ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING APPLICATIONS IN SMART CITIES

Ms.Deepmala Sharma, Mrs.Ashwini Malani, Faculty, Dept. of Computer Science Tilak Maharashtra Vidyapeeth, Pune-37

Abstract
Flexibility and creative thinking are crucial in the industrial sector. This recent development is expected to lead to eco-friendly manufacturing that utilises emerging technology. Global perspectives on smart production application technologies are essential for promoting sustainable development. Extensive research in artificial intelligence (AI) has led to the creation of a variety of AI-based techniques, one of which is machine learning. These AI-based approaches are now being used in the industry to promote sustainable manufacturing practises. Lean manufacturing is one of the approaches that is attempted to be used.The purpose of this study was to conduct an in-depth analysis of the existing academic literature about the use of artificial intelligence (AI) and machine learning (ML) in business environments. The project's overall objective was to do this. In this day and age of Industry 4.0, artificial intelligence (AI) as well as machine learning are regarded as the most important drivers of the transition of traditional factories into smart factories. This study was conducted with the intention of categorising the existing body of literature according to a number of different criteria, such as the year of publication, authors, scientific field, country, and institution. Keywords were also taken into consideration. For the purpose of conducting the inquiry, both Web of Science and SCOPUS were consulted as sources of information. For the successful completion of the tasks, the software packages UCINET and NVivo 12 were applied. The empirical studies in the fields of machine learning (ML) and artificial intelligence (AI) that were published in the past century were the focus of a literature evaluation that was carried out. The purpose was to examine the evolution of the subject matter before and after the introduction of Industry 4.0, which commenced in 1999 and is ongoing. The evaluation and categorization of eighty-two articles was completed. A bigger number of works have been published in the United States, and there has been an increase in interest since the start of Industry 4.0. This is the first fascinating outcome.
Keywords: Artificial Intelligence (AI), Machine Learning (ML), Business Settings, Industry 4.0, Sustainability, Emerging Technology

Introduction

The use of one-of-a-kind ideas is necessary for intelligent production systems in order to achieve the goals of raising the level of quality and sustainability of the manufacturing process while simultaneously cutting costs. The combination of a few different components could be all that's needed to accomplish this goal. The promise of artificial intelligence (AI) technologies is that they will allow for the development of new industrial paradigms [1]. The Internet of Things, embedded systems, cloud computing, big data, cognitive systems, and virtual and augmented reality are some of the I4.0 Key Enabling Technologies that are driving the development of these technologies.

It is important to note that in the 1990s, the creator of artificial intelligence, John McCarthy, described it as "the science and engineering of creating intelligent machines, particularly intelligent computer programmes" [2]. This is an important definition to remember since it is notable. The meaning of the term "artificial intelligence" may be found in the book "Artificial Intelligence: The Science and Engineering of Making Intelligent Machines." The phrase "artificial intelligence" (AI) refers to the process through which computers are able to replicate the functions of the human brain, such as learning and problem solving [3]. The popular definition of artificial intelligence (AI) is the process through which computers attempt to mimic human thought processes.

When viewed from a very high level, the many subfields of artificial intelligence may be broken down into a total of sixteen different categories [4–8]. Natural language comprehension, theorem proving, constraint fulfilment, programming, artificial life, belief revision, data mining, distributed

artificial intelligence, expert systems, genetic algorithms, systems, and distributed artificial intelligence are some examples of these [9–11].

Research on artificial intelligence is currently a topic of interest in all areas of study in the twenty-first century. The following list contains a variety of professions and industries, some of which include engineering, science, education, medical, business, accounting, finance, marketing, economics, and the stock market [12–18]. However, this list is not exhaustive and other fields may also conduct research on artificial intelligence. Because of the substantial implications that machine learning skills on computers' intelligence have had on industry, governments, and society [19], artificial intelligence (AI) has seen a major expansion in its area of application, which has led to a corresponding rise in its scope.Moreover, they have an influence on worldwide patterns pertaining to environmental sustainability. Moreover, they have an influence on worldwide patterns pertaining to environmental sustainability. Artificial intelligence (AI) has the potential to make a substantial contribution to tackling important difficulties connected to sustainable manufacturing. These challenges include, among others, the optimisation of energy resources, logistics, supply chain management, and waste management. AI also has the ability to play a role in the development of new solutions to these challenges. The popularity of integrating artificial intelligence (AI) into green industrial processes is on the rise in the setting of more stringent environmental regulations [20]. As of March 2019, Hendrik Fink, head of sustainability services at PricewaterhouseCoopers, said that the effective use of artificial intelligence has the potential to launch a substantial shift in the area of sustainability. It has been predicted by authoritative academic sources that artificial intelligence will play a significant part in driving the fourth industrial revolution [21].

