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Civil Servants' Perception Toward Application of Artificial Intelligence in Public Service
Delivery: Potentials and Challenges

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We hereby declare that the research project titled 'Civil Servants' Perception Toward Application of Artificial Intelligence in Public Service Delivery: Potentials and Challenges' is an independent research work conducted by Md. Robiul Islam, Assistant Professor in the Department of Public Administration at the University of Dhaka, as the Lead Researcher; Syedur Rahman, Assistant Director at BPATC, as the Research Director; and Mohammad Baha Uddin, Research Officer at BPATC, as the Research Officer under the guidance of research advisor Dr. Md. Mohoshin Ali, MDS (Joint Secretary) of BPATC. This report has not been previously submitted for any academic purpose or for the award of any diploma, degree, or similar title. The team extends its sincere thanks and gratitude to all participants involved in data collection, processing, and analysis.

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Abbreviation and Acronym

AI	Artificial Intelligence
ATU	Attitude Toward Use
BIU	Behavioral Intention to Use
BPATC	Bangladesh Public Administration Training Centre
MLGRD&C	Ministry of Local Government, Rural Development and Co-operatives
MOA	Ministry of Agriculture
MOE	Ministry of Education
MOEFCC	Ministry of Environment, Forest and Climate Change
MOF	Ministry of Finance
MOH&FW	Ministry of Health and Family Welfare
MOPA	Ministry of Public Administration
PEOU	Perceived Ease of Use
PMO	Prime Minister's Office
PU	Perceived Usefulness

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Abstract

Background: Artificial Intelligence has been an essential part of government work worldwide. Governments of both developed and developing nations have begun to intervene in policy to streamline AI in public service. The Bangladesh government has taken several policy initiatives to integrate AI into administrative functions.

Aims and Objective: In this regard, the study aims to evaluate civil servants' perceptions in Bangladesh regarding the application of artificial intelligence in public service delivery within the country's context. It further attempts to analyze the factors influencing the perception of civil servants regarding the application of artificial intelligence in public service delivery in the context of Bangladesh, as well as the potential challenges to implementing artificial intelligence in public service delivery within the same context.

Methods: The study employs a mixed-methods research design, incorporating both qualitative and quantitative approaches, which are followed by survey questionnaires and semi-structured interviews. Using simple random sampling, 200 responses were collected from officials (9th grade and above) through a survey questionnaire, and 10 additional responses were obtained through semi-structured interviews. Data were analyzed with the Statistical Package for the Social Sciences (SPSS) version 26 and R software (version 4.5.1).

Findings: The study shows that civil servants' familiarity with AI tools varies, categorized as follows: very familiar (23%), moderately familiar (48.5%), somewhat familiar (16.5%), slightly familiar (11.5%), and not at all familiar (0.5%). Only 12.5% of civil servants believe their office or department has implemented an AI tool in various activities, while the majority (87.5%) disagree. However, civil servants generally view AI tools and applications positively, believing they can assist with desk jobs in public service delivery. It is also noted that only 3% of civil servants have received AI-based training from their ministries, offices, or departments, whereas most (97.0%) have not received any AI training within the civil service. Using the Technology Acceptance Model (TAM), results reveal that age, education, gender, and training ($p\text{-value} > 0.05$) do not significantly influence the perceived usefulness (PU) of AI in the civil service, as indicated by a chi-square test. Spearman's Rank Correlation shows that only training effectiveness strongly correlates with the application of AI in enhancing public service delivery efficiency ($r = .866$), improving service quality for citizens ($r = .866$), reducing administrative burdens ($r = .866$),

increasing citizen satisfaction ($r = .866$), with a moderate positive correlation with AI assisting decision-making ($r = .645$). Regarding perceived ease of use (PEOU), it appears that ministries or offices may find it convenient to customize AI tools to meet specific public service needs. An attitude toward use analysis indicates that over 70% of participants agree with using AI in public service, reflecting positive views among civil servants toward artificial intelligence (AI) in the public sector. Additionally, behavioral intention to use (BIU) suggests that civil servants generally show a willingness to adopt AI-related systems and technologies in public service. Overall, attitude toward use (ATU) strongly correlates ($r = .794$) with behavioral intention to use (BIU); the more positive the attitude, the greater the willingness among civil servants to adopt AI. Using ordinal logistic regression, the study finds that male civil servants are perceived to find AI 92.1% more useful ($OR = 1.921$, 95% CI) in public service than females. Those who have used AI tools in their offices or departments have 96.7% higher odds ($OR = 1.976$, 95% CI) of perceiving AI as easy to use (PEOU) compared to those who have not. Participants see AI's potential in personalized government services, full automation of processes, predictive governance, increased citizen participation, cost savings, resource optimization, and improved transparency and accountability. Significant challenges include security and safety concerns (36.5%) and lack of policy guidelines (30.5%). They also identified high-level issues related to AI in public service, such as ethical concerns (31.0%), regulatory and legal complexities (38.5%), and a lack of citizen orientation (32.5%).

Chapter One: Introduction

1.1 Background of the Study

The world is moving first to undergo a new industrial revolution (i.e., the 4th Industrial Revolution). Various new edge-cutting technologies will dominate each sphere of our lives. These technologies will make the production process more cost-effective and efficient, thereby enhancing people's lives and improving the overall life standards of human beings (Agbaji et al., 2023). Artificial intelligence (AI) is one of them. According to [pewresearch.org](https://www.pewresearch.org), "*people will become even more dependent on networked artificial intelligence (AI) in complex digital systems by 2030*". However, the 4th Industrial Revolution is imminent for all. No Country today or tomorrow can escape the impact of this revolution. Instead, the country that adopts it earlier will be more successful, and the country that delays adopting it will be at a disadvantage in this competitive era. Hence, it will be far better for a country to embrace it as easily as possible (He, 2019). The Bangladesh government is committed to establishing a hunger-free and exploitation-free society, which will be technology-based and develop basic tools of E-Governance in every step of governance, service delivery system, and education system (Chowhan, 2020).

Hence, to achieve this vision, the government enacted the National ICT policy in 2009 and introduced 3G, 4G, and 5G services, connected via two submarine lines, and provided concessions on smartphones and ICT Products. The government also established 8,280 digital Centers, numerous plans to develop over 39 Hi-tech Parks, Introduced Smart cards, and a National Website, among other initiatives. The country will soon reap the benefits of this vision. Moreover, all basic government services are now available online, and over 18 crore 32 lakh mobile subscribers, as well as more than 12 crore 91 lakh Internet subscribers, enjoy the benefits of this digitalization (ICT Division, 2019).

But this is not enough to keep pace with the world and the new technological revolution. The country needs to walk many more miles and embrace new technologies in our governance system and production mode. Keeping this in mind and to capitalize on the opportunities offered by artificial intelligence-based technologies, the visionary government of Bangladesh has already initiated new policies and further developed its vision and plans.

1.2 Statement of the Problem

In 2020, the government initiated the National Strategy for Artificial Intelligence in Bangladesh. In this context, the government has declared a new vision to build Smart Bangladesh by 2041, aiming to take Bangladesh to a new height of technological revolution (ICT Division, 2020). Although the government initiated the National Strategy for Artificial Intelligence in Bangladesh in 2020, only a few government institutions have adopted its use. However, the usage of Artificial Intelligence in these sectors is still not satisfactory in the public sector. Hence, the prime aim of this study is to analyze the perception of Bangladesh Civil Servants towards Artificial Intelligence (AI), whether they are not readily accepting of the usage of Artificial Intelligence (AI) in governance and service delivery process or AI is still not gained much trust from among them or there exists any other factor that causes to sluggishness in the application of AI in different sectors of government even after four years have been passed since it a policy has been initiated in 2020 in this regards.

1.3 Rationale of the Study

Over the past two to three centuries, the world has witnessed several Industrial Revolutions, which have brought about significant changes in various aspects of human life, society, economics, and business, as well as rapidly changing global trends, primarily driven by advancements in science and technology (Peckham, 2021). Notably, one of the key advantages of the 4th Industrial Revolution is its potential to bring about a dramatic change in all aspects of human life. Among the leading technologies, including 4IR and Artificial Intelligence (AI), that tend to make human life more comfortable and efficient, and enhance the production process (Ally & Work, 2020).

The government of Bangladesh has also set several national development agendas, including alleviating extreme poverty by 2031 (Arfanuzzaman, 2024), becoming an upper-middle-income country by 2031, and achieving developed country status on the global map by 2041. Thus, the proper application of this vision-driven policy is essential for achieving a country's development agenda while embracing the challenges of the Fourth Industrial Revolution. However, it is unfortunate to note that, despite four years from 2020 to 2024, the country has seen very sluggish progress in implementing this policy. Only a few usages of Artificial Intelligence have been marked in government service delivery systems. Civil servants are the firefighters of policy implementation in Bangladesh (GED, 2020).

The Bangladesh government has formulated a policy in 2020 to ensure the proper and utmost application of Artificial Intelligence in Bangladesh. Conversely, to successfully attain the Digital Bangladesh vision by 2021, the government of Bangladesh has set a new vision of building a Smart Bangladesh that will be technology-inclusive and e-governance-based. Additionally, Bangladesh is in a leading position in terms of transforming from a lower-middle-income country to a developed one. In the government service delivery system, this technology will bring a smooth transformation, making the process simpler and citizen-focused. However, it also poses numerous challenges for installation in a country like Bangladesh. Therefore, the study aims to measure the perception of civil servants by identifying potential and challenges associated with integrating artificial intelligence in public service delivery.

Hence, it is essential to assess the perception of Bangladeshi civil servants towards Artificial Intelligence (AI). Hence, it will be very convenient to develop a policy suggestion then to enhance the proper application of Artificial Intelligence to harness the potentials of this edge-cutting technology in the governance system. Consequently, the evaluation of civil servant's readiness to accept Artificial Intelligence is of utmost importance when considering the goal of building a smarter Bangladesh that can make its mark on the global stage by 2041.

1.4 Research Objectives

The primary objective of this study is to evaluate civil servants' perceptions in Bangladesh regarding the application of artificial intelligence in public service delivery within the country's context. To achieve this primary goal, the study focuses on the following three sub-goals:

- a. To explore the civil servants' conceptual understanding and familiarity with artificial intelligence in public service delivery in Bangladesh.
- b. To analyze factors affecting the perception of civil servants in the application of artificial intelligence in public service delivery in the context of Bangladesh.
- c. To identify potential and challenges associated with the application of artificial intelligence in public service delivery in Bangladesh.

1.5 Research Questions

The study's central question is, 'What are the civil servants' perceptions in Bangladesh about the use of artificial intelligence in public service delivery?'. To achieve this primary question, the study focuses on the following three sub-questions:

- a. How do civil servants perceive and understand artificial intelligence in public service delivery in Bangladesh?
- b. To what extent do the factors influencing civil servants' perceptions of applying artificial intelligence in public service delivery within the context of Bangladesh?
- c. What are the potentials and challenges of applying artificial intelligence in public service delivery within Bangladesh?

1.6 Outline of the Report

The chapter is divided into eight sections.

