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Exploring AI Adoption and Perceptions in Pakistan: An Empirical Study of User Familiarity, Satisfaction, and Future Prospects

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<p>Uzma Taslim MPhil Research Scholar, Department of Commerce, University of Karachi. uzma_taslim@hotmail.com</p> <p>Hasan Raza Assistant Professor, Department of Commerce, University of Karachi. hasan.raza@uok.edu.pk</p> <p>Khurram Iftikhar Assistant Professor, Applied Economics Research Centre (AERC), University of Karachi. khurram.iftikhar@aerc.edu.pk</p> <p>Muhammad Farrukh Aslam Lecturer, Department of Commerce, University of Karachi farrukh.aslam@uok.edu.pk</p>	<p>Abstract</p> <p>The research has conducted an analysis of the degree to which artificial intelligence (AI) is being utilized in Pakistan. The study investigated the factors that contribute to higher acceptance of AI, including user happiness, familiarity with AI, and usage levels. An analysis that was data-driven and utilized both qualitative and quantitative research methods was carried out in order to evaluate the impact of a number of different factors on the adoption of artificial intelligence in Pakistan. The data was collected through surveys from a variety of different segments. In the context of Pakistan, the study explores the extent to which AI has been adopted, the amount of user familiarity, and the satisfaction levels. For the purpose of improving the existing body of research on artificial intelligence in economies that are not yet matured, this preliminary study on AI in Pakistan is necessary. The information that was supplied was vital, and it will help all of the stakeholders in Pakistan make educated decisions. It will also enable policymakers to refocus their plans in order to leverage the integration of AI.</p>
<p>Keywords:</p>	<p>Artificial Intelligence (AI), AI Technology Adoption, Customer Satisfaction, AI Familiarity, AI Perception</p>



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Introduction

Artificial intelligence (AI) has been instrumental in transforming all areas of our life, and how the business is performed, reshaping both business operations as well as daily routines across the globe. The penetration of AI has been swift in all sectors of the economy worldwide, yet developing nations like Pakistan have still a long way to go to catch up with leveraging the potential of AI (Khan et al., 2024). The slow pace of growth in the adoption of AI tools and features are affected by socio-economic and infrastructural challenges that are much greater than the developed countries. (Rane et al., 2024).

In order to exploit the potential of AI, the concerns in AI adoption needs to be tackled initially. These issues include ethical, privacy, and regulatory challenges. Despite its potential to streamline decision-making, enhance efficiency and boost economic growth, Pakistan confronts unique challenges in leverage the true potential of AI. Likewise, as AI is a rapidly evolving technology, initiatives such as advance skill development, developing the culture of innovation will reduce the threat of job displacement. (Ranković et al., 2023)

The research examines the extent of AI adoption, user familiarity, level of satisfaction in the context of Pakistan. It also evaluated the perceived barriers to adoption of AI-powered services. This study aims to provide valuable insights to all the stakeholders including, businesses, consumers and policymakers to accelerate beneficial adoption of AI in Pakistan, by creating a conducive environment. Since, AI is evolving dynamically, the existing literature is scant and previous studies have become obsolete in many cases. Additionally, Pakistan has distinct and unique culture and economic landscape which limits the scope of generalization of studies conducted elsewhere. Moreover, there are less unexplored themes, like challenges faced by consumers, and businesses in Pakistan to fully utilize the potential of AI leading to a need for more focused research on assessment of the influence of demographic factors on the growth of AI in Pakistan. Therefore, there exists major gaps in literature in terms of user experience, skill-sets and awareness that need to be analyzed to promote the growth of AI across the board.

Moreover, there is insufficient AI infrastructure and knowledgebase in Pakistan which restricts the use of AI by both the individuals and organizations, making it necessary to evaluate the practical application of AI. Hence, there is a lack of comprehensive research on how different dimensions of AI can be leveraged to recognize and capitalize on the opportunities in the specific case of Pakistan.

Addressing these gaps through focused research could significantly enhance the degree of success of AI adoption and contribute to effective support mechanisms and policies for AI implementation.

The following models are relevant in this study:

Technology Acceptance Model (TAM) (Davis, 1989)

This model assesses Perceived Usefulness (PU) and Perceived Ease of Use (PEU). In this study, TAM is incorporated as customer satisfaction depends on how well AI interactions enhance service efficiency, personalization, and overall experience.

Expectation-Confirmation Theory (ECT) (Oliver, 1980)

This theory explains Pre-adoption expectations, Post-adoption performance, Confirmation or disconfirmation. This study applies ECT by exploring whether AI interactions matches customer expectations leading to higher satisfaction levels.

SERVQUAL Model (Parasuraman et al., 1988)

This model measures services on five dimensions which in case of AI Adoption have following implications:

1. Tangibility: Usability of AI platforms
2. Reliability: AI's scope of consistent and reliable data processing
3. Responsiveness: AI has the capability to process data swiftly
4. Assurance: The customer experience while interacting with AI
5. Empathy: AI's ability to personalize information as per the needs of the customers or users.

Resource-Based View (RBV) (Barney, 1991)

It explains that businesses gain a competitive advantage through unique resources. Hence firms can invest in AI technologies to create a sustainable competitive advantage in customer service, leading to higher satisfaction.



