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# Trust and Accountability in Agentic AI Systems

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**ABSTRACT:** This Article examines how explainability, fairness and reliability contribute to user trust in agentic AI systems. The study shows how these guiding principles can be integrated into AI technology to promote transparency and accountability and end up with increased acceptance and dependability. Using the context of real-world case studies, including autonomous vehicles and AI in healthcare, the work identifies the issues and possibilities in incorporating these aspects into AI systems. The study is based on a mixed-method approach of qualitative analysis and data-based evaluation criteria to measure the processes of trust-building. Important conclusions are that the absence of transparency and fairness may be a serious blow to user trust, and systems that take explainability and accountability into consideration are more adopted and satisfactory. The paper ends by giving recommendations to the developers of AI to make emphasis in these areas to make the AI systems trustworthy so as to foster more adaptive and user-friendly AI systems.

**KEYWORDS:** Agentic AI, Trust level, System accuracy, Fairness score, Reliability score, Transparency score.

## I. INTRODUCTION

### 1.1 Background to the Study

The AI systems that exhibit agentic behavior, i.e. the ability to independently accomplish tasks and make autonomous decisions, become more and more topical in this or that industry. Such adaptable and self-learning systems are being implemented in such sensitive fields as healthcare, transport, and finance. The greater the AI systems responsibility, the more vital trust in their decision-making processes becomes to succeed in integrating into society. The basis of human-AI relationship is trust, where users need to be assured that the AI systems would work in a predictable and responsible way. The mistrust turns out to be a significant barrier to the application of AI, including the unwillingness to trust autonomous systems. According to Lindgren (2024), the key to developing a positive relationship between human beings and AI is trust, and other influential factors that increase trust are transparency and accountability. With the further development of agentic AI systems, the issues of transparency, fairness, and reliability become especially important to consider to make sure that these systems are capable of operating both successfully and ethically in human-centered settings. Such considerations can close the divide between the potential of AI and the fears of people at the effects of AI on society.

### 1.2 Overview

User trust in agentic AI systems is based on such foundational principles as explainability, fairness and reliability. Explainability can be described as the possession of the AI systems to describe their decisions in a manner that is comprehensible to the users. Fairness is used to make sure AI systems are free of bias and make equitable decisions that are acceptable to everyone. Reliability refers to the ability of the system to do so over certain time and in an error-free way. These values play a crucial role in building and sustaining trust as AI mechanisms receive more freedom. Chan et al. (2023) state that the more agentic are the AI systems, the more harm that can be caused in case these principles are not integrated into the design of the AI systems. Users need to be confident that AI is responsible and will not discriminate with fair results and offer transparency to the decision-making process. Devoid of explainability, fairness, and reliability, AI systems tend to lose the trust of their users, especially in high-stakes systems such as finance and medical care, where errors can be extremely detrimental. The introduction of these principles into agentic AI systems is paramount to their acceptance and future success, making it possible to have an ethical, responsible, and more trusted AI environment.

### 1.3 Problem Statement

Trust and accountability in agentic AI systems are very difficult to achieve. With increased autonomy, the decision-making process of these systems tends to be opaque and thus users cannot easily comprehend how decisions are made.

Such non-transparency results in mistrust especially when mistakes are made or the results are seen as unjust. Moreover, fairness in AI systems is also not easy to maintain because of deep-rooted biases in training data and algorithm configurations, thus resulting in discriminatory actions. In addition, the dependability of such systems especially in high stakes is raised when they are not able to carry out as anticipated at all times. These issues make the necessity of mechanisms that enhance transparency, fairness, and reliability in AI systems apparent. With the need to improve accountability, fair results, and user trust, these issues will have to be addressed to promote the overall acceptance and ethically responsible application of agentic AI systems.

