VIVA-TECH IJRI
ANNUAL RESEARCH JOURNAL
VIVA-TECH INTERNATIONAL JOURNAL FOR RESEARCH AND INNOVATION
ANNUAL RESEARCH JOURNAL
ISSN(ONLINE): 2581-7280

ARTIFICIAL INTELLIGENCE IN INFORMATION SYSTEMS

Unnati Jain[1], Apurva Pednekar[2]
[1](MCA, VIVA Institute of Technology / University of Mumbai, India)
[2](MCA, VIVA Institute of Technology / University of Mumbai, India)

Abstract : *AI provides opportunities to reinvent business models , change the future of work, performance improvements ,and even enhance human capabilities. There is, however, a growing concern that research on AI could experience a lack of cumulative building of knowledge. This study addresses this concern, by conducting a systematic literature review of AI research in IS between 2005 and 2021. In doing so, this study makes important contributions, namely*
(i) an identification of the reported business value and contributions of AI,
(ii) research on the use of AI in IS and
(iii) opportunities for future AI research in information systems

Keywords - *artificial intelligence, ai in is, information systems, research agenda ,symmetric literature review*

I. INTRODUCTION

Artificial Intelligence is the ability to design intelligent devices or develop self-study software applications that mimic aspects of the human mind such as thinking, problem solving, planning, making the right decisions, sensory ideas etc. The power of clever ways of doing more than just efficiency. human actions in terms of access to information have garnered the attention of business and research communities around the world, and this field of research has seen rapid progress over the past two decades.
Growing interest in AI to transform the economy is reflected in global spending, with International Data Corporation (IDC) predicting global spending on AI will reach approximately $ 98 billion by 2023, more than double the $ 37.5 billion spent. in 2019. However, there is no consensus on what defines AI or what distinguishes it from other digital technologies.[1]
AI is said to provide opportunities for change in all sectors and industries, from supply chain management to medicine, to automotive. Research has reported that AI provides opportunities to innovate business models, change the future of work, improve performance, and even improve human skills.

II. EVOLUTION OF ARTIFICIAL INTELLIGENCE

2.1. EVOLUTION OF AI DEFINITION

Artificial Intelligence has grown into an awesome tool in recent years that allows robots to think and act like humans. In addition, it has attracted the attention of IT companies worldwide and is seen as the next major technological change following the growth of mobile and cloud platforms. It has even been called the "fourth industrial revolution" by some. Researchers have developed software that uses Darwin's theory of evolution, such as “survival of the fittest,” to build AI algorithms that improve generation after generation without the need for human intervention. The computer has been able to recreate decades of AI research in just a few days, and its creators believe that one day it will be able to discover new AI techniques.

AI has a much longer history than most commonly understood, in the fields of science and philosophy dating back to ancient Greece, but its modern repetition owes Alan Turing and a conference at Dartmouth College in 1956, when the term "Artificial Intelligence" was coined and coined by John McCarthy at the time. "Like the science and engineering of intelligent machinery". [2] referred to it as "the birth of artificial intelligence." One of the first paradigms of AI was that it revolved around a high level of understanding.

Despite its ingenuity, it has been around for thousands of years, it was not until the 1950s that its true power was investigated. A generation of scientists, physicists, and scientists had the idea of AI, but it was not until Alan Turing, a British polymath, suggested that people solve problems and make decisions using available knowledge and reason. The advent of computers has been a major stumbling block in the rise. They had to be flexible before they could grow. Machines can make orders but do not keep them. Until 1974, funding was also a problem. By 1974, computers were becoming increasingly popular. Now they were faster, less expensive, and able to store more data.

The difference between a weak AI and a strong AI is also about compliance with rules, that is, how machines work with rules. distinguishes law-based decision-making in which the machines strictly respect the rules set by the engineers from the law following the decision-making process which machines follow the rules that are not strictly specified in it. Legitimate decision-making is similar to weak AI, whereas law-abiding decision-making is an effort based on strong AI. An example of law-abiding decision-making is neural networks (NN), which allow algorithms to learn from them. Strong AI can be machines that make its own rules and follow them, which is not possible in the current phase. [3]

"By using the 'ordinary act of wisdom 'we wish to show the breadth of the same intelligence we see in human actions: that in any real situation proper conduct at the end of a process and compliance with environmental requirements is possible, within certain limits. of speed and complexity. [4] Intelligence often means "the ability to solve difficult problems"

"AI is concerned with ways to achieve goals in situations where the information available has a certain complex character. The methods to be used are related to the problem that the situation presents and are the same whether the problem solver is a person, Martian, or a computer program". [5]

With so many different perspectives on what AI is, the lack of common test consistency (i.e., conditions, benchmark testing, critical measurements) makes it a major challenge for the industry to maintain healthy growth.