- Chapter One covers the background of the study, the statement of the problem, the rationale of the study, the research objectives, and the research questions.
- Chapter two covers the literature review from various sources, along with the research gap.
- Chapter three covers the Theoretical Framework of the study, including perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (ATU), and behavioral intention to use (BIU).
- Chapter four explains the study's methodology, including research design, research methods, data collection sources, scope of the study, sampling techniques, data analysis tools and techniques, data triangulation, and ethical considerations.
- Chapter five discusses the results and findings of the study, including the demographic profile of the participants, civil servants' understanding and knowledge of AI tools, perceived usefulness (PU) of artificial intelligence in public service delivery, perceived ease of use (PEOU) of artificial intelligence in public service delivery, attitude toward use (ATU) of artificial intelligence in public service delivery, and behavioral intention to use (BIU) of artificial intelligence in public service delivery.
- Chapter six covers the conclusion and recommendations.
- Chapter seven discusses references, while chapter eight covers annexes, including the survey and interview questionnaires.

Chapter Two: Literature Review and Theoretical Framework

2.0 Introduction

The chapter incorporates literature from secondary sources, including relevant articles, journals, publications, various reports, policy documents, government notices, and website information. Following this, it identifies a research gap in evaluating civil servants' perceptions in Bangladesh regarding the application of artificial intelligence in public service delivery within the country's context.

2.1 Literature Review

Li et al. (2018) demonstrated that in the new era of the Fourth Industrial Revolution in the 21st century, the field of Artificial Intelligence (AI) is gaining popularity and showing an increasing trend of growth. AI has been reshaping the service industry by performing various tasks and introducing innovation. AI technologies are advancing cognitive abilities and human capabilities (Wirtz, 2018). Reis et al. (2021) highlight that Artificial Intelligence (AI) can be defined as a machine's ability to perform tasks based on human reasoning. In other words, AI is a technology capable of executing human-like intellectual tasks. It includes six types of technologies used in service delivery systems: text, machine learning, deep learning, image recognition, natural language processing, and machine vision.

Babu (2021) focused on how Bangladesh has been transforming itself from an agriculture-based to a modern, technology-driven country to keep pace with global trends. Day by day, Artificial Intelligence (AI), the Internet of Things (IoT), Big Data, Blockchain, and automation are becoming more popular concepts that are being implemented in various industries and service sectors. AI technologies are becoming dominant factors in providing services across multiple fields, including finance, transportation, education, agriculture, healthcare, and environmental management.

Hasan et al. (2019) showed that integrating AI-based technologies in the public health sector has great potential, as this sector faces many health-related challenges. The Government of Bangladesh has adopted advanced technologies to address these challenges, such as District Health Information System 2 (DHIS2), Open Medical Record System (OpenMRS), and the open-source Smart Register Platform, which have made health data collection and service delivery easier than ever before (Khan et al., 2019; Alam, 2023).

To make the country technologically advanced, the government has launched various initiatives, such as introducing 5G, launching Bangladesh Satellite-1 and 2, building a Hi-Tech Park, an IT Training and Incubation Centre, and a Tier-IV Data Centre, among others. As a result, AI-based technologies are becoming dominant tools (Deowan, 2020). It is predicted that the growing use of AI technologies will lead to the fastest economic growth and create more job opportunities by developing new sectors (Hasan, 2019). In Bangladesh, civil servants and public offices play a crucial role in providing services to citizens. Therefore, what these civil servants think about their knowledge, feelings, fears, and hopes really matters in determining whether AI can be implemented across different sectors. Many recent studies address the technical aspects of AI and ethical questions. However, little attention is given to the people inside the system, especially in developing countries. This literature review aims to synthesize existing knowledge on how civil servants perceive AI, what factors influence their perspectives, and the opportunities and challenges they face. It also offers a theoretical foundation for understanding this issue. It concludes by pointing out a significant research gap, which underscores the importance of examining civil servants' perceptions of AI in service delivery.

Several larger factors influence how civil servants perceive AI. The culture of an office and its readiness for change are of great importance. If a workplace is open to new ideas, supports learning, and allows people to experiment without fear, workers tend to view AI in a more positive light (Jöhnk et al., 2021). Training programs, clear messages from leaders about the benefits of AI, and rewards for acquiring new skills all help alleviate concerns and foster greater staff support. Also, the kind of technology and data systems already being used can make AI adoption either smooth or very difficult, and this shapes how civil servants think about its usefulness (Mikalef & Gupta, 2021).

Factors such as age, years of service, and professional background also influence perception. Generally, younger officers or those working in tech-related fields tend to be more optimistic about AI and less apprehensive about it. On the other hand, senior officials sometimes worry more about larger risks, such as liability in the event of something going wrong (Lindgren et al., 2019). Many studies highlight the potential benefits of AI, and most align with the key goals of good governance. Improved efficiency and productivity are perhaps the most significant. Routine administrative tasks can be automated, allowing officials to focus more on complex work that

requires human qualities like judgment, ethics, and empathy (Wirtz et al., 2020). AI tools, such as chatbots, can offer services at any time, day or night. Additionally, by utilizing citizen data, services can be more personalized, which often increases public satisfaction with government (Sun & Medaglia, 2019). AI can assist governments in shifting from merely reacting to issues to proactively preventing them. For instance, predicting when roads need repairs, identifying early public health risks, or targeting welfare programs more precisely (Mikalef & Gupta, 2021). Automated systems can also reduce the need for direct human handling in tasks such as issuing permits or reviewing contracts, potentially lowering corruption risks and making decisions easier to audit (Sharma et al., 2022).

Although AI has significant potential, various obstacles affect how civil servants view it. In many developing countries, government offices often lack proper data systems, reliable internet connections, or sufficient computing power to support AI (Dwivedi et al., 2021). Most civil servants lack the necessary technical skills and often view AI as too complicated or unfamiliar. This means governments need to invest in training, which is expensive and usually not a top priority (Jöhnk et al., 2021). Issues like bias, privacy breaches, or unclear AI decisions are not just hypothetical; they happen in real situations. Civil servants recognize they are the ones dealing directly with the public when problems occur, so they remain cautious (Zuiderwijk et al., 2021). AI systems are costly to design, buy, and maintain. When budgets are tight, funding AI can be challenging to justify compared to pressing needs such as hospitals or schools (Sharma et al., 2022). Large public offices tend to resist significant changes. A culture of “we always did it this way” can hinder the adoption of new technologies, even when other challenges are addressed (Aoki, 2020).

2.2 Research Gap

Although current research provides a solid foundation for understanding AI in government, a significant gap remains. Most studies have been conducted in developed countries with strong institutions and advanced technology (Lindgren et al., 2019; Jöhnk et al., 2021). The findings from these places are closely tied to their specific contexts. However, there is very little research focused on developing countries, especially in South Asia. Bangladesh stands out as a key example because it is rapidly progressing with the Technology-Based plan and is already testing AI in services. So, the aim is to examine the perception of civil servants regarding AI application in public service.

2.3 Theoretical Framework

The study includes the Technology Acceptance Model (TAM). The TAM comprises perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (ATU), and behavioral intention to use (BIU). Using these components, this chapter presents an analytical framework for the study to examine the factors influencing civil servants' perceptions of the use of artificial intelligence in public service delivery in Bangladesh.

2.4 Technology Acceptance Model

In 1986, Fred Davis developed the Technology Acceptance Model (TAM) for exploring how people's attitudes, knowledge, perceptions, and behavior toward technology are influenced by external variables, perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (ATU), behavioral intention to use (BIU), and actual system use (BIU) (Davis, 1989). However, the study considers four variables, including perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (ATU), and behavioral intention to use (BIU).

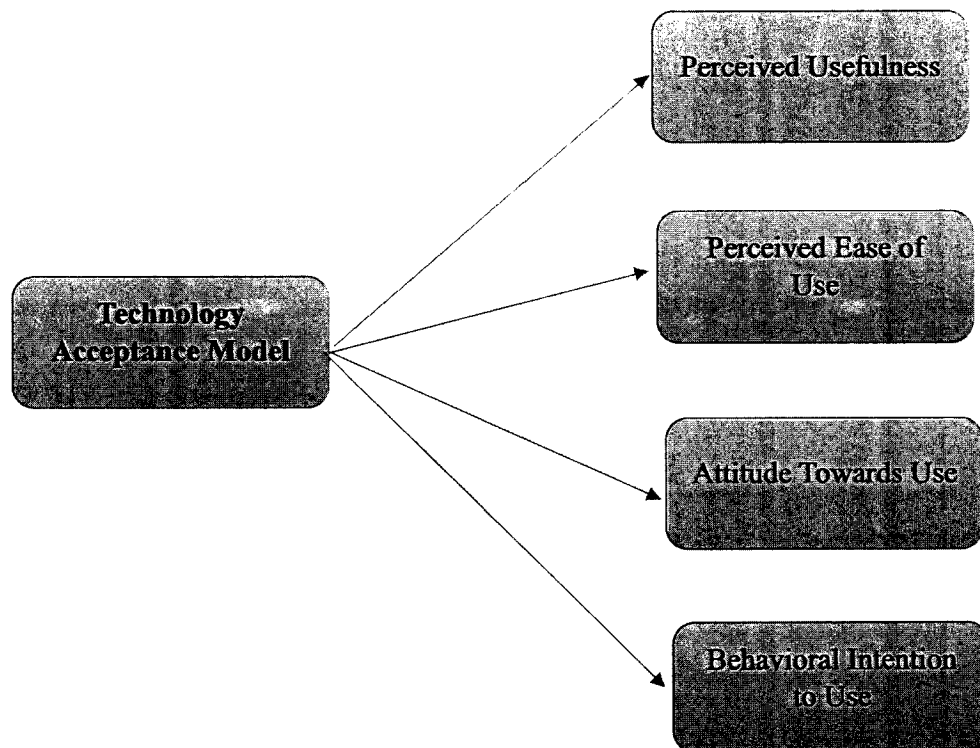


Figure 2.1 Technology Acceptance Model (TAM) (Davis, 1989a)

2.4.1 Perceived Usefulness (PU)

Perceived Usefulness (PU) refers to the extent to which individuals believe that using a particular system or tool can help improve performance in achieving their goals. It also focuses on whether individuals perceive technology as useful (Davis, 1989a).

2.4.2 Perceived Ease of Use (PEOU)

Perceived Ease of Use (PEOU) refers to the extent to which individuals believe that using a particular system or tool will be free of effort in achieving their goals (Davis, 1989a).

2.4.3 Attitude toward Use (ATU)

Attitude toward Use (ATU) refers to the overall positive and negative feelings. It is also called a valuable effect of the positive or negative feelings of the individuals in a particular behavior (Davis, 1989a).

2.4.4 Behavioral Intention to Use (BIU)

Behavioral Intention to Use (BIU) refers to the overall intention or willingness to utilize a system or technology, specifically. The usage is influenced by the behavioral intention of individuals consciously planning to perform with a new technology or behavior (Davis, 1989a).