This phenomenon has resulted in the emergence of several subdisciplines within the field of artificial intelligence, such as machine learning, natural language processing, image processing, and data mining, which have gained significant prominence and focus among leading technological companies in the present day. Because of the consistently rapid development of the technologies that are accessible today, the topic of artificial intelligence (AI) continues to be of significant interest to the scientific community.

An area of AI called machine learning (ML) is now developing at a breakneck speed. Its applications have spread to a number of industries, including the use of learning machines in smart manufacturing, pharmaceutical research, archaeology, agriculture, and business, among other fields.

The present study included doing a comprehensive literature analysis on the research pertaining to artificial intelligence (AI) and machine learning (ML) techniques during the period spanning from 1999 to 2019. This action was taken in consideration of the aforementioned considerations. Consequently, there is a prevailing belief in the need of developing a categorization system that encompasses publications that together address both of these difficulties. This approach promotes more variety and introspection. The impact of other aspects, such as the subject matters and sectors where the technologies are most relevant, was also examined in order to get a deeper understanding. In order to have a better understanding, this was done. The providing of an overview of the research that has been conducted up to this point is the most important contribution provided by this study.

Over the course of many years, several outstanding documentations of well-established research methodologies and philosophies have been the subject of discussion. Regrettably, there is very limited opportunity for comparison and integration among research. An all-encompassing comprehension of AI and ML research and its many guises has been developed during the course of this piece.

This presentation will not make any attempt to provide an all-encompassing summary of the research done in the fields of artificial intelligence and machine learning. Instead, the objective of this work is to attempt to establish a starting point for the integration of knowledge gathered from diverse studies in this subject and to identify routes for additional research. Both of these goals will be accomplished by the conclusion of this paper. It investigates research in a variety of emerging fields, including environmental pollution, medicine, preventative maintenance, manufacturing, and others.

Additional study is required to expand the current boundaries of knowledge in artificial intelligence (AI) by incorporating the ideas and philosophies of certain conventional fields into the frameworks that are already in place for AI [22–24].
Nevertheless, it is expected that this study might serve as a vital intellectual instrument for both the reorientation of the activity and the exploration of new intellectual prospects. This text does not intend to be the catalyst for a rapid explosion in a highly concentrated industry. This text would like to presume that the aim is not what causes a rapid explosion of a sector that is already concentrated. While conducting study on AI and ML, this article offers relevant notions and points of view that may be helpful.
The ultimate objective was to speculate on the way in which the field would develop in the next era. This would be a trip that may perhaps go in a different direction than originally planned due to the fact that fresh generations of academics would be contributing to the discussion and the action. As was said before, the objective of this study is to give a review; as a consequence, it clears the path for more research to be conducted. Not only does it provide a framework for future comparisons, but it also brings up a number of new problems that need to be examined. This should be done as soon as possible. Although there are a great many topics that may be deemed the outputs of this research, only a select fraction of those topics are of exceptionally broad interest or importance.

Methodology
Combining bibliometric, content analysis, and methods for analysing social networks is the methodological approach that was used. Using the SCOPUS and Web of Science databases, state-of-the-art research was conducted in order to accomplish the goal of this investigation and advance the field of study. The period of time extending from 1999 to 2021 was selected as the focal point of the research in order to investigate the shifts in attention that were paid to the topic both before and after the introduction of Industry 4.0. The commencement of this endeavour was initiated in the year 1999. A comprehensive evaluation of the existing body of research was settled on as the appropriate strategy for this investigation [25]. The following is an outline of the main stages of the study:
1. The first phase will consist of research and classification. The current stage was broken up into three distinct stages:
- The first step is identification;
- The second step is screening; and
- The third step is inclusion.