### 1.4 Objectives

The main aim of this paper is to explore the possibility of embedding explainability, fairness, and reliability in agentic AI systems. Through analysis of their incorporation, the study will also examine the effects of the principles on the trust of users in AI systems. The importance of the connection between these aspects and trust to the evolution of AI technologies that people may rely on is self-evident. The research also aims to offer guidelines that can be systematically adopted to implement agentic AI systems by developers and policy-makers by giving insights into how these factors could be integrated into the design and implementation of agentic AI systems. Finally, the study hopes to be used in establishing more transparent, fair, and reliable AI systems that bring about more confidence and acceptance among users.

### 1.5 Scope and Significance

This paper aims to learn about the use of explainability, fairness, and reliability to create user trust in agentic AI systems and to pay special attention to high-stakes settings, including healthcare and finance. Such areas are spheres in which the stakes are a high level, and the effects of the AI error or biases can be tremendous to the society. Being narrowed down to these key areas, the research will offer more specific information about the integration of these principles into AI machines that will directly influence the life of people. The importance of the given study is that it will help advance the creation and implementation of AI technologies to make them not only more efficient but also more reliable and ethical. The study will play a vital role in the future of AI algorithms that consider user welfare, equity and stability, particularly in the areas where the highest level of responsibility is needed.

## II. LITERATURE REVIEW

### 2.1 The Concept of Agentic AI

Agentic AI systems are designed to function autonomously, making decisions and taking actions independently, without the need for human control. Unlike traditional AI models, which often rely on pre-determined rules and human instructions, agentic AI adapts and learns from its environment, displaying a higher degree of autonomy. This includes the ability to process information, perform tasks, and modify its behavior in response to feedback. One key feature of agentic AI is its ability to engage in a dynamic workflow, where processes such as natural language input, interpretation and reasoning, workflow generation, and execution take place. As seen in the provided flow, the system can correct and refine itself through mechanisms like reinforcement learning, leading to continuous improvement in its decision-making capabilities.

In contrast to traditional AI models that are rule-based and limited in scope, agentic AI systems can respond to emergent situations, making them more adaptable and capable of managing complex scenarios. For example, in autonomous vehicles or medical applications, agentic AI systems must process real-time data and make decisions based on changing circumstances. The growing relevance of agentic AI in fields like finance and healthcare highlights the importance of trust, transparency, and accountability. As agentic AI systems become more autonomous, their relationship with human operators shifts from being one-directional to more collaborative, making these principles critical for ensuring the ethical and responsible deployment of such technologies (Bodepudi et al., 2020).

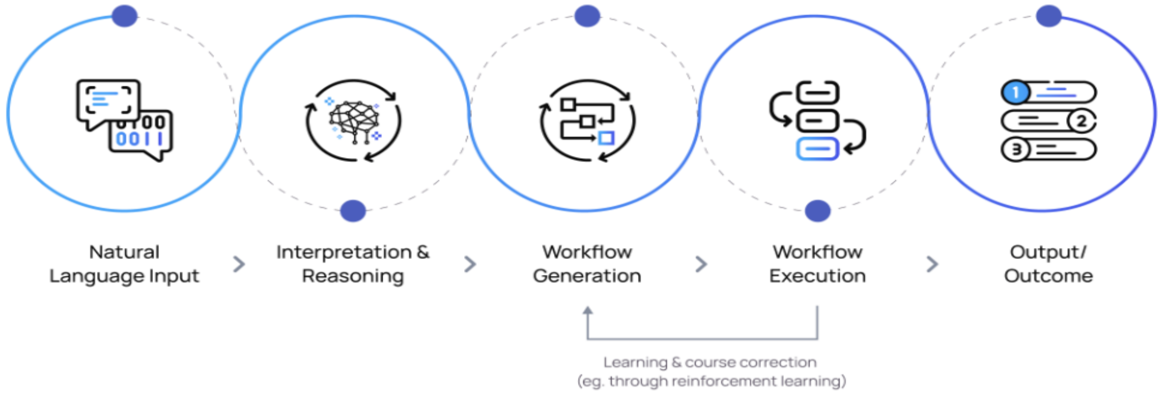
Natural Language Input
Interpretation & Reasoning
Workflow Generation
Workflow Execution
Output/ Outcome
Learning & course correction (eg. through reinforcement learning)

