AI assists in developing sales and marketing strategies that result in significant improvements in corporate performance. The above studies emphasize the relevance of AI in business. Furthermore, significant hurdles, ethical considerations, and applications guided businesses looking to implement AI in their operations. Firms should consider the elements and obstacles while incorporating AI into their operations [1].

Wael Basri discussed the influence of artificial intelligence-assisted social media marketing on the performance of small and medium-sized businesses in Saudi Arabia. They used a survey

approach to gather, analyze, and interpret primary and secondary data. Participants were Saudi Arabian company owners and workers from startups and small and medium-sized firms [24]. Partial least squares structural equation modelling was used to examine the data and the findings were that artificial intelligence-assisted social media marketing is becoming more popular among Saudi startups and small and medium enterprises, accounting for an overall increase in the number of customers and customer bases and an additional tertiary effect of increased profitability. Artificial intelligence-assisted social media marketing improves business management and the performance of small and medium-sized businesses [25].

Furthermore, good company management improves the success of small and medium-sized businesses. This study is exceptionally unique in that it investigates whether artificial intelligence-assisted social media marketing strategies substantially impact the performance of small and medium-sized businesses, with competent business management acting as a moderator. This study can help practitioners improve their performance by reducing numerous marketing challenges through artificial intelligence-assisted social media marketing [13].

Ida Merete et al. provide a narrative assessment of how firms might use AI and what value-generating methods such AI employs. The end result of this study is divided into three sections. First, numerous AI enablers and obstacles are discovered. These AI adoption antecedents include technological, organizational, and environmental resources and situations. Second, several AI use cases are distinguished. AI technology may be used by businesses to automate processes or enhance humans for internal or external objectives. Internal purposes refer to the use of AI to enhance internal company operations in situations where the client does not have direct touch with the AI-solution. Furthermore, employing AI for external purposes entails applying it in products and services that directly touch clients. Finally, the effects of AI are discussed [19].

Paliwal M et al. anticipated artificial intelligence will be able to perform everything a person can, but with more accuracy, and this will be possible via the use of cutting-edge futuristic technology. This study's findings will assist corporate organizations in gaining an understanding of artificial intelligence and machine learning. This research will assist the company in identifying the gap between present operational techniques and emerging methodologies that leverage machine learning and artificial intelligence for business operations. Artificial intelligence in corporate operations enables organizations to handle their business prospects swiftly, eliminates mistakes, promotes transparency, and raises revenues by leaps and bounds. It's tough to predict where this technology will generate new jobs in the future [20].

Weber M et al. contributed to a basic knowledge of AI startup business models by identifying important traits, typical instantiations, and distinguishing features. Furthermore, this study suggests

intriguing future areas for entrepreneurship research. In reality, the taxonomy and patterns function as organized instruments to aid entrepreneurial action [21].

Bernardo D. et al. explained how artificial intelligence might operate as a catalyst and engine of change in markets through the formation of startups. The characteristics of artificial intelligence align with the requirements of new initiatives. In this study, a large number of Italian startups are profiled, as well as a comparison of startups in the same industry, with a focus on those who use AI and those that do not, in order to identify differences in economic performance, customer perceptions, and business model quality. Finally, the overview of artificial intelligence as a driver of innovation and success for startups may be enhanced by considering user evaluations and their customer experience, contentment, and loyalty, both in the B2B and B2C markets [22].

Nishad Nawaz described how artificial intelligence and robotics technologies can fully automate business processes such as finance, human resources, manufacturing, and so on, and how automation can reduce labour and related costs. On the other hand, it will increase the opportunity for organizations to have a massive amount of data and information to extract many insights of knowledge by using collected data and will be helpful in data mining and machine learning algorithms [23].

6. Findings:

The findings of the study are;

1) Artificial intelligence (AI) is a technology that is now being used by various startups and business sectors to solve consumer issues and converse with them. All major and emerging companies are incorporating artificial intelligence and machine learning technologies into their business marketing efforts to improve the principles of client engagement, develop connections, win the battle, and enhance profits.

2) Artificial Intelligence is being used to find new consumer groups for better targeting. Artificial intelligence-based tools amass client knowledge.

It is possible to provide the best-customized offer to consumers from a mechanical and construction standpoint.