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Literature Review

Global Perspective on AI Adoption

The transformative potential of AI has been widely recognized in developed economies, where AI technologies play a critical role in enhancing user experiences, driving operational efficiency, and generating personalized solutions (Alhosani & Alhashmi, 2024). In these settings, AI is often seen as a tool for automation, capable of performing complex tasks previously limited to human intervention (Sarker, 2022). AI-powered virtual assistants, customer service chatbots, and language translation tools have become integral to daily operations and are well-received by users. (Barikzai et al., 2024). Businesses that chose to adopt AI need to understand the data challenges and modelling requirements for AI deployment and re-evaluation of strategies to effectively reach out more customers. (Mogaji et al., 2021)

AI in the Financial Sector

One of the industries most impacted by AI technology is finance, where AI has enabled automated and data-driven decision-making processes, particularly in areas like wealth management, loan assessment, and customer service. AI is facilitating wide range of data-driven decisions, reshaping business models, and creating customer value with its evolving technologies ranging from Machine Learning algorithms to Neural Networks. Lately, robo-advisors are revolutionizing investment strategies, offering personalized advice with minimal human intervention. Similarly, AI-powered predictive models are delivering greater accuracy in credit scoring, thus transforming lending practice. (Ranković et al., 2023)

AI allows financial institutions to analyze vast amounts of transaction data, enhance financial health recommendations, and streamline loan decision processes. There are some financial tools e.g. Envestnet Intelligence which have the capabilities to predict and converse facilitating in real-time, and data-backed decisions (Ranjan et al., 2020). AI facilitates wealth managers to manage their clients in a better way and develop reports for their customers swiftly allowing them to offer personalized recommendations. Bankers also use AI for making loan decisions in real-time, rendering them more efficient. The capabilities of AI include analyzing payments patterns, assessing risks and find alternative sources of data. (Ranjan et al., 2020). Similarly, other financial management tools such as Transaction Data Enrichment (TDE) provide interpretation of complex transaction strings into readable text which facilitates management and analysis of financial data related to consumers and financial institutions (Sarker, 2022).

In Pakistan's financial sector, the application of AI is promising yet limited due to infrastructural and regulatory constraints. AI-driven financial services, including robo-advisors and voice-assisted banking, have the potential to improve customer service and increase operational efficiency. However, concerns such as cybersecurity vulnerabilities, data privacy risks, and the ethical implications of AI-driven decisions are significant challenges (Ranjan et al., 2020). The use of blockchain technology to expedite transactions has shown potential for improving efficiency, but the lack of regulatory clarity and public trust hinders broader adoption (Ranković et al., 2023).

Personalized Financial Services involves personalized interface such as robotized budgetary guides and organizers, clients' money related objectives, portfolio management and stock recommendation (Saxena & Muneeb, 2024). Likewise, Smart and Digital wallets have also revolutionized the financial sector in which significant players such as Paypal, Google, Apple, have contributed. This has resulted in reducing the reliance on physical money, subsequently growing the range of services and cashless options (Garbi, 2023). With Voice Assisted Banking, the need to physical presence has been reduced as it engages clients to utilize banking administrations with voice directions and contact screens. Typical language AI support can process inquiries to respond to questions, discover data, and associate clients with different financial administrations which decreases human-level mistakes while improving proficiency (King, 2010).

Data-driven AI and Blockchain applications are equipped for investigating a colossal volume of information. Such applications are usually installed in end-client gadgets, and monetary establishment servers. These applications are able to create money related plans and techniques through research and can also track the advancements (Ranjan et al., 2020).

The use of AI can potentially transform a business to an enhanced form that is able to offer customized administration, and achieve bigger objectives. However, it has increased the requirements to expand cyber-security dangers to cope up with the emerging challenges (Ranjan et al., 2020). To prevent the risks of evolving role of AI in finance, adaptable and forward-looking regulatory frameworks are imminent (Ranković et al., 2023). Yet, these technologies have the potential to transform the financial industry big time. (Ranković et al., 2023)

Predictive Analysis via AI

Organizations are able to anticipate future trends and events through the use of predictive analytics (PA), together with AI which gives them an edge over other by allowing for proactive rather than reactive decision-making. (Yerraguravagari et al., 2024).



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It is vital to ensure that the data used to train the algorithms is representative of the population being analysed as well as diverse to mitigate the risks related to AI usage in predictive analysis. The personal data also need to be stored securely to prevent any unauthorized access or misuse. This can be done through encryption or other security measures, and complying with data protection regulations. Professionals should use their own judgment to make final decisions instead of solely relying on AI results. (Božić, n.d.)

Customer Behavior Insights in Retail: PA can be used to track and predict customer behavior, which enable businesses to offer personalized product recommendations in the fields of retail and e-commerce. (Akter & Wamba, 2016) (Balaraman & Chandrasekar, 2016). AI based predictive models can boost sales and customer loyalty by evaluating browsing patterns, purchase history, and customers' demographic information (Potla & Pottla, 2024).

Risk Management in Finance and Insurance: For financial institutions, predictive analytics can assist in managing various forms of risk, such as credit risk, investment risk, and operational risk. By using AI to analyze credit scores, transaction history, and alternative data sources, banks and insurance companies can assess risk profiles more accurately, leading to better loan approval decisions and tailored insurance policies (Zanke, 2023).