2.2. OBJECTIVE / SCOPE OF AI

The purpose of this study is to understand the various aspects of AI learned within the context of IS. Systematic literature reviews are important as they can be used to provide a valuable basis for further research efforts. [6] [7] The objectives of this systematic review are:

(i) to identify reported business value and AI offerings,
(ii) research on the use of AI in IS and
(iii) opportunities for future AI research in information systems.

The structure of the paper is as follows. First, an introduction to AI-related work in the IS field was introduced. The formal text review process is then described, and the research limitations are accepted. Next, a high-level AI study was introduced, which included reported business value and AI offerings, and an analysis of how AI was defined. The discussion, implications, and agenda for future research are followed.

III. METHODOLOGY

The systematic approach was chosen because of its ability to provide high quality reviews and clear and repetitive reviews. In addition, it is useful for studies with a well-structured research questionnaire and to summarize large amounts of research. Therefore, the SLR was selected for the following reasons:

(i) research will produce large quantities of literature;

(ii) this study aims to answer a specific research question;

(iii) aims to systematically exclude AI references from subjects in public.

3.1. A systematic guide to literature review development

Suggest a systematic review process consisting of 8 steps, namely planning, selection, removal and execution) completed in all 4 stages (see Fig. 1.). Each of these four sections and the eight steps are discussed in detail in the rest of the section. [8]

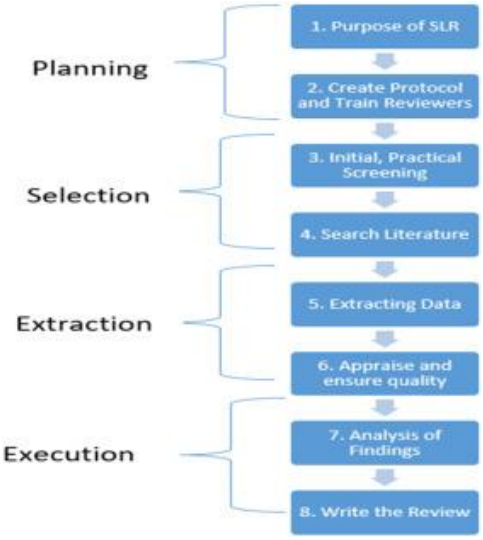

Fig 1 : Steps for review process

RQ1: How is AI defined in the IS field?

The purpose of this research question is to identify and analyze the different AI definitions used in the IS field. It was noted in Section 2.1 of the difficulties the field of AI had with definitions, and these research questions aimed at looking at how IS coped with those difficulties. However, despite AI and Machine Learning being a large part of the core subjects, many did not provide an explanation, or the explanations used were not specified (see Fig 2).

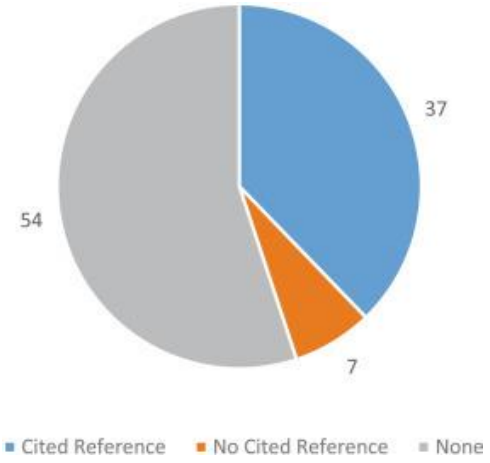

Fig. 2. AI definition cited.

Of the 98 basic studies, 54 of them did not provide a clear definition of research-related AI. And of the 44 studies that provided the explanation, 7 of them did not say anything about the given explanation. The AI definitions used in the main studies differ in both the definition times and the quoted source. Ignoring

the seven studies that described AI without quoting a source, Russel & Norvig's book Artificial Intelligence: A Modern Approach was the most quoted source for explaining AI, although the actual book system differed, each study using the latest system time.

RQ 2 : What types of AI technologies are used by IS researchers?

The purpose of this research question is to classify studies on AI based on the type of AI used in the initial study. It is possible to combine a variety of these genres together into a single AI system. For example, Watson of IBM combines NLP, ML and machine recognition methods. [9] [10] However, for the purpose of this SLR, research will be categorized based solely on the main AI type of research (see Fig. 3.)