2.5 Components of PU, PEOU, ATU, and BIU

a. Perceived Usefulness (PU)

PU 1- The application of AI can improve the efficiency of public service delivery
PU 2- AI can enhance the quality of services provided to citizens
PU 3- AI can reduce the administrative burden in the working environment
PU 4- AI can assist in improving decision-making in public service delivery
PU 5- AI can improve the satisfaction level of the citizens in public service

b. Perceived Ease of Use (PEOU)

PEOU 1- It would be easier for my department office/ministry to integrate AI into the existing public service process
PEOU 2- Civil servants can easily understand the AI system in public service without specialized knowledge
PEOU 3- It would be easy for my office to adapt to AI tools
PEOU 4- It is convenient for my office/department to customize AI tools to fit the specific needs of public service delivery
PEOU 5- AI systems can be easily integrated with other existing digital tools or platforms within the government

c. Attitude toward Use (ATU)

ATU 1- I feel positive about the use of AI in improving public service delivery
ATU 2- AI can significantly enhance the quality of services provided by the government
ATU 3- I trust AI technologies in making fair and unbiased decisions in public service delivery
ATU 4- I have an optimistic feeling about the long-term impact of AI on public service delivery
ATU 5- I think that AI will make public services more accessible and user-friendly for citizens

d. Behavioral Intention to Use (BIU)

BIU 1- I intend to use AI technologies to improve public service delivery in my department/office
BIU 2- I think AI tools will become a regular tool in my work for improving public service delivery in the future
BIU 3- I will use AI to analyze data for making policy decisions or resource allocations
BIU 4- I would recommend using AI tools to other colleagues in their respective department/office
BIU 5- I am willing to engage with AI technologies in public service continuously

Chapter Three: Methodology of the Study

3.1 Research Design

The study employs a mixed-methods research design, incorporating both qualitative and quantitative research approaches. Utilizing mixed-method research can help determine perceptions based on both quantitative and qualitative aspects to achieve the study's objectives.

3.1.1 Qualitative Design

The qualitative design has helped explore the civil servants' conceptual understanding on artificial intelligence in public service delivery in Bangladesh.

3.1.2 Quantitative Design

A quantitative design is necessary to assess factors influencing how civil servants perceive the use of artificial intelligence in public service delivery within Bangladesh. The key factors include perceived usefulness (PU), perceived ease of use (PEOU), attitude toward the use (ATU), and behavioral intention to use (BIU).

3.2 Research Method

The study employed a survey method to collect data from participants.

3.2.1 Survey Method

The survey methods included survey questionnaires and interviews with the participants involved in the study. The survey questionnaires consisted of both open- and closed-ended questions. A semi-structured interview was conducted to gather in-depth information from the participants.

3.3 Source of Data Collection

The study has collected data from both primary and secondary sources.

3.3.1 Primary Data Collection

The primary data typically consisted of survey questionnaires and semi-structured interviews with the participants.

3.3.2 Secondary Data Collection

The secondary data included relevant articles, journals, publications, various reports, policy documents, government notices, website information, and so on.

Table 3.1: Objective of the study concerning the source of data

Objectives	Source of Data
a. To explore the civil servants' understanding on artificial intelligence in public service delivery in Bangladesh.	Primary and Secondary
b. To analyze factors affecting the perception of civil servants in the application of artificial intelligence in public service delivery in the context of Bangladesh.	Primary
c. To identify potential and challenges toward the application of artificial intelligence in public service delivery in the context of Bangladesh.	Primary and Secondary

3.4 Scope of the study

The study has focused on the applicability of AI in public service, specifically regarding civil servants' perceptions of perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (ATU), and behavioral intention to use (BIU).

3.5 Sampling Method

The study has applied probability sampling to collect data through fieldwork. Based on simple random sampling, 200 responses were collected from officials (9th grade and above) through a survey questionnaire.

- Ministry of Public Administration
- Ministry of Agriculture
- Ministry of Fisheries and Livestock
- Ministry of Road Transport and Bridges
- Ministry of Finance
- Ministry of Health and Family Welfare
- Ministry of Food
- Ministry of Education
- Ministry of Information and Broadcasting
- Ministry of Housing and Public Works
- Ministry of Home Affairs

- Ministry of Environment, Forest and Climate Change
- Ministry of Local Government, Rural Development and Co-operatives
- Ministry of Planning
- Prime Minister's Office

The study also conducted five interviews with civil servants from the Ministry of Public Administration, the Ministry of Health and Family Welfare, the Ministry of Local Government, Rural Development and Co-operatives, and the Ministry of Planning.

Table 3.2: Sampling size of the study

Sl.	Data Collection Tools	Ministry/Office	Total
1	Survey Questionnaire	Ministry of Public Administration	94
		Ministry of Agriculture	25
		Ministry of Fisheries and Livestock	7
		Ministry of Road Transport and Bridges	5
		Ministry of Finance	12
		Ministry of Health and Family Welfare	24
		Ministry of Food	3
		Ministry of Education	2
		Ministry of Information and Broadcasting	1
		Ministry of Housing and Public Works	6
		Ministry of Home Affairs	2
		Ministry of Environment, Forest and Climate Change	5
		Ministry of Local Government, Rural Development and Co-operatives	10
		Ministry of Planning	3
		Prime Minister's Office	1
Total			200
2		Ministry of Public Administration	2
		Ministry of Health and Family Welfare	1

Semi-structured Interview	Ministry of Local Government, Rural Development and Co-operatives	1
	Ministry of Planning	1
Total		05
In-total		205

3.6 Data Analysis Tools and Techniques

3.6.1 Qualitative Analysis

The study employed content analysis and thematic analysis of qualitative data to investigate the factors influencing how civil servants perceive the application of artificial intelligence in public service delivery in Bangladesh.

3.6.2 Quantitative Analysis

The study used the Statistical Package for the Social Sciences (SPSS) version 26 and R software (version 4.5.1). Based on the Kolmogorov-Smirnov and Shapiro-Wilk tests ($p\text{-value} (.000) < 0.05$), it was determined that the data were not normally distributed. Additionally, the study further assessed normality by calculating Z-statistics and Cook's distance. Non-parametric tests, including Spearman's Rank Correlation, the Mann-Whitney U test, and the Kruskal-Wallis H test, were used to analyze the data. The study also employed ordinal logistic regression and factor analysis, using principal component analysis (PCA). A 5-point Likert Scale was used, with options: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. Cronbach's Alpha was calculated to assess the reliability of the Likert Scale data, with a value of .950 indicating high internal consistency. Data were analyzed with a 95% confidence level, meaning the results are expected to fall within the calculated confidence intervals. The study also used a 5% error level (0.05) to minimize the risk of a Type I error.

Table 3.3: Data Analysis Techniques of the Study

Sl.	Data Analysis techniques	Specific Tool
1.	Univariate Analysis	Descriptive Statistics, frequency, percentage
2.	Bi-variate Analysis (Nonparametric test)	Mann-Whitney U test, and Kruskal-Wallis H test

3.	Bi-variate Multiple Correlation	Spearman's Rank Correlation
4.	Statistical Modeling	Ordinal Logistic Regression
5.	Reliability Analysis	Cronbach's Alpha and Principal Component Analysis (PCA)

3.7 Triangulation of Data

The study employed triangulation of data, utilizing literature from secondary sources, data sources, and data analysis techniques.

Table 3.4: Triangulation of Data

No.	Areas of Triangulation	Techniques
1	By Study	Literature Review, Reviewing books and contents
2	By data Source	Primary and Secondary
3	By the data analysis technique	Central Tendency, Spearman's Rank correlation, Hypothesis testing, and levels of measurement

3.8 Ethical Concerns of the Study

The study was initially conducted using a scientific method to determine the sample size. The questionnaire was finalized after pilot study findings confirmed that the data were valid and suitable for analysis through quantitative data techniques. Throughout data collection, the study maintained participant anonymity, and a clear statement was provided to participants that data were collected solely for academic purposes. Prior approval was obtained from respondents before data collection.

Chapter Four: Results and Findings

4.0 Introduction

Chapter four consists of demographic profile of the participants, civil servants' understanding and knowledge on AI tools along with the source of information, familiarity with AI technologies tools, level of familiarity with AI technologies tools, AI applicability in the related office or department, and training on AI, among other topics, perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (ATU), and behavioral intention to use (BIU) of Artificial Intelligence in Public service delivery. It also describes the potentials and challenges of AI applications in public service delivery.

4.1 Demographic profile of the participants

Table 4.1 shows the demographic profile of the participants. In terms of gender, the study covers male (73.0%) and female (27%) participants. The age distribution is as follows: 54% from 25-30, 36.5% from 30-35, 5.5% from 35-40, 0.5% from 40-45, 2.5% from 45-50, and 1.0% from 50 and above. As part of their educational qualifications, the participants held master's degrees (62%), bachelor's degrees (37.5%), and a PhD & above (0.5%). The officials belong to Ministry of Public Administration (47%), Ministry of Agriculture (12%), Ministry of Fisheries and Livestock (3.5%), Ministry of Road Transport and Bridges (3.5%), Ministry of Finance (6%), Ministry of Health and Family Welfare (12%), Ministry of Food (1.5%), Ministry of Education (1%), Ministry of Information and Broadcasting (.5%), Ministry of Housing and Public Works (3%), Ministry of Home Affairs (1%), Ministry of Environment, Forest and Climate Change (2.5%), Ministry of Local Government, Rural Development and Co-operatives (5%), Ministry of Planning (1.5%), and Prime Minister's Office (.5%). 91.5% civil servants had 1-5 years of length of service, along with 4.5% of 6-10 years, and 4% of 11 years and above of service experience.

Table 4.1 Demographic Profile of the participants

Component	n (%)	Mean	Std. Deviation
1. Gender			
- Male	146 (73.0)		
- Female	54 (27.0)	---	---
2. Age			
- 25 – 30	108 (54.0)		
- 30 – 35	73 (36.5)		
- 35 – 40	11 (5.5)	30.00	4.178
- 40 – 45	1 (.5)		
- 45 – 50	5 (2.5)		
- 50 and above	2 (1.0)		
3. Education Level			
- Bachelors	75 (37.5)		
- Masters	124 (62.0)	---	---
- PhD and above	1 (.5)		
4. Ministry/Office			
- Ministry of Public Administration	94 (47.0)		
- Ministry of Agriculture	25 (12.5)		
- Ministry of Fisheries and Livestock	7 (3.5)		
- Ministry of Road Transport and Bridges	5 (3.5)		
- Ministry of Finance	12 (6.0)		
- Ministry of Health and Family Welfare	24 (12.0)		
- Ministry of Food	3 (1.5)		
- Ministry of Education	2 (1.0)		
- Ministry of Information and Broadcasting	1 (.5)	---	---
- Ministry of Housing and Public Works	6 (3.0)		
- Ministry of Home Affairs	2 (1.0)		
- Ministry of Environment, Forest and Climate Change	5 (2.5)		
- Ministry of Local Government, Rural Development and Co-operatives	10 (5.0)		
- Ministry of Planning	3 (1.5)		
- Prime Minister's Office	1 (.5)		
5. Length of Service (years)			
- 1 – 5	183 (91.5)		
- 6 – 10	9 (4.5)	2.53	3.939
- 11 and above	8 (4)		

4.2 Civil Servants' understanding and knowledge on AI Tools

Table 4.2 illustrates the sources of information about artificial intelligence (AI) tools. Civil servants learned about AI tools mainly through social media (30.4%), self-study (18.1%), media exposure (17.4%), print and electronic media (11.9%), professional experience (8.7%), government agenda (5.0%), research work (5.0%), and collaboration with AI professionals (3.4%). Hence, it seems that civil servants mostly obtained information outside of the government's official initiatives or agenda.

