

FINAL STUDY REPORT

A Comprehensive Study on Artificial Intelligence, Digital Infrastructure, and Data Policies with Recommendations for Policy to Strengthen AI Ecosystem in Nepal

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Executive Summary

This report presents the findings and recommendations of a comprehensive study conducted by Facet Technology to strengthen Nepal's AI-driven digital ecosystem. The study evaluates Nepal's current policies, digital infrastructure, and practices related to artificial intelligence, data privacy, cybersecurity and governance. By identifying key gaps and challenges, the study provides actionable policy recommendations to support ethical AI innovation and ensure alignment with international best practices.

The research methodology incorporated a detailed desk review, surveys, focus group discussions, and Key Informant Interviews, ensuring a diverse range of perspectives from stakeholders across various sectors. Insights from these data collection methods were rigorously analyzed to provide a holistic understanding of Nepal's AI landscape.

The key findings highlight the importance of a comprehensive approach, integrating sector-specific AI policies along with cross-border data-sharing regulations to accelerate AI adoption in industries such as healthcare, education, and finance. Strengthening data privacy laws, ensuring informed consent, and upskilling the workforce are critical for equitable AI access. Policies should prioritize ethical AI, ensuring fairness, transparency, and security while fostering innovation. A privacy preserving and secure AI ecosystem is essential, with strong cybersecurity measures to mitigate risks like deepfakes and cyberattacks. The regulatory approach should guide rather than control, creating space for startups and entrepreneurship. Nepal specific strategies, including localized AI policies, inclusive workforce development, and infrastructure tailored to national needs, will be key. Fostering public private partnerships, building scalable infrastructure, and establishing AI hubs will drive sustainable innovation, while a robust monitoring framework will ensure ethical compliance and adaptability to emerging technologies.

Facet Technology collaborated closely with Data for Development, The Asia Foundation throughout the study to ensure quality, transparency, and stakeholder engagement. The study was executed with a strong focus on risk management, proactive scheduling, and consistent progress tracking through bi-weekly updates and milestone-based reviews.

This study is a pivotal step in Nepal's digital transformation journey. By offering clear insights and practical recommendations, it equips policymakers with the tools needed to design effective AI policies, address infrastructure gaps, and promote inclusive AI capacity-building. The findings serve as a foundation for building a sustainable, competitive, and globally aligned AI ecosystem in Nepal.

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Table of Contents

Executive Summary	2
Acknowledgement	3
Chapter 1	16
Introduction	16
1.1 Background	16
1.2 Objectives and Research Questions	18
Chapter 2	20
Desk Review	20
2.1 Brief History of ICT in Nepal	20
2.2 Existing ICT and Related Policies in Nepal	23
2.3 AI and Review of AI Policy	31
2.3.1 AI Policies and Practices in Nepal	33
2.3.2 International AI Practices	36
2.3.3 Gaps in AI Practices	39
2.4 Review of Data Privacy, Data Protection, Cybersecurity and Data Governance	41
2.4.1 Data Privacy and Protection in Nepal	42
2.4.2 International Practices for Data Privacy and Protection	47
2.4.3 AI, Data Governance and Privacy OECD Artificial Intelligence	50
2.4.4 Gaps of Nepal Data Protection and Privacy based on International Practices	51
2.5 Review of Digital Infrastructure	53
2.5.1 Role of Digital Infrastructure in AI	53
2.5.2 Current Scenario of Digital Infrastructure in Nepal	53
2.5.3 Review of Current Digital Infrastructure with AI Ecosystem Development	56
3.6 Desk Review Summary	58
Chapter 3	60
Methodology	60
3.1 Inception Phase	60
3.2 Desk Review	60
3.3 Primary Data Collection	61
3.3.1 Surveys	62
3.3.2 Focus Group Discussions	62
3.3.3 Key Informant Interviews	63
3.4 Findings Integration	63
3.5 Draft Study Report	64

	5
3.6 Workshop for Review Draft and Peer Review	64
3.7 Deliverable: Final Study Report	65
Chapter 4	66
Data Analysis, Key Findings, and Actionable Recommendations	66
4.1 Surveys	66
4.1.1 Statistical Analysis	71
4.1.2 Survey Findings	76
4.1.2 Overall Findings from Sub-Research Questions	104
4.2 Focus Group Discussion	106
4.2.1 SRQ1(Policy Adequacy)	106
4.2.2 SRQ2(Regulatory Framework)	107
4.2.3 SRQ3(Ecosystem Development)	108
4.2.4 SRQ4(Digital Infrastructure, Data and Governance)	109
4.2.5 SRQ5(AI Risks)	110
4.2.6 SRQ6(AI for National Priorities)	111
4.2.7 SRQ7(Strategic Roadmap)	112
4.3 Key Informant Interviews	113
4.3.1 SRQ1(Policy Adequacy)	113
4.3.2 SRQ2(Regulatory Framework)	114
4.3.3 SRQ3(Ecosystem Development)	115
4.3.4 SRQ4(Digital Infrastructure, Data and Governance)	116
4.3.5 SRQ5(AI Risks)	117
4.3.6 SRQ6(AI for National Priorities)	119
4.3.7 SRQ7(Strategic Roadmap)	120
4.4 Integration of Findings	121
SRQ1: Policy Adequacy	121
1. Key Convergent Themes	121
2. Notable Divergences and Partial Coverage	122
3. Desk Review Validation/Challenges	122
4. Overall Synthesis	123
5. Gaps and Recommendations	123
SRQ2: Regulatory Framework	124
1. Key Convergent Themes	124
2. Notable Divergences and Partial Coverage	124
3. Desk Review Validation/Challenges	124
4. Overall Synthesis	125

	6
5. Gaps and Recommendations	125
SRQ3: Ecosystem Development	125
1. Key Convergent Themes	125
2. Notable Divergences and Partial Coverage	126
3. Desk Review Validation/Challenges	126
4. Overall Synthesis	126
5. Gaps and Recommendations	127
SRQ4: Digital Infrastructure, Data, and Governance	127
1. Key Convergent Themes	127
2. Notable Divergences and Partial Coverage	127
3. Desk Review Validation/Challenges	127
4. Overall Synthesis	128
5. Gaps and Recommendations	128
SRQ5: AI Risks	128
1. Key Convergent Themes	128
2. Notable Divergences and Partial Coverage	129
3. Desk Review Validation/Challenges	129
4. Overall Synthesis	129
5. Gaps and Recommendations	130
SRQ6: Opportunities for AI Development in Nepal	130
1. Key Convergent Themes	130
2. Notable Divergences and Partial Coverage	131
3. Desk Review Validation/Challenges	131
4. Overall Synthesis	131
5. Gaps and Recommendations	132
SRQ7: Strategic Roadmap for AI Development	132
1. Key Convergent Themes	132
2. Notable Divergences	133
3. Desk Review Validation/Challenges	133
4. Overall Synthesis	133
5. Gaps and Recommendations	134
4.5 Overall Recommendation	134
4.6 Scope and Limitation of Study	137
Chapter 5	138
Recommendations to National Artificial Intelligence Policy Draft 2081	138
Chapter 6	145

	7
Conclusion	145
References	146
Appendix A: Survey Questions	158
SRQ1: Policy Adequacy	159
SRQ2: Regulatory Framework	160
SRQ3: Ecosystem Development	162
SRQ4: Digital Infrastructure, Data, and Governance	163
SRQ5: AI Risks	165
SRQ6: AI for National Priorities	166
SRQ7: Strategic Roadmap	168
Appendix B: FGD and KII Research Questions	170

List of Figures

Figure 1: Study Methodology Flow	60
Figure 2: Respondents based on Gender	67

List of Tables

Table 4.1: Number of Sub-Research Questions	655
Table 4.2: Details of Demographic Information and Related Distribution	655
Table 4.3: Distribution of Respondents' Educational Qualifications	67
Table 4.4: Distribution of Respondents' Age Group	67
Table 4.5: Distribution of Respondents as AI Practitioner	68
Table 4.6: Distribution of Respondents as AI Practitioner Vs Educational Qualification	68
Table 4.7: Case - Gender Based Differences in AI Policy Prioritization	69
Table 4.8: Case- Age-Based Differences in Economic Growth Prioritization	70
Table 4.9: Result of Anova Test Regarding Age-Based Differences in Economic Growth Prioritization	71
Table 4.10: Case- AI Practitioners' Views on Public Service Transformation	710
Table 4.11: Case- AI Policy and Regulation of Disinformation	733
Table 4.12: Respondent' Prioritization for AI in Public Service Transportation	744
Table 4.13: Status of AI Policies, Frameworks, and Guidelines in Nepal	754
Table 4.14: Perceptions on AI Policy Addressing Social Needs	755
Table 4.15: Need for Benchmarking Nepal's AI Policies with International Standards	76
Table 4.16: Sufficiency of Education and Training for AI Development	76
Table 4.17: Prioritization of Economic Growth vs. Ethical Concerns in AI Policies	77
Table 4.18: Effectiveness of Existing Regulatory Frameworks in AI Data Security and Privacy	78
Table 4.19: Prioritizing Ethical Guidelines for AI Development in Nepal	78
Table 4.20: Perspectives on Stricter AI Regulations in Nepal	79
Table 4.21: Regulatory Effectiveness in Combating AI-Generated Disinformation	79
Table 4.22: Perspectives on Sharing Cross-border Data involving AI	800
Table 4.23: AI Governance Framework for Inclusivity and Transparency in Nepal	811
Table 4.24: Regulatory Framework for Safeguarding AI's Impact on Human Rights	811
Table 4.25: Key Factors for Building a Robust AI Ecosystem in Nepal	822
Table 4.26: Government Incentivizing Startups for AI Investment	843
Table 4.27: Prioritizing Public-Private Partnerships for AI Development in Nepal	843
Table 4.28: Addressing Gender and Geographical Disparities in Nepal's AI Policy	854
Table 4.29: Enhancing AI Skill Development to Bridge Workforce Gaps in Nepal	865
Table 4.30: Funding Opportunities for AI Research and Innovation in Nepal	865
Table 4.31: AI Awareness Initiatives for Fostering Adoption in Nepal's AI Policy	86
Table 4.32: Assessing Nepal's Digital Infrastructure for AI Development	86
Table 4.33: Balancing Privacy and AI Development Using Data Governance Policies in Nepal	87