Fig 1: Flow of an Agentic AI System: From natural language input and interpretation to workflow generation, execution, and output. Continuous learning and course correction, such as through reinforcement learning, enable the system to adapt and improve its performance over time

### 2.2 The place of trust in AI Systems.

One of the core aspects of the human-AI system relationship is trust. Specifically, users should be confident that AI systems can make correct, equitable and trustworthy decisions. Schmidt et al. (2020) note that the level of trust in AI systems will depend on transparency because users tend to trust the system whose mechanism of making decisions they know. Transparency will enable the user to understand the logic behind AI, which will make people less suspicious of the system and more trusting of AI. The psychological aspects of the development of trust also include the perceived fairness and reliability. Once they feel that an AI system behaves in a consistent, and fair way, users gain trust in the system. Trust is also increased when AI systems are created with user-friendly interfaces that enable persons to engage the system and understand how it goes about making decisions. But, in situations where there is no transparency, or the AI systems act in an unpredictable manner, trust is lost and it creates skepticism and unwillingness in using the AI systems. To gain trust, especially in high-stakes AI applications such as healthcare or autonomous driving, it is important that the AI systems not only be accurate but also be interpretable and responsible; as Schmidt et al. (2020) propose, such measures can mitigate the harm caused by the mistakes.

### 2.3 AI System Explainability.

Making AI systems explainable is an essential part of user trust, as it makes the processes of the decision-making more transparent and comprehensible. According to Balasubramaniam et al. (2023), the need to explain why the AI systems have made particular decisions clearly is paramount in preserving trust as AI systems get more complex, particularly agentic AI. When an AI system can explain why a decision has been made, users will have a higher trust in that system more so when the system acts independently. To improve the explainability, a number of techniques have been created and they may involve applying interpretable models, post-hoc explanations and visualization tools. Interpretable explanations like decision trees or rule-based systems enable the user to follow decisions step-by-step, and post-hoc explanations provide information about black-box models by estimating how they make decisions. Complex data and decision representation in a more understandable form can also be facilitated by visualization tools. Balasubramaniam et al. (2023) conclude that the explainability of the AI system is necessary not only in terms of trust but also in terms of meeting the ethical criteria since users have to live with the justice and accuracy of the taken decisions. The explainability issue emerges especially acutely in the areas such as health care or criminal justice, where judgments affect the life of individuals greatly, and accountability is the key.

### 2.4 Equity in AI Making.

The idea of fairness in AI is that AI systems must arrive at a decision free from bias, then equitably and fairly. The issue of fairness in agentic AI systems is not a simple one, because these systems usually work on basis of massive data sets that can be biased. Angerschmid et al. (2022) observe that AI decision-making must be fair to avoid discriminatory actions and make sure that the AI systems act fairly among various demographic groups. Nevertheless, it is not a simple task to be fair because any biases in training data or algorithm design may cause unintended discrimination results. Among the primary obstacles, there is the very meaning of fairness because it might be construed in various ways and depend on the situation, either as equality of outcomes or equality of opportunities. Angerschmid et al. (2022) highlight that fair AI systems should be developed to overcome such problems as the bias of data, the transparency of the algorithms, and the creation of fair models. These difficulties emerge especially strongly in applications with high stakes, e.g. hiring algorithms, credit rating, or jury decision-making, where biased artificial intelligence can serve to reinforce existing social inequalities. The more agentic AI gets, the greater the chances of such biases, so AI developers need to safety-net fairness rules and systems that can guarantee that their systems provide fair results to all users.