4.2.1 Source of information about AI tools

Table 4.2: Source of information regarding artificial intelligence (AI) tools

Source	n (frequency)	% (Percentage)
Government agenda	22	5.0
Media exposure	76	17.4
Research work	22	5.0
Professional experience	38	8.7
Self-study	79	18.1
Print and electronic media	52	11.9
Social media	133	30.4
Collaboration with AI professionals	15	3.4

* Multiple responses recorded

4.2.2 Civil servants' familiarity with AI tools/technologies

Table 4.3 shows how familiar civil servants are with AI technologies and tools. The main AI tools include ChatGPT (74.5%), Gemini (11.0%), Grammarly (9.0%), QuillBot (4.5%), and OpenAI Codex (1.0%). This clearly reflects the orientation of civil servants toward AI tools and technologies. Table 5.4 describes the level of familiarity with AI tools among civil servants. It is seen as very familiar (23%), moderately familiar (48.5%), somewhat familiar (16.5%), slightly familiar (11.5%), and not at all familiar (0.5%). Therefore, more than two-thirds of civil servants have a sufficient level of familiarity with AI technologies and tools.

Table 4.3: Familiarity with AI tools/technologies by the civil servants

AI tool	n (frequency)	% (Percentage)
ChatGPT	149	74.5
Grammarly	18	9.0
Gemini	22	11.0
QuillBot	9	4.5
OpenAI Codex	2	1.0

Table 4.4: Level of familiarity with AI tools/technologies by the civil servants

	n (frequency)	% (Percentage)
Very familiar	46	23.0
Moderately familiar	97	48.5
Somewhat familiar	33	16.5
Slightly familiar	23	11.5
Not at all familiar	1	.5

4.2.3 Association of gender, age, education, and ministry/office with civil servants' familiarity with AI tools/technologies

Table 4.5 shows the connection between gender, age, education, office, and information source and civil servants' familiarity with AI tools and technologies. The results indicate that both male (52.5%) and female (22.0%) civil servants are mostly familiar with AI tools and technologies. Male participants also recognize Grammarly (6.5%), Gemini (8.5%), QuillBot (4.5%), and OpenAI Codex (1.0%). Meanwhile, female participants are familiar with Grammarly (2.5%) and Gemini (2.5%). Regarding age, participants aged 25-30 (40.0%) and 30-35 (32.5%) are most familiar with ChatGPT. In terms of education level and department or ministry, it appears that ChatGPT, Grammarly, and Gemini are the most recognized tools among civil servants. According to the Chi-square test, there is no significant association ($p\text{-value} > 0.05$) between gender ($p\text{-value} = 0.313$), age ($p\text{-value} = 0.488$), education ($p\text{-value} = 0.984$), or ministry/office ($p\text{-value} = 0.729$) and civil servants' familiarity with AI tools and technologies.

Table 4.5: Relationship of gender, age, education, and ministry/office with civil servants' familiarity with AI tools/technologies

Component	ChatGPT n (%)	Grammarly n (%)	Gemini n (%)	Quill Bot n (%)	OpenAI Codex n (%)	p- value
1. Gender						
- Male	105 (52.5)	13 (6.5)	17 (8.5)	9 (4.5)	2 (1.0)	.313
- Female	44 (22.0)	5 (2.5)	5 (2.5)	0 (0.0)	0 (0.0)	
2. Age						
- 25 – 30	80 (40.0)	10 (5.0)	11 (5.5)	5 (2.5)	2 (1.0)	.488
- 30 – 35	56 (32.5)	5 (2.5)	9 (4.5)	3 (1.5)	0 (0.0)	
- 35 – 40	7 (3.5)	1 (0.5)	2 (1.0)	1 (0.5)	0 (0.0)	
- 40 – 45	0 (0.0)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	
- 45 – 50	5 (2.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
- 50 and above	1 (0.5)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	
3. Education Level						
- Bachelors	57 (28.5)	5 (2.5)	10 (5.0)	2 (1.0)	1 (0.5)	.948
- Masters	91 (45.5)	13 (6.5)	12 (6.0)	7 (3.5)	1 (0.5)	
- PhD and above	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
4. Ministry/Office						
- Ministry of Public Administration	67	11	9	5	2	.729
- Ministry of Agriculture	21	2	2	0	0	
- Ministry of Fisheries and Livestock	6	0	1	0	0	
- Ministry of Road Transport and Bridges	3	0	1	1	0	
- Ministry of Finance	10	0	1	1	0	
- Ministry of Health and Family Welfare	20	2	2	0	0	
- Ministry of Food	1	1	1	0	0	
- Ministry of Education	2	0	0	0	0	

- Ministry of Information and Broadcasting	0	0	0	1	0
- Ministry of Housing and Public Works	5	0	1	0	0
- Ministry of Home Affairs	2	0	0	0	0
- Ministry of Environment, Forest and Climate Change	4	1	0	0	0
- Ministry of Local Government, Rural Development and Co-operatives	5	1	3	1	0
- Ministry of Planning	2	0	1	0	0
- Prime Minister's Office	1	0	0	0	0

4.2.4 Status of AI tool application in the office/department

Table 4.6 shows civil servants' opinions on whether their respective office or department uses AI. Only 12.5% of civil servants believe their office or department has implemented an AI tool in various activities, while the majority (87.5%) hold a different view. However, civil servants generally have a positive perception that many AI tools and applications can assist with desk jobs in public service delivery. Participants responded to ChatGPT (51.7%), Gemini (15.5%), Grammarly AI (10.6%), QuillBot (9.2%), Gamma AI (3.4%), Canva (1.9%), Microsoft Copilot (1.9%), DeepSeek (1.4%), and others (See Table 5.7). This clearly shows the civil servants' awareness of various AI tools and applications, especially in the context of public service provision.

Table 4.6: Civil servants' opinion on whether their respective office/department applies AI

	n (frequency)	% (Percentage)
- Yes	25	12.5
- No	175	87.5

Table 4.7: Civil servants' opinions on AI tools that can assist with desk jobs in public service delivery (multiple response)

AI Tools	n (frequency)	% (Percentage)
- ChatGPT	107	51.7
- Gemini	32	15.5
- Grammarly AI	22	10.6
- QuillBot	19	9.2
- DeepSeek	3	1.4
- Canva	4	1.9
- Microsoft Copilot	4	1.9
- Gamma AI	7	3.4
- OpenAI Codex	1	0.5
- Microsoft Power BI	2	1.0
- Perplexity	2	1.0
- GROK	2	1.0
- Midjourney	1	0.5
- Manus	1	0.5

* Multiple responses recorded

One of the civil servants opined that-

Artificial intelligence has not been widely used in Bangladesh's civil service. The government began developing an AI framework in 2020 and plans to launch an AI Policy in 2025. I firmly believe that integrating AI into service-related tasks is crucial at this moment. This initiative aims to simplify administrative processes related to service work.

4.2.5 Training on artificial intelligence (AI) availed by the civil servants

Table 4.8 shows that only 3% of civil servants received AI-based training from their respective ministry, office, or department. Meanwhile, the majority of civil servants (97.0%) had not received any training on AI applications within the civil service. Those who did receive training gained insights into human decision-making with artificial intelligence, the use of Chatbots for citizen inquiries, data analysis with AI tools, and integrating patient data.

Participants shared their opinions on the types of training or resources they need to use AI in their roles (See Table 4.9). Civil servants listed workshops (31.7%), hands-on training (27.8%), online courses (23.8%), and case studies (16.7%) as preferred options.

Table 4.8: Civil servants' status of receiving AI-based training by the civil servants

	n (frequency)	% (Percentage)
- Yes	6	3.0
- No	194	97.0

Table 4.9: Types of training or resources that civil servants need for utilizing AI in their respective roles

	n (frequency)	% (Percentage)
- Workshops	112	31.7
- Online courses	84	23.8
- Hands-on training	98	27.8
- Case studies	59	16.7

* Multiple responses recorded

One of the civil servants argued that-

The Bangladesh government has not prioritized establishing a training mechanism for AI integration in public service delivery. However, there is limited training on AI in the civil service. As a result, civil servants lack the opportunity to familiarize themselves with AI and engage in AI-related tasks in their work. Therefore, the government should incorporate AI-based curricula into the training programs for civil servants.

4.3 Perceived usefulness (PU) of artificial intelligence in public service delivery

Perceived usefulness refers to the extent to which civil servants believe that using a specific system or tool can help improve their performance in achieving goals. In PU 1, civil servants strongly agreed (50.0%) that AI can enhance the efficiency of public service delivery, with varying opinions: agree (37.0%), neutral (11.0%), disagree (1.0%), and strongly disagree (1.0%). In PU 2, 42.5% of civil servants strongly agreed that AI can improve the quality of services provided to citizens, while others held different views: agree (43.0%), neutral (10.5%), disagree (3.0%), and strongly disagree (1.0%). In PU 3, 38.0% strongly agreed that AI can reduce administrative

burdens, with other opinions being: agree (43.50%), neutral (12.5%), disagree (3.0%), and strongly disagree (3.0%). In PU 4, 26.0% of civil servants strongly agreed that AI can help improve decision-making in public service, alongside others who agreed (44.0%), remained neutral (22.0%), disagreed (7.0%), or strongly disagreed (1.0%). In PU 5, 24.0% strongly agreed that AI can boost citizens' satisfaction with public services, with opinions: agree (45.5%), neutral (22.0%), disagree (5.5%), and strongly disagree (3.0%). The overall analysis of perceived usefulness (PU) shows that more than two-thirds of participants support the application of AI in public service (See Table 4.10).

Table 4.10: Perceived Usefulness (PU) of the civil servants regarding the application of AI in public service

Component	Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree
PU 1- The application of AI can improve the efficiency of public service delivery	100 (50.0)	74 (37.0)	22 (11.0)	2 (1.0)	2 (1.0)
PU 2- AI can enhance the quality of services provided to citizens	85 (42.5)	86 (43.0)	21 (10.5)	6 (3.0)	2 (1.0)
PU 3- AI can reduce the administrative burden in the working environment	76 (38.0)	87 (43.50)	25 (12.5)	6 (3.0)	6 (3.0)
PU 4- AI can assist in improving decision-making in public service delivery	52 (26.0)	88 (44.0)	44 (22.0)	14 (7.0)	2 (1.0)
PU 5- AI can improve the satisfaction level of the citizens in public service	48 (24.0)	91 (45.5)	44 (22.0)	11 (5.5)	6 (3.0)
Total	36.1	42.6	15.6	3.9	1.8

Table 4.11 presents the factors associated with the perceived usefulness of AI in the civil service, as determined by the chi-square test. In most cases, $p\text{-value} > 0.05$ indicates that age, education, gender, and training do not have an association with perceived usefulness of AI in civil service. However, a very significant association was found between the ministry/office and the perceived usefulness, with the ministry/office contributing to improved efficiency in public service delivery ($p\text{-value} = .007$) and higher citizen satisfaction with public service ($p\text{-value} = .005$). Civil servants' familiarity with AI has significant implications for improving the efficiency of public service delivery ($p\text{-value} = .016$) and reducing the administrative burden in the workplace ($p\text{-value} = .013$).