	10
Table 4.34: Enhancing AI Innovation in Nepal: Accessibility of Local Public Datasets	88
Table 4.35: Evaluating Data Privacy in Nepal's AI Infrastructure	88
Table 4.36: Government Priorities in Data Governance for AI Advancement	89
Table 4.37: Aligning Digital Infrastructure Investments with AI Growth in Nepal	89
Table 4.38: Quality and Utilization of Public Data for AI in Nepal	90
Table 4.39: Minimizing AI Risks: Addressing Bias and Misuse Effectively	921
Table 4.40: Strengthening Measures to Combat AI-Driven Misinformation in Nepal	921
Table 4.41: Integrating Human Rights Considerations into Nepal's AI Policies	932
Table 4.42: Assessing the Risk of Unethical AI Use in Nepal	943
Table 4.43: Balancing Privacy Concerns and Innovation in AI Policies	943
Table 4.44: Impact of Ethical Safeguards on AI Development in Nepal	954
Table 4.45: Leveraging AI for National Priorities: Education and Healthcare	954
Table 4.46: Accelerating AI Adoption in Public Services	965
Table 4.47: Expanding AI Access to Underserved Communities	96
Table 4.48: Promoting AI Adoption in Small and Medium Enterprises	96
Table 4.49: Assessing the Economic Impact of AI in Nepal	97
Table 4.50: Prioritizing Regional Equity in AI Accessibility	97
Table 4.51: Ensuring Socio-Economic Inclusivity in AI Initiatives	98
Table 4.52: The Importance of a Strategic Roadmap for AI Development in Nepal	99
Table 4.53: Aligning Nepal's AI Policy with International Best Practices: A Priority or Not	99
Table 4.54: The Need for a Dedicated AI Governance Body in Nepal	100
Table 4.55: Prioritizing Ethical Considerations in Nepal's AI Strategy	101
Table 4.56: Enhancing AI Adoption in Public Sectors with Actionable Plans	1021
Table 4.57: Prioritizing Long-Term Sustainability in Nepal's AI Strategies	1032
Table 5.1: AI Policy Recommendation Mapping Table	139

List of Abbreviations

AI	Artificial Intelligence
AMC	Annual Maintenance Contracts
APP	Australian Privacy Principles
ATM	Automated Teller Machine
AWS	Amazon Web Services
BPO	Business Process Outsourcing
CCPA	California Consumer Privacy Act
CDMA	Code-Division Multiple Access
CDN	Content Delivery Networks
D4D	Data for Development
EU	European Union
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GoN	Government of Nepal
GSM	Global System for Mobile Communication
IaaS	Infrastructure as a Service
ICT	Information and Communication Technology
KII	Key Informant Interviews
LTE	Long Term Evaluation
IEC	International Electrotechnical Commission
IRB	Institutional Review Board
ISO	International Organization for Standardization
IST	Internet Service Provider

IT	Information Technology
ITU	International Telecommunication Union
MIS	Management Information System
MOCIT	Ministry of Communication and Information Technology
NEFAS	Nepal Foundation for Advanced Studies
NHRC	Nepal Health Research Council
NITC	National Information Technology Centre
NTA	Nepal Telecommunications Authority
NTC	Nepal Telecom
NTIS	Nepal Trade Integration Strategy
OAIC	Office of the Australian Information Commissioner
OECD	Organisation for Economic Co-operation and Development
PaaS	Platform as a Service
PDPC	Personal Data Protection Commission
QoS	Quality of Service
R&D	Research and Development
RONAST	Royal Nepal Academy of Science and Technology
RQ	Research Question
SaaS	Software as a Service
SDGs	Sustainable Development Goals
SPSS	Statistical Package for Social Sciences
SRQ	Sub-Research Question
TAF	The Asia Foundation
TU	Tribhuvan University
Pvt	Private

Ltd	Limited
UGC	University Grants Commission
UNESCO	United Nations Educational, Scientific and Cultural Organization
U.S.	United States
WCDMA	Wideband Code Division Multiple Access

Chapter 1

Introduction

1.1 Background

Nepal, a landlocked country situated in South Asia, has a total area of approximately 147,181 square kilometers (Government of Nepal, n.d.) and a population of around 30 million (World Bank, 2023). The population is divided between males and females, with females constituting approximately 49.6% of the total population. The country operates under a federal system, with seven provinces, 77 districts and several local governments, further decentralizing administrative responsibilities. Nepal's Gross Domestic Product (GDP) is approximately \$40.91 billion, reflecting a developing economy with agriculture, services, and remittances playing vital roles (World Bank, 2023).

Nepal has made significant strides in Information and Communication Technology (ICT) development, yet notable gaps persist in global rankings and performance metrics. In 2017, Nepal was ranked 140th in the ICT Development Index, reflecting the need for greater advancements in the sector (International Telecommunication Union [ITU], 2017). By 2023, the country ranked 114th out of 134 nations in the Network Readiness Index, highlighting incremental progress but ongoing challenges (Portulans Institute, 2023). Additionally, Nepal's position in the e-Government Development Index stood at 119th out of 193 countries in 2024, while it ranked 152nd in the e-Participation Index, signaling limited citizen engagement through digital platforms (United Nations E-Government Knowledgebase, 2024). On a positive note, the country's mobile penetration rate reached 122.16% as of Ashadh 2081, with total teledensity standing at 141.13% as of Poush 2080 (Nepal Telecommunications Authority [NTA], 2080, 2081). However, internet performance remains a concern, as Nepal ranked 108th globally in fixed broadband speeds in 2021, with average download speeds of 33.87 Mbps and upload speeds of 29.63 Mbps (The Kathmandu Post, 2021). These metrics underscore the need for continued efforts to enhance Nepal's digital infrastructure and connectivity.

The ICT journey in Nepal began with the Telecommunications Act of 1997 and the Telecommunications Regulation of 1997, followed by the Information Technology Policy of 2000, which facilitated private sector participation in ICT development. In 2015, the government introduced the Information Communication Technology Policy 2015 to cover the evolving demands of both information and communication technology sectors.

As for Artificial Intelligence (AI), Nepal's AI readiness is in its nascent stage, though there is growing recognition of its potentiality. According to the Oxford National AI Readiness Index, Nepal is ranked in 150 out of 193 countries (Government AI Readiness Index, 2024). The country's limited AI infrastructure and skillset are barriers to fully leveraging AI, but advancements in digital infrastructure, such as mobile networks and internet connectivity, present a foundation for the technology's integration into the public and private sectors. Nepal's

AI ecosystem is currently underdeveloped but is progressing, with AI education becoming more widespread across universities and institutions. However, AI development is hindered by challenges such as data privacy concerns, lack of regulatory frameworks, and limited investment in AI-focused startups and innovations.

In comparison with global standards, Nepal lags in areas such as cybersecurity, data protection, and digital literacy. According to the Global Cybersecurity Index, Nepal ranks 138th out of 190 countries globally, indicating gaps in cybersecurity preparedness (ITU, 2021). Moreover, Nepal adopted the Privacy Act in 2018 and the National Cybersecurity Policy in 2023. Similarly, Statistics Act 2022 replaced the Statistics Act 1958. Nevertheless, the data governance and privacy regulations are still evolving, with limited enforcement and public awareness. To successfully build an AI-driven economy, Nepal must address these gaps by strengthening its cybersecurity policies, enhancing data protection laws, and investing in digital literacy and skills development. The following sections will delve deeper into AI policy recommendations, considering both Nepal's current technological landscape and international best practices.

The rapid advancement of digital technologies, including AI, has become a transformative force globally. Governments and organizations are increasingly formulating and implementing comprehensive policies to harness AI for innovation, economic growth, and societal benefits. For instance, the Artificial Intelligence Act, also known as Regulation (EU) 2024/1689, harmonizes AI regulations across the European Union (EU) by implementing a risk-based framework to govern AI systems based on their potential impact on society and fundamental rights (European Parliament, 2024), while the United States focuses on initiatives like the National AI Initiative Act of 2020 to promote AI innovation and public trust (U.S. Congress, 2020).

Many organizations and countries are actively developing policies on AI, digital infrastructure, cybersecurity, data privacy, and governance to promote the ethical use of AI and its broader ecosystem. For simplicity, this document uses the term "*AI-driven digital ecosystems*" to collectively refer to these areas. Globally, digital infrastructure policies emphasize robust cloud-based systems, high-speed internet access, and secure data centers to drive digital transformation. Similarly, data governance frameworks, such as the EU's General Data Protection Regulation (GDPR) (European Parliament, 2024), have established benchmarks for ensuring data privacy, compliance, and security. On the other hand, The United Nations has been actively advancing AI regulation through various initiatives to promote ethical, inclusive, and human-centered AI governance. The Governing AI for Humanity report, released in 2024 by the UN Secretary-General, outlines urgent actions to ensure AI aligns with human rights, peace, and sustainable development. The AI for Good Impact Initiative, led by the International Telecommunication Union (ITU), focuses on leveraging AI to accelerate progress toward the Sustainable Development Goals (SDGs). UNESCO's Recommendation on the Ethics of Artificial Intelligence (2021) remains a key global framework, while discussions under the proposed Global Digital Compact aim to shape international AI governance. Through these efforts, the UN emphasizes multilateral cooperation to harness AI's benefits while mitigating risks. These global advancements highlight the critical need to integrate AI policies with strong digital infrastructure and effective data privacy mechanisms.

Nepal is at a critical juncture in its digital transformation journey. The integration of AI in public service delivery, private sector innovation, and governance has shown interest, although on a limited scale. The Digital Nepal Framework 2019 outlines technology-driven socio-economic goals, emphasizing digital literacy and infrastructure development (Government of Nepal, 2019).

Current frameworks, including the IT Policy 2015, are insufficient to address challenges related to privacy, security, and emerging technologies (MOCIT GoN, 2015). Recently, the Ministry of Communication and Information Technology, Nepal has released an AI concept paper outlining the current status, opportunities, challenges, risks and way forward (MOCIT GoN, 2024).

Furthermore, the AI concept paper highlights the need for robust policies addressing cybersecurity, data protection, and privacy to support secure and ethical AI use. It proposes establishing a governance framework to regulate and promote AI in compliance with national and international standards. Emphasis is placed on fostering original research, accelerating AI adoption through targeted programs, and prioritizing capacity-building initiatives such as re-skilling, upskilling, and workforce training to prepare for an AI-driven future.

Although initial steps have been taken toward developing policies related to AI-driven digital ecosystems, comprehensive research is still required to understand their current status in the Nepalese context. This includes examining existing laws, current practices, industrial demands, challenges, attitudes toward AI policies, and sentiments regarding the adoption, use, and future of AI across industry, government, academia, and AI practitioners and users as a whole. A thorough understanding of Nepal's current scenario will provide a solid foundation for offering informed recommendations for drafting policies related to AI-driven digital ecosystems.

1.2 Objectives and Research Questions

This study aims to achieve the following objectives:

- Evaluate existing policies and frameworks within AI-driven digital ecosystems.
- Identify gaps and challenges in comparison to global standards.
- Offer strategic recommendations to strengthen Nepal's AI-driven digital ecosystems.

To achieve these objectives, the study explores the following key research question:

Research Question: What are the ways Nepal can enhance its policies, regulatory frameworks, and ecosystem strategies to build a sustainable, inclusive AI-driven digital ecosystem that meets technological, societal, and economic needs while fostering innovation and aligning with national priorities?

To answer this research question, the following sub-research questions (SRQs) are divided:

- **SRQ1 (Policy Adequacy):** Are the existing *AI-driven digital ecosystem* related policies, laws, procedure guidelines in Nepal sufficient to address the country's

technological, societal, and economic needs, and what improvements are necessary to meet future demands?

