

DECISION TREE ON BEHAVIOURAL INTENTION TOWARDS USAGE OF AI TOOLS AMONG THE RESEARCH SCHOLARS

Ravindra Patil
Research Scholar
University of Mumbai

Abstract:

Researchers are using AI technologies more and more frequently to improve their data analysis, literature review, and predictive modelling skills. By simplifying difficult activities, these technologies increase research productivity and accuracy while freeing researchers to concentrate more on the creative parts of their job. A decision tree can assist in identifying and visualizing the critical elements and decision paths that most strongly influence researchers' intentions to adopt these technologies, such as perceived utility, ease of use, and outside influences. This will help researchers better understand their behavioural intention towards the usage of AI tools among research scholars. This study evaluates the use of a decision tree using Python analysis to examine research academics' behavioural intentions about the use of AI tools. It was found that AI Tools for research are highly likely to be used by people with high levels and moderate levels of digital literacy in urban areas. However, those in rural locations with high levels of digital literacy have inconsistent adoption rates that are impacted by income brackets. Those individuals who are living in rural areas and have high digital literacy have mixed adoption rates. It was further seen that their incomes influence their likelihood of adopting AI Tools. For instance, it was found that Individuals living in Rural areas with low Income show a mixed likelihood towards adoption of AI Tools. Whereas, Individuals who have high incomes are unlikely to adopt AI Tools for research. It was discovered that age was not a significant indicator of AI Tools adoption.

Keywords: *Decision Tree, Behavioural Intention, Artificial Intelligence.*

1. Introduction:

Artificial intelligence (AI) is expected to have a major impact on the next ten years due to its ability to greatly improve human capabilities at a comparatively low cost (Liu, 2017; Mott et al., 2004; Schwab, 2017). According to Murphy et al. (2021), artificial intelligence (AI) might influence a number of industries and add \$15.7 trillion to the global economy by 2030. This technology could significantly enhance daily living because of its potential to improve customer service, healthcare, and transportation. If widespread adoption of AI is to occur, research is needed to understand the factors that influence users' acceptance of AI. Advances in technology have led to a surge in research investigating the factors that lead to AI adoption as well as the creation or expansion of several acceptance models. A thorough synthesis of the existing research on user adoption of AI is still lacking, nevertheless. The intention or readiness to use, buy, or test an item is referred to as user acceptability. It is crucial to understand the factors that promote adoption and use of AI given the potential benefits it may have for society in areas like education, mental health care, and transportation.

1.1 Defining Artificial Intelligence

The creation of machines that are capable of doing activities that typically require human intelligence is the aim of the computer science discipline known as artificial intelligence (AI). These tasks cover pattern recognition, problem solving, decision making, comprehending natural language, and experience-based learning (Russell & Norvig, 2021). Artificial intelligence (AI) systems employ diverse methodologies, including machine learning, which involves algorithms enhancing through data exposure, and neural networks, which replicate the structure and operation of the human brain to handle information (Goodfellow, Bengio, & Courville, 2016). The development of autonomously operating systems that mimic or improve human cognitive capacities is the ultimate aim of AI.

1.2 Impact of AI on Research

Artificial intelligence (AI) is the processing, analysing, and interpreting of data in research and education through the use of statistical models and computer algorithms (Sabzalieva & Valentini, 2023). AI is quickly changing many facets of contemporary life, including university education (Marr, 2021). Understanding how AI technologies affect research methods, conclusions, and knowledge creation as a whole is critical for scholars debating the place of these technologies in academia. According to Ahmed (2019), Enebeli & Gilbert (2022), Fosso Wamba et al. (2022), Khot & Sutar (2023), and Obschonka & Audretsch (2020), AI has emerged as a disruptive force in mainstream public life. According to Krupiy (2020), sophisticated algorithms are utilized in a wide range of applications, ranging from medical diagnostic tools to streaming service recommendation engines. These algorithms have a profound impact on how individuals see the world, make decisions, and consume media. AI is particularly significant in academia, as it is bringing in a new era of data analysis and research methods.

Artificial intelligence (AI) has had a revolutionary effect on research, increasing the effectiveness and scope of scientific investigations. Large datasets may be handled more quickly and easily with the help of AI technology, which enables researchers to uncover patterns and insights that would be impossible to uncover with more traditional methods. This capacity quickens the rate of discovery in several disciplines, including climate science and genetics (Thomas et al., 2023). Additionally, researchers can focus on more complicated analytical work by using AI tools to help automate monotonous chores like data input and literature reviews (Duan, Edwards, & Dwivedi, 2019). Because AI approaches may be implemented across a variety of areas and generate creative answers to challenging challenges, their inclusion into research also fosters interdisciplinary collaboration (Obschonka & Audretsch, 2020). But the use of AI also brings up ethical questions, especially in light of data privacy and the possibility of algorithmic biases (Alaa, 2021). Notwithstanding these difficulties, artificial intelligence (AI) has a generally very good effect on research, greatly expanding the scope and power of scientific investigation.