Table 4.11: Factors associated with the perceived usefulness (PU) of AI in civil service (chi-square test)

	Age	Education	Gender	Ministry	Familiarity with AI	Training
PU 1- The application of AI can improve the efficiency of public service delivery	.943	.960	.289	.007**	.016*	.883
PU 2- AI can enhance the quality of services provided to citizens	.997	.890	.377	.427	.633	.758
PU 3- AI can reduce the administrative burden in the working environment	.875	.890	.122	.586	.013*	.622
PU 4- AI can assist in improving decision-making in public service delivery	.931	.684	.465	.244	.563	.945
PU 5- AI can improve the satisfaction level of the citizens in public service	.892	.869	.057	.005**	.734	.606

* Significant ** Very Significant

Table 4.12 displays the Spearman Rank Correlation of perceived usefulness of AI in public service with age, education, familiarity, and training effectiveness. The results do not show a correlation between the perceived usefulness of AI in public service and age, education, or familiarity with AI among civil servants. It also indicates that the only training effectiveness has a strong positive correlation with the application of AI for improving the efficiency of public service delivery ($r=.866$), enhancing the quality of services provided to citizens ($r=.866$), reducing the administrative burden in the work environment ($r=.866$), improving citizen satisfaction with public services ($r=.866$), and a moderate positive correlation with AI assisting in improving decision-making in public service delivery ($r=.645$).

Table 4.12: Spearman Rank Correlation of perceived usefulness (PU) of AI in public service with age, education, familiarity, and training effectiveness

Component	Age (r-value)	Education (r-value)	Familiarity with AI (r-value)	Training Effectiveness (r-value)
PU 1- The application of AI can improve the efficiency of public service delivery	.163	-.027	.159	.866**
PU 2- AI can enhance the quality of services provided to citizens	.106	.014	.145	.866**
PU 3- AI can reduce the administrative burden in the working environment	.135	-.023	.119	.866**
PU 4- AI can assist in improving decision-making in public service delivery	.073	-0.22	.105	.645*
PU 5- AI can improve the satisfaction level of the citizens in public service	.174	.082	.007	.866**

* Moderate positive correlation and ** High positive correlation

4.4 Perceived Ease of Use (PEOU) of Artificial Intelligence in Public Service Delivery

Perceived ease of use refers to how much civil servants believe that using a specific system or tool will require little effort to achieve their goals. In PEOU 1, civil servants strongly agreed (18.0%) that it would be easier for their department, office, or ministry to integrate AI into existing public service processes, along with varying opinions: agree (45.5%), neutral (20.0%), disagree (10.5%), and strongly disagree (6.0%). In PEOU 2, civil servants strongly agreed (11.5%) that they can easily understand the AI system in public service without specialized knowledge, alongside differing opinions: agree (27.5%), neutral (23.0%), disagree (29.5%), and strongly disagree (8.5%). In PEOU 3, they strongly agreed (16.0%) that it would be easy for their office to adapt to AI tools, with other opinions: agree (27.5%), neutral (23.0%), disagree (25.5%), and strongly disagree (8.0%). In PEOU 4, civil servants strongly agreed (16.5%) that it is convenient for their office or department to customize AI tools to meet specific public service needs, with other views: agree (34.0%), neutral (27.0%), disagree (16.5%), and strongly disagree (6.0%). In PEOU 5, civil servants strongly agreed (19.0%) that AI systems can be easily integrated with other existing digital tools or platforms within the government, along with differing opinions: agree (44.0%), neutral (23.5%), disagree (7.5%), and strongly disagree (6.0%). The overall analysis of perceived ease of use (PEOU) shows that more than half of the participants agree with using AI in public service, while the others have mixed opinions (see Table 4.13). This component indicates a range of views among civil servants, raising questions about whether using a particular AI system or tool will truly save labor in achieving their goals.

Table 4.13: Perceived ease of use (PEOU) of the civil servants regarding the application of AI in public service

Component	Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree
PEOU 1- It would be easier for my department/office/ministry to integrate AI into the existing public service process	36 (18.0)	91 (45.5)	40 (20.0)	21 (10.5)	12 (6.0)
PEOU 2- Civil servants can easily understand the AI system in public service without specialized knowledge	23 (11.5)	55 (27.5)	46 (23.0)	59 (29.5)	17 (8.5)
PEOU 3- It would be easy for my office to adapt to AI tools	32 (16.0)	55 (27.5)	46 (23.0)	51 (25.5)	16 (8.0)
PEOU 4- It is convenient for my office/department to customize AI tools to fit the specific needs of public service delivery	33 (16.5)	68 (34.0)	54 (27.0)	33 (16.5)	12 (6.0)
PEOU 5- AI systems can be easily integrated with other existing digital tools or platforms within the government	38 (19.0)	88 (44.0)	47 (23.5)	15 (7.5)	12 (6.0)
Total	16.2	35.7	23.3	17.9	6.9

Table 4.14 shows the factors related to the perceived ease of use of AI in the civil service, based on the chi-square test. In most cases, a p-value greater than 0.05 means that age, education, gender, and training do not have a significant connection with the perceived ease of use of AI in the civil service. However, a very significant association was found, indicating that the ministry or office

can greatly contribute to the perceived usefulness of easing the department or office's integration of AI into the existing public service process (p-value = 0.000) and the adoption of AI tools for offices (p-value = 0.002). The p-value of .018 suggests that the ministry or office may find it convenient to customize AI tools to meet the specific needs of public service delivery. Civil servants' familiarity with AI is highly significant for helping the office adapt to AI tools (p-value = .004), customize AI tools for specific public service needs (p-value = .003), and integrate AI systems with other existing digital tools or platforms within the government (p-value = .003).

Table 4.14: Factors associated with the perceived ease of use (PEOU) of AI in civil service (chi-square test)

Component	Age	Education	Gender	Ministry	Familiarity with AI	Training
PEOU 1- It would be easier for my department/office/ministry to integrate AI into the existing public service process	.434	.577	.330	.000**	.115	.756
PEOU 2- Civil servants can easily understand the AI system in public service without specialized knowledge	.219	.611	.162	.068	.149	.281
PEOU 3- It would be easy for my office to adapt to AI tools	.233	.591	.530	.002**	.004**	.354
PEOU 4- It is convenient for my office/department to customize AI tools to fit the specific needs of public service delivery	.176	.817	.930	.018*	.003**	.467
PEOU 5- AI systems can be easily integrated with other existing digital tools or platforms within the government	.948	.972	.940	.225	.003**	.451

* Significant ** Very Significant

Table 4.15 presents the Spearman Rank Correlation of perceived ease of use of AI in public service with age, education, familiarity, and training effectiveness. The results show no correlation between the perceived usefulness of AI in public service and age, education, or familiarity with AI among civil servants. It also indicates that training effectiveness is highly positively correlated with civil servants' ease of understanding AI systems in public service without specialized knowledge ($r=.800$), integrating AI systems with other existing digital tools or platforms within the government ($r=.866$), and has a moderate positive correlation with offices' ease of adapting to AI tools ($r=.645$) as well as the convenience of customizing AI tools to fit the specific needs of public service delivery ($r=.645$).

Table 4.15: Spearman Rank Correlation of perceived ease of use (PEOU) of AI in public service with age, education, familiarity, and training effectiveness

Component	Age (r-value)	Education (r-value)	Familiarity with AI (r-value)	Training Effectiveness (r-value)
PEOU 1- It would be easier for my department/office/ministry to integrate AI into the existing public service process	.168	.094	-.007	.000
PEOU 2- Civil servants can easily understand the AI system in public service without specialized knowledge	.086	.068	.020	.800**
PEOU 3- It would be easy for my office to adapt to AI tools	.149	.017	-.019	.645*
PEOU 4- It is convenient for my office/department to customize AI tools to fit the specific needs of public service delivery	.206	.053	.104	.645*
PEOU 5- AI systems can be easily integrated with other existing digital tools or platforms within the government	.116	.049	.151	.866**

* Moderate positive correlation and ** High positive correlation

4.5 Attitude Toward Use (ATU) of Artificial Intelligence in Public Service Delivery

Attitude toward use (ATU) reflects the overall positive and negative feelings of civil servants regarding artificial intelligence (AI) in public service. In ATU 1, a majority of civil servants (40.0%) strongly agreed that they have a positive attitude towards AI's role in enhancing public service delivery, with additional responses: agree (49.5%), neutral (8.5%), disagree (1.5%), and strongly disagree (0.5%). In ATU 2, 34.5% strongly agreed that AI can significantly improve the quality of services provided by the government, with other opinions: agree (47.5%), neutral (13.0%), disagree (5.0%), and strongly disagree (0.0%). In ATU 3, 22.0% strongly agreed that they trust AI technologies to make fair and unbiased decisions in public service, while others expressed agreement (35.0%), neutrality (30.5%), disagreement (11.5%), and strong disagreement (1.0%). In ATU 4, 27.5% strongly agreed that they feel optimistic about the long-term impact of AI on public service, with additional opinions: agree (49.0%), neutral (17.0%), disagree (6.0%), and strongly disagree (0.5%). In ATU 5, 30.5% strongly agreed that AI will make public services more accessible and user-friendly for citizens, along with responses: agree (49.5%), neutral (15.0%), disagree (3.0%), and strongly disagree (2.0%). Overall, the analysis of ATU shows that over 70% of participants agree on the use of AI in public service (see Table 5.16). This indicates that civil servants generally hold positive views about artificial intelligence (AI) in the public sector.

Table 4.16: Attitude toward the use (ATU) of civil servants regarding the application of AI in public service

Component	Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree
ATU 1- I feel positive about the use of AI in improving public service delivery	80 (40.0)	99 (49.5)	17 (8.5)	3 (1.5)	1 (0.5)
ATU 2- AI can significantly enhance the quality of services provided by the government	69 (34.5)	95 (47.5)	26 (13.0)	10 (5.0)	0 (0.0)
ATU 3- I trust AI technologies in making fair and unbiased decisions in public service delivery	44 (22.0)	70 (35.0)	61 (30.5)	23 (11.5)	2 (1.0)
ATU 4- I have an optimistic feeling about the long-term impact of AI on public service delivery	55 (27.5)	98 (49.0)	34 (17.0)	12 (6.0)	1 (0.5)
ATU 5- I think that AI will make public services more accessible and user-friendly for citizens	61 (30.5)	99 (49.5)	30 (15.0)	6 (3.0)	4 (2.0)
Total	30.9	46.1	16.8	5.4	0.8

Table 4.17 shows the factors linked to attitudes toward AI use in the civil service, based on the chi-square test. In most cases, a p-value above 0.05 indicates that age, education, gender, familiarity with AI, and training do not significantly influence attitudes toward AI in the civil service. However, a strong association was found indicating that the ministry or office can play a significant role in making public services more accessible and user-friendly for citizens (p-value = .012).