The gathering of bibliometric information was the first step, which took place during phase 1. The next thing that needed to be done was to go through all of the findings and determine which articles may be taken into account in light of the study topics that were regarded intriguing and relevant (this was step 2 of the process). After this step had been completed, the next and final phase (step 3) began with the intention of selecting the articles that would be investigated in more depth later on.
2. The next phase is analysis. The second step, known as phase 2, began after phase 1 was finished and included a review of the results. The bibliometric study's approach included the following elements:
- Utilisation of Indicators for the Understood Parameters.
- Social network analysis (SNA) for the investigated keywords.

Total papers (TPs) and total citations (TCs), which represent the cumulative number of citations received, were the research indicators that were employed in this study. TPs show the overall amount of publications, while TCs indicate the total number of citations received.
Recently, Social Network Analysis (SNA) has been applied to explore a variety of phenomena, including global commerce, information dissemination, institutional analysis, and organisational functioning. SNA has found application in a number of subfields that fall under the umbrella of the social sciences and has been more popular in recent years. The examination of the word "SNA" as used in the literature reveals a significant increase in the scholarly discourse around this computational method for representing complex and interrelated phenomena. Excel was employed as a tool for data input in the study, while the UCINET and NetDraw software packages were used to

create a graphical representation of the keywords that were included inside the network. The software UCINET was used for the purpose of representing the keywords inside the network, while NetDraw was specifically designed to facilitate the building and visual manipulation of networks.
The input data was used to build a sociometric network, which was built using the UCINET application using NetDraw. This network elucidates the interrelationships among the various classifications.
The study of keyword use in the papers included the utilisation of the NVivo 12 software, which is well recognised as the prevailing tool for computer-assisted qualitative analysis (CAQDAS) within the industry. In this particular instance, the methodology was used to establish potential connections among the important terms found in the texts being examined. The objective was to construct conceptual frameworks that may serve as a basis for deriving interpretive hypotheses.
3. The discussion stage (Phase 3). Following the successful conclusion of the second phase, the third and final phase was the one that came next. During this stage, the results were examined, and inferences were drawn based on those examinations.
Figure 1 presents an overview of the primary stages and procedures involved in the investigation.