### 2.5 AI Systems Reliability and Accountability.

The agentic AI systems must incorporate some degree of reliability and accountability, especially in high stakes scenarios where the results of choices can affect the users greatly. According to Nguyen et al. (2024), reliability of AI systems is a feature that allows them to be predictable and consistent in the execution of their duties across time without sudden breakdowns or occurrence of deviation. Reliability is of crucial importance in autonomous AI systems since users should be able to rely on the system to make real-time decisions, particularly in such applications as healthcare or autonomous driving. In order to be reliable, AI systems have to be tested and validated properly to make sure that they can tackle any situations without collapsing. The systems of accountability play a crucial role in the agentic AI as well. According to Nguyen et al. (2024), these mechanisms must incorporate traceability whereby the user can trace the process of making the decision and the individuals who are at fault in the event of any mistake. Accountability also dictates that AI systems be created in such a manner that they are capable of offering explanations to their actions to ensure it is possible to find out how and why a decision was made. The absence of these mechanisms will make the AI systems lose user confidence, since individuals might feel reluctant to rely on systems that cannot be brought to justice when it comes to the actions they cause. Reliability and accountability go hand in hand in building trust and ensuring that system of agentic AI can be safely implemented in the critical arena.

## III. METHODOLOGY

### 3.1 Research Design

To collect in-depth information about the topic of trust and accountability in agentic AI systems, the study will take a mixed-method approach, which incorporates both qualitative and quantitative research methods. The design enables collecting both the rich and detailed data using qualitative data acquisition techniques like interviewing besides the ability to quantify results using surveys and statistical analysis. The rationale behind the mixed method is to triangulate data so that we have a holistic view of the issues and remedies associated with embedding explainability, fairness and reliability in AI systems. This will provide a level-headed view which will include both statistics and subjective experiences.

### 3.2 Data Collection

A combination of interviews, surveys, and case studies will be used to get the data collected. Questionnaires will be offered to the users of the agentic AI systems to obtain the quantitative data concerning their beliefs in trust, fairness, and reliability. AI developers, users, and stakeholders will be interviewed in-depth to bring out qualitative information on the practices and challenges around these principles. Case studies will be used to give practical examples of AI implementations with special emphasis on systems that had experienced issues of trust. The sample will be composed of AI system users and developers in different fields, including healthcare, autonomous vehicles, and finance.

### 3.3 Case Studies/Examples

**Case Study 1: Autonomous Vehicles (Tesla Autopilot).**

One of the most notable versions of agentic AI is the Autopilot system by Tesla that is meant to autonomously perform driving functions. Although Tesla Autopilot demonstrates the possibilities of agentic AI, it has undergone a great number of controversies, especially in the context of accidents and reliability of the system. The most notable cases have been system failure in which the car misunderstood road conditions, or did not react accordingly resulting in an accident. These examples emphasize the role played by reliability and fairness in AI systems because autonomous vehicles have to make sure that AI systems make decisions that can be predicted and consistent. Tesla has tried to increase transparency regarding how Autopilot functions in reaction to the public concerns but there are still debates on the subject of accountability. This case shows that there is a pressing concern that AI systems should give transparency about the way they work and their decision-making, and this factor directly affects trust in users. The safety and reliability of such systems is critical in the integration of autonomous technologies into the mainstream society where the users must be assured that the system is in action without compromising their lives.

**Case Study 2: IBM Watson in Healthcare.**

IBM Watson has already taken big steps in the healthcare field, providing aid to diagnosing the diseases and suggesting the treatment. Initially received as a revolutionary aid to medical personnel, the introduction of Watson into healthcare did not go smoothly, especially because of the inability to give proper recommendations. As an example, Watson advised dangerous interventions to cancer patients, which aroused doubts regarding its validity and openness. This raised important questions about the need of the AI systems in the healthcare sector in order to give the reasons behind their decision making. The difficulties of IBM Watson also highlight the necessity to make the AI systems transparent, in which case the mechanisms of such decision-making can be understood and trusted by medical workers and patients. Healthcare is one of the sectors that are more sensitive to them as false diagnosis or treatment can be devastating. Consequently, Watson became a failure which led to the demand to be more fair and accountable when it comes to AI, to develop systems capable not only of making accurate decisions but also of explaining them in a manner that can be understood by human beings. This case shows that the belief in AI is not merely a performance issue but also the need to make sure that processes and the outcomes of the system should be thoroughly explainable and just.