Table 4.17: Factors associated with the attitude toward the use (ATU) of AI in civil service (chi-square test)

Component			Age	Education	Gender	Ministry	Familiarity with AI	Training
ATU 1-	I feel positive about the use of AI in improving public service delivery		.764	.506	.203	.593	.154	.722
ATU 2-	AI can significantly enhance the quality of services provided by the government		.631	.950	.580	.128	.510	.670
ATU 3-	I trust AI technologies in making fair and unbiased decisions in public service delivery		.497	.336	.282	.666	.679	.750
ATU 4-	I have an optimistic feeling about the long-term impact of AI on public service delivery		.814	.623	.037	.900	.923	.750
ATU 5-	I think that AI will make public services more accessible and user-friendly for citizens		.779	.729	.500	.012*	.305	.549

* Significant

Table 4.18 presents the Spearman Rank Correlation of attitude toward the use (ATU) of AI in public service with age, education, familiarity, and training effectiveness. The results show a very low correlation between attitudes toward AI use in public service and age, education, and familiarity with AI among civil servants. It also indicates that only training effectiveness has a

strong positive correlation with civil servants' positive feelings about using AI to improve public service delivery ($r=.866$) and a moderate positive correlation with AI's role in enhancing the quality of services provided by the government ($r=.408$), making fair and unbiased decisions in public service delivery ($r=.323$), fostering an optimistic outlook on AI's long-term impact on public service ($r=.433$), and increasing the accessibility and user-friendliness of public services for citizens ($r=.548$).

Table 4.18: Spearman Rank Correlation of attitude toward the use (ATU) of AI in public service with age, education, familiarity, and training effectiveness

Component	Age (r-value)	Education (r-value)	Familiarity with AI (r-value)	Training Effectiveness (r-value)
ATU 1- I feel positive about the use of AI in improving public service delivery	.149	-.159	.163	.866**
ATU 2- AI can significantly enhance the quality of services provided by the government	.146	-.101	.147	.408*
ATU 3- I trust AI technologies in making fair and unbiased decisions in public service delivery	.176	.027	.036	.323*
ATU 4- I have an optimistic feeling about the long-term impact of AI on public service delivery	.116	-.041	.212	.433*
ATU 5- I think that AI will make public services more accessible and user-friendly for citizens	.119	-.126	.158	.548*

* Moderate positive correlation and ** High positive correlation

4.6 Behavioral Intention to Use (BIU) of Artificial Intelligence in Public Service Delivery

Behavioral intention to use (BIU) refers to the overall intention or willingness to utilize a system or technology, specifically among civil servants, regarding the application of artificial intelligence (AI) in public service. In BIU 1, civil servants strongly agreed (22.0%) that they intend to use AI technologies to improve public service delivery in their department/office, along with different opinions: agree (60.5%), neutral (12.5%), disagree (5.0%), and strongly disagree (0.0%). In BIU 2, civil servants strongly agreed (25.5%) that AI tools will become a regular tool in their work for improving public service delivery in the future, along with different opinions of agree (53.5%), neutral (15.0%), disagreed (4.0%), and strongly disagreed (2.0%). In BIU 3, civil servants strongly agreed (20.5%) that they are willing to use AI to analyze data for making policy decisions or resource allocations, along with different opinions of agree (56.0%), neutral (17.0%), disagree (5.5%), and strongly disagree (1.0%). In BIU 4, civil servants strongly agreed (26.5%) that they would recommend using AI tools to other colleagues in their respective department/office, along with different opinions of agree (54.0%), neutral (16.0%), disagreed (3.0%), and strongly disagreed (0.5%). In BIU 5, civil servants strongly agreed (26.0%) that they are willing to continuously engage with AI technologies in public service, along with different opinions: agree (52.0%), neutral (15.5%), disagree (3.5%), and strongly disagree (3.0%). The overall analysis of the behavioral intention to use (BIU) revealed that nearly 80% of the participants agreed with the application of AI in public service (See Table 5.19). This component suggests that civil servants generally have a positive intention or willingness to utilize systems or technologies related to the application of artificial intelligence (AI) in public service.

Table 4.19: Behavioral intention to use (BIU) of civil servants regarding the application of AI in public service

Component	Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree
BIU 1- I intend to use AI technologies to improve public service delivery in my department/office	44 (22.0)	121 (60.5)	25 (12.5)	10 (5.0)	0 (0.0)
BIU 2- I think AI tools will become a regular tool in my work for improving public service delivery in the future	51 (25.5)	107 (53.5)	30 (15.0)	8 (4.0)	4 (2.0)
BIU 3- I will use AI to analyze data for making policy decisions or resource allocations	41 (20.5)	112 (56.0)	34 (17.0)	11 (5.5)	2 (1.0)
BIU 4- I would recommend using AI tools to other colleagues in their respective department/office	53 (26.5)	108 (54.0)	32 (16.0)	6 (3.0)	1 (0.5)
BIU 5- I am willing to engage with AI technologies in public service continuously	52 (26.0)	104 (52.0)	31 (15.5)	7 (3.5)	6 (3.0)
Total	24.1	55.2	15.2	4.2	1.3

Table 4.20 presents the factors associated with behavioral intention to use (BIU) of AI in the civil service, based on the chi-square test. In most cases, a p-value greater than 0.05 indicates that age, education, gender, ministry/office, and training do not have a significant association with the behavioral intention to use of AI in the civil service. However, a very significant association was found that the civil servants' familiarity with AI influences their intention to use AI technologies to improve public service delivery in my department/office (p-value = .001) and to make AI a regular tool in work for improving public service delivery in the future (p-value = .002).

Table 4.20: Factors associated with the behavioral intention to use (BIU) of AI in civil service (chi-square test)

	Age	Education	Gender	Ministry	Familiarity with AI	Training
BIU 1- I intend to use AI technologies to improve public service delivery in my department/office	.989	.115	.089	.723	.001**	.638
BIU 2- I think AI tools will become a regular tool in my work for improving public service delivery in the future	.958	.868	.090	.540	.002**	.800
BIU 3- I will use AI to analyze data for making policy decisions or resource allocations	.950	.510	.196	.777	.757	.722
BIU 4- I would recommend using AI tools to other colleagues in their respective department/office	.886	.283	.282	.065	.384	.827
BIU 5- I am willing to engage with AI technologies in public service continuously	.805	.788	.115	.065	.109	.783

** Very Significant

Table 4.18 shows the Spearman Rank Correlation of behavioral intention (BIU) of AI in public service with age, education, familiarity, and training effectiveness. The results revealed a very low correlation between the attitude toward the use of AI in public service and age, education, and familiarity with AI among civil servants. It also shows that the only training effectiveness has a moderate positive correlation with civil servants' intention toward the use of AI technologies to improve public service delivery in my department/office ($r=.548$), using the AI tool regularly in work for improving public service delivery in the future ($r=.433$), using the AI tool to analyze data for making policy decisions or resource allocations ($r=.433$), recommending to use AI tools to other colleagues in their respective department/office ($r=.433$), and willing to engage with AI technologies in public service continuously ($r=.433$).

Table 4.21: Spearman Rank Correlation of behavioral intention (BIU) to use of AI in public service with age, education, familiarity, and training effectiveness

Component	Age (r-value)	Education (r-value) (r-value)	Familiarity with AI (r-value)	Training Effectiveness (r-value)
BIU 1- I intend to use AI technologies to improve public service delivery in my department/office	.094	.138	.106	.548*
BIU 2- I think AI tools will become a regular tool in my work for improving public service delivery in the future	.093	.029	.147	.433*
BIU 3- I will use AI to analyze data for making policy decisions or resource allocations	.145	.091	.115	.433*
BIU 4- I would recommend using AI tools to other colleagues in their respective department/office	.159	.092	.204	.433*
BIU 5- I am willing to engage with AI technologies in public service continuously	.094	.036	.223	.433*

* Moderate positive correlation

4.7 Correlation between the PU, PEOU, ATU, and BIU

The Technology Acceptance Model (TAM) has four key components: perceived usefulness (PU), perceived ease of use (PEOU), Attitude toward use (ATU), and Behavioral intention to use (BIU). Table 4.22 shows Pearson's correlation between the components of the Technology Acceptance Model (TAM). The perceived usefulness (PU) has a moderate correlation ($r = .448$) with perceived ease of use (PEOU) and a high positive correlation with attitude toward use (ATU) ($r = .750$), as well as with behavioral intention to use (BIU) ($r = .708$). This means that perceived usefulness (PU) can contribute to the belief among civil servants that AI tools will require minimal effort to achieve their goals in official work, promote positive feelings, and overall intention or willingness to utilize a system or technology related to artificial intelligence (AI) in public service. The perceived ease of use (PEOU) exhibits a moderate correlation with attitude toward use (ATU) ($r = .555$) and behavioral intention to use (BIU) ($r = .554$). Therefore, the improved perceived ease of use can moderately contribute to creating positive feelings and intentions regarding the application of artificial intelligence (AI) in public service. The attitude toward use (ATU) has a high correlation ($r = .794$) with the behavioral intention to use (BIU), as the more positive the attitude, the more positive the intention and willingness among civil servants regarding the use of artificial intelligence (AI) in public service.

Table 4.22: Pearson's correlation between Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Use (ATU), and Behavioral Intention to Use (BIU)

Component			Perceived Usefulness (PU)	Perceived Ease of Use (PEOU)	Attitude Toward Use (ATU)	Behavioral Intention to Use (BIU)
-	Perceived (PU)	Usefulness	***	.448	.750	.708
-	Perceived (PEOU)	Ease of Use	.448	***	.555	.554
-	Attitude (ATU)	Toward Use	.750	.555	***	.794
-	Behavioral Use (BIU)	Intention to	.708	.554	.794	***

*Grouping Likert Scale items of PU, PEOU, ATU, and BIU

4.8 Association of PU, PEOU, ATU, and BIU with other components

Table 4.23 presents the relationships between PU, PEOU, ATU, and BIU and age, gender, education, ministry/office, familiarity, and training, as determined by the Kruskal-Wallis H test and the Mann-Whitney U-test. Perceived usefulness (PU) has no association with age, gender, ministry/office, familiarity, or training, as indicated by a p-value greater than 0.05. Only gender (p-value = 0.29) is a significant factor in relation to perceived usefulness (PU) regarding the application of artificial intelligence (AI) in public service. Perceived ease of use (PEOU) has no association with age, gender, education, ministry/office, familiarity, or training, as indicated by a p-value greater than 0.05. Civil servants' familiarity (p = .022) with AI tools has a significant relationship with promoting positive feelings toward artificial intelligence (AI) in public service. It also has a very substantial relationship (p = .009) with enhancing the overall intention or willingness of the civil servants about artificial intelligence (AI) in public service.

Table 4.23: Relationship of PU, PEOU, ATU, and BIU with age, education, gender, ministry/office, familiarity, and training

Component	Kruskal-Wallis H-test				Mann-Whitney U-test	
	Age	Education	Ministry/ Office	Familiarity With AI tools	Gender	Training
Perceived Usefulness (PU)	.348	.738	.111	.239	.029*	.142
Perceived Ease of Use (PEOU)	.082	.304	.126	.113	.214	.076
Attitude Toward Use (ATU)	.120	.270	.313	.022*	.309	.146
Behavioral Intention to Use (BIU)	.487	.175	.152	.009**	.041*	.234

* Significant ** Very Significant

4.9 Factor Analysis of the Components of the Technology Acceptance Model (TAM)

The study comprised 25 components, consisting of four elements of the TAM model, each with five corresponding statements to measure the civil servants' perception of the application of AI in public service using Principal Component Analysis with Varimax Rotation. The value of the **Kaiser-Meyer Olkin measure of adequacy** is .927, which is above the recommended value of .60, and **Bartlett's test of Sphericity** was significant ($\chi^2=190$) as the p-value is determined ($.000<0.05$).