Operational Efficiency in Supply Chains: Predictive analytics can streamline supply chain operations by forecasting demand, reducing stock-outs, and optimizing inventory levels. AI-driven tools can account for variables like seasonal demand fluctuations, supplier lead times, and transportation delays to minimize waste and improve efficiency (Pasupuleti et al., 2024).

Ethical Considerations and Bias Mitigation: To ensure ethical and unbiased outcomes, it is essential to use diverse datasets that accurately represent the population. Regular audits and assessments of AI algorithms can help identify and correct biases, making predictions fairer and more inclusive (Mensah, 2023).

Privacy and Data Security: With large amounts of data used in predictive analytics, protecting user privacy is essential. Businesses should implement strong data encryption, adhere to data protection regulations, and establish clear data governance practices to prevent unauthorized access and misuse (Ahmad & Khan, 2024).

Transparency and Explainability of AI Models: AI models in predictive analytics should be transparent and interpretable, especially when used in high-stakes decision-making areas such as finance, healthcare, and criminal justice. Explainable AI techniques allow users to understand the rationale behind predictions, which can increase trust and accountability (Chau, 2024).

Balancing Human Judgment with AI Insights: Predictive analytics should supplement, not replace, human judgment. Decision-makers should use AI-generated predictions alongside other information, applying their expertise and contextual knowledge to interpret results and make final decisions (Smith, 2023).

Tools for Predictive Analytics and Customization: Different tools offer specialized features for predictive analytics. Python and R provide flexibility for data scientists through a range of libraries, while platforms like IBM SPSS and Microsoft Azure offer enterprise-level solutions with in-built support for machine learning and scalability (Mazumder, 2016).

Predictive Analytics for Sustainable Development: Predictive analytics has potential applications in sustainability by forecasting resource consumption, assessing the impact of industrial processes, and aiding in resource optimization. These insights can support environmentally conscious practices across industries (Bibri, 2018).

ChatGPT and AI in Research

The usage of AI models such as chat generative pre-trained transformer (ChatGPT) for executing different tasks, involving research, idea generation and content writing assistance, is witnessing an exponential growth. ChatGPT by Open AI is an advanced language model capable to produce text responses that closely resemble those of humans. Such AI models use 'natural language processing' (NLP) and advanced algorithms, which enables these models to understand the textual prompts and inputs in the same way as any human can do. AI models are trained on large datasets, where the data quality and representativeness can impact their output which are based on patterns learned. However, sometimes they generate responses that sound plausible but are inaccurate, biased, or misleading. This underscores the need of human verification and critical evaluation of AI generated output to ensure the validity and reliability of the research findings. Therefore, AI is a man-made innovation that is susceptible to many limitations, misinformation, and potential errors (Sharma & Ruikar, 2024).

Moreover, AI models may not have access to the most up to date information as they are trained on an existing large dataset; also, they lack the ability to access external data or the ability to browse the internet, leading to obsolete or incomplete responses. Furthermore, comparable prompts and inputs may result in identical outputs when AI assists writers. Unintentional plagiarism may result when these outputs are sent to publications without being carefully reviewed, supervised, or assessed (Sharma & Ruikar, 2024).

Moreover, AI models are not capable to run human based peer review process and lack decision making abilities. This might lead to compromised judgment, creating doubts on the authenticity of the manuscript (Sharma & Ruikar, 2024).

Methodology

A mixed-method strategy (qualitative and quantitative methods) was adopted to collect data by combining both qualitative with quantitative research which was then analyzed using statistical tools (Eviews and SPSS) (Creswell & Creswell, 2017). The methodology included compiling a detailed literature review, and evaluating insights from the gathered information which led to develop an understanding of current status of the global AI landscape. The information was then mapped in the context of Pakistan. A comprehensive survey was conducted to collect data related to AI perception from individuals across different demographics as well as professionals belonging to diverse firms and sectors in Pakistan. The primary data collected through a survey explored status of AI adoption, perceptions, and barriers of AI implementation in Pakistan. On the other hand, the secondary data was compiled from credible sources including research paper, news and journals etc.

Qualitative data was evaluated to derive inferences on AI adoption, technologies in place, opportunities and challenges. The quantitative data was analyzed using descriptive statistics, correlation and logistic regression analysis to identify relationships among variables. Respondents rated their perceptions about AI's impact, their satisfaction levels, concerns and barriers.

The research findings from the questionnaires are integrated to develop understanding of the AI impact on individuals and organization in Pakistan. The study revealed that several businesses have invested heavily in AI pilot projects to have an edge and enhance efficiencies through AI automation. Both individuals and organizations realize the importance of AI and are ready to invest in AI technologies to reap the associated benefits and maintain their competitiveness.

In order to understand the scope and use of the AI solutions, a well thought out questionnaire was designed and shared with individuals with diverse backgrounds in an attempt to gather unbiased responses on this topic. The questionnaire was developed through a collaborative process involving subject matter experts, and researchers. The questionnaire was kept clear, concise, and easy to comprehend, taking just 5-10 minutes to complete. The population surveyed comprised of consumers, organizations, professionals and general public which are directly or indirectly involved in the use of AI based technologies for both personal and business use to gather quantitative data on their perceptions of AI initiatives.

Topics covered under the survey included general company info, status of AI awareness, and usage, customer experience with AI, preferred tool, how AI is reshaping different functions in businesses. Questions were carefully designed to yield data that is simple, easy for the respondent to understand, having direct relevance to the topic. The use of Likert scales to quantify perceived impact among the qualitative responses also helped in the mixed methods analysis. This strategy enabled us to evaluate the responses of the respondents about AI adoption in the specific case of Pakistan.