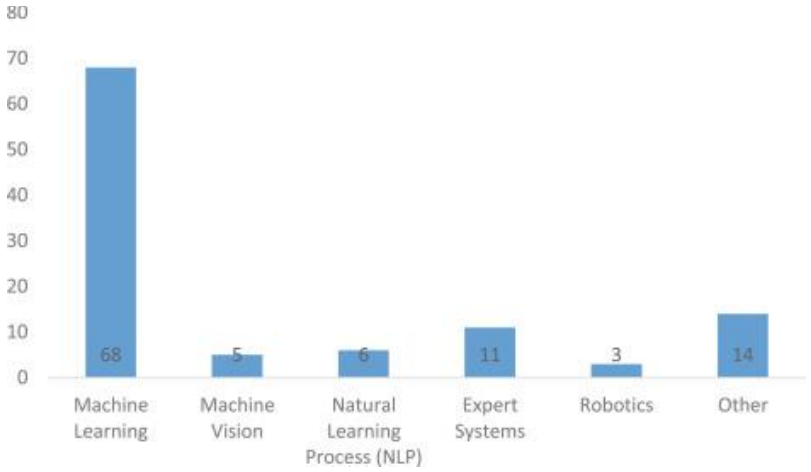

Fig. 3. Types of AI.

Fig 3 shows that ML is the most popular type of AI used in basic subjects, with 69 subjects divided under it. There was a small distance among the other species, 11 specialist systems, 5 machine vision and 6 NLP. Robots were very unusual with 3 subjects very focused on them.

IV. AI FUNCTION

The current difficulty of solving the agreed definition of AI is discussed above, but for the purposes of this systematic review, we focus on AI functions as described. [11] A comprehensive list of tasks is shown below Table no. 1

Title	Description	Example
Expert Systems (ES)	Designed to mimic human problem-solving behavior	DENDRAL: A specialist system used for chemical analysis to predict cell formation.

Title	Description	Example
Machine learning	Automatically refines its methods and improves its results as it receives additional data.	Most of the most advanced complimentary programs are, Google, YouTube etc.
Robotics	Relating to the production of computer-controlled visual animation in various settings	Service robots
Natural Language Processing (NLP)	is designed to understand and analyze language as it is used by humans. NLP is the basis of AI-powered Speech Recognition.	Smart agents namely, Apples Siri, Amazons Alexa
Machine vision	is used for algorithmic testing.	A computer concept used to help drive private cars
Speech recognition	Can be understood as a method related to the translation of spoken words in a text.	Google Dictate uses speech recognition to convert spoken words into text

After all, studies show potential opportunities for adopting AI in a variety of fields, through manufacturing, digital marketing and healthcare that generate greater interest in studies. In manufacturing, factories are likely to use more AI as products increase and the industry uses AI and physical cyber systems. Healthcare researchers are proposing to use AI systems connected to sensors placed on people to monitor and record their health. With digital marketing, it predicts that demand forecasts using AI will more than double between 2019 and 2023 and that chatbot interactions will reach $ 22 billion in the same year from the current levels of 2.6 billion. However, these opportunities are only available if one can not understand what AI is. [12]

V. CONCLUSION

This systematic literature review provides a systematic understanding of AI research in IS. This was achieved by identifying 98 basic lessons from the related AI articles of 1877 over a period of sixteen years (2005 - 2021) and analyzing them for definitions of AI,the type of contribution,AI type and

At the beginning of the 21st century, no area has had a greater impact on AI than the workplace. Machine learning strategies lead to unprecedented productivity gains. AI transforms the way we do business, from workflow management solutions to trending predictions and even the way businesses buy advertising. AI research has so many promises that it is difficult to imagine the world without it. Be it its driving cars, more accurate weather forecasts, or space travel, AI will be in vogue in everyday life by 2030.

The clear findings from this systematic review are the need to (i) increase the number of robust AI courses, especially in terms of tools and models, (ii) further clarification of the AI definition used in the lessons, even if they are not focused, and (iii) build on the information gathered. Research on AI in IS has not yet been tested. Although there is a very large number of AI-related literature in some way, a complete review of what is known about AI in IS is lacking. This is especially true of the way AI is described in IS, still different. This study examines the body of information about AI in IS. This work has developed one of the very few SLRs in AI in IS and provided a systematic analysis of trends and gaps in the field. This study provides new insights into the IS field through descriptive AI concepts, map-to-AI activities, and AI-related value. We have identified information gaps in the context of AI and IS research, which provides a starting point for IS researchers and IS staff to develop the social-technological knowledge surrounding AI. Therefore, we request that future IS studies explore AI, especially how AI is defined in contemporary IS research.

ACKNOWLEDGEMENTS

We are pleased to present the research paper "AI / ML Augmented Hyper-automation" as part of the 'Master of Computer Application' curriculum. We express our deepest gratitude to our research paper guide Prof. Shreya Bhamare with patient guidance, enthusiastic encouragement, and the useful criticism of this research work

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