- **SRQ2 (Regulatory Framework):** What regulatory and governance frameworks, including ethical and legal considerations, are required to ensure responsible, transparent, and inclusive AI development and deployment in Nepal?
- **SRQ3 (Ecosystem Development):** What strategies and frameworks should Nepal adopt to cultivate an innovative AI startup ecosystem, addressing critical challenges such as talent development, funding, industry collaboration, infrastructure, AI awareness, and support for emerging AI-driven enterprises?
- **SRQ4 (Digital Infrastructure, Cybersecurity, Data and Governance):** How can Nepal design data security, data governance, cybersecurity and digital infrastructure policies that support AI innovation while ensuring privacy, accessibility, and equitable access to AI technologies in Nepal, including ethical dilemmas, societal impacts, bias, misinformation, and misuse, and how can these risks be mitigated through policy?
- **SRQ5 (AI Risks):** How can Nepal develop AI policies that effectively minimize risks such as bias, misuse, and ethical concerns while balancing innovation, privacy, and human rights considerations?
- **SRQ6 (AI for National Priorities):** How can an AI-driven *digital ecosystem* be strategically leveraged to address Nepal's national priorities, such as education, healthcare, agriculture, economic growth, human rights, and regional inclusivity, while considering the country's unique socio-economic context?
- **SRQ7 (Strategic Roadmap):** What actionable policy recommendations and strategic roadmaps should Nepal implement to achieve its AI goals over the short term and long term, aligning with international standards and addressing ethical, societal, and legal concerns with international standards?

Chapter 2

Desk Review

The desk review aims to evaluate Nepal's current landscape of *AI-driven digital ecosystems*. This includes a comprehensive literature review of existing research, reports, and publications, along with an analysis of national policies, strategies, and regulatory frameworks. Additionally, the review incorporates an analysis of the international best practices within this domain. It further assesses the quality, accessibility, and readiness of internet connectivity, data centers, cloud services, and data policies, with particular emphasis on privacy, security, and data quality, which are essential for the advancement of AI technologies.

This chapter provides a structured overview of key topics related to ICT and AI in Nepal. It commences with a concise historical account of ICT development in the country, followed by an analysis of existing ICT policies. The review then focuses on AI policies, encompassing both Nepal's practices and international benchmarks, while identifying gaps. A comprehensive examination of data privacy, protection, cybersecurity and governance highlights Nepal's current status, contrasts it with global standards, and identifies areas for improvement. The discussion further extends to digital infrastructure, exploring Nepal's current landscape and its alignment with AI ecosystem development. The section concludes with a desk review summary that synthesizes findings across all examined areas.

2.1 Brief History of ICT in Nepal

The development of ICT in Nepal has spanned over half a century, marked by significant milestones and rapid advancements.

Early Beginnings (1960s–1980s)

- Establishment of IoE: Institute of Engineering is one of the top and oldest technical Institutes of Nepal. It was founded in 1930 (TU Today, 2023).
- Facet for census calculation: For the first time in 1961, Facet was used for census calculation in a scientific manner (Workshop - Conference on Population, Family Planning, and Development in Nepal, 1975)
- Use of second-generation computers for census calculation: In 1971, IBM 1401, a second-generation computer, was used for census calculation.
- Establishment of Yantrik Saralikiran Kendra: 1974 AD (2031 BS) – A center for (Yantrik Saralikiran Kendra) (Electronic Data Processing) was established.
- Telecommunication Initiatives: In 1960, Nepal Telecommunications Corporation (NTC) established the first telephone exchange in Kathmandu Valley, laying the foundation for long-distance communication (Onlinekhabar, 2019).

- In 2039 B.S., microcomputers such as Apple, Vector, Sins, etc were imported by private companies and individuals. (“History of Computers and Information Technologies (IT) in Nepal”, n.d.).
- 1991 AD: Kathmandu University (KU) is an autonomous, not-for-profit, self-funding public institution established by an Act of Parliament in December 1991.
- 1997 AD – Pokhara University started computer education under the Faculty of Science and Technology.
- 1998 AD – On the basis of the Telecommunications Act 1997, Nepal Telecommunications Authority (NTA) – a telecommunication regulatory body was formed.
- 1998 AD – IOE under TU started a Bachelor in Computer Engineering.
- 2000 AD – Purbanchal University also started computer education in various disciplines.
- Global Recognition: In 1984, Nepal became a member of the ITU, aligning with international telecom standards.

Internet Revolution (1990s)

- In 1993, the Royal Nepal Academy of Science and Technology (RONAST) launched Nepal’s first email service (Adhikari, 2006).
- In mid 1994, Mercantile Communications introduced commercial internet services, connecting Nepal to the global internet for the first time and sparking a digital revolution (Nepal Foundation for Advanced Studies (NEFAS), 2004).
- By 1998, the Nepal Telecommunications Authority (NTA) was established under the Telecommunications Act (1997) to regulate and promote competition, enabling the growth of Internet Service Providers (ISPs) like WorldLink, Subisu, and Vianet.

Growth of Mobile Technology and Digital Services (2000s)

- In 2003, NTC launched GSM mobile services, followed by private telecom operators like Ncell, boosting competition and mobile penetration (“Development of telecommunications in Nepal”, 2021)
- 3G services were introduced in 2007, accelerating mobile internet adoption, especially in urban areas (“3G Services Arrive in Nepal”, 2007).
- By 2008, broadband internet became widely available, making internet access affordable for households and businesses (Wikipedia contributors, (n.d.)).

- In 2008, the government enacted the Electronic Transaction Act to ensure the reliability and security of electronic transactions including the control of unauthorized use of electronic records or alteration in such records through illegal manner.

Digital Transformation Era (2010s–Present)

- **4G Services:** In 2017, NTC launched 4G LTE services in major cities, further improving internet speeds and reliability (“Nepal Telecom rolls out nationwide 4G service”, 2017)
- **Digital Nepal Framework:** In 2018, the Government introduced the Digital Nepal Framework, a comprehensive strategy to integrate ICT into eight sectors, such as education, health, and tourism, aiming to transform Nepal into a knowledge-based economy (Ministry of Communication and Information Technology, 2019).
- **5G Trials:** By the 2020s, 5G trials began, showcasing Nepal's ambition to adopt cutting-edge technologies (Data Center Dynamics, 2023).
- **Digital Services:** Digital payment platforms like Khalti and eSewa, e-governance initiatives such as the Nagarik App, and smart city projects have transformed public services and daily life (Nagarik App, n.d.).

Policies and Governance

- Nepal's ICT policy dates back to the Radio Act of 1957, which regulated radio transmission (Pandey, 1986).
- The Telecommunications Act (1997) and Information Technology Policy (2000) introduced privatization and autonomous regulation, fostering ICT sector growth (Information Technology Policy, 2057 (2000)).
- The ICT Policy of 2015 emphasized the need for a consistent regulatory framework to manage converging ICT, telecommunications, and broadcasting services (National Information and Communications Technology Policy, 2015).

Emerging ICT Sector and IT Outsourcing

- Nepal's IT sector has been identified as a key export service in the Nepal Trade Integration Strategy (NTIS) 2010 (Information Technology/ICT, n. d.)
- The ITES-BPO sector has grown rapidly, serving both domestic and international markets with software development, AI, machine learning, and data analytics (“IT Services Nepal”, 2024).
- Over 500 IT companies operate in Nepal, providing solutions for web/app development, mobile financial services, and enterprise software (“Best IT company in Nepal”, 2024)

Current Landscape

- Internet Penetration: As of 2023, over 90% of Nepal's population has access to mobile internet, supported by more than 25 active ISPs (Management Information System [MIS] Report, 2023) .
- Education: ICT is being integrated into schools and universities, promoting digital learning and e-education initiatives (Education Sector ICT Policy and Strategies, 2022).
- Tech Startups: A vibrant ecosystem of fintech, healthtech, and edtech startups is driving innovation, job creation, and economic growth (Startups in Nepal: Ecosystem Growth and Opportunities, 2023).
- Professional Services: Companies now offer ICT Annual Maintenance Contracts (AMCs), ICT infrastructure management, and OEM-certified solutions to enhance ICT services in various industries (Enhancing ICT Services in Nepal: Industry Insights, 2023).

Nepal's journey in ICT has evolved from basic telecommunication systems to cutting-edge digital solutions like AI and cybersecurity. With policies like the Digital Nepal Framework and growing investment in IT infrastructure, Nepal is poised for further growth in digital transformation and innovation.

2.2 Existing ICT and Related Policies in Nepal

In this subsection, we are going to explore the policies related to the *AI-driven digital ecosystem*, related to IT, AI, data privacy, data protection, digital governance, cybersecurity, digital infrastructure etc.

Information Technology Policy, 2057 (2000)

The Information Technology Policy 2057 (2000) was introduced with the ambitious vision of placing Nepal on the global IT map within five years. Recognizing the transformative potential of IT, the policy aimed to accelerate the development of key sectors such as education, health, agriculture, tourism, and trade. By leveraging IT, Nepal intended to achieve economic consolidation, promote democratic norms and values, ensure equitable distribution of resources, and enhance public awareness, thereby raising living standards and contributing significantly to poverty alleviation. The policy also highlighted the importance of a robust IT infrastructure to overcome geographical challenges and position Nepal advantageously in the global digital economy. Key initiatives included encouraging private sector participation, promoting e-commerce, and establishing the National Information Technology Centre (NITC) to support government IT needs and standardize IT protocols.

Additionally, the policy envisaged substantial foreign investment, allowing up to 100% foreign ownership in IT parks, research and development, technology transfer, and human resource development. This open investment policy was designed to attract international expertise and

capital, fostering rapid IT sector growth. However, while the policy laid a strong foundation, it did not address emerging issues such as AI, data privacy, data protection, and data governance, which are crucial for the contemporary digital landscape. The policy also proposed the creation of the Information Technology Park Development Committee to oversee the development of IT parks, info-cities, and info-villages, aiming to enhance IT infrastructure across Nepal.

Electronic Transaction Act, 2063 (2008)

The Electronic Transaction Act 2063 of Nepal provides a legal framework for the use of electronic transactions and digital signatures in the country. The Act aims to promote e-commerce, safeguard electronic transactions, and ensure legal recognition of electronic records and signatures. It establishes provisions for the authentication of electronic documents, legal validity of contracts made through electronic means, and the regulation of cybercrimes such as hacking and fraud. The law also empowers the government to establish regulatory bodies and frameworks to ensure the smooth functioning of digital transactions in various sectors, enhancing the country's digital economy.

Electronic Transaction Rules, 2064 (2008)

The Electronic Transaction Rules 2064 (2008) are designed to support the implementation of the Electronic Transaction Act 2063 in Nepal. These rules provide detailed procedures and guidelines for the regulation and facilitation of electronic transactions, digital signatures, and e-commerce activities. They specify the requirements for the authentication and registration of electronic documents, the operation of certification authorities, and the prevention of cybercrimes. The rules also define the responsibilities of service providers and users in ensuring the secure use of electronic communications and transactions, aiming to create a trusted environment for digital activities in Nepal.

National Information and Communication Technology Policy 2015

The National Information and Communication Technology Policy 2015 was established by the Government of Nepal to create a comprehensive framework for the development and use of ICT in the country. This policy aimed to enhance the role of ICT in achieving sustainable economic growth, social development, and good governance. The key objectives included promoting digital literacy, expanding ICT infrastructure, encouraging e-governance, fostering innovation and entrepreneurship in the ICT sector, and ensuring cybersecurity and data protection. By leveraging ICT, the policy sought to improve the delivery of public services, increase transparency, and empower citizens through better access to information.