Table 1 – Summary of Survey Questionnaire

Aspects	Questionnaire Items	Options of Responses
General Awareness	How familiar are you with the concept of AI?	Not familiar at all, Somewhat familiar, Very familiar
Usage of AI Tools	Do you use any AI-powered tools or services in your daily life?	Yes, No
Preferred AI Tools	Which AI tools do you prefer to use?	Multiple-choice options: Virtual assistants, Search engines, etc.
Application Areas	In which areas do you use AI tools or services?	Multiple-choice options: Online shopping, Virtual assistants, etc.
Perceptions of AI	To what extent do you agree with statements about AI's impact on daily life?	Likert scale (1-5): Strongly Disagree to Strongly Agree
Future Prospects	How likely are you to use more AI-powered tools or services in the next year?	Likert scale: Very unlikely to Very likely
Organizational Usage	Does your organization use AI in its operations?	Yes, No, Not sure
Impact on Customer Experience	To what extent do you agree with statements about AI's impact on customer experience in your organization?	Likert scale (1-5): Strongly Disagree to Strongly Agree



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In the introductory paragraph of the questionnaire, it was clearly defined what the survey is attempting to evaluate and how data will be used, ensuring transparency and fostering trust with participants. Respondents appeared to be motivated to fill out the questionnaire themselves, even though help was given, where needed. The data was gathered after the full informed consent of all participants and ensured their anonymity. Beyond the survey, additional information was collected through available online material and reports on industry status from gray literature including news articles etc. The triangulation of data greatly helped with the validity and reliability of the findings.

Hypotheses

H1: Familiarity with AI positively impacts AI adoption.

H2: Higher perceived usefulness of AI leads to greater user satisfaction.

Sample

The survey included a representative sample of 132 respondents across various age groups, educational levels, and professional backgrounds in Pakistan. Data were collected over a one-month period in 2024, ensuring a diverse cross-section of AI users. Researchers obtained information by sharing the link of questionnaire through social media platforms particularly Whatsapp to ask for their inputs directly. Participants were asked to provide their email addresses and organizational affiliations to verify their professional status along with other demographics.

The following variables were analyzed:

Dependent Variable: AI Adoption

Independent Variables

- AI Familiarity
- Use more AI-powered tools or services in the next year
- Organization use AI in its operations
- Organization to invest more in AI technologies in the next 2 years?
- Customer satisfaction level in your organization before and after AI implementation

The Data was then analyzed using the following techniques:

- **Descriptive Statistics:** Statistical analysis covering cross tabs were calculated for survey responses to summarize the descriptive data.
- **Logistics Regression:** Logistics Regression was used to predict the probability of a high perceived impact of AI adoption based on various factors, including Familiarity with AI, Satisfaction level, barriers, and Demographics.

Descriptive Analysis

Out of the total respondents, ~95% agreed to be familiar with the concept of Artificial Intelligence while ~86% were actively using AI-powered technologies in Pakistan. However, only 35% of organizations are utilizing AI advancements in their businesses, indicating that there is limited adoption of AI in the business segment. Yet, 57% are planning to invest in AI technologies for improved business performance and higher sales.

- Use more AI-powered tools or services in the next year
- Organization use AI in its operations
- Organization to invest more in AI technologies in the next 2 years?
- Customer satisfaction level in your organization before and after AI implementation

Relationship of AI Adoption with AI Familiarity

Out of the total responses, majority (92%) had some level of familiarity with AI Services. The results depicted very distinct relationship of AI Familiarity with AI Adoption, as when AI familiarity increased, the likelihood of AI Adoption also surged. The respondents which were very familiar with AI had 91.7% more likely to adopt AI, therefore, familiarity strongly correlates with adoption. On the flip side, of the respondents who were "Not Familiar," 5 or 71.4% have not adopted AI suggesting lack of familiarity is a significant barrier to adoption.

Table 2 – Cross-Tabulation of AI Adoption with AI Familiarity

AI Adoption	Not Familiar	Somewhat Familiar	Very Familiar	Total
No	5	10	4	19
Yes	2	66	44	112
Total	7	76	48	131

Relationship of AI Adoption with AI Usage

Majority of the respondents revealed greater willingness to use AI tools extensively. The likelihood of AI usage in future demonstrates a promising trend of growing interest in AI-powered services and tools which can lead to thriving AI ecosystem. It can be suggested that those who are familiar with AI are more likely to expand their use of this technology in future.

Table 3 – Cross-Tabulation: Use more AI-Powered Services Next Year

AI Adoption	Very Unlikely	Unlikely	Neutral	Likely	Very Likely	Total
No	1	1	2	12	3	19
Yes	1	0	12	56	43	112
Total	2	1	14	68	46	131

Relationship of AI Adoption with AI Usage in Organizations

Data revealed that a large proportion (45%) of organizations are not currently using AI tools and services in their operations while surprisingly a significant respondents were not sure (~20%) about the usage of AI in their organization, reflecting a notable gap of awareness and organizational communication.