1.3 Decision Tree

A decision tree is a predictive modelling technique that maps out actions and their consequences using a structure resembling a tree. This approach for supervised learning can be used for both regression and classification challenges. The nodes of the tree stand in for decision points, the branches for decision outcomes, and the leaf nodes for projections or ultimate results. Decision trees are constructed by recursively segmenting the dataset into subsets based on the feature that, at each node, provides the maximum value of information or minimises impurity (Breiman et al., 1984). This process continues until no further splits materially improve the prediction accuracy or

until a predefined end point is achieved, such as the highest depth possible or a minimum node size. Because they are straightforward and easy to read, decision trees are popular for tasks where comprehending the decision-making process is essential.

1.4 Behavioural Intention

Behavioural intention describes a person's own likelihood or probability of engaging in a particular behaviour. Psychology and social sciences have extensively researched this idea, especially when it comes to comprehending and forecasting human behaviour. The three main factors that influence behavioural intention are as follows: “subjective norms (perceived social pressure to perform or not perform the behaviour), attitude towards the behaviour (positive or negative evaluation of performing the behaviour), and perceived behavioural control (perceived ease or difficulty of performing the behaviour), according to the Theory of Planned Behaviour (Ajzen, 1991)”. When measuring behavioural intention in research, self-reported scales or surveys are frequently used to gauge how likely people are to engage in specific behaviours, such making a purchase, utilising new technology, or engaging in an activity relevant to their health. Since intents are seen by many theoretical models as a proximal driver of behaviour, understanding behavioural intention is essential for forecasting actual behaviour (Ajzen, 1991).

2. Review of Literature:

2.1 Bastian, Burger., et al. (2023). The study's objectives were to evaluate the state, trends, and developments in artificial intelligence (AI) use in research as well as to develop guidelines for using AI in systematic literature reviews (SLRs). The study developed guidelines that can be applied to a variety of research domains, including support functions, data quality, quantitative and qualitative research, and literature reviews. These guidelines outline the use of AI in scientific research processes. The authors underlined AI's potential to improve the efficiency, dependability, and speed of researchers' work while pointing out its benefits in objectivity and repeatability as well as its limitations due to the design of existing general-purpose models.

2.2 Ekundayo, Tosin, (2024). The paper set out to examine how artificial intelligence (AI) has affected academic research through focus group discussions with researchers who have employed AI technology. The focus group, comprising seven members from several academic domains, provided comprehensive perspectives on how artificial intelligence has impacted research methodologies, findings, and knowledge generation overall. Our understanding of how artificial intelligence is influencing academic research has improved as a result of the thematic analysis of the data, which revealed significant themes and patterns. The study offered scholars practical guidance for incorporating AI into their research procedures in addition to outlining potential future directions for this technology's use in academic research.

2.3 Gupta, S., et al. (2022). The focus of the study was to examine previous studies on “decision support systems (DSSs)” and the integration of artificial intelligence (AI) with operations research (OR), emphasising the similarities, differences, and synergies between AI, DSSs, and OR. The review provided taxonomies based on AI, DSS, and OR and demonstrated how AI has enhanced decision-making in operations research (OR) by classifying previous studies into theory-building and application-based methodologies. In the area of mental decision-making under uncertainty, it also indicated research gaps and prospective paths in anticipation, acquiring knowledge, decision-making, and optimisation. The study questions were justified by discussing the theoretical and managerial consequences.

2.4 Odysseas, Spyroglou., et al. (2022). This paper proposes the use of transdisciplinary AI technologies to support scientists and researchers in their fundraising efforts, especially given the complex and extremely competitive proposal preparation landscape. The study encourages the (semi-)automation of several application and proposal preparation steps using AI approaches. This approach aims to increase efficiency and effectiveness in negotiating research goals, policy issues, and impact considerations at the national and international levels by lessening the load and discomfort that individual scientists and researchers must bear.