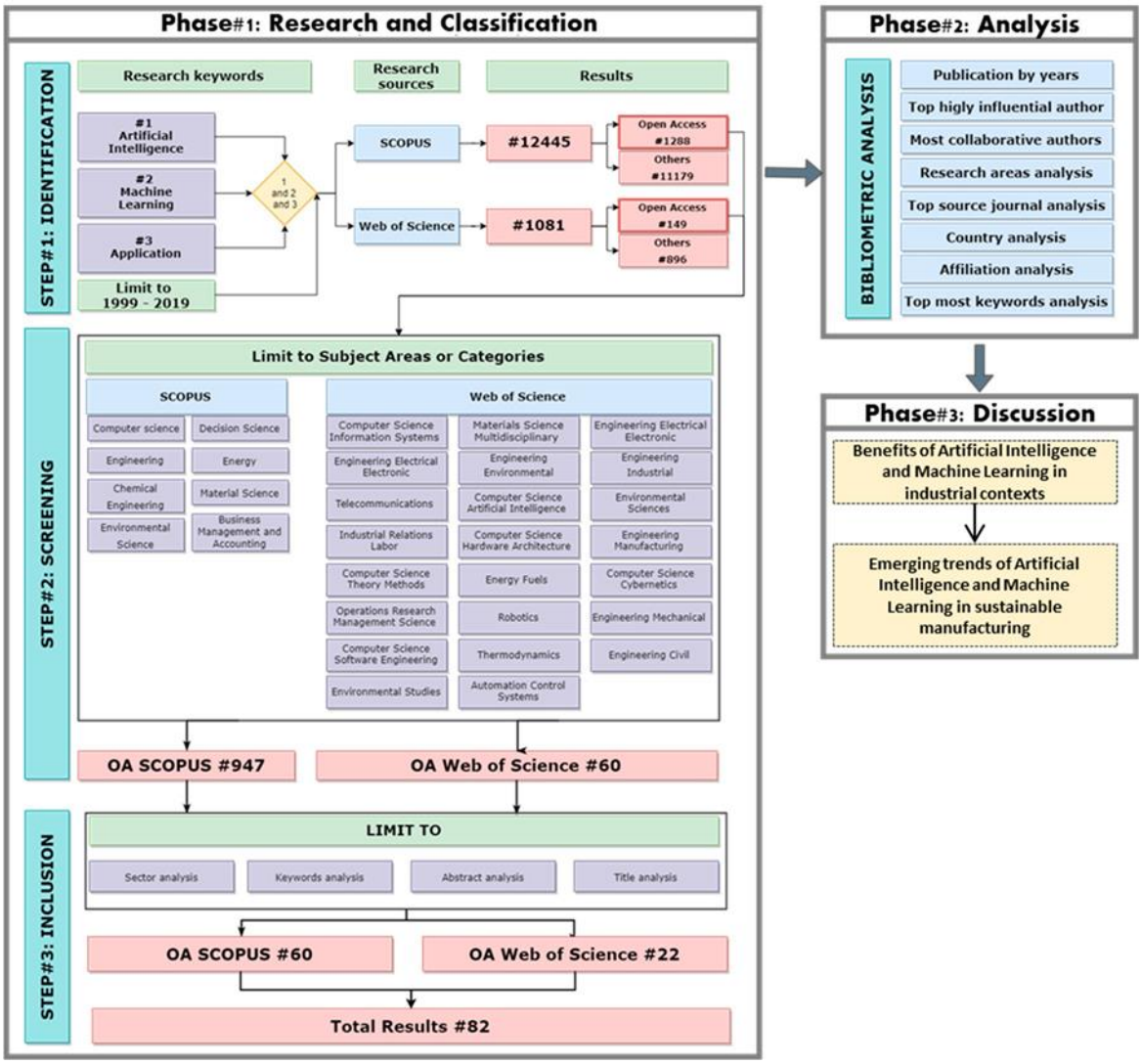

Figure 1: Flow chart for the procedure

Results

Both databases were searched using the same keywords, and the time window for the analysis was set to span from 1999 to 2021. This was done to ensure that the obtained findings would be comparable to one another.

The survey's performance keywords were chosen with the awareness that AI and ML have the potential to be helpful tools in the attempt to embrace ethical business practises within the framework of smart manufacturing. This was taken into consideration while selecting the survey's keywords. The choice to carry out the survey was influenced in part by this understanding. In this regard, it is significant to note that we focused our research on the issue of sustainability since the discussions around climate change are becoming more and more relevant. This choice seems to be appropriate. Therefore, applications related to sustainability were taken into consideration while selecting the articles.

Table 1: Keywords and Time Period

Keywords	**Time Period**
Artificial Intelligence (AI)	1999-2021
Machine Learning (ML)	
Application	

In terms of their numerical value, the results that were recovered by Scopus are superior than those that were retrieved by Web of Science (WoS). The top result on the list has 12,432 results, while the second result on the list only has 1088 items.

Table 2: Total research results from Scopus and WoS

ResearchCarriedouton2021		
Sourceofresearch	Scopus	WebofScience
Results	12,432	1088

The table 3 provides a comparison of the various kinds of documents and the record counts that correspond to each of those document types in two separate categories. In the first category, "Article" comprises the majority with 472 recordings, contributing 46.13% of the total, followed by "Proceedings paper" with 432 entries (42.81%), and "Review" with 144 records (12.74%). "Proceedings paper" comes in third with 144 records, giving 12.74% of the total. The "Conference Paper" category, on the other hand, has a large 7129 records and accounts for 57.11% of the total for the category. This is followed by the "Article" category, which has 4202 recordings and accounts for 33.44%, and the "Review" category, which has 422 entries and accounts for 3.33%. The table offers a transparent overview of how various document kinds are divided within these two categories, making it possible to do a fast comparison of the relative frequency of each document type and the percentages that it contributes to the total number of records.