Table 4 – Cross-tabulation of AI Adoption with Organization use AI in its operations

AI Adoption	No	Yes	Not Sure	Total
No	11	3	4	18
Yes	40	36	19	95
Total	51	39	23	113

Relationship of AI Adoption with AI Investments by Organizations

Most of the respondents (56%) were of the view that their firms will be inclined to invest in AI technologies in the next two years revealing a strong growth potential of such technologies. Again a sizeable portion of participants were unsure of their organizations' plans leading to further substantiate the need of increasing awareness and communication by business entities. Overall there exist strong correlation of AI Adoption and firms' intentions to invest which can lead growth and innovations in this segment.

Table 5 – CrossTab: AI Adoption with AI Investments by Organizations in 2 years

AI Adoption	Very Unlikely	Unlikely	Neutral	Likely	Very Likely	Total
No	4	2	4	4	1	15
Yes	9	9	19	41	14	92
Total	13	11	23	45	15	107

Relationship of AI Adoption with Customer Satisfaction with AI Usage

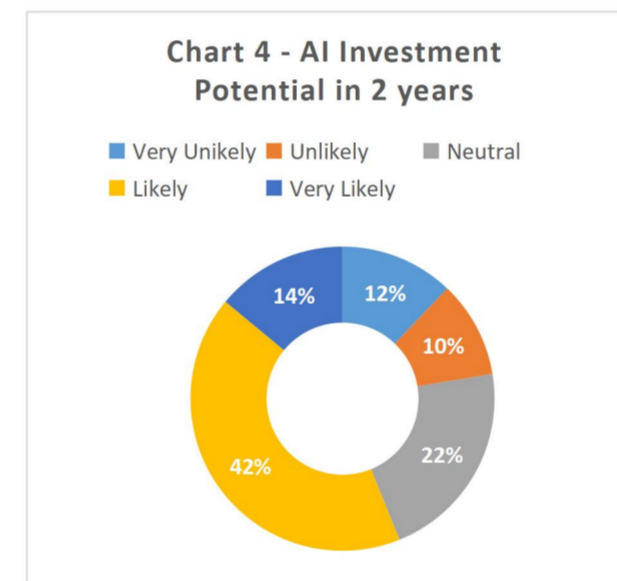
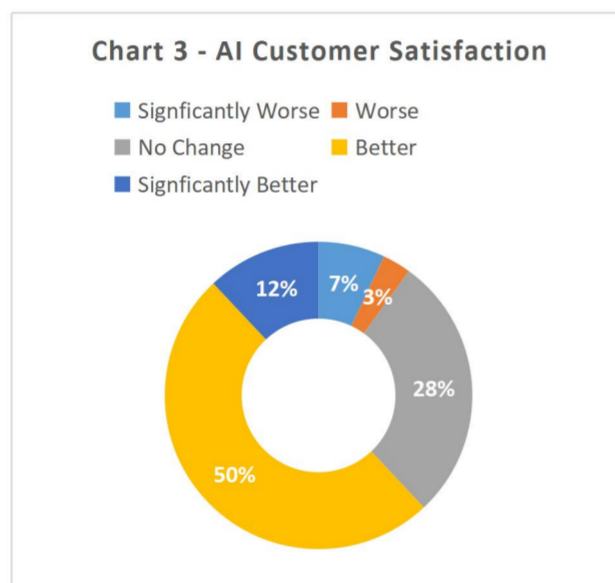
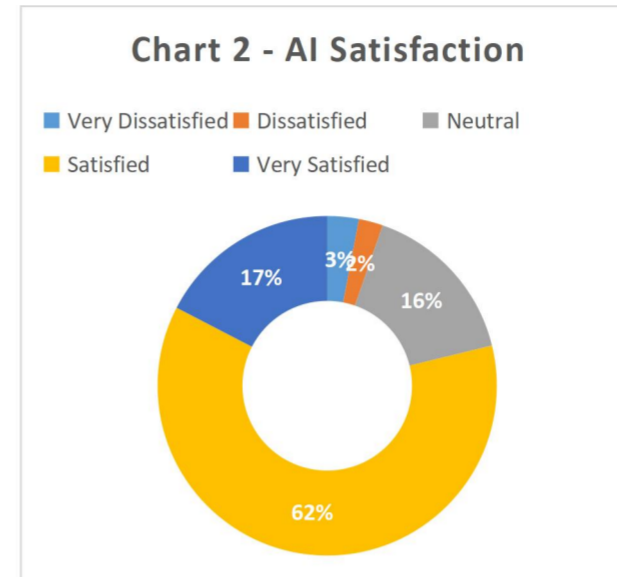
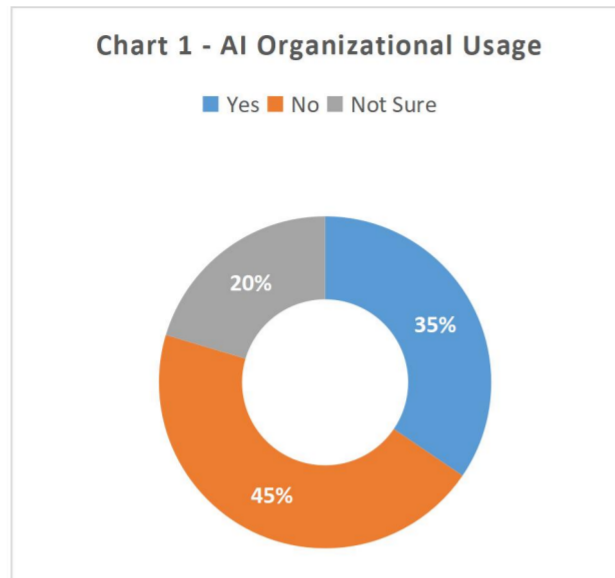
A large majority (~80%) of respondents who adopted AI reported to have witnessed improved customer satisfaction levels after using AI based technologies in customer engagements. This overwhelming satisfaction depicts a strong correlation of AI adoption with improved customer experience, providing a compelling case for expansion in AI adoption.