2.5 Sage Kelly, et al. (2023). The goal of the study was to synthesise studies to better understand aspects impacting user acceptance of artificial intelligence (AI) technology by conducting a comprehensive review of the literature on the subject. Out of the 7912 papers found through the systematic review, 60 were included in the final analysis. It was discovered that most research did not provide readers or participants with a clear definition of AI. Behavioural intention, willingness, and use behaviour of AI were significantly predicted by the extended Technology Acceptance Model (TAM), the most widely used framework. TAM highlighted perceived utility, performance expectancy, attitudes, trust, and effort expectancy. The analysis did, however, also highlight cultural contexts in which AI cannot fully replace human interaction.

2.6 Sarker, I. H., et al. (2020). The research sought to develop a behavioural decision tree (BehavDT) model that takes into consideration user behavior-oriented generalisation based on individual preference levels, as well as a context-aware predictive model based on a variety of user behavioural actions utilising cellphones. In some extraordinary circumstances, the BehavDT model generated decisions that were both context-specific and generalised. Research conducted on real smartphone datasets showed that when it came to predicting a wide range of user behaviours while taking into account multi-dimensional settings, the BehavDT model outperformed traditional machine learning techniques.

2.7 Weerasinghe, Ravishka. (2023). The research was conducted to determine the variables influencing final-year undergraduate students in the “University of Kelaniya, Sri Lanka's Faculty of Commerce & Management Studies” use of AI technologies about their academic achievement. “Perceived utility, voluntariness, perceived ease of use, and social impact” were found to have a substantial positive link with academic success as measured by GPA. The study underlined how crucial these elements are to raising the standard of instruction. It recommended ways for the institution to raise students' awareness of and desire to utilise AI wisely. For more research, the study suggested cross-validating its results in various academic contexts using bigger sample sizes.

2.8 Mohammad, Hosseini., et al. (2023). The study sought to address the moral dilemmas associated with producing or editing scholarly manuscripts using artificial intelligence (AI) tools, such as ChatGPT and other large language models (LLMs), and exposing such tools. Due to potential for concealed usage and problems with enforceability, the authors advocated against outright prohibiting LLMs. They proposed that although LLMs are helpful for writing and editing, they shouldn't be acknowledged or credited as writers since they are incapable of having free will. Instead, they suggested enhancing APA Style to incorporate particular information on the use of LLM, like the model, contributor, version, and time of use.

3. Objective of the Study:

1. To analyse demographic variables influencing adoption of AI Tools

2. To give appropriate suggestions to enhance Adoption of AI Tools among the Research scholars

4. Research Methodology:

Table No: 1 Research Methodology

Research Design	Descriptive
Data Collection	Primary and Secondary
Sampling Technique	Non-Probability Purposive Sampling
Sample Size	200 Research Scholars of South Mumbai
Statistical Technique	Decision Tree
Statistical Tool	Python

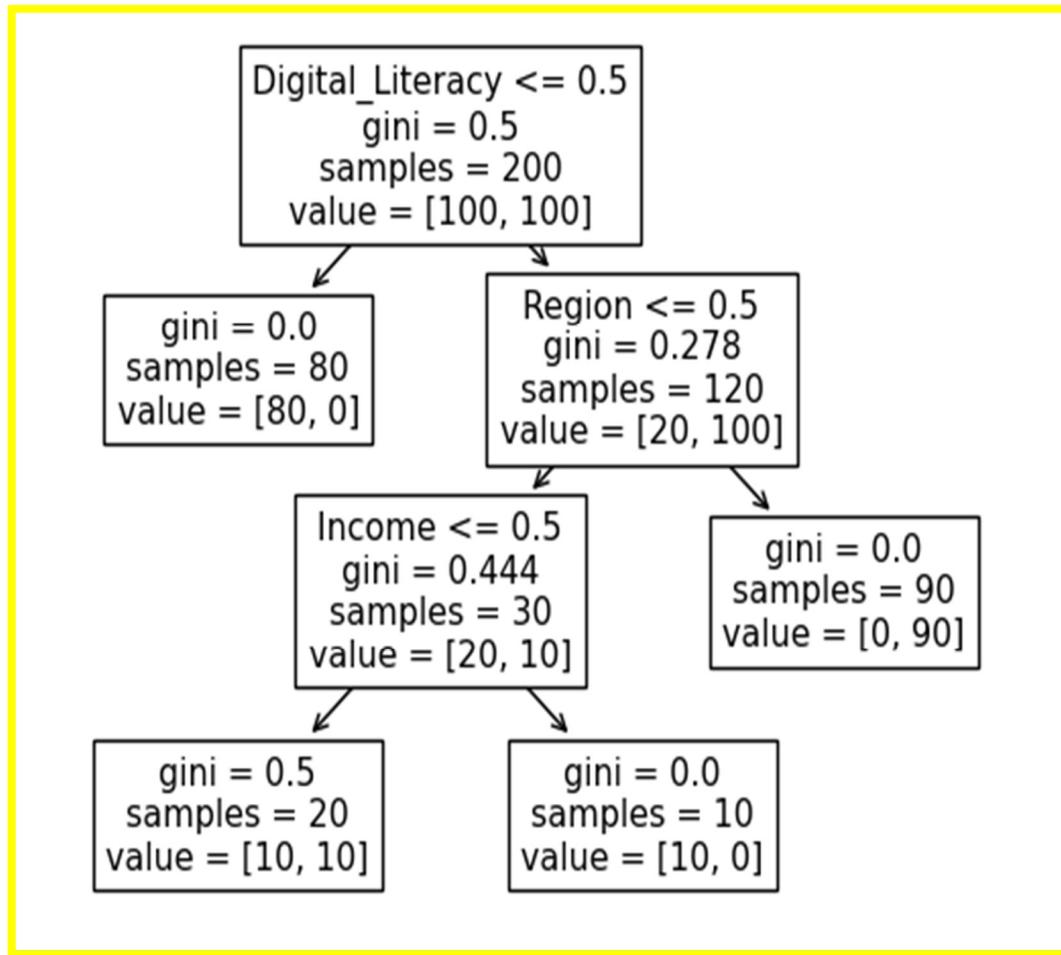
5. Data Analysis and Interpretation:

Table No: 2 Demographic Profile

Category	Variables	Frequency	Percentage
Gender	Male	97	48.50
	Female	103	51.50
Age	25 to 35 years	44	22.00
	36 – 45 years	62	31.00
	46 – 55 years	53	26.50
	56 and above	41	20.50
Faculty	Commerce	70	35.00
	Science	70	35.00
	Arts	60	30.00

Data was collected from 200 research scholars from South Mumbai Region to analyze their behavioural intention towards usage of AI tools. It was seen that there are 97 (48.50%) male and 107 (51.50%) Females. As for the Age, it was observed that there are 44 (22.00%) scholars belonging to 25-35 years of age, 62 (31.00%) belonging to 36 – 45 years, 53 ((26.50) belonging to 46 – 55 years and 41 (20.50%) who belonged to the 56 and above age category. 70 (35.00%) research scholars each belonged to Commerce and Science Faculty, and 60 (30.00%) belonged to Arts.

Figure No: 1 Decision Tree



6. Conclusion:

1. It can be seen from the above analysis that individuals with low digital literacy are unlikely to adopt AI Tools for research.
2. Individuals who have high digital literacy and are living in urban areas are very likely to adopt AI Tools for research.
3. It was also observed that individuals who have moderate digital literacy and are residing in urban areas are likely to adopt AI Tools.
4. Those individuals who are living in rural areas and have high digital literacy have mixed adoption rates. It was seen that their incomes influence their likelihood of adopting AI Tools.
5. Individuals living in Rural areas with low Income show a mixed likelihood towards adoption of AI Tools. Whereas, Individuals who have high incomes are unlikely to adopt AI Tools for research.
6. It was seen that age has no direct relation with the likelihood of adoption of AI Tools for research by individuals as it was observed as an insignificant predictor in the decision tree.

7. Suggestions

- Conduct frequent workshops on digital literacy for researchers, with an emphasis on AI Tools's useful.
- Offer webinars and online courses to expand the target market that cover everything from the fundamentals to expert computer abilities.
- Incorporate AI Tools usage instruction and digital literacy into university curricula by partnering with colleges.
- Establish computer labs and internet-connected digital literacy centres in remote regions.
- Work together to offer AI Tools training sessions and materials in your neighbourhood libraries.
- Provide instruction and demonstrations for digital literacy in rural regions by sending out mobile units manned by trainers with expertise in the subject.
- Collaborate with NGOs or local governments to offer subsidised or reasonably priced internet connection in rural areas.
- Provide free or inexpensive access to digital devices so that users can utilise AI Tools.
- Give low-income people money or financial incentives so they can access AI Tools tools and training.
- Form alliances with groups to provide research scholars from rural areas with stipends or scholarships.
- Simplify AI Tools' user interface and offer clear instructions for lessons and guidance.
- Academics who do not speak English, provide them with multilingual help.
- Start promoting AI Tools' advantages in research, stressing its efficiency and time-saving features.
- Use community outreach initiatives like local radio, and social media to raise awareness.
- Share the success stories and endorsements of academic researchers who have successfully included AI Tools into their study.

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