The policy also emphasized the importance of collaboration between the public and private sectors, as well as international cooperation, to achieve its goals. It highlighted the need for investment in ICT education and training to develop a skilled workforce capable of driving the sector forward. Additionally, the policy addressed the digital divide by focusing on rural and underserved areas, ensuring that the benefits of ICT are accessible to all segments of society. The National ICT Policy 2015 laid the groundwork for a digitally inclusive Nepal, aligning with

global ICT trends and standards to foster national development and competitiveness in the global arena.

Broadband Policy 2071

The Broadband Policy 2071 of Nepal was formulated by the Government of Nepal with the aim of expanding broadband services across the country to support national development goals and enhance the overall digital ecosystem. The policy seeks to promote broadband as an essential tool for driving economic growth, improving access to education and healthcare, enhancing government services, and bridging the digital divide. It outlines strategies for the expansion of broadband infrastructure, particularly in rural and underserved areas, to ensure equitable access to high-speed internet for all segments of society. The policy also focuses on creating a competitive market environment, encouraging private sector participation, and improving service quality through regulatory measures and technological innovations.

Additionally, the Broadband Policy 2071 emphasizes the importance of fostering digital literacy, strengthening cybersecurity, and developing a skilled workforce capable of utilizing broadband technology to its full potential. It encourages collaboration between government agencies, service providers, and other stakeholders to ensure the successful implementation of broadband initiatives.

Constitution of Nepal, 2072 (2015)

The Constitution of Nepal, 2072 (2015), promulgated on September 20, 2015, is the fundamental law of Nepal that establishes the country as a democratic, sovereign, and inclusive republic. It guarantees various fundamental rights, including the right to equality, freedom of expression, and the right to privacy. The Constitution also defines the structure of government, delineates the separation of powers, and enshrines provisions for federalism, ensuring power-sharing between the central government and local governments. It also highlights the importance of secularism, social justice, and the protection of the rights of marginalized communities, contributing to the foundation of a more democratic and inclusive Nepal.

The Constitution of Nepal, 2015 recognizes the Right to Privacy as a fundamental right under Article 28. This provision guarantees the inviolability of privacy, offering protection to individuals against unauthorized interference. The right is not absolute and may only be restricted by law, ensuring that any limitation is legally justified. Article 28 safeguards personal privacy in various aspects of life, including one's body, residence, property, documents, records, statistics, correspondence, and reputation. This recognition emphasizes the state's commitment to protecting the dignity and privacy of its citizens, establishing a strong constitutional framework for privacy rights in Nepal.

Journalist Code of Conduct, 2016

The Journalist Code of Conduct, 2016 was established by the Press Council Nepal to provide ethical guidelines for journalists and media professionals in Nepal. The code aims to uphold the integrity of journalism, promote responsible reporting, and ensure that media serves the public

interest while adhering to principles of truth, accuracy, fairness, and independence. It outlines the duties and responsibilities of journalists to avoid spreading misinformation, sensationalism, and bias in their reporting. The code also emphasizes the importance of respecting privacy, avoiding conflicts of interest, and ensuring that media coverage does not harm individuals or groups. Furthermore, it encourages journalists to prioritize the public's right to information while maintaining high standards of professionalism.

The code includes specific provisions regarding the reporting of sensitive topics, such as gender issues, national security, and political matters, to ensure that journalists act in a manner that contributes to the peaceful, democratic development of Nepal. It also lays down the framework for handling complaints and accountability, ensuring that media professionals who violate the code face appropriate disciplinary actions. By adhering to the Journalist Code of Conduct, 2016, journalists in Nepal are encouraged to promote ethical journalism that strengthens democracy, public trust, and the media's role as a fourth estate.

National Mass Communication Policy 2073 (2016)

The National Mass Communication Policy 2073 (2016) was introduced by the Government of Nepal with the aim of promoting effective communication for national development and democratic governance. The policy emphasizes the role of mass communication in enhancing public awareness, fostering national unity, and informing citizens about government activities, societal issues, and cultural values. It outlines strategies to strengthen the media sector by ensuring independence, diversity, and accessibility to information for all segments of society. The policy also addresses issues like the spread of misinformation and aims to improve media literacy, professional journalism, and ethical reporting.

Additionally, the National Mass Communication Policy 2073 focuses on developing media infrastructure and human resources to improve the quality of mass communication across various platforms, including print, radio, television, and digital media. It advocates for the inclusion of regional and local media to ensure that information reaches remote and rural areas of Nepal. The policy further promotes collaboration between the government, media organizations, and other stakeholders to create an environment where media serves the public interest and contributes to the social, cultural, and political development of the nation.

Criminal Code of Nepal, 2017

The Criminal Code of Nepal, 2017, enacted on August 17, 2017, is a comprehensive legal framework designed to define and address criminal offenses in Nepal. This code consolidates and updates various criminal laws and is structured to enhance justice by setting clear definitions for crimes and their corresponding punishments. It covers a wide range of offenses, including those related to property, personal offenses, family matters, and public safety. The code emphasizes human rights, focusing on protection from torture and unlawful detention, and strengthens the criminal justice system by providing for more systematic procedures. It also includes provisions related to cybercrime, aiming to address emerging issues in the digital era.

The Criminal Code is intended to promote fairness, prevent impunity, and uphold the rule of law in Nepal.

The Privacy Act, 2075 (2018)

The Privacy Act, 2075 (2018), enacted by the Government of Nepal, aims to protect individuals' privacy rights concerning their body, residence, property, documents, data, communication, and character. It establishes guidelines for the collection, storage, and use of personal information by public bodies, ensuring that such data is managed responsibly and securely. The Act defines "personal information" to include details such as caste, ethnicity, religion, education, contact information, biometric data, and criminal records

The Privacy Act also addresses unauthorized access to personal information, prohibiting actions like unauthorized body searches, trespassing, and the collection or dissemination of personal data without consent. It emphasizes the need for public bodies to obtain explicit consent before collecting personal information and mandates that such data be used solely for the purpose for which it was collected. While the Act provides a foundational framework for data protection, it acknowledges the necessity for additional regulations to effectively implement its provisions.

UGC Policy Regarding Research Misconduct, 2018

The UGC Policy Regarding Research Misconduct, established by the University Grants Commission (UGC) of Nepal, provides a framework for addressing and preventing research misconduct within higher educational institutions. This policy outlines the procedures for identifying, reporting, and investigating allegations of research misconduct, ensuring that such cases are handled with integrity and fairness. It emphasizes the importance of maintaining high ethical standards in research activities and aims to uphold the credibility and trustworthiness of academic work in Nepal. By implementing this policy, the UGC seeks to promote a culture of responsible research conduct and to deter unethical practices in the academic community.

Digital Nepal Framework 2019

The Digital Nepal Framework 2019 is a comprehensive initiative launched by the Government of Nepal aimed at transforming the country through the strategic use of digital technologies. The framework identifies eight key domains: digital foundation, agriculture, health, education, energy, tourism, finance, and urban infrastructure, with 80 initiatives designed to drive economic growth and improve public service delivery. By leveraging digital technologies, the framework aims to create a more inclusive and connected society, bridge the digital divide, and enhance the overall quality of life for all Nepalese citizens. It focuses on building robust digital infrastructure, promoting digital literacy, and encouraging innovation and entrepreneurship within the ICT sector.

Moreover, the Digital Nepal Framework 2019 emphasizes the importance of public-private partnerships and international cooperation to achieve its ambitious goals. The framework seeks to attract investment in ICT, develop a skilled workforce, and ensure cybersecurity and data protection. By aligning with global digital trends and best practices, the framework aims to

position Nepal as a competitive player in the global digital economy. This transformative approach is expected to spur socio-economic development, enhance governance, and provide new opportunities for growth and prosperity in Nepal.

National Science and Technology Innovation Policy, 2076

The National Science and Technology Innovation Policy, 2076 (2019) was introduced by the Government of Nepal to promote scientific and technological advancements in the country and foster an innovation-driven economy. The policy aims to create a conducive environment for scientific research, technological development, and innovation, which are seen as key drivers of economic growth and sustainable development. It emphasizes the need to invest in research and development (R&D), encourage collaboration between academia, industry, and the government, and build a strong science and technology infrastructure. The policy also stresses the importance of promoting innovation in key sectors such as agriculture, health, education, energy, and infrastructure, with a focus on addressing the country's specific challenges and needs.

In addition, the policy aims to develop a skilled workforce capable of driving technological innovation and supporting the digital transformation of Nepal. It encourages the establishment of innovation hubs, technology parks, and incubators to foster entrepreneurship and the commercialization of new ideas. The National Science and Technology Innovation Policy, 2076 further outlines strategies for enhancing public awareness of science and technology, ensuring equitable access to knowledge, and promoting environmental sustainability through green technologies. By prioritizing innovation and technology, the policy is designed to position Nepal as a competitive player in the global knowledge economy and contribute to the nation's overall socio-economic development.

National Ethical Guidelines for Health Research in Nepal, 2019

The National Ethical Guidelines for Health Research in Nepal, 2019, developed by the Nepal Health Research Council (NHRC), establishes a structured framework for conducting health research in Nepal. These guidelines ensure that research in the health sector adheres to ethical principles, safeguarding the dignity, rights, and well-being of participants. They emphasize the need for ethical review by an institutional review board (IRB) or ethics committee, ensuring that research projects are evaluated for potential risks to participants and that measures are taken to minimize harm. The guidelines mandate that researchers obtain informed consent from participants, guaranteeing that they fully understand the nature of the research, its risks, and its benefits. Additionally, the guidelines underscore the importance of maintaining confidentiality and protecting sensitive information collected during research.

Furthermore, the guidelines focus on promoting scientific integrity and transparency in health research. They outline the responsibilities of researchers, institutions, and sponsors to ensure that studies are conducted honestly and that findings are reported accurately. The ethical guidelines also cover the principles of fairness and equity in health research, ensuring that vulnerable populations are not exploited and that the research benefits society as a whole. By adhering to these guidelines, researchers in Nepal contribute to the advancement of public health while

maintaining the trust of participants and the broader community. The framework helps foster a culture of ethical health research that aligns with international standards and enhances the credibility and reliability of health research in Nepal.

Policy on the Use of Social Media in Electoral Management, 2077

The Policy on the Use of Social Media in Electoral Management, 2077 (2020) was introduced by the Election Commission of Nepal to regulate and guide the use of social media during electoral processes. The policy aims to ensure that social media platforms are used responsibly to enhance democratic participation, promote transparency, and ensure the integrity of elections. It outlines the roles and responsibilities of various stakeholders, including political parties, candidates, media organizations, and the public, to prevent the spread of misinformation, hate speech, and other harmful content during elections. The policy emphasizes the importance of maintaining ethical standards in the digital space, fostering a fair and balanced exchange of ideas, and ensuring that electoral campaigns are conducted within the boundaries of the law.

In addition, the policy provides guidelines for political parties and candidates on how to use social media platforms effectively for campaigning, voter engagement, and information dissemination while adhering to the principles of fairness and neutrality. The Election Commission is tasked with monitoring the use of social media during election periods to ensure compliance with the policy and take corrective actions if necessary. This initiative is part of Nepal's broader efforts to modernize electoral processes and leverage digital tools to enhance voter education, participation, and the overall integrity of the election system.