Table 6 – Cross-tabulation of AI Adoption with Customer Satisfaction with AI Usage

AI Adoption	Significantly Worse	Worse	No Change	Better	Significantly Better	Total
No	1	0	8	8	2	19
Yes	3	3	13	72	21	112

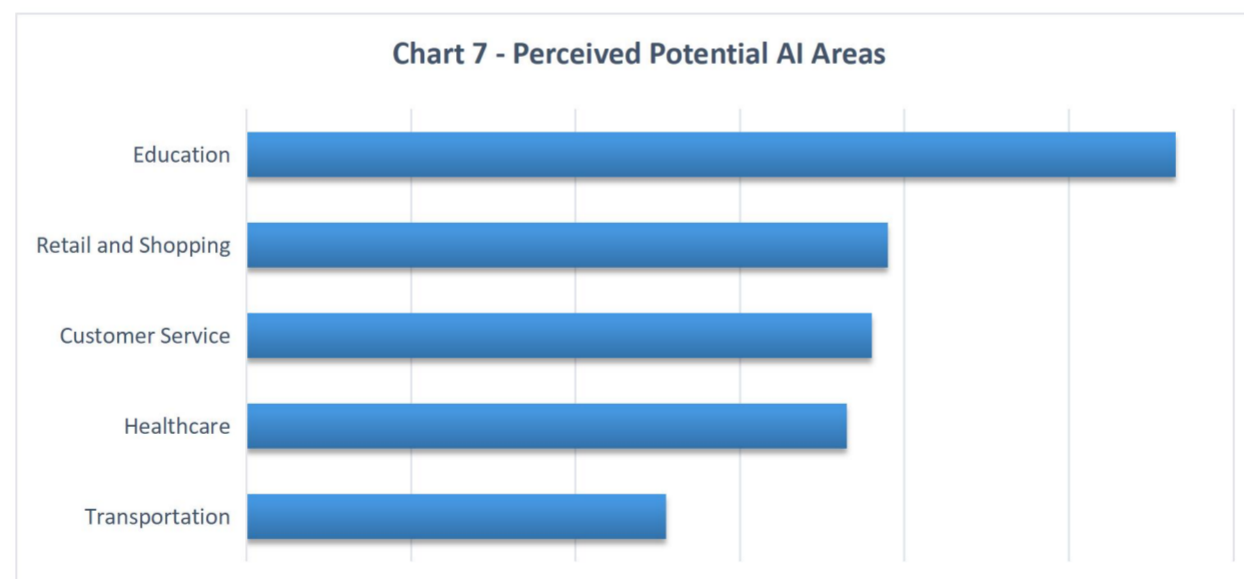
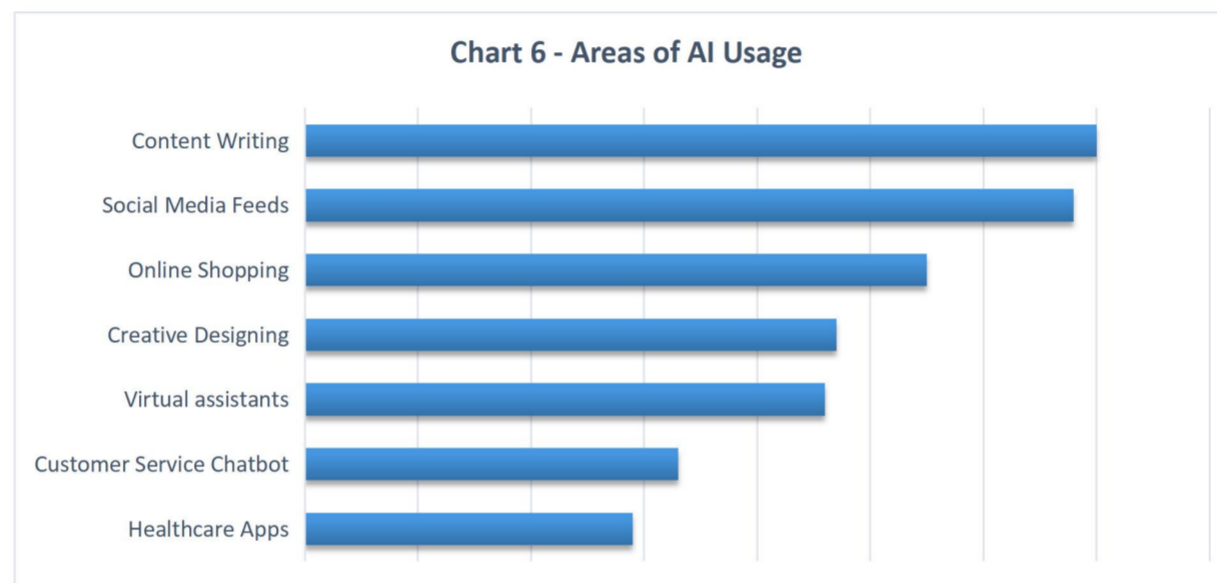
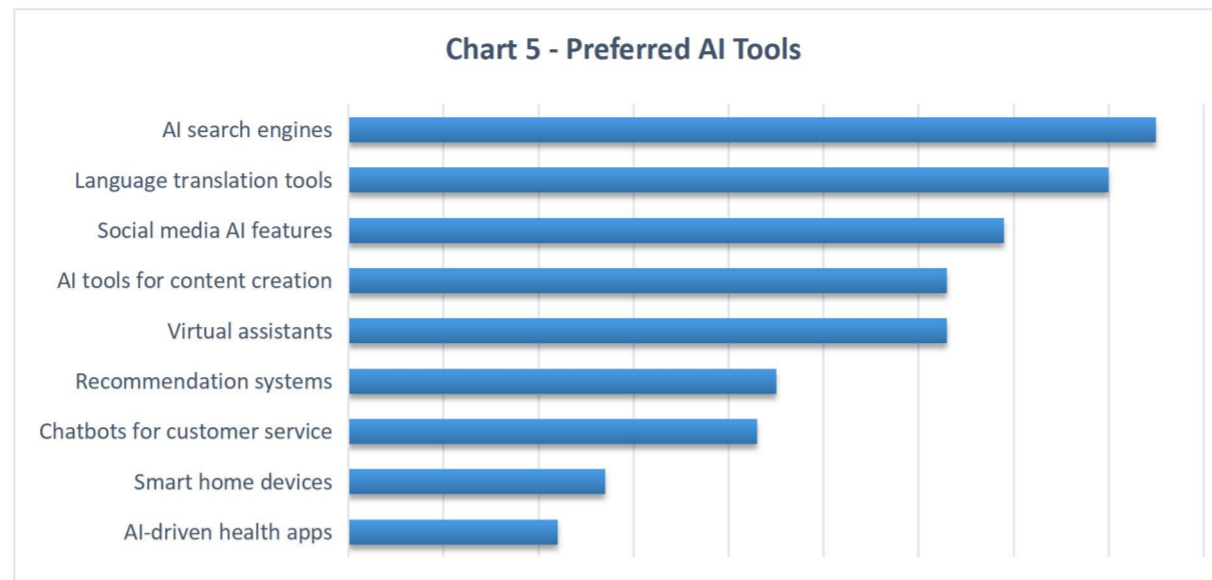
Total	4	3	21	80	23	131
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As customer satisfaction is high, majority of the organization are now planning to take the benefits of AI in improving their businesses. Higher usage of AI can provide organizations competitive advantage over those not incorporating AI technologies in their business operations.