Table 3: Document type distribution in Scopus and Web of Science

DocumentTypes	**Records**	**Contribute %**	**DocumentTypes**	**Records**	**Contribute %**
-	-	-	Editorial	24	0.11
-	-	-	Letter	8	0.21
-	-	-	Note	12	0.72
-	-	-	ShortSurvey	8	0.33
Article	472	46.13	ConferencePaper	7129	57.11
Bookchapter	2	0.32	ConferenceReview	117	1.41
Editorialmaterial	15	1.553	ArticleinPress	164	1.44
Meetingabstract	3	0.21	BookChapter	187	1.76
Proceedingspaper	432	42.81	Article	4202	33.44
Retractedpublication	1	0.11	Book	92	0.33
Review	144	12.744	Review	422	3.33

Research Area Analysis

There might be more than one research area analysis for each work, hence a total of 164 research area analyses were collected from the 82 papers. The categorization mostly focuses on the continuing industrial revolution since there are so few papers that have been found that date from before I4.0. Furthermore, the outcome in this particular instance aligns with the adoption of paradigm 4.0, which has facilitated the acceleration of research and technical progress. The first thematic categories and academic disciplines that occupy the biggest positions in the ranking are computer science, engineering, biochemistry, genetics, and molecular biology. Computer science and engineering are also at the top of the list. These fields account for 29%, 23%, and 6% of the articles, respectively.Additionally, I4.0 views the other listed fields for which there are pertinent results as being cross-disciplinary to the first three disciplines. The first three sections make up around 60% of the articles under review in terms of percentage contribution.Figure 2 shows a greater degree of concentration in the disciplines mentioned above based on the frequency of distribution of the top 20 research topics.

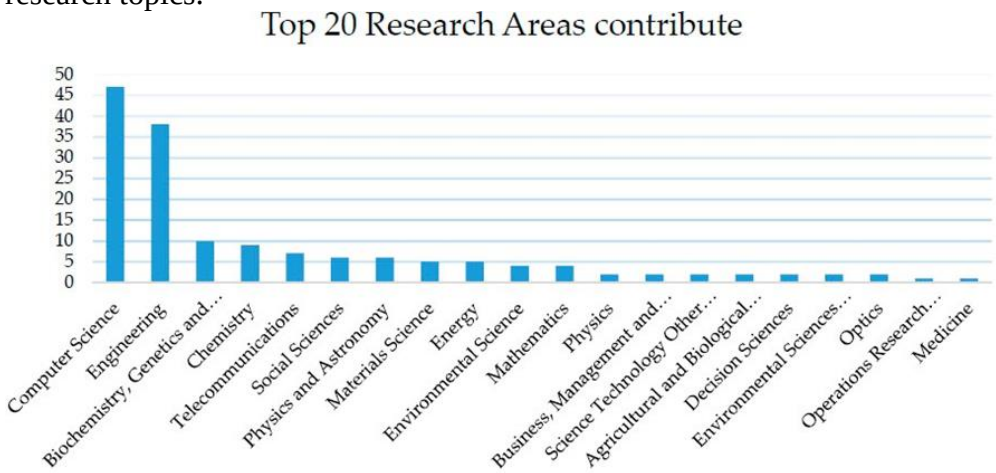

Figure 2: Top 20 Research Area Contributors

Top Source Journals Analysis

The twenty sources or journals that are most regularly published are given in this section. A journal is a regular publication that tracks the advancement of the field it represents while also attempting to promote it. In this case, 74 source journals were found in the documents; nevertheless, only 13 of the top 20 sources, or 43% of the total, had more than one article published, according to the distribution frequency of the source journals. Based on an independent review of the sources, it was seen that the results in the two databases were not consistent. The magazine IEEE Access demonstrated prominence inside the Web of Science (WoS) database, since it had two papers that were well regarded. However, it is worth noting that IEEE Access had just a single publication listed within the Scopus database.

The precedia The key journals that each have four articles and together account for 5% of the total are Computer Science, Matec Web of Conferences, and Machine Learning. Each of these journals has four publications. The ranking has been revised based on the Scopus database, incorporating data from both databases. As a direct result of this, IEEE Access has been moved down the rankings to eighth place, bringing it in line with the rankings that have been acquired only from Scopus. The precedia The magazines that now occupy the top three rankings are Computer Science, Matec Web of Conferences, and Machine Learning; moreover, all three of these periodicals have an equal number of articles. The publishing contribution made by the 10 journals indicated is equivalent to that made by the original journal, accounting for around 1% of the total articles. On the other hand, the publishing contribution of the leading ten journals is equal to 3% of the total. Because there is not a particularly high concentration of these sources, these issues tend to crop up in a lot of different scientific journals. In spite of this, it is essential to call attention to the fact that additional references, such as Nuclear Engineering and Design, Sustainability Switzerland, and BMC Bioinformatics, have been included into the work. It is to be predicted that well-known academic publications in the area,

such as AI Magazine and Machine Learning, would be positioned among the top 13 sources in the category. This is to be expected since it is to be anticipated that these journals will play an important role in the field.