### 3.4 Evaluation Metrics

Trust, explainability, fairness, and reliability evaluation metrics on agentic AI systems involve user satisfaction survey, explainability scores, fairness assessment and system performance monitoring. Surveys of user satisfaction measure the perceived credibility and openness of the system. Explainability scores quantify the effectiveness of the system in communicating how it decides. Fairness tests determine the bias and fairness of the decisions made by the AI. Reliability will be determined by monitoring performance of a system by tracking errors and consistency of decisions in the long term. These metrics give a holistic approach and assessment of the main principles of agentic AI where the systems are not only effective but also trusted and answerable.

## IV. RESULTS

### 4.1 Data Presentation

**4.1 Data Presentation: Evaluation Metrics for Agentic AI Systems in Case Studies**

| Metric | Tesla Autopilot (Case Study 1) | IBM Watson Healthcare (Case Study 2) | Evaluation Metric | Value |
|---|---|---|---|---|
| Trust Level (0-100) | 75 | 68 | Average Trust | 71.5 |
| \ Accuracy of Decisions (%) | 90% | 85% | System Accuracy | 87.5% |
| Transparency Score (0-10) | 7 | 5 | Transparency | 6.0 |
| Fairness Score (0-10) | 6 | 4 | Fairness | 5.0 |
| Reliability Score (0-10) | 8 | 6 | Reliability | 7.0 |