Areas to Benefit Most from AI in the Future

The survey revealed that AI has higher adoption in the fields of Education and Online Shopping in Pakistan yet majority of organizations have not shifted their function to AI automation, reflecting ample room for AI implementation in Pakistan. A good percentage (~86%) used AI-powered tools, primarily search engines, virtual assistants, translation services, and social media AI tools. Respondents mainly used AI in the areas of content writing, and creative designing.



Logistic Regression Analysis

The Overall Statistics show that the variables under discussion are significant predictors of the AI Adoption under logistic regression analysis. The paper establishes important correlations between AI Adoption and major independent variables influencing the process as well as reveals the importance of planned future investments in AI technologies.

Major Drivers Influencing the Implementation of AI

AI Familiarity ($p < 0.001$)

AI Familiarity appears to be a key predictor of AI Adoption. This indicates that the likelihood of adopting AI is high for those people or organizations that have high awareness and high level of knowledge as regard to AI. Recognition might eliminate the unknown, instill confidence in the application of AI and enable organizations to find realistic applications for it. This is why such educational programs, workshops, and trainings aimed at increasing the awareness of the employees and decision-makers regarding the AI importance are essential.

Anticipated Use of AI-powered Tools or Services ($p < 0.001$)

Organizations who are currently placing strategies to adopt AI are more likely to do it in their operations. This is due to the fact that the result also presents a forward looking perspective in which businesses regard artificial intelligence as a decisive enabler of operational optimization and new product and process development. Another promising sign seems to be the active AI adoption planning in organizations which suggests that companies are undertaking efforts to integrate AI technologies.

Current Organizational Use of AI ($p < 0.05$)

The current use of AI in an organizations helps expand the use of the technology in the organization. From this perspective, it could be inferred that organizations that are aware of the uses and value of AI, are more inclined to expand use of such technology. This relationship reflects the reinforcing effect of AI use. Moreover, organizations continue to get positive results with the help of AI, it makes them want to incorporate it in other lines of the business.

Customer Satisfaction Before and After AI Implementation ($p < 0.05$)

Customer satisfaction levels vary when AI is implemented; thus, it was found to have a strong impact on AI Adoption. This implies that ongoing customer positive response after recognizing its implementation means that organizations want to continue encouraging AI technologies. Several aspects that AI can help to bring improvement to the customer experiences, simplify services, and offer unique solutions underscore the importance of AI for businesses. Therefore, customer satisfaction is among the benefits of AI and at the same time a reason good enough to embrace it.