Table 4.24: Total Variance explained using Principal Component Analysis (PCA) of PU, PEOU, ATU, and BIU

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)
1.	10.352	51.760	51.760	10.352	51.760	51.760	5.575	27.877	27.877
2.	2.116	10.579	62.339	2.116	10.579	62.339	4.293	21.467	49.344
3.	1.090	5.449	67.788	1.090	5.449	67.788	3.689	18.444	67.788
4.	.860	4.301	72.089	---	---	---	---	---	---
5.	.731	3.657	75.746	---	---	---	---	---	---
6.	.623	3.116	78.862	---	---	---	---	---	---
7.	.584	2.922	81.785	---	---	---	---	---	---
8.	.528	2.640	84.425	---	---	---	---	---	---
9.	.463	2.317	86.741	---	---	---	---	---	---
10.	.456	2.281	89.022	---	---	---	---	---	---
11.	.330	1.650	90.672	---	---	---	---	---	---
12.	.322	1.611	92.282	---	---	---	---	---	---
13.	.277	1.383	93.666	---	---	---	---	---	---
14.	.251	1.254	94.920	---	---	---	---	---	---
15.	.231	1.156	96.075	---	---	---	---	---	---
16.	.203	1.016	97.092	---	---	---	---	---	---
17.	.186	.930	98.022	---	---	---	---	---	---
18.	.158	.789	98.811	---	---	---	---	---	---
19.	.146	.730	99.541	---	---	---	---	---	---
20.	.092	.459	100.000	---	---	---	---	---	---

Table 4.25: Rotated Component Matrix analysis of PU, PEOU, ATU, and BIU

Component	Behavioral Intention and Attitude Toward Use	Perceived Usefulness (PU)	Perceived Ease of Use (PEOU)
BIU 4- I would recommend using AI tools to other colleagues in their respective department office	.776	.344	.165
BIU 5- I am willing to engage with AI technologies in public service continuously	.772	.342	.224
BIU 2- I think AI tools will become a regular tool in my work for improving public service delivery in the future	.756	.247	.291
BIU 3- I will use AI to analyze data for making policy decisions or resource allocations	.722	.220	.198
BIU 1- I intend to use AI technologies to improve public service delivery in my department/office	.709	.218	.306
ATU 5- I think that AI will make public services more accessible and user-friendly for citizens	.699	.363	.228
ATU 4- I have an optimistic feeling about the long-term impact of AI on public service delivery	.662	.443	.185
ATU 2- AI can significantly enhance the quality of services provided by the government	.657	.481	.260
ATU 1- I feel positive about the use of AI in improving public service delivery	.587	.443	.175
ATU 3- I trust AI technologies in making fair and unbiased decisions in public service delivery	.441	.217	.385
PU 1- The application of AI can improve the efficiency of public service delivery	.283	.846	.076
PU 2- AI can enhance the quality of services provided to citizens	.385	.844	.084
PU 3- AI can reduce the administrative burden in the working environment	.339	.799	.150
PU 5- AI can improve the satisfaction level of the citizens in public service	.364	.711	.289
PU 4- AI can assist in improving decision-making in public service delivery	.385	.588	.234
PEOU 3- It would be easy for my office to adapt to AI tools	.214	.033	.843
PEOU 4- It is convenient for my office/department to customize AI tools to fit the specific needs of public service delivery	.335	.127	.787
PEOU 2- Civil servants can easily understand the AI system in public service without specialized knowledge	.141	.029	.736
PEOU 1- It would be easier for my department/office/ministry to integrate AI into the existing public service process	.112	.347	.735
PEOU 5- AI systems can be easily integrated with other existing digital tools or platforms within the government	.262	.207	.690

Table 4.24 shows that the analysis is fit for three factors explaining a total of 67.788% of the variance in the data. Table 5.25 shows the rotated component matrix analysis of PU, PEOU, ATU, and BIU.

Factor one is labeled as behavioral intention to use (BIU) and attitude toward use (ATU) because of high loadings in BIU 4, BIU 5, BIU 2, BIU 3, BIU 1, ATU 5, ATU 4, ATU 2, ATU 1, and ATU 3. Both behavioral intention to use (BIU) and attitude toward use (ATU) account for 51.760% of the variance after rotation in attitudes and behaviors related to applying AI in the civil service. Factor two is named perceived usefulness (PU) due to high loadings in PU1, PU2, PU3, PU5, and PU4. When perceived usefulness (PU) is considered, 62.339% of the variance after rotation explains the increase in civil servants' belief that using a specific system or tool can help improve performance through applying AI in public service. Factor three is named perceived ease of use (PEOU) because of high loadings in PEOU 3, PEOU 4, PEOU 2, PEOU 1, and PEOU 5. Altogether, these three factors explain a combined 67.788% of the variance, showing that a well-structured factor model for AI application is presented after rotation.

4.10 Regression analysis of the components of the TAM model with other variables

In the 'Gender' component, OR=1.921 indicates that male civil servants are perceived to have a 92.1% higher usefulness (PU) of AI in public service compared to female civil servants, when other variables are held constant. OR=1.434 indicates that male civil servants will have a 43.4% higher perceived ease of use (PEOU) of AI in public service than female civil servants when other variables are held constant. OR=1.354 indicates that male civil servants will have a 35.4% higher attitude toward use (ATU) of AI in public service than female civil servants when other variables are held constant. OR=1.781 indicates that male civil servants will have a 78.1% higher behavioral intention to use (BIU) of AI in public service than female civil servants when other variables are held constant.

In the 'application of AI tools in office' component, OR=1.458 indicates that those who have used AI tools in their respective office/department will have 45.8% higher odds in perceived usefulness (PU) regarding AI in public service than those who have not. OR=1.967 indicates that those who have used AI tools in their respective office/department will have 96.7% higher odds in perceived ease of use (PEOU) regarding AI in public service than those who have not. OR=1.220 indicates

that those who have used AI tools in their respective office department will have 22.0% higher odds of a positive attitude toward the use (ATU) of AI in public service than those who have not.

In the 'training received by the civil servants' component, OR=2.647 indicates that those who received training on AI tools will have 164.7% higher odds in perceived usefulness (PU) regarding AI in public service than those who have not. OR=3.667 indicates that individuals who received training on AI tools have 3.667 times higher odds of perceiving ease of use (PEOU) regarding AI in public service than those who have not. OR=2.375 indicates that individuals who received training on AI tools have 137.5% higher odds of a positive attitude toward using AI (ATU) in public service than those who have not. OR=6.616 indicates that individuals who received training on AI tools have 6.616 times higher odds of having a higher behavioral intention to use (BIU) regarding AI in public service than those who have not.

Table 4.26 Ordinal Logistic Regression (OLR) Analysis of PU, PEOU, ATU, and BIU with gender, application of AI tools in the office, and training received by civil servants

Component	Odds Ratio (OR) or Exp(B)			
	Perceived Usefulness (PU)	Perceived Ease of Use (PEOU)	Attitude Toward Use (ATU)	Behavioral Intention to Use (BIU)
1. Gender				
- Male	1.921	1.434	1.354	1.781
- Female	---	---	---	---
2. Application of AI tools in the office/department				
- Yes	1.458	1.967	1.220	1.139
- No	---	---	---	---
3. Training received by the civil servants				
- Yes	2.647	3.667	2.375	6.616
- No	---	---	---	---

4.11 Potentials of AI Application in Public Service Delivery

Table 4.27 shows the potential of AI tools or applications in public service delivery. Participants reported the potential of AI in personalized government services, indicating very high (19.0%), high (43.5%), medium (36.4%), low (6.0%), and very low (2.0%). They also reported the potential of AI in fully automating public service processes, indicating very high (21.0%), high (34.5%), medium (31.5%), low (11.0%), and very low (2.0%) levels. Predictive governance is identified as having high potential in 15.5% of the participants, including high (35.5%), medium (33.5%), low (11.0%), and very low (2.0%) potential. Public safety and security are considered high potential in 15.5% of the participants, including high (28.0%), medium (33.0%), low (18.0%), and very low (23.5%). Participants reported the potential of AI in ensuring enhanced citizen participation, indicating very high (16.5%), high (42.0%), medium (31.0%), low (9.0%), and very low (1.5%) levels. They reported the potential of AI in cost reduction and resource optimization, indicating very high (28.5%), high (39.5%), medium (22.5%), low (7.0%), and very low (2.5%). They also reported the potential of AI in enhancing transparency and accountability, indicating very high (25.0%), high (42.0%), medium (23.0%), low (8.0%), and very low (2.0%). Lastly, the participants considered Personalized Citizen Services to be very high (18.5%), high (39.5%), medium (31.5%), low (8.0%), and very low (2.5%).

Table 4.27: Civil servants' perception on the potential of AI in public service delivery

		Very High n (%)	High n (%)	Medium n (%)	Low n (%)	Very Low n (%)
-	Personalized Government Services	38 (19.0)	87 (43.5)	59 (29.5)	12 (6.0)	4 (2.0)
-	Full Automation of Public Service Processes	42 (21.0)	69 (34.5)	63 (31.5)	22 (11.0)	4 (2.0)
-	Predictive Governance	31 (15.5)	71 (35.5)	67 (33.5)	28 (14.0)	3 (1.5)
-	Public Safety and Security	31 (15.5)	56 (28.0)	70 (35.0)	36 (18.0)	7 (3.5)
-	Enhanced Citizen Participation	33 (16.5)	84 (42.0)	62 (31.0)	18 (9.0)	3 (1.5)

- Cost Reduction and Resource Optimization	57 (28.5)	79 (39.5)	45 (22.5)	14 (7.0)	5 (2.5)
- Enhancing Transparency and Accountability	50 (25.0)	84 (42.0)	46 (23.0)	16 (8.0)	4 (2.0)
- Personalized Citizen Services	37 (18.5)	79 (39.5)	63 (31.5)	16 (8.0)	5 (2.5)

One of the Civil Servants commended during the interview-

Civil servants in our country are a competent and educated segment of the population who have undergone a competitive selection process. Being skilled and proficient in AI, they can significantly contribute to the office work and service delivery process if the government integrates AI into the service delivery process. The utilization of public services must ensure a more transparent and accountable service. The automation of services should reduce service-related hassles, leading to increased recipient satisfaction.

4.12 Challenges of AI Application in Public Service Delivery

Table 4.28 shows that civil servants perceived very high challenges in security and safety concerns (36.5%) and a lack of policy guidelines (30.5%). They identified high-level challenges related to the application of AI in public service, specifically in areas of ethical concerns (31.0%), regulatory and legal complexities (38.5%), and a lack of citizen orientation (32.5%). They also identified a medium level of challenges related to bias and fairness issues (35.0%), willingness of the government officials (35.5%), security and safety concerns (20.5%), ethical concerns (24.5%), lack of policy guidelines (27.0%), and a lack of citizen orientation (31.5%).