NTA Cyber Security Byelaw, 2077 (2020)

The NTA Cyber Security By-Law, 2077 (2020) was enacted by the Nepal Telecommunications Authority (NTA) to enhance the country's cybersecurity framework and ensure the protection of digital infrastructure within Nepal's telecommunications sector. The by-law sets forth a comprehensive set of rules and regulations designed to safeguard telecommunication services, service providers, and users from cyber threats, data breaches, and other digital risks. It mandates the implementation of robust cybersecurity practices, such as encryption, monitoring, and incident response mechanisms, by telecommunication operators and service providers. Additionally, the by-law requires the creation of a national cybersecurity framework to align with international standards and provide guidelines for the management of cyber risks across the sector.

The NTA Cyber Security By-Law, 2077 also establishes provisions for the licensing and certification of cybersecurity professionals, ensuring that qualified individuals are responsible for managing cybersecurity operations. It emphasizes the need for constant monitoring, reporting of cyber incidents, and the use of modern tools to mitigate risks. The by-law is a critical part of Nepal's broader strategy to develop a secure digital ecosystem, facilitate the safe use of digital services, and protect both citizens and businesses from the growing threat of cyber attacks.

National Cybersecurity Policy 2023 (2080)

The National Cybersecurity Policy 2023 of Nepal outlines a strategic framework to safeguard the nation's digital infrastructure and ensure the protection of data, networks, and systems from cyber threats. The policy emphasizes the importance of establishing a resilient cybersecurity ecosystem by enhancing the country's institutional capacity, promoting cybersecurity awareness, and fostering public-private collaborations. It aims to strengthen the cybersecurity governance structure and includes provisions for securing critical information infrastructures, developing a robust legal framework, and improving cyber incident response mechanisms. Additionally, the policy focuses on capacity building and skill development to address the growing challenges in the cybersecurity domain.

Directives on the Operation of Social Networks 2023

The Directives on the Operation of Social Networks 2023 were enacted by the Government of Nepal to regulate social media platforms and their users. The directives mandate that social media companies establish a presence in Nepal, either by setting up an office or appointing a focal person, within three months of enforcement. They are also required to register with the Ministry of Information and Communication Technology; failure to do so may result in the suspension of their operations in Nepal.

For users, the directives prohibit the creation of fake identities, sharing or commenting through such identities, and posting content that spreads hatred against any gender, community, caste, religion, profession, or group. Additionally, it bans the promotion of activities like child labor, human trafficking, child marriage, and polygamy. The directives also prohibit the use of content that spreads hate speech, disrespects or defames others, distorts images, invades privacy, or promotes illegal activities such as the use and trade of narcotic substances, gambling, spreading fake news, cyberbullying, and terrorism-related content.

E-Commerce Bill 2080 (2023)

The E-Commerce Bill 2080 (2023), recently enacted by the Government of Nepal, aims to create a legal framework that governs electronic commerce in the country. With the growing digital economy, the bill seeks to regulate online businesses, ensuring fair practices and consumer protection. One of the key features of the bill is the requirement for all e-commerce platforms to register with the Ministry of Industry, Commerce, and Supplies. This registration helps ensure that these platforms meet national standards and regulations. The bill also includes provisions for the protection of consumers, with clear guidelines regarding order confirmations, refunds, secure payment methods, and transparent delivery systems. By ensuring e-commerce businesses operate with integrity, the bill aims to enhance consumer trust and safeguard their rights in the digital marketplace.

In addition to consumer protection, the bill also outlines mechanisms for resolving disputes between consumers and e-commerce platforms. It establishes an efficient process for addressing grievances, ensuring timely resolution and accountability. Furthermore, while the bill does not explicitly detail provisions on data protection, it acknowledges the importance of safeguarding personal information in online transactions. As a result, the bill is seen as a significant step

toward fostering a secure and transparent e-commerce ecosystem in Nepal. By regulating online transactions and platforms, the E-Commerce Bill 2080 supports the growth of the digital economy while promoting fairness and trust within the market.

Information Technology and Cybersecurity Bill, 2024

The Nepal IT and Cybersecurity Bill 2024 is a landmark legislative measure aimed at fortifying the nation's digital infrastructure and safeguarding its cyberspace. This comprehensive bill outlines stringent regulations and frameworks to ensure the security and privacy of digital data, protect critical information infrastructure, and mitigate cyber threats. It mandates the establishment of a National Cybersecurity Center responsible for monitoring, preventing, and responding to cyber incidents. The bill also introduces strict penalties for cybercrimes, ranging from data breaches and identity theft to cyber espionage and digital fraud. By promoting robust cybersecurity practices and enforcing compliance, the bill seeks to build a resilient digital environment that can support Nepal's growing reliance on information technology.

In addition to enhancing cybersecurity, the Nepal IT and Cybersecurity Bill 2024 aims to foster a culture of digital responsibility and awareness among citizens and organizations. It includes provisions for cybersecurity education and training programs to equip the workforce with the necessary skills to tackle cyber threats. The bill encourages public-private partnerships to drive innovation in cybersecurity technologies and practices. It also emphasizes the importance of international collaboration to address the global nature of cyber threats, enabling Nepal to benefit from shared intelligence and best practices. Overall, the bill is a forward-thinking initiative that positions Nepal to proactively manage and secure its digital future in an increasingly interconnected world.

Social Media Regulation Bill 2024

The Nepal government approved the Social Media Regulation Bill on December 14, 2024, with the aim of curbing the spread of misinformation, cyberbullying, and harmful online content. This bill requires social media platforms to register in Nepal and remove harmful content, such as posts that could endanger national security or public order. While government officials argue it is necessary to safeguard national interests, critics express concerns that it could restrict free speech and increase government control over online discourse (Giri, 2024).

2.3 AI and Review of AI Policy

AI is a transformative technology that enables machines to mimic human intelligence by performing tasks such as learning, reasoning, problem-solving, and decision-making. It leverages data, algorithms, and computational power to simulate intelligent behavior, driving innovation across diverse fields like healthcare, finance, manufacturing, and entertainment. AI is the cornerstone of modern advancements, enabling technologies such as autonomous vehicles, virtual assistants, and predictive analytics. By processing vast amounts of data and continuously

improving through machine learning, AI not only enhances efficiency but also unlocks solutions to complex problems that were previously unattainable.

AI can be broadly categorized into three main types: Narrow AI, General AI, and Super AI. Narrow AI, also known as Weak AI, focuses on performing specific tasks efficiently, such as speech recognition, image analysis, or recommendation systems. General AI, or Strong AI, aims to replicate human-level intelligence, enabling machines to understand, learn, and adapt to a wide range of tasks and scenarios autonomously. Super AI, still a theoretical concept, envisions machines surpassing human intelligence, potentially leading to profound societal and ethical implications. These types highlight the scope and potential of AI, shaping the way humans interact with technology and the future of innovation.

The development of AI in Nepal has begun to influence various sectors, improving efficiency and addressing critical challenges. However, the absence of a structured AI policy limits its full potential. The need for a comprehensive AI policy in Nepal is driven by:

- **National Development:** AI can significantly contribute to sectors like agriculture, education, healthcare, and governance, addressing Nepal's unique challenges, such as remote accessibility and resource optimization.
- **Economic Growth:** AI-driven innovation can create jobs, enhance productivity, and foster new businesses, particularly in IT and Business Process Outsourcing (BPO).
- **Regulation and Ethics:** Policies are needed to ensure ethical AI practices, prevent data misuse, and maintain transparency.
- **Data Governance:** Reliable, secure, and accessible data is critical for AI development. A policy can define data ownership, privacy, and security standards.
- **Skilled Workforce:** Nepal requires AI-specific educational programs and skill development initiatives to prepare its youth for the global AI job market.
- **Global Competitiveness:** As AI becomes a global driver of innovation, Nepal must position itself as a hub for AI solutions to attract investment and international collaboration.
- **Security:** Cybersecurity threats and potential misuse can be solved by using AI technology.

As highlighted in the AI concept paper, AI has a broad and diverse range of applications across various sectors. These include healthcare, banking, manufacturing, education, and communication, where AI enhances efficiency, accuracy, and accessibility. Additionally, AI plays a significant role in improving government services, ensuring public safety, fostering creativity in art, advancing research and innovation, modernizing agriculture, and promoting the tourism industry. Its transformative potential can address challenges and unlock new opportunities, contributing to Nepal's economic growth and societal development.

In the following subsections, the AI policies and practices in Nepal will be examined. After exploring international AI policies and practices, the existing gaps and challenges faced by Nepal will be discussed.

2.3.1 AI Policies and Practices in Nepal

AI Concept Paper 2024

On Asar 16, 2081 B.S., Nepal's Ministry of Information and Communication Technology (MoICT) released a Concept Paper on "The Use and Practice of AI in Nepal". This paper, developed by a dedicated task force, marks the beginning of an effort to explore the potential and challenges of AI within the country. The Ministry has since established another task force tasked with drafting an Artificial Intelligence Policy, which will lay out a strategic framework for the adoption and governance of AI. Based on this policy, the government aims to introduce legislation to regulate and promote the ethical, safe, and innovative use of AI technologies in Nepal.

The Concept Paper covers the following areas:

- The concept of artificial intelligence
- Vision and objectives
- Current situation
- Policy framework
- Institutional and implementation arrangements
- International practices
- Problems and challenges
- Possible risks
- Future directions
- Proposed action plan
- Key partners

The objectives of the concept paper include:

- Developing digital public infrastructure to improve public service delivery through information technology and AI-driven e-services.
- Increasing productivity by leveraging AI in industrial production.

- Exploring both national and international opportunities, along with monitoring mechanisms to evaluate the impact and growth of AI initiatives in Nepal.
- Promoting research, education, and industrial collaboration to build a strong AI ecosystem.
- Ensuring responsible AI practices through the establishment of ethical guidelines, risk mitigation strategies, and public awareness campaigns.
- Facilitating quality control and operational policy management for companies developing AI-powered technologies like horizontal rovers.

The paper also stresses the need to view AI from several perspectives:

- Social Perspective
- Economic Perspective
- Technical Perspective
- Policy and Management Perspective
- Education and Training Perspective
- International Cooperation Perspective

Additionally, the paper outlines AI use cases across various sectors, including healthcare, agriculture, education, tourism, smart cities, transportation, infrastructure development, environmental monitoring, disaster management, natural resource management, cultural heritage, language translation, finance, good governance, and public services.

It identifies several problems and challenges related to AI in Nepal, categorizing AI risks based on the EU Artificial Intelligence Act's risk levels. The paper also proposes an action plan that includes:

- National AI Policy
- National AI Strategy
- Nepal AI Act
- Data protection framework and legislation
- Sector-specific AI guidelines
- Establishment of a dedicated nodal authority
- Development of foundational infrastructure and AI standards

- Creation of a unified AI portal
- National AI project development
- AI literacy initiatives
- AI research and development

The paper concludes by emphasizing the future direction for policy and framework development, which includes:

- A comprehensive AI policy framework
- National AI Strategy
- Data protection frameworks
- Sector-specific regulatory frameworks
- AI governance structures
- Digital literacy programs for AI
- Ongoing AI research and development initiatives.

National Science and Technology Innovation Policy, 2076

The National Science and Technology Innovation Policy, 2076 highlights the strategic role of advanced technologies such as bioinformatics, AI, and robotics in driving rapid development across industries, businesses, and other sectors (reference 9.36 & section 10). This policy envisions leveraging innovation to improve productivity and foster growth in Nepal's economy.