3) Automation in startup will undoubtedly result in various benefits, including increased worker productivity, rapid startup growth, accessibility to buying and selling with service to customers at any time throughout the year, and improved performance and efficiency in startup operations. It also eliminates the human factor, which is the root of many problems in day-to-day company processes.

4) AI can assist you in developing a single, cross-cutting strategy to address fraud, stringent compliance, and security threats. You'll be able to protect your company's brand and income,

prevent in appropriate payments connected to deceptive actions, additional payment, and abuse before they occur, and detect early signals about emerging dangers.

5) Machine learning and artificial intelligence will combine knowledge, validate patterns, and optimize and forecast trends. Algorithms based on the technology will choose resumes, identify suitable applicants, create superior employee profiles, understand video interviews, and provide information on persons who appear to be on their way to the interview. Several companies utilize AI to find perfect employees, evaluate the resumes of potential employees, send employment letters to them, and develop professional communications.

7. Conclusion:

This study's findings will aid commercial organizations in gaining a better understanding of artificial intelligence and machine learning. This research will aid the company in recognizing the differences between current operational approaches and emerging methodologies that employ machine learning and artificial intelligence in startup operations. Artificial Intelligence in startup operations helps startups handle business opportunities more rapidly, remove mistakes, promote transparency, and raise income by leaps and bounds. It is impossible to say where this technology will produce new employment in the future, but it will inevitably be beneficial to humans. Experts believe that artificial intelligence will be in charge of everything. A simple example is a machine defeating a human at chess that a human can do, but with more precision. Champion at chess, and attained with the use of cutting-edge future technologies, This shift to automation is for centuries that has influenced many greater industries nowadays to confirm a lot of these modifications technologically and to bring this in existence startups must use particular human abilities and program this ability to triumph the human-like capabilities in the decision by the machines.

References:

1.   Adoption of Advanced Technologies are the Driving Force in Re-Shaping the Technology Based Startup Eco System, *Int. J. Recent Technol. Eng.*, vol. 8, no. 3S2, pp. 963–972, Dec. 2019, doi: 10.35940/ijrte.C1265.1083S219.

2.   "Artificial Intelligence Startups in India," Jul. 13, 2021. https://tracxn.com/explore/Artificial-Intelligence-Startups-in-India/ (accessed Mar. 07, 2022).

3.   A. Lemaire, R. Lucazeau, T. Rappers, F. Westerheide, and C. E. Howard, "Artificial Intelligence – A strategy for European startups. Recommendations for policymakers," *Roland Berg. GmBH*, p. 32, 2018.

4.   A. Sharma, S. Ajadi, and A. Beavor, "Artificial Intelligence and Start-Ups in Low- and Middle-Income Countries : Progress , Promises and Perils," *GSMA*, p. 42, 2020.

5. B. Parekh, "Impact of Artificial Intelligence On StartUp Business." https://www.linkedin.com/pulse/impact-artificial-intelligence-startup-business-bhavesh-parekh (accessed Mar. 06, 2022).

6. Eckert and Daniel, "Artificial intelligence is changing how companies do business. What should boards know?," *PwC Gov. Insights Cent. Technol. Ser. Board Byte Artif. Intell.*, 2017.

7. F. Caram, A. Proto, H. Merlino, and R. García-Martínez, "Using Ising Model to Study Distributed Systems Processing Capability," in *Recent Trends in Applied Artificial Intelligence*, Berlin, Heidelberg, 2013, p. 92.101. doi: 10.1007/978-3-642-38577-3.

8. G. Oswald and M. Kleinemeier, Eds., *Shaping the Digital Enterprise*. Cham: Springer International Publishing, 2017. doi: 10.1007/978-3-319-40967-2.

9. I. D. Bernardo, M. Tregua, G. Fabio, and R. Andrea, *AI as a boost for startups companies: Evidence from Italy*, vol. 2. Anahei Publishing, 2021. doi: 10.5038/9781955833035.

10. I. M. Enholm, E. Papagiannidis, P. Mikalef, and J. Krogstie, "Artificial Intelligence and Business Value: a Literature Review," *Inf. Syst. Front.*, Aug. 2021, doi: 10.1007/s10796-021-10186-w.