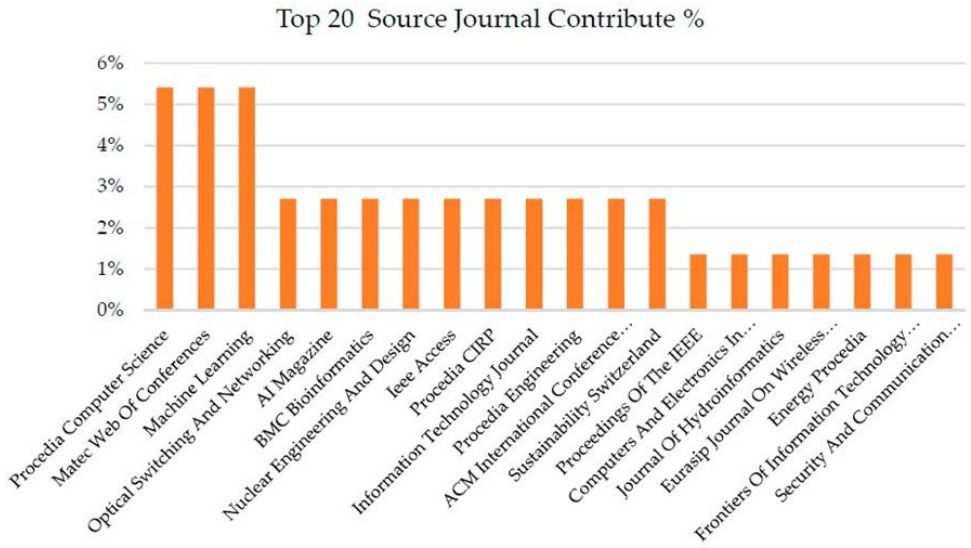

Figure 3: Top 20 Source Journal Contributors

Industrial Applications of Artificial Intelligence and Machine Learning

The research conducted in this paper emphasises the increasing significance of innovation and digitalization in the domains of commodities, services, and business processes. Consequently, there is a growing concern over the use of contemporary industrial technologies such as artificial intelligence (AI) and machine learning (ML). Algorithms grounded on artificial intelligence (AI) and machine learning (ML) has the capability to effectively handle extensive quantities of data and address complex problems. The problem at hand has garnered attention from a multitude of scientific disciplines, particularly within the realms of computer science and engineering.

Utilising AI and ML in industrial sectors has a number of noteworthy benefits, including increased creativity, streamlined operations, effective resource allocation, and higher quality.

An important technology that is now changing the economy and society is AI with ML. This is shown by the significant volume of patent applications—more than 340,000—filed during the 1950s.

The writers' affiliations and further information about them have been made public. The fact that many of these publications have a 1:1 ratio with the chosen documents shows that there isn't much emphasis on particular technology applications. But this just serves to highlight how widespread interest is among scientists. The USA, China, and European nations have the most interest in scientific research. The result is anticipated.

China and the US are presently spearheading investment efforts to outpace other nations and gain supremacy in the AI business. By 2030, China wants to be the world leader in artificial intelligence, according to its stated goals [26]. The "Made in China 2025" strategy, which is one of China's efforts and focuses on advancing the manufacturing industry, is particularly significant. The "Internet +" concept is also committed to boosting innovation and smart manufacturing.

The aforementioned factors may result in the creation of new generations of academics who will contribute to comparative studies in the future and provide fresh research issues.

Sustainable Manufacturing: Emerging Trends in Artificial Intelligence and Machine Learning

The report stressed that smart manufacturing has the potential to greatly improve the sector from a sustainability aspect by addressing resource constraints and boosting productivity.

The study found that there is growing interest in AI/ML applications for sustainable development and green manufacturing. This demonstrates how AI/ML can significantly improve sustainability by controlling materials and energy use intelligently. This entails lowering energy use and pollutant emissions, as well as monitoring and assessing the effects on the environment.