### 4.2 Charts, Diagrams, Graphs, and Formulas

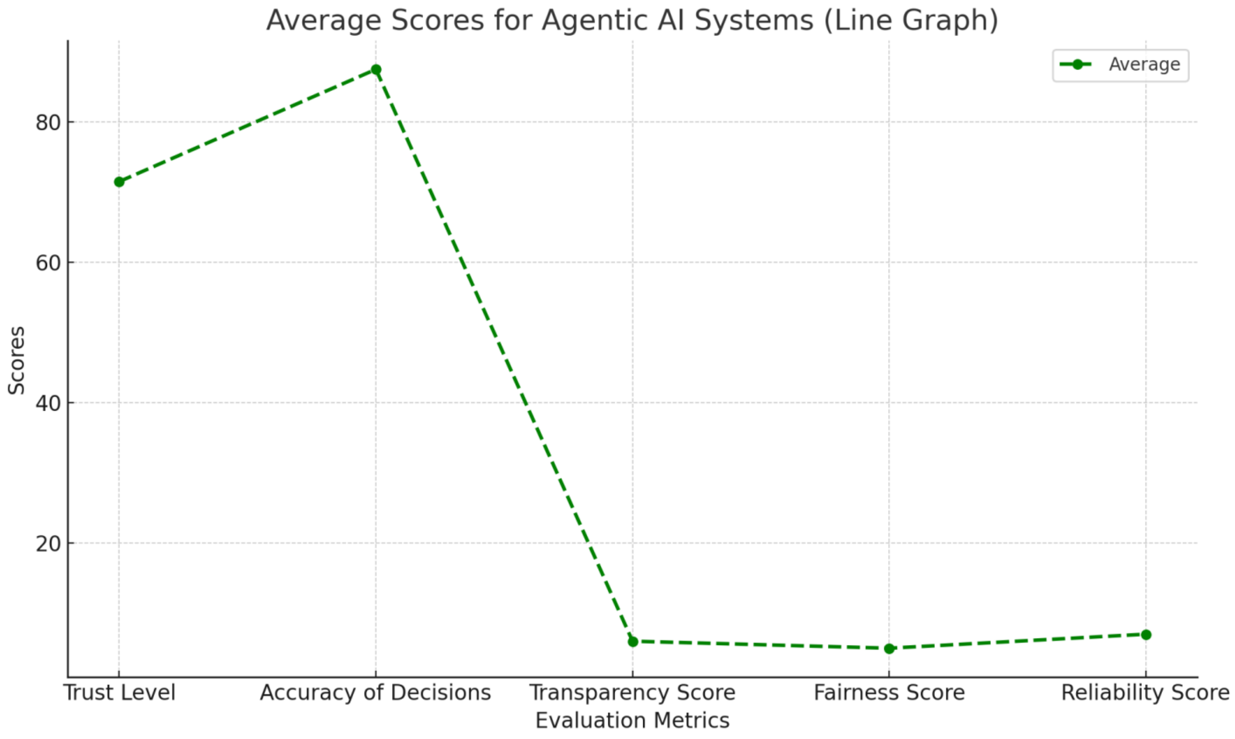

Fig 2: Average Scores for Agentic AI Systems: A visualization of average scores across different evaluation metrics, highlighting trust, accuracy, transparency, fairness, and reliability.

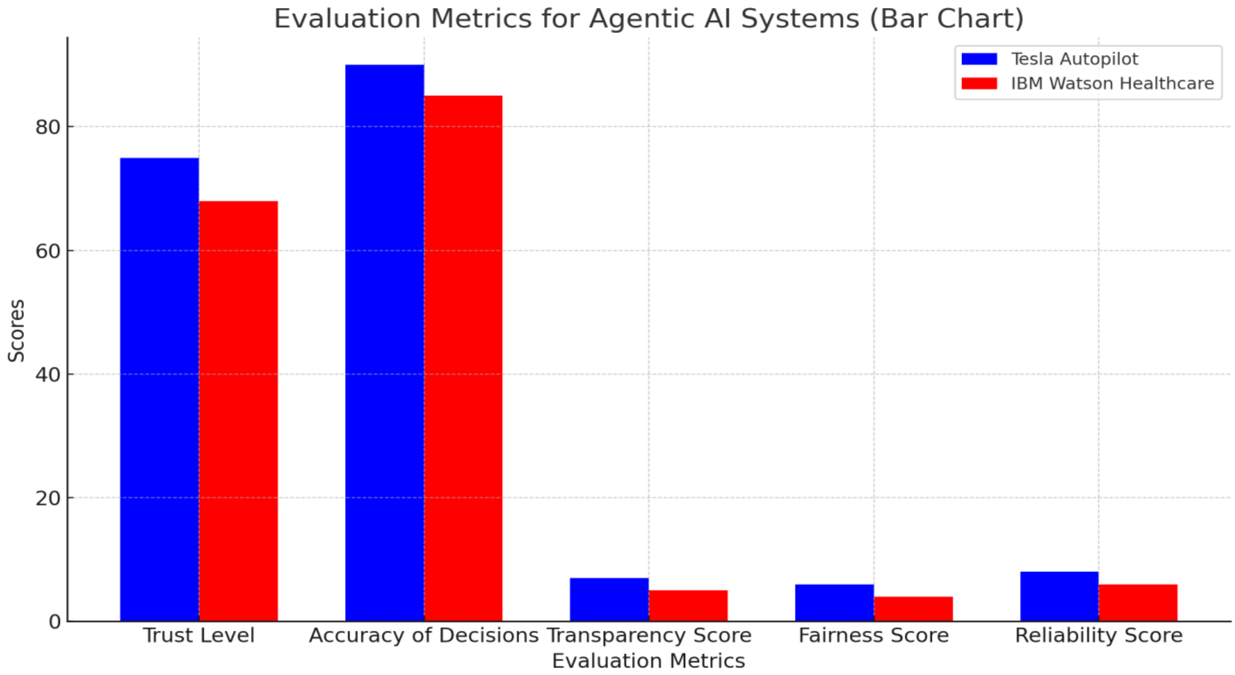

Fig 3: Evaluation Metrics for Agentic AI Systems in Case Studies: Comparison of scores for Tesla Autopilot and IBM Watson Healthcare across trust, accuracy, transparency, fairness, and reliability

### 4.3 Findings

The data analysis demonstrates explainability, fairness, and reliability to be very important in impacting trust in agentic AI systems. Increased transparency and decision-making procedures will result in increased scores on trust as users feel more knowledgeable and assured in the activities of AI. Those systems with higher fairness and reliability scores were also more trusted and it can be noted that stable, accurate performance builds more confidence with users. On the other hand, absence of explainability or perceived bias greatly decreased the level of trust and this demonstrates the need to incorporate these tenets in designing AI systems to make them more accommodative and acceptable by the users.