Surprisingly, future investments in AI technologies ($p > 0.05$) are insignificant to AI Adoption in the model. Many organizations develop an AI strategy and are considering AI investments; however, they experience challenges to the effective application of AI. A possible weakness of planned investments is that the time horizon of the planned investments is long-term, while the adoption decisions are immediate. Some of the adoption decisions may be more influenced by operational requirements for the organization and the customers instead of having strong strategic goals in mind.

This means that although strategic intent is important to guide AI investment by organizations, intent cannot exist without clear strategies and resources to enable adoption of AI in the enterprise. Based on the study results, the following strategies can be worked upon to enhance the AI Adoption:

Focus on Awareness and Education

As a component of AI Capability Framework, the enhanced AI Familiarity should be the first on the list of priorities for organizations that need AI. Organizations should encourage training and access to AI solutions by employees so that they gain understanding and familiarity with the technology.

Encourage Proactive Planning and Short-term Implementation

AI Awareness, AI Usage, and Enhanced Customer Satisfaction are core factors that impact AI Adoption. It is crucial, however, to focus on actionable steps to incorporate AI tools and integrate AI into the organization. Relationship with planned future investments is not significant showing that there is need to make more practical strategies. Policy makers and organizational managers should develop programs to enhance awareness on AI, create realistic adoption opportunities, and understand the challenges associated with planned AI investments to guarantee practical achievement of intended goals.

Table 7 – Logistic Regression Analysis

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
AI Familiarity	41.263	19.377	2	.000
Use more AI-powered tools or services in the next year	44.557	22.671	4	.000
Organization use AI in its operations	30.600	8.713	2	.013

Customer satisfaction level in your organization before and after AI implementation	32.617	10.730	4	.030
Organization to invest more in AI technologies in the next 2 years?	24.542	2.656	4	.617

Discussion

This study sheds light on how AI adoption is gradually taking root in Pakistan, but also highlights some significant hurdles along the way. While more than half of the respondents are familiar with AI concepts, and many use AI-powered tools like search engines, virtual assistants, and translation services, its adoption is still limited to certain areas such as education, online shopping, content creation, and creative design.

Interestingly, most people (79%) are satisfied with AI-powered services, which shows the potential of AI to make life easier and more efficient. However, a lack of awareness and insufficient infrastructure are holding back broader adoption, especially among businesses (Iyelolu et al., 2024).

There were a large number of participants willing to use more AI tools in the next years and majority of organizations were eyeing to invest in AI technologies within the next two years, which is an encouraging indication that a large numbers of firms and individuals are more likely to adopt AI sooner. Similarly, familiarity with AI along with its current use in businesses seemed to play a significant role in encouraging AI adoption. While the current level of AI adoption is relatively low in Pakistan, the prospects are great. However it is apparent that a great deal of policy intervention is required to unlock its full potential as well as to mitigate the inherent challenges. Literature suggests that among a host of concerns, privacy and trust issues remain major barriers, and these findings are consistent with the case in other developing economies (Shamim et al., 2023). Similarly, AI satisfaction levels were higher among respondents who were more familiar with AI, depicting importance of awareness and training to fully tap the AI potential. Moreover, the demographic analysis suggested that individuals belonging to younger population with better digital skills are generally more inclined to adopt AI which signify a generational shift in AI adoption also (Kaya et al., 2024).

Conclusion and Recommendations

AI technology has great potential for revolutionizing the way business is conducted, yet it is critical that the adoption of AI is backed by a thoughtful discourse to manage the risks around the tech implementation. The power of AI needs to be harnessed effectively and ethically, to create a prosperous and equitable future for the country's economic landscape which will require extensive stakeholder engagements (Ranković et al., 2023). For policymakers, businesses and individuals, the findings of the study emphasize the need to address privacy concerns, build trust and increase public awareness on AI technologies and what is required to benefit from it. If concerns are addressed amicably, AI's broader integration is expected to happen swiftly, leading to accelerated economic growth and innovation in Pakistan. While individuals and businesses are starting to explore the benefits of AI, challenges like privacy concerns, lack of awareness, and limited infrastructure are slowing progress.

The following measures if taken aptly will accelerate AI adoption in Pakistan:

- Addressing privacy and trust concerns so that user of the technologies feel confident and safe. This require policy intervention as well as regulatory enforcement to protect the basic rights of the individuals as well as firms. Offering incentives such as tax breaks or tech grants for AI investments will also encourage more businesses to make the leap in to latest technologies. Moreover, policies need to evolve in tandem with the AI and tech advancements for which regulators will have to stay informed and vigilant in updating rules and laws without hampering AI innovation and growth.
- Awareness can bridge the gap in AI adoption which can be created through learning opportunities. It will require conducting workshops, training programs, and awareness campaigns for public which can make AI less worrisome.
- In order to revolutionize the local businesses with AI adoption, infrastructural requirements need to be addressed properly involving high speed internet access, other relevant hardware and software such as cloud computing capabilities.

Pakistan holds immense potential to capitalize on the advantages of AI, however, the obstacles are required to be removed initially to pave way for smooth transition. AI can open up new opportunities for growth and innovation which will be instrumental in driving economic prosperity in the country.

Limitations and Future Research

There is limited perspectives of users as many are not decision makers who are capable of take steps to adopt AI in their businesses which limits the scope of this study. Since AI is a dynamic field, the current perspectives and concerns might change over time as new technologies emerge which counter the current challenges.



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