Digital Nepal Framework, 2019

The Digital Nepal Framework, 2019 identifies transformative technologies like AI, robotics, and IoT as critical enablers for exponential growth in both government and private sectors (page 16). These technologies are expected to revolutionize work processes, service delivery, and decision-making across sectors, ensuring Nepal's active participation in the global digital ecosystem.

Electronic Transaction Act, 2008

Electronic Transaction Act, 2008 provides a foundation for ensuring secure online transactions and digital activities. However, the frameworks primarily address broad data security concerns and lack specific provisions for AI-related data governance.

2.3.2 International AI Practices

UNESCO's AI Ethics Recommendation, 2021

AI policies and guidelines from different countries emphasize several common themes, such as ethical development, transparency, data protection, cybersecurity, and digital infrastructure. For instance, UNESCO's AI Ethics Recommendation (2021) calls for AI systems to uphold human rights, with a strong focus on inclusivity, transparency, and accountability. The recommendation stresses the importance of aligning AI development with the Sustainable Development Goals (SDGs), ensuring that AI is deployed for the public good, particularly in areas like healthcare, education, and environmental sustainability. Additionally, data privacy is emphasized, with AI systems required to safeguard personal data and respect privacy laws. On cybersecurity, the policy highlights the need for robust standards to protect AI systems from misuse and malicious attacks. UNESCO's guidelines also encourage countries to establish governance structures that ensure AI's ethical use (UNESCO, 2021).

India's National AI Strategy, 2021

India's National AI Strategy (2021) focuses on leveraging AI for national development, particularly in sectors like agriculture, healthcare, and education. The strategy stresses the importance of creating a transparent AI ecosystem that promotes accountability and avoids discrimination. Data privacy is a key concern, with policies advocating for compliance with global standards, such as the GDPR. Cybersecurity is also emphasized, urging measures to secure AI systems and prevent cyber threats, especially in critical infrastructure. Furthermore, the policy emphasizes the need to strengthen digital infrastructure to facilitate AI adoption across industries (NITI Aayog, 2021).

Sri Lanka's the National AI Strategy, 2022

In Sri Lanka, the National AI Strategy (2022) promotes the ethical use of AI, ensuring fairness and transparency while also focusing on AI's role in public services like healthcare and education. Data protection and privacy are essential elements, with AI technologies required to comply with national laws on data handling. The policy underscores the importance of cybersecurity, recommending strong protections for AI systems from cyber threats. Additionally, Sri Lanka's strategy prioritizes digital infrastructure development to support AI applications (Ministry of Science, Technology, and Research, 2022).

Bangladesh's National AI Policy, 2021

Bangladesh's National AI Policy (2021) also highlights AI as a tool for public welfare, emphasizing its potential to enhance sectors like agriculture and healthcare. The policy promotes ethical AI by ensuring transparency and inclusivity. On data protection, the policy mandates responsible handling of personal data, with strict compliance with privacy regulations. Cybersecurity is prioritized to protect AI systems from potential vulnerabilities. Bangladesh's policy similarly focuses on enhancing digital infrastructure to support AI innovation.

United States's National AI Strategy, 2023

The United States recently updated its National AI Strategy (2023), emphasizing its leadership in AI research and development. The strategy advocates for AI systems that are transparent and

accountable, with clear guidelines for mitigating biases and ensuring fairness. Data privacy is a key concern, with a push for stronger privacy laws to protect individuals' data. Cybersecurity is a critical aspect of the strategy, ensuring AI systems are secure from potential cyber threats. Additionally, the strategy focuses on strengthening digital infrastructure to support AI deployment across various sectors (The White House, 2023).

The European Union's AI Act, 2021

The European Union's AI Act (2021) introduces a regulatory framework for AI based on a risk-based approach. High-risk AI systems are subject to strict regulations, ensuring transparency and human-centric values in their design and deployment. The policy also integrates data protection principles, ensuring compliance with the GDPR. Cybersecurity is a significant focus, with specific requirements for high-risk AI systems to be resilient against cyber threats. The EU also emphasizes sustainability, ensuring that AI technologies contribute positively to long-term societal development.

Japan's the AI Strategy, 2021

In Japan, the AI Strategy (2021) encourages the responsible development of AI with a focus on enhancing human well-being. Japan promotes international collaboration to set global standards for AI. Cybersecurity is a core element, with strong protections for AI systems to prevent cyber vulnerabilities. Data privacy is similarly prioritized, with AI systems required to adhere to Japan's privacy laws. Additionally, the policy focuses on strengthening digital infrastructure to facilitate AI deployment.

China's AI Governance Principles, 2021

China's AI Governance Principles (2021) emphasize ethical AI, ensuring that AI systems are fair, transparent, and accountable. Data protection is a significant concern, with AI technologies subject to strict regulations on data collection and privacy. Cybersecurity is prioritized, especially in critical sectors like healthcare and defense, where AI systems must be safeguarded from cyber threats. Innovation is another focus, with China aiming to leverage AI for national technological and economic leadership. China also invests heavily in digital infrastructure to support AI development.

South Korea's AI Policy, 2022

South Korea's AI Policy (2022) focuses on ethical guidelines to ensure fairness and human rights in AI applications. The policy advocates for the use of AI in public welfare, addressing societal issues such as the aging population and healthcare. Cybersecurity is emphasized to protect AI systems from potential cyber threats, while data protection is prioritized to ensure personal data is handled responsibly. South Korea's policy also includes significant investments in digital infrastructure to enable AI technologies to be efficiently deployed across industries.

OECD's AI Principles, 2021

Finally, the OECD's AI Principles (2021) provide a framework for AI governance, emphasizing inclusive growth, transparency, accountability, and safety. The principles call for international collaboration on AI development, ensuring global consistency in AI regulations. Data privacy and cybersecurity are central to the OECD's framework, with AI systems required to comply with privacy laws and be secure from potential cyber threats. Additionally, the OECD advocates for the sustainability of AI technologies, ensuring they align with global environmental goals (Organisation for Economic Co-operation and Development [OECD], 2021).

Summary from the International Practices

Human-Centric AI: Across most AI frameworks, there is a strong emphasis on ensuring that AI systems respect human dignity, fundamental rights, and ethical principles. This includes the promotion of fairness, equity, and social good through responsible AI development and deployment.

Transparency and Explainability: A key principle in AI governance is transparency. This transparency helps build trust and accountability, as individuals can better understand and challenge decisions made by AI.

Data Privacy and Protection: A significant focus in AI policies is safeguarding personal data when AI systems collect, process, and analyze sensitive information.

Ethical and Social Responsibility: Governments and international organizations emphasize the need for AI to be developed and deployed responsibly, ensuring that AI technologies do not perpetuate biases or inequities.

Workforce Upskilling and Development: As AI becomes increasingly integrated across industries, there is a growing focus on developing the AI workforce through education, training, and research collaborations.

International Collaboration: Many nations are collaborating on establishing international AI frameworks that set shared ethical standards and regulatory approaches.

Cybersecurity Standards: Ensuring that AI systems are resilient to cyber threats is a key concern, particularly for high-risk applications.

Digital Infrastructure: Nearly all AI policies highlight the need for strong digital infrastructure to support the scalable and efficient deployment of AI applications.

2.3.3 Gaps in AI Practices

The current policies and concept paper in Nepal leave several crucial questions unanswered:

- How does the policy address diverse perspectives impacting AI, such as data privacy, protection, freedom of speech, and cybersecurity risks? While risks are mentioned theoretically, practical approaches remain unclear.

- What strategies can transform society through AI?
- How can marginalized, geographically isolated, or deprived groups benefit equitably from AI advancements?
- From Nepal's perspective, how can a balance between stringent regulation and the necessary flexibility foster AI ecosystem development?
- What is Nepal's long-term vision for AI, and how can policies align with this goal?
- What roles and responsibilities do multi-stakeholders—central, federal, and local governments, civil society, and others—have in shaping and implementing AI strategies?
- Although the draft includes a rich collection of international practices, it lacks direction-specific recommendations tailored to Nepal's unique context.
- How can Nepal uplift its AI ecosystem effectively?
- What strategies should be employed for skilling and reskilling the workforce to ensure economic growth through AI?
- What policies should govern cross-border data transfers involving AI?

Additionally, key areas of policy development remain unexplored, such as:

- Ensuring algorithmic transparency and accountability.
- Defining intellectual property rights for AI innovations.
- Establishing ethical guidelines for AI design and deployment.
- Building technical infrastructure for AI development.
- Formulating import and export policies for AI data and models.

Challenges of AI in Nepal

1. **Lack of Skills, Expertise, and Experience:** Nepal faces a significant shortage of skilled professionals, technical expertise, and hands-on experience in the development, implementation, and utilization of AI technologies.
2. **Data Identification and Ecosystem Challenges:** The absence of a well-defined and efficient data ecosystem, coupled with difficulties in identifying relevant datasets, poses a major hurdle for AI implementation.
3. **Lack of AI Literacy:** There is a general lack of awareness and literacy regarding the development, use, and potential benefits of AI technologies in various sectors.

4. **High Cost and Resource Requirements:** AI development and deployment require substantial investment and computational resources, which are often inaccessible in Nepal due to financial and infrastructural constraints.
5. **Absence of Data Security and Privacy Policies:** Nepal lacks robust policies and legal frameworks to ensure data security, privacy, and ethical AI implementation, leading to vulnerabilities in AI systems.
6. **Limited Collaboration and Coordination:** Insufficient collaboration and coordination among government, private sector, academia, and other stakeholders hinder the growth and implementation of AI in the country.
7. **Dependence on Imported AI Systems:** Due to the lack of indigenous AI systems, Nepal relies heavily on imported technologies, which raises concerns regarding data security, privacy, and sovereignty.
8. **Ethics and Inclusivity Concerns:** Ensuring ethical use of AI, inclusivity, and fairness remains a challenge, particularly in a diverse socio-economic context like Nepal.
9. **Transparency, Accountability, and Responsibility:** There is a need to establish mechanisms that ensure transparency, accountability, and clear responsibility in the development and deployment of AI solutions.
10. **Intellectual Property Protection:** Weak intellectual property regulations and enforcement hinder research, innovation, and investment in AI technologies.
11. **Limited Research and Development:** Nepal faces a lack of adequate research and innovation in AI, which is critical for developing effective and sustainable AI applications tailored to the country's needs.
12. **Lack of Computational Resources:** The limited availability of computational infrastructure, such as high-performance computing systems, restricts the development and widespread use of AI technologies in Nepal.

2.4 Review of Data Privacy, Data Protection, Cybersecurity and Data Governance

Data protection and digital privacy are critical considerations in the development and implementation of AI. AI systems rely heavily on vast amounts of personal data for training and decision-making, making privacy and data protection essential to prevent misuse and unauthorized access. Without clear data privacy regulations, AI can inadvertently infringe on individual rights by processing sensitive data without consent or transparency. As AI technologies continue to evolve, ensuring compliance with data protection laws like GDPR is crucial to safeguard personal information, maintain trust, and avoid legal repercussions. By

integrating privacy and protection measures into AI development, organizations can foster more ethical AI practices that respect individual rights and enhance data security.