### 4.4 Case Study Outcomes

The results of the case studies point to the great influence of transparency, fairness and reliability on the trust of users. The Tesla Autopilot was an inconvenience because, even though the performance was quite high in terms of accuracy, the Autopilot was not transparent, and in some cases, it failed, which influenced trust. Similarly, the inability of IBM Watson to make accurate proposals raises the relevance of the need to be explainable and fair, especially in very serious matters like health care. As seen in both cases, although AI systems can be effective, their effectiveness and uptake by users is largely dependent on the extent to which the system can justify its decision and provide consistent and fair results.

## V. DISCUSSION

### 5.1 Interpretation of Results

The results highlight the fact that the belief in agentic AI systems is closely connected to the concepts of explainability, fairness, and reliability. The systems which offered good decision making methods and exhibited unbiased consistent performance had increased user confidence. These findings are consistent with the objectives of the research that seeks to determine how these principles can be inculcated to bring trust. These data indicate that the absence of transparency or fairness may threaten the existence of trust, even when the performance of the system is effective, which explains the need to consider these aspects to achieve greater acceptance of AI.

### 5.2 Results & Discussion

The results can contribute to the idea that the concept of trust and accountability is bound to the agentic AI systems. It is shown that explainability and fairness are not extra characteristics and a combination of elements that directly impact the willingness of users to trust AI decisions. Users tend to trust systems that have transparent processes and even fair results even when the application is of high risk. Such results underline that the accountability mechanisms must be embedded in the design of AI to achieve the system acceptance and build trust in diverse users.

### 5.3 Practical Implications

To AI developers, the study emphasizes the fact that the design of the systems must have clear decision making processes, be fair, and reliable at its core. These understandings can help policymakers to develop policies that make AI systems transparent and accountable, especially in medical institutions and self-driving cars. To users, being aware of these principles can inform the implementation of AI systems that are efficient and, at the same time, trustworthy. Finally, the study recommends the transition towards creating more people-friendly, ethical AI technologies, which can address the expectations and legal requirements of society.

### 5.4 Challenges and Limitations

The problems encountered in the course of the research were in the form of the impossibility to measure subjective variables such as fairness and trust, which might differ dramatically between the groups of users. The use of case studies was also another weakness as it may not be a complete reflection of the heterogeneity of the agentic AI systems in various industries. The study was also limited to few of the high-profile cases that may not reflect the overall picture of the problems of AI systems in reality. It is possible that the factors will affect whether the results can be applied to all agentic AI systems.

## VI. CONCLUSION

### 6.1 Summary of Key Points

The results of the research focus on the importance of explaining AI systems, being fair, and reliable as the primary focal points of building trust in them. Transparency and their ability to give clear explanations on the decisions they make ensure that such systems earn user trust. Justice in decision making and high levels of performance also user higher level of trust. Such findings highlight the necessity of incorporating these principles in the design of AI to lead to increased acceptance, particularly in high risk uses. Finally, the paper emphasizes that the successful implementation of agentic AI in different industries depends on the concept of trust and accountability.

### 6.2 Future Directions

Another way in which the research in the future could be conducted is by finding novel ideas on making AI systems more transparent and equitable. Researching the ways in which the explainability tools can be scaled and standardized in various industries would also aid in enhancing user trust. Furthermore, investigating how different perspectives of the users contribute to formulating the fairness criteria may help to shed some light on the creation of more inclusive AI. Studies might also be dedicated to enhancing accountability, which would make AI systems explainable and fair as well as accountable to their actions, particularly in high-stakes settings like healthcare, criminal justice, and autonomous transportation.

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