Applications for AI/ML algorithms in sustainable development are varied and include participants from different nations and industries. Predictive maintenance, manufacturing, and inventory and supply chain management are some of these uses.
Pérez-Ortiz, Jiménez-Fernández, Gutiérrez, et al. [27] conducted a comprehensive examination of categorization algorithms as they pertain to the issues in the field of renewable energy (RE). Algorithms are often used in the realm of energy and resource management to enhance efficiency. They provide predictive analysis, enabling various tasks such as data preparation, result interpretation, and evaluation.
Artificial intelligence (AI) and machine learning (ML) have shown their effectiveness in several industries, including optimising processes, industrial applications, and preventative maintenance.
The research conducted by Lieber, Stolpe, Konrad, et al. [28] provides a substantial addition to the field of steel manufacturing. This study presents a methodology for the automated preparation of value series data, with the aim of enhancing both process and product quality. The use of artificial intelligence and machine learning techniques has shown promising results in enhancing quality control optimisation inside industrial systems.
Adoption of AI/ML technology may aid in the creation of intelligent manufacturing systems and sustainable manufacturing processes. This covers a range of sustainable process components, including supply chain management, quality assurance, preventive maintenance, and energy use.

Main Areas in Sustainable Manufacturing	Key Objective	AI/ML Applications
Supply Chain Management	Ready product available in the appropriate place at a specific time	Improves transparency, accelerates decision-making, and produces accurate demand forecasting
Quality Control	Recognize the early signs of potential production failures within the shortest terms in orderto save resources and sustain operational efficiency	Improves the response time and allows eliminating possible failures
Predictive Maintenance	Detects possible production malfunctions that may cause product quality issues	Creates accurate forecasts as to when the machinery must be repaired
Energy consumption	Recommendations that will strikea balance in energy use	Improves excessive use of certain materials, redundant production scrap waste, inefficient supply chain management, logistics, and unequal distribution of energy resources.

Figure 4: Main areas in sustainable manufacturing

Conclusion

This investigation's main focus was on examining the state-of-the-art in machine learning and artificial intelligence applications. The topic, which is now one of the most well-liked fields of exploration in the world of scientific inquiry, was the focus of a literature analysis. The amount of written material that is now accessible on any topic is extensive, which means that providing an exhaustive account of all the papers that have been published in relation to a certain subject might be difficult or perhaps impossible. As a result, a methodical selection process was used to choose the literature that was the most relevant. This article presents a comprehensive analysis of applications that make use of ML methods across a range of different scientific domains. The researchers used objective and transparent methods of study throughout the document selection process, irrespective of their prior experience. The laying of a foundation for the synthesis of research results in this area was one of the key goals of this article, along with the presentation of alternative paths that may be pursued by researchers in the future. In addition to this, the purpose of the project was to provide an all-encompassing summary of the current body of literature about the research fields of artificial intelligence (AI) and machine learning (ML). This was just one of the numerous reasons why the newspaper was created. It is essential to underline that this document was crafted with just the WoS

and Scopus databases; these are the ones that were used. It should be noted that both of these databases only include publicly available articles. As a result, in addition to other indexing databases like Google Scholar and a large number of other publications that are solely accessible to certain individuals, they might be included in future research.