Table 4.28: Civil servants' perception on challenges of AI in public service delivery

Nature of challenges	Very High n (%)	High n (%)	Medium n (%)	Low n (%)	Very Low n (%)
Security and Safety Concerns	73 (36.5)	62 (31.0)	41 (20.5)	16 (8.0)	8 (4.0)
Bias and Fairness issues	40 (20.0)	50 (25.0)	70 (35.0)	27 (13.5)	13 (6.5)
Ethical Concerns	48 (24.0)	62 (31.0)	49 (24.5)	37 (18.5)	4 (2.0)

Regulatory and Legal complexities	41 (20.5)	77 (38.5)	56 (28.0)	23 (11.5)	3 (1.5)
Lack of policy guidelines	61 (30.5)	59 (29.5)	54 (27.0)	23 (11.5)	3 (1.5)
Lack of Citizens' orientation	48 (24.0)	65 (32.5)	63 (31.5)	18 (9.0)	6 (3.0)
Willingness of the government officials	38 (19.0)	49 (24.5)	71 (35.5)	33 (16.5)	9 (4.5)

During the interview, one official urged that..

Currently, integrating artificial intelligence into civil services is not easy because it is hard to get oriented. Incorporating artificial intelligence into public services requires strong security and safety measures. The Government of Bangladesh has just developed an AI policy, but the ethical framework remains uncertain. One major concern about adding AI to public services is whether citizens' data can be properly protected.

Along with, one official added that,

The main challenges are the government's willingness, the legal framework, and citizens' attitudes toward AI in public service. Although many developing countries have launched various initiatives, the Bangladesh government has not made significant progress in this area. Global studies show that AI will replace human desk jobs in the future. In that case, our lack of government preparation could cause us to fall behind in the competitive landscape. It's not enough to just integrate AI without establishing ethical and safety laws for both service providers and recipients. Finally, the government needs to rethink citizens' knowledge and capabilities regarding how they can be included in AI-based public services.

Chapter Five: Conclusion & Recommendation

5.1 Conclusion

In conclusion, this study shows a cautious optimism among the Bangladesh Civil Service regarding Artificial Intelligence (AI). Civil servants, especially younger ones, are aware of AI tools like ChatGPT and understand how they could change the way public services are delivered. They believe AI can help address long-term issues such as file delays, enhance services for citizens, and simplify their daily work. They generally have a positive outlook, and it's clear they are eager to adopt AI into their work.

However, a significant implementation gap hinders this willingness. The truth is that AI is rarely used in most ministries, including the Ministry of Public Administration and the Ministry of Health. The operational level has not yet been impacted by the "National Strategy for Artificial Intelligence." The nearly complete lack of structured AI training is a significant obstacle; officials are left to fend for themselves and rely on social media for information. Additionally, opinions differ; male officers in more technical roles show greater confidence, indicating that an inclusive strategy is necessary.

Although they are aware of the risks, civil servants believe AI can help Bangladesh advance toward its "Smart Bangladesh 2041" vision through cost savings, transparency, and predictive governance. Their primary concerns are institutional rather than technical: the Ministry of Public Administration's vague policy guidelines, worries about data security involving private citizen information, and the ethical challenges of automated decision-making. Consequently, the civil service is at a crossroads, with a workforce ready for change but waiting for clear guidance and stable government foundations.

5.2 Recommendation

The following comprehensive suggestions are put forth to successfully close the gap between AI enthusiasm and real-world implementation within the Bangladesh Civil Service:

1. Create a National AI Governance Policy and Framework:

A comprehensive National AI Policy for the Public Sector must be promptly developed and released by the Ministry of Information and Communication Technology and the Ministry of Public Administration. To build trust and ensure safe implementation, this framework should clearly establish rules on algorithmic accountability, data privacy, ethical use, and procurement standards.

2. Mandate AI Literacy and Sector-Specific Training for All Civil Servants:

The Bangladesh Public Administration Training Centre (BPATC) should immediately incorporate mandatory AI literacy modules into all core training courses for civil servants, such as the Foundation Training Course (FTC), the Advanced Course on Administration and Development (ACAD), and the Senior Staff Course (SSC). Additionally, all government offices should organize in-house training on AI implications for service delivery. Beyond raising general awareness, specialized, practical training must be developed for key sectors, such as:

- **Health:** Training on AI tools for disease surveillance and resource allocation.
- **Agriculture:** Workshops on AI for predictive analytics on crop yields and pest control.
- **Local Government:** Practical skills for using AI in urban planning and utility management.

3. Launch Pilot Projects in Key Service Delivery Ministries:

The ICT Division should collaborate with high-impact ministries such as the Ministry of Health, the Ministry of Local Government, the Ministry of Agriculture, and the Ministry of Rural Development and Cooperatives to initiate focused AI pilot projects rather than deploying them all at once. For example, this could include predicting disease outbreaks with AI or optimizing agricultural subsidy distribution. This approach provides practical regional experience.

4. Create Centralized Innovation and AI Support Ecosystems:

Establish a special "AI in Governance" cell within the a2i Program or ICT Division to serve as a focal point for resources. To create context-specific solutions, this cell will collaborate with local

tech companies, universities, and government agencies, approve projects, and provide technical advice.

5. Upgrade Citizen-Centric Grievance Redress Systems:

The government should use AI-driven sentiment analysis to improve grievance redress portals by classifying and prioritizing complaints, ensuring faster and more empathetic service. This method would also automate responses for common issues and identify urgent cases.

6. Encourage an AI-Ready Culture through Incentives and Leadership:

All government offices and civil servants who successfully develop or implement AI solutions that result in a measurable increase in efficiency or citizen satisfaction should receive official recognition and performance incentives from the government.

By implementing these specific measures, the government can effectively leverage the strengths of its civil service, translate potential into tangible results, and ensure that AI integration is safe, fair, and genuinely benefits the lives of Bangladeshi citizens.

Chapter Six: Bibliography

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Chapter Seven: Annex

7.1 Survey Questionnaire

Civil Servants' Perception Toward Application of Artificial Intelligence in Public Service Delivery: Potentials and Challenges

We would like to ask some questions about this topic. The survey may take approximately 10 minutes to complete. Your information will be kept confidential and used only for research purposes. Thank you very much for participating in this survey.

Section A: Demographic Information

1. Name (or anonymous)-----
2. Age-----
3. Gender-----
4. Position/Title-----
5. Year of Service in Civil Service-----
6. Ministry/Office-----
7. Education Level: a. Bachelor b. Masters c. PhD and Above

Section B: Understanding artificial intelligence in public service delivery

8. How did you know about artificial intelligence? (multiple responses)
 - a. Government Agenda
 - b. Media exposure
 - c. Research papers
 - d. Professional experience
 - e. Self-study
 - f. Print and Electronic media
 - g. Social Media
 - h. Collaboration with AI professionals
 - i. Others.....
 9. Which AI technologies are you most familiar with?
 - a. ChatGPT
 - b. Gemini
 - c. Grammarly
 - d. Quill Bot
 - e. OpenAI Codex
 - f. Others.....
 10. How familiar are you with AI technologies?
 - a. Very familiar b. Moderately familiar c. Somewhat familiar d. Slightly familiar e. Not at all familiar
 11. What types of AI applications are required in public service? (select all that apply)
 - a. Chatbots
 - b. Virtual assistants
 - c. Predictive analytics
 - d. Personalized citizen services
 - e. Natural Language Processing for Public Feedback
 - f. Automated regulatory compliance
 12. Are there any services/functions where your office/department has applied AI?
 - a. Yes b. No
 13. If yes, then explain
-

14. Which AI tools or technologies do you believe could help your desk job or the services provided by your ministry?

15. Have you received any training on AI technologies? a. Yes b. No

16. If yes, how effective was the training in preparing you for using AI in your work?

a. Very effective b. Effective c. Neutral d. Ineffective e. Very Ineffective

17. What type of training or resources would you find helpful for utilizing AI in your role? (multiple response)

a. Workshops b. Online courses c. Hands-on training d. Case studies e. Others

Section: C Perceived Usefulness of artificial intelligence in public service delivery

Question 18- 22	Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree
PU 1- The application of AI can improve the efficiency of public service delivery					
PU 2- AI can enhance the quality of services provided to citizens					
PU 3- AI can reduce administrative burden in the working environment					
PU 4- AI can assist in improving decision-making in public service delivery					
PU 5- AI can improve the satisfaction level of the citizens in public service					

Section: D Perceived Ease of Use of artificial intelligence in public service delivery

Question 23-27	Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree
PEOU 1- It would be easier for my department/office/ministry to integrate AI into the existing public service process					

PEOU 2- Civil servants can easily understand the AI system in public service without specialized knowledge			
PEOU 3- It would be easy for my office to adapt to AI tools			
PEOU 4- It is convenient for my office/department to customize AI tools to fit the specific needs of public service delivery			
PEOU 5- AI systems can be easily integrated with other existing digital tools or platforms within the government			

Section: E Attitude Towards Use of artificial intelligence in public service delivery

Question 28-32	Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree
ATU 1- I feel positive about the use of AI in improving public service delivery					
ATU 2- AI can significantly enhance the quality of services provided by the government					
ATU 3- I trust AI technologies in making fair and unbiased decisions in public service delivery					
ATU 4- I have an optimistic feeling about the long-term impact of AI on public service delivery					
ATU 5- I think that AI will make public services more accessible and user-friendly for citizens					

Section: F Behavioral Intention to Use of artificial intelligence in public service delivery

Question 33-37	Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree
BIU 1- I intend to use AI technologies to improve public service delivery in my department/office					
BIU 2- I think AI tools will become a regular tool in my work for improving public service delivery in the future					
BIU 3- I will use AI to analyze data for making policy decisions or resource allocations					
BIU 4- I would recommend using AI tools to other colleagues in their respective department/office					
BIU 5- I am willing to engage with AI technologies in public service continuously					

Section: G Potentials of AI in Public Service Delivery

Question 38

	Very High	High	Medium	Low	Very Low
Personalized Government Services					
Full Automation of Public Service Processes					
Predictive Governance					
Public Safety and Security					
Enhanced Citizen Participation					

Cost Reduction and Resource Optimization				
Enhancing Transparency and Accountability				
Personalized Citizen Services				

Challenges of AI in Public Service Delivery

Question 39

	Very High	High	Medium	Low	Very Low
Security and Safety Concerns					
Bias and Fairness issues					
Ethical Concerns					
Regulatory and Legal complexities					
Lack of policy guidelines					
Lack of Citizens' orientation					
Willingness of the government officials					

Question 40

Do you have any additional comments on the potentials and challenges of AI in public service delivery?

THANKS

7.2 Interview Questionnaire

Title of the Study

Civil Servants' Perception Toward Application of Artificial Intelligence in Public Service Delivery: Potentials and Challenges

- Name:
- Office:
- Designation:
- Gender:
- Education Level:

Q1: What is your opinion regarding the application of AI in public service?

Ans:

Q2: Did the government take initiatives to introduce AI in public service? If yes, what are they? If not, why?

Ans:

Q3: What is your opinion about the usefulness of AI in public service delivery?

Ans:

Q4: Do you think that AI can ease the service delivery process of the government? Give your opinion.

Ans:

Q5: What is your opinion about the attitude of the government officials toward using AI?

Ans:

Q6: Do you see any potential for the application of AI in public service delivery? Give your argument.

Ans:

Q7: What are the possible challenges that may arise in integrating AI in public service delivery?

Ans:

Q8: Additional comments or observations:

Ans:

THANKS