Data: Data refers to information that is collected, processed, and stored in various formats. It can include facts, figures, observations, or measurements that can be analyzed to draw conclusions or make decisions. Data exists in structured (e.g., databases) or unstructured forms (e.g., text, images). According to Wang and Strong (1996), high-quality data is characterized by its accuracy, completeness, and relevance.

Data Privacy: Data privacy pertains to the proper handling, processing, and storage of personal data to ensure individuals' rights and confidentiality are protected. It involves controlling how personal information is collected, used, shared, and stored. Data privacy frameworks, such as the GDPR, aim to ensure that personal data is managed ethically and legally (Regulation (EU) 2016/679).

Data Protection: Data protection refers to the measures and safeguards implemented to secure data from unauthorized access, misuse, or breaches. It involves technical and organizational strategies, such as encryption, access controls, and regular audits, to ensure data integrity, availability, and confidentiality (ISO/IEC 27001:2013). Effective data protection ensures compliance with regulatory standards and builds trust among stakeholders (Von Solms & Van Niekerk, 2013).

Cybersecurity: Cyber security refers to the practice of protecting systems, networks, devices, and data from cyber threats such as hacking, malware, and unauthorized access. It encompasses measures and strategies designed to defend against cyberattacks, ensure the confidentiality, integrity, and availability of information, and maintain the safe functioning of digital environments. Cybersecurity involves various domains, including network security, application security, data security, identity management, and disaster recovery. It is essential for safeguarding sensitive information and ensuring the security and reliability of information systems used by individuals, organizations, and governments (NIST, 2016).

Data Governance: Data governance refers to the management of data availability, usability, integrity, and security within an organization. It involves setting policies, standards, and procedures to ensure that data is managed effectively and responsibly throughout its lifecycle. This includes ensuring data is accurate, accessible to authorized users, and compliant with applicable laws and regulations, while minimizing risks related to misuse or breaches. The purpose of data governance is to enable organizations to make informed, data-driven decisions, improve data quality, and maintain compliance with legal requirements (Khatri & Brown, 2010).

2.4.1 Data Privacy and Protection in Nepal

Nepal has established a legal framework for data privacy and protection through its constitution and subsequent legislation. Below is a review of the key provisions related to these areas:

Constitution of Nepal, 2072 (2015)

The Constitution of Nepal enshrines the Right to Privacy as a fundamental right under Article 28. This provision guarantees the inviolability of privacy, except as prescribed by law. It protects individuals' privacy regarding their person, residence, property, documents, records, statistics, correspondence, and reputation. This recognition underscores the commitment of the state to safeguard personal privacy against unauthorized intrusion, ensuring a robust constitutional foundation for data protection.

The Privacy Act, 2018

Data plays a pivotal role in the application of AI and other emerging technologies. The Personal Privacy Act, 2075 ensures the protection of written, statistical, and correspondence-related information, emphasizing the secure use of personal data within public bodies and institutions. It also emphasizes to have privacy of documents of the person (section 11) and to have privacy of data (section 12), to have privacy of correspondence (section 13), not to open letter (section 14), to have privacy of character (section 15), not to take or sell photograph (section 16), to have privacy of electronic means (section 19) etc. Adopted to operationalize the constitutional provision, the Privacy Act, 2018, is a comprehensive piece of legislation that governs privacy-related issues, including personal data protection. Key features of the Act include:

- **Scope of Privacy Protection:** The Act ensures the privacy of individuals regarding their body, family, residence, property, documents, data, correspondence, and character.
- **Electronic Data Protection:** Section 19 explicitly extends these protections to personal information stored electronically.
- **Definitions:**
 - Personal Information is defined in Section 2(c), while Sensitive Information is elaborated in Section 27(2).
- **Consent and Disclosure Requirements:**
 - Section 23 mandates that personal data cannot be collected or used without legal compliance.
 - Section 26 requires prior consent from the data subject before their information is processed.
 - Section 23(4) obligates entities to disclose the purpose, objectives, content, and nature of the data collection.
- **Restrictions on Processing:**
 - Section 27 prohibits government agencies from processing sensitive data without due authorization.

These provisions align Nepal's data privacy laws with international best practices, emphasizing transparency, informed consent, and lawful processing.

The Criminal Code of Nepal, 2017

The Criminal Code provides additional safeguards against privacy breaches in Part 3, Chapter 1, by criminalizing various privacy violations, such as:

- Unauthorized listening to or recording of private conversations.
- Divulging confidential information.
- Photographing or disfiguring a person's image without consent.
- Selling photographs without consent.
- Taping telephone conversations.
- Unauthorized entry into private premises.

These prohibitions further strengthen the privacy protection regime in Nepal by imposing penalties on unauthorized actions that breach personal or data privacy.

Guidelines for Research Ethics and Data Collection

Nepal has initiated efforts to regulate research ethics and data collection, with frameworks such as:

- *National Ethical Guidelines for Health Research in Nepal, 2019*: Establishing ethical standards for health-related research.
- *UGC Policy on Research Misconduct, 2018*: Addressing research misconduct and promoting integrity in academic research.

However, these guidelines are sector-specific and do not extend to broader AI development, highlighting the need for explicit directives in this domain.

Information Technology and Cybersecurity Bill, 2024

The Nepal IT and Cybersecurity Bill 2024 is a landmark legislative measure aimed at fortifying the nation's digital infrastructure and safeguarding its cyberspace. This comprehensive bill outlines stringent regulations and frameworks to ensure the security and privacy of digital data, protect critical information infrastructure, and mitigate cyber threats. It mandates the establishment of a National Cybersecurity Center responsible for monitoring, preventing, and responding to cyber incidents. The bill also introduces strict penalties for cybercrimes, ranging from data breaches and identity theft to cyber espionage and digital fraud. By promoting robust cybersecurity practices and enforcing compliance, the bill seeks to build a resilient digital environment that can support Nepal's growing reliance on information technology.

In addition to enhancing cybersecurity, the Nepal IT and Cybersecurity Bill 2024 aims to foster a culture of digital responsibility and awareness among citizens and organizations. It includes provisions for cybersecurity education and training programs to equip the workforce with the necessary skills to tackle cyber threats. The bill encourages public-private partnerships to drive innovation in cybersecurity technologies and practices. It also emphasizes the importance of international collaboration to address the global nature of cyber threats, enabling Nepal to benefit from shared intelligence and best practices. Overall, the bill is a forward-thinking initiative that positions Nepal to proactively manage and secure its digital future in an increasingly interconnected world.

Social Media Regulation Bill 2024

The Nepal government approved the Social Media Regulation Bill on December 14, 2024, with the aim of curbing the spread of misinformation, cyberbullying, and harmful online content. This bill requires social media platforms to register in Nepal and remove harmful content, such as posts that could endanger national security or public order. While government officials argue it is necessary to safeguard national interests, critics express concerns that it could restrict free speech and increase government control over online discourse.

Cybersecurity and Data Breaches in Nepal

This section discusses data breaches in Nepal, highlighting various incidents that have occurred. These incidents underscore the urgent need for robust cybersecurity measures, improved data protection practices, and comprehensive regulatory frameworks to safeguard against the growing threat of cyber attacks in Nepal.

NIC Asia Bank Cyber Heist

The SWIFT-related cyber heist on NIC Asia Bank in October 2017 highlighted the significant impact of business process compromises in the banking sector. Hackers successfully exploited vulnerabilities in the SWIFT (Society for Worldwide Interbank Financial Telecommunication) network, leading to the unauthorized transfer of approximately \$4.4 million from the bank's accounts. The perpetrators gained access to the bank's SWIFT system, allowing them to issue fraudulent transaction instructions to foreign banks. This incident underscored the critical importance of robust cybersecurity measures and stringent business process controls within financial institutions to prevent such breaches and protect against the growing threat of sophisticated cyber attacks (Trend Micro, 2017).

Millions Stolen by ATM Hackers Exposes Vulnerability of Nepali banks

The theft of millions by ATM hackers in Nepal has exposed significant vulnerabilities within the country's banking sector. In October 2019, hackers orchestrated a series of coordinated attacks on several ATMs, successfully extracting millions of rupees by exploiting weaknesses in the banks' security systems. This high-profile incident highlighted the inadequate cybersecurity measures in place, raising concerns about the banks' ability to protect customer data and financial assets. The breach underscored the urgent need for Nepali banks to bolster their security

infrastructure, implement more robust defense mechanisms, and adopt advanced technologies to safeguard against such sophisticated cyber threats in the future (Trend Micro, 2019).

Vianet Data Breach

In early April 2020, Vianet Communications, one of Nepal's leading Internet service providers, suffered a significant data breach that resulted in the leakage of personal details of over 160,000 customers. The breach exposed sensitive customer information, including names, email addresses, contact numbers, and addresses. This incident, discovered when the stolen data was found circulating on various online platforms, prompted widespread concern about the company's data security protocols and the broader cybersecurity infrastructure in Nepal. Vianet acknowledged the breach and assured customers of its commitment to strengthening security measures to prevent such incidents in the future. This event underscored the pressing need for robust cybersecurity practices to safeguard personal information in the digital age (Shrestha, 2020).

Foodmadu Data Breach

In April 2020, Foodmandu, a prominent food delivery platform in Nepal, experienced a significant data breach that exposed the personal information of over 50,000 users. The breach, orchestrated by an individual known as Mr. Mugger, resulted in the leakage of sensitive data, including customer names, contact details, and addresses. This incident came on the heels of the Vianet data breach, further exacerbating concerns about digital data privacy in Nepal. Foodmandu acknowledged the breach and took immediate steps to enhance their security measures, while also cooperating with cybersecurity experts and law enforcement agencies to investigate the incident. The breach highlighted the urgent need for stronger cybersecurity protocols to protect user data in Nepal's growing digital economy (Shrestha, 2020).

Singha Durbar Server Continues to Face Cyberattacks

The Singha Durbar server, a critical component of Nepal's government infrastructure, has been under persistent cyberattacks, significantly disrupting operations and raising severe concerns about national cybersecurity. As reported in January 2023, these ongoing attacks have targeted sensitive government data and disrupted essential services, highlighting substantial vulnerabilities within the governmental digital framework. Despite efforts by the National Information Technology Center (NITC) to bolster security measures, the server remains a prime target for cybercriminals. This relentless assault underscores the urgent need for comprehensive cybersecurity strategies, enhanced protective measures, and robust response mechanisms to safeguard Nepal's critical digital assets and ensure the continuity of government functions (Shrestha, 2023).

Government's Main Server Faces Cyberattacks

In January 2024, Nepal's main government server faced multiple cyberattacks, disrupting various online services and raising significant concerns about the country's cybersecurity infrastructure. The attacks targeted the government's primary server, impacting the functionality and

accessibility of several crucial governmental websites. Authorities confirmed the incident, stating that immediate measures were taken to contain the breach and restore services. The National Information Technology Center (NITC) and cybersecurity experts are conducting a thorough investigation to identify the source and nature of the attacks. This incident underscores the urgent need for enhanced cybersecurity protocols and robust defensive mechanisms to safeguard national digital assets against increasingly sophisticated cyber threats (Shrestha, 2024).