References

[1]Gupta, N. (2017). A literature survey on artificial intelligence. International Journal of Engineering Research & Technology (IJERT), 5(19), 1-5.
[2]McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (2006). A proposal for the dartmouth summer research project on artificial intelligence, august 31, 1955. AI magazine, 27(4), 12-12.
[3]Moore, A. (2017). Carnegie Mellon Dean of Computer Science on the future of AI. Forbes.
[4]Becker, A., Bar-Yehuda, R., & Geiger, D. (2000). Randomized algorithms for the loop cutset problem. Journal of Artificial Intelligence Research, 12, 219-234.
[5]Singer, J., Gent, I. P., &Smaill, A. (2000). Backbone fragility and the local search cost peak. Journal of Artificial Intelligence Research, 12, 235-270.
[6]Chen, X., & Van Beek, P. (2001). Conflict-directed backjumping revisited. Journal of Artificial Intelligence Research, 14, 53-81.
[7]Hong, J. (2001). Goal recognition through goal graph analysis. Journal of Artificial Intelligence Research, 15, 1-30.
[8]Stone, P., Littman, M. L., Singh, S., & Kearns, M. (2001, May). ATTac-2000: An adaptive autonomous bidding agent. In Proceedings of the fifth international conference on Autonomous agents (pp. 238-245).
[9]Peng, Y., & Zhang, X. (2007). Guest editorial: Integrative data mining in systems biology: from text to network mining. Artificial Intelligence in Medicine, 41(2), 83-86.
[10]Zhou, X., Liu, B., Wu, Z., & Feng, Y. (2007). Integrative mining of traditional Chinese medicine literature and MEDLINE for functional gene networks. Artificial intelligence in medicine, 41(2), 87-104.
[11]Wang, S., Wang, Y., Du, W., Sun, F., Wang, X., Zhou, C., & Liang, Y. (2007). A multi-approaches-guided genetic algorithm with application to operon prediction. Artificial Intelligence in Medicine, 41(2), 151-159.
[12]Halal, W. E. (2003). Artificial intelligence is almost here. On the Horizon, 11(2), 37-38.
[13]Masnikosa, V. P. (1998). The fundamental problem of an artificial intelligence realization. Kybernetes, 27(1), 71-80.
[14]Metaxiotis, K., Ergazakis, K., Samouilidis, E., &Psarras, J. (2003). Decision support through knowledge management: the role of the artificial intelligence. Information Management & Computer Security, 11(5), 216-221.
[15]Gash, S. (2000). The International Dictionary of Artificial Intelligence. Reference Reviews, 14(6), 28-29.
[16]Stefanuk, V. L., &Zhozhikashvili, A. V. (2002). Productions and rules in artificial intelligence. Kybernetes, 31(6), 817-826.
[17]Tay, D. P., & Ho, D. K. (1992). Artificial Intelligence and the Mass Appraisal ofResidential Apartments. Journal of Property Valuation and Investment, 10(2), 525-540.
[18]Wongpinunwatana, N., Ferguson, C., & Bowen, P. (2000). An experimental investigation of the effects of artificial intelligence systems on the training of novice auditors. Managerial Auditing Journal, 15(6), 306-318.
[19]Oke, S. A. (2008). A literature review on artificial intelligence. International journal of information and management sciences, 19(4), 535-570.
[20]Carvalho, T. P., Soares, F. A., Vita, R., Francisco, R. D. P., Basto, J. P., &Alcalá, S. G. (2019). A systematic literature review of machine learning methods applied to predictive maintenance. Computers & Industrial Engineering, 137, 106024.
[21]Cioffi, R., Travaglioni, M., Piscitelli, G., Petrillo, A., & De Felice, F. (2020). Artificial intelligence and machine learning applications in smart production: Progress, trends, and

directions. Sustainability, 12(2), 492.
[22]Markham, I. S., Mathieu, R. G., & Wray, B. A. (2000). Kanban setting through artificial intelligence: A comparative study of artificial neural networks and decision trees. Integrated Manufacturing Systems, 11(4), 239-246.
[23]Kotsiantis, S. B., Zaharakis, I., &Pintelas, P. (2007). Supervised machine learning: A review of classification techniques. Emerging artificial intelligence applications in computer engineering, 160(1), 3-24.
[24]Cortes, C., &Vapnik, V. (1995). Support-vector networks. Machine learning, 20, 273-297.
[25]Kitchenham, B. (2004). Procedures for performing systematic reviews. Keele, UK, Keele University, 33(2004), 1-26.
[26]Dutton, T. (2018). An overview of national AI strategies. *Politics+ AI*, *28*.
[27]Pérez-Ortiz, M., Jiménez-Fernández, S., Gutiérrez, P. A., Alexandre, E., Hervás-Martínez, C., & Salcedo-Sanz, S. (2016). A review of classification problems and algorithms in renewable energy applications. *Energies*, *9*(8), 607.
[28]Lieber, D., Stolpe, M., Konrad, B., Deuse, J., &Morik, K. (2013). Quality prediction in interlinked manufacturing processes based on supervised & unsupervised machine learning. *Procedia Cirp*, *7*, 193-198.