11. J. Bughin *et al.*, "ARTIFICIAL INTELLIGENCE: THE NEXT DIGITAL FRONTIER?," *McKinsey Glob. Inst.*, p. 80, 2017.

12. K. TULLY, "Artificial Intelligence and its Growing Impact on Startups." https://startupnation.com/grow-your-business/artificial-intelligence-impact/ (accessed Mar. 06, 2022).

13. Kharade, K. G., Kamat, R. K., Kharade, S. K., & Katkar, S. V. (2019). Automation of Paper Setting Process to Improve Effectiveness of The Examination System of The University. Journal of Emerging Technologies and Innovative Research, 490-493.

14. Kharade, K. G., Kamat, R. K., Mudholkar, R. R., & Kharade, S. K. (2018). Removable Drive Blocker Application for Virus Detection. International Journal of Research Culture Society, 233-234.

15. Kharade, K. G., Katkar, S. V., Patil, N. S., Sonawane, V. R., Kharade, S. K., Pawar, T. S., & Kamat, R. K. (2021). Text Summarization of an Article Extracted from Wikipedia Using NLTK Library. In M. Singh, V. Tyagi, P. K. Gupta, J. Flusser, T. Ören, & V. R. Sonawane (Eds.), *Advances in Computing and Data Sciences* (Vol. 1441, pp. 195–207). Springer International Publishing. https://doi.org/10.1007/978-3-030-88244-0_19

16. M. Grant, "What Is a Startup?," *Investopedia*. https://www.investopedia.com/terms/s/startup.asp (accessed Mar. 06, 2022).

17. M. Weber, M. Beutter, J. Weking, M. Böhm, and H. Krcmar, "AI Startup Business Models:

Key Characteristics and Directions for Entrepreneurship Research," *Bus. Inf. Syst. Eng.*, vol. 64, no. 1, pp. 91–109, Feb. 2022, doi: 10.1007/s12599-021-00732-w.

18. Mildred Austria, "How Artificial Intelligence Impacts Startups." https://techdayhq.com/community/articles/how-artificial-intelligence-impacts-startups (accessed Mar. 06, 2022).

19. N. Anute, M. Paliwal, M. Patel, and N. Kandale, "Impact of artificial intelligence and machine learning on business operations," *J. Manag. Res. Anal.*, vol. 8, no. 2, pp. 69–74, Jun. 2021, doi: 10.18231/j.jmra.2021.015.

20. N. Nawaz, "Entrepreneurship in the age of artificial intelligence and robotics," *Int. J. Hum. Resour. Manag. Res.*, vol. 9, pp. 28–33, Apr. 2019.

21. N. Soni, E. K. Sharma, N. Singh, and A. Kapoor, "Artificial Intelligence in Business: From Research and Innovation to Market Deployment," *Procedia Comput. Sci.*, vol. 167, pp. 2200–2210, 2020, doi: 10.1016/j.procs.2020.03.272.

22. Nageswara Rao, G., Aruna Kumari, K., Ravi Shankar, D., & Kharade, K. G. (2021). A comparative study of augmented reality-based head-worn display devices. *Materials Today: Proceedings*, S2214785320401178. https://doi.org/10.1016/j.matpr.2020.12.400

23. P. Dey, "5 Reasons why working for a startup is a good idea...," *Entrepreneur*. https://www.entrepreneur.com/article/252996 (accessed Mar. 13, 2022).

24. V. Palanivelu and V. B, "ROLE OF ARTIFICIAL INTELLIGENCE IN BUSINESS TRANSFORMATION," *Int. J. Adv. Sci. Technol.*, vol. 29, no. 4, pp. 392–400, 2020.

25. W. Basri, "Examining the Impact of Artificial Intelligence (AI)-Assisted Social Media Marketing on the Performance of Small and Medium Enterprises: Toward Effective Business Management in the Saudi Arabian Context:," *Int. J. Comput. Intell. Syst.*, vol. 13, no. 1, p. 142, 2020, doi: 10.2991/ijcis.d.200127.002.

26. W. Wisetsri and V. C, "Rise of Artificial Intelligence in Healthcare Startups in India," *Adv. Manag.*, vol. 14 (1), pp. 48–52, Mar. 2021.

27. X. I. Quan and J. Sanderson, "Understanding the Artificial Intelligence Business Ecosystem," *IEEE Eng. Manag. Rev.*, vol. 46, no. 4, pp. 22–25, Dec. 2018, doi: 10.1109/EMR.2018.2882430.