Youngsters Lead Cyber Fraud Surge in Nepal

In recent years, Nepal has witnessed a significant surge in cyber fraud, predominantly driven by young individuals. According to a report published in November 2024, an increasing number of young people are engaging in cybercriminal activities, leveraging their tech-savviness to exploit vulnerabilities in digital systems. This trend has been fueled by factors such as high unemployment rates, the lure of easy money, and the rapid proliferation of digital technology. Authorities have noted a rise in various forms of cyber fraud, including phishing, hacking, and online scams. The Nepal Police and cybersecurity experts are intensifying efforts to combat this growing menace, emphasizing the need for stronger digital literacy programs, stricter law enforcement, and robust cybersecurity measures to protect individuals and organizations from cyber threats (Aryal, 2024).

F1Soft's Bank Account Hacked

In a shocking incident reported on December 22, 2024, hackers stole Rs 34.2 million from the account of F1Soft, a leading Nepali technology company and operator of popular platforms like eSewa and fonipay. Exploiting the company's corporate banking system, the funds, held in Citizens Bank International, were transferred to multiple accounts in a suspected international hacking operation. Linked to informal hundi transactions, the theft highlights critical vulnerabilities in Nepal's banking security. Despite arrests and ongoing investigations, the hacking method remains unclear, prompting authorities to urge financial institutions to enhance cybersecurity measures amid rising cybercrime threats in the digital banking era (Pardafash, 2024).

Nepal's cybersecurity landscape is currently grappling with several challenges as digital adoption increases across sectors. While the government and private organizations have made efforts to strengthen security protocols, recent incidents, including high-profile data breaches, ongoing cyberattacks on critical infrastructure, and a rise in cybercrime, highlight significant vulnerabilities. The involvement of young individuals in cyber fraud, as well as the persistent targeting of government servers, underscores the urgent need for more robust cybersecurity frameworks. There is a growing recognition of the need for comprehensive cybersecurity laws, digital literacy programs, and enhanced cooperation between governmental agencies, private entities, and cybersecurity experts. To mitigate risks and protect the digital ecosystem, Nepal must invest in stronger security measures, advanced threat detection systems, and a culture of cybersecurity awareness.

2.4.2 International Practices for Data Privacy and Protection

Data privacy and protection are critical issues globally, and many countries have implemented robust legal frameworks and practices to safeguard personal data. These practices focus on transparency, consent, accountability, and security, and they aim to protect individuals' privacy while promoting the responsible use of data.

General Data Protection Regulation (GDPR) – European Union

The GDPR, which came into effect in 2018, is one of the most comprehensive and widely recognized frameworks for data protection. It applies to all businesses operating within the EU or handling the personal data of EU citizens. Key provisions of the GDPR include:

- **Consent:** Organizations must obtain explicit consent from individuals before collecting or processing their personal data (Article 7).
- **Rights of Data Subjects:** The GDPR grants individuals several rights, including the right to access, rectify, erase (right to be forgotten), and port their data (Articles 15-20).
- **Data Breach Notification:** Organizations are required to notify the relevant authorities and affected individuals within 72 hours of discovering a data breach (Article 33).
- **Data Protection by Design and Default:** Organizations must integrate data protection into their business processes from the outset (Article 25).
- **Penalties:** Failure to comply with the GDPR can result in fines up to €20 million or 4% of annual global turnover, whichever is higher (Article 83).
The GDPR has set a global benchmark for data protection practices, influencing regulations in other regions, such as Brazil's LGPD and California's CCPA.

California Consumer Privacy Act (CCPA) – United States

The California Consumer Privacy Act (CCPA), enacted in 2018, is a significant privacy law in the United States, focusing on the rights of California residents. The CCPA includes provisions such as:

- **Right to Access:** Consumers have the right to know what personal information is being collected and to request access to it (Section 1798.100).
- **Right to Deletion:** Consumers can request the deletion of their personal information, with certain exceptions (Section 1798.105).
- **Right to Opt-Out:** Individuals can opt out of the sale of their personal information (Section 1798.120).
- **Penalties:** The CCPA imposes penalties for non-compliance, including fines for each violation (Section 1798.155).

While the CCPA is more limited in scope than the GDPR, it has had a significant impact on privacy practices in the U.S. and has inspired the development of similar laws in other states.

Personal Data Protection Act (PDPA) – Singapore

Singapore's Personal Data Protection Act (PDPA), enacted in 2012, is another leading example of data protection legislation in Asia. The PDPA incorporates several core principles, including:

- ***Consent***: Organizations must obtain the consent of individuals before collecting, using, or disclosing their personal data (Section 13).
- ***Purpose Limitation***: Data must only be collected for specific purposes, and organizations must ensure that data is used only for those purposes (Section 18).
- ***Data Access and Correction***: Individuals have the right to access and correct their personal data held by organizations (Section 21).
- ***Data Breach Notification***: Organizations must notify the Personal Data Protection Commission (PDPC) of data breaches that pose a significant risk to individuals (Section 26).

The PDPA also mandates that organizations implement reasonable security measures to protect personal data and allows for enforcement through penalties for non-compliance.

Privacy Act – Australia

Australia's ***Privacy Act 1988*** regulates the handling of personal information by Australian Government agencies and private organizations. Key features of the Act include:

- ***Australian Privacy Principles (APPs)***: The Act outlines 13 privacy principles that cover the collection, use, and disclosure of personal information, data quality, and security (Section 6).
- ***Consent and Transparency***: Organizations must inform individuals about the collection and purpose of their personal data (APP 5).
- ***Data Breach Notification***: The Privacy Amendment (Notifiable Data Breaches) Act 2017 requires organizations to notify individuals about eligible data breaches (Section 26WE).
- ***Rights of Individuals***: Individuals can request access to their data and seek correction if it is inaccurate (APP 12 and 13).

The Privacy Act also imposes penalties for violations and provides an avenue for individuals to lodge complaints with the Office of the Australian Information Commissioner (OAIC).

Convention 108 – Council of Europe

Convention 108, adopted in 1981, is the first international treaty to address data privacy. It provides a framework for protecting individuals' personal data and has been ratified by numerous countries. Key principles include:

- **Fair and Lawful Processing:** Personal data should be processed fairly and in accordance with the law.
- **Data Minimization:** Data should be collected only for specified, legitimate purposes and should not be kept longer than necessary.
- **Rights of Data Subjects:** Individuals have the right to access their data and rectify inaccuracies.
- **International Cooperation:** Convention 108 promotes the exchange of information on data protection practices between countries and ensures cross-border data protection.

UNESCO AI Ethics Recommendation, on 24th November 2021, addressing ethical issues concerning AI, UNESCO has declared ten basic principles which are as follows:

1. Prioritizing secure AI systems, any challenges that such systems pose must be addressed in a way that is beneficial to humanity and the environment.
2. A.I. stakeholders must ensure openness and impartiality and make its benefits available to all.
3. The human, social, cultural, economic, and environmental impacts of AI should be regularly examined and ensured that it is consistent with the UN Sustainable Development Goals, including the UN Sustainable Development Goals.
4. Privacy must be protected throughout the life cycle of AI systems.
5. To ensure that Member States are able to impose moral and legal obligations on people resulting from AI systems Moreover, as a rule, life and death decisions should not be handed over to AI systems.
6. AI systems (including those with regional impact) to support democratic governance. It is important to make sure that people are transparent and explanatory.
7. Appropriate monitoring, inspection, impact assessment to ensure accountability for AI systems. A proper management mechanism, including auditing, must be developed.
8. AI through open and accessible education, citizen engagement, AI ethics training etc. Public awareness and understanding of technologies should be promoted so that people can make informed decisions about the use of AI systems and be protected from undue influence.
9. States are able to regulate data that originates or passes through their territories and will be able to take measures to effectively regulate data in accordance with international law. In addition, measures should be taken to allow limited groups meaningful participation

2.4.3 AI, Data Governance and Privacy OECD Artificial Intelligence

This report focuses on the privacy risk and opportunities stemming from recent AI developments.

1. Generative A catalyst for collaboration on AI and privacy
2. Mapping existing OECD principles on privacy and on AI: Key policy considerations
3. National and regional developments in AI and privacy.

Privacy and the OECD Recommendation on AI

- Respect for the rule of law, human rights and democratic values, including fairness and privacy, throughout the AI system lifecycle
- Robustness, security and safety-calls for AI actors to, among other things, ensure the traceability of AI systems including in relation to datasets, processes and decisions made during the AI system lifecycle, and that AI actors should apply a systematic risk management approach to AI system lifecycle phases to address risks such as privacy, digital security, safety and bias.
- Investing in AI research and development-calls for, among other things, governments to consider public investment and encourage private investment in open datasets that are representative and respect privacy and data protection.

G7 Round table of Data Protection and Privacy Authorities

- Legal authority for the processing of personal information, particularly that of minors and Children, in relation to train models;
- Security safeguards to protect against threats and attacks that can leak personal information originally processed in the database used to train the model;
- Mitigation and monitoring measures to ensure personal information generated by generative AI tools is accurate and non-discriminatory;
- Transparency measures to promote openness and explain-ability in the operation of generative AI tools;
- Technical and organizational measures to ensure the ability for individuals affected by or interacting with these systems to exercise their rights, e.g. to erasure or not to be subject to automated decisions;
- Accountability measures to ensure appropriate levels of responsibility among actors in the AI supply chain;
- Limiting collection of personal data to only that which is necessary to fulfil the specified task.

5 Value-based Principles for Trustworthy, Human-centric AI

1. Inclusive growth, sustainable development and well-being
2. Respect for the rule of law, human rights and democratic values, including fairness and privacy
3. Transparency and explainability
4. Robustness, security and safety
5. Accountability

5 Recommendations to Governments for AI Ecosystems to Benefit Societies

1. Investing in AI research and development
2. Fostering an inclusive AI-enabling ecosystem (data, compute, technologies)
3. Shaping an enabling interoperability governance and policy environment for AI
4. Building human capacity and preparing for labor market transformation
5. International cooperation and measurement on trustworthy AI

2.4.4 Gaps of Nepal Data Protection and Privacy based on International Practices

1. **Extra-Territorial Effect:** Nepal's data privacy laws do not address data breaches affecting Nepali citizens outside of Nepal, unlike the GDPR, which applies internationally.
2. **Regulatory Authority:** There is no dedicated regulatory body in Nepal to enforce data protection laws, whereas other countries have established authorities to oversee compliance.
3. **Data Breach Notification Requirement:** Nepal's law lacks mandatory notification requirements for data breaches to authorities or individuals, while GDPR mandates breach notifications within 72 hours.
4. **Data Subject Rights:** The Privacy Act does not grant rights such as data access, erasure, or portability, which are available under GDPR.
5. **Penalties for Data Breaches:** Nepal does not impose penalties for mishandling personal data, unlike GDPR, which enforces heavy fines for non-compliance.
6. **Cross-Border Data Transfer:** There are no clear regulations in Nepal for the transfer of data outside the country, unlike GDPR, which has strict rules on cross-border data transfers.

7. **Digital Data Protection:** Nepal lacks comprehensive guidelines for securing digital data, while other countries provide detailed protection measures for digital information.
Data Processing Definitions: Nepal's law does not clearly define "data processing," unlike GDPR, which offers precise definitions for better compliance.
8. **Data Protection by Design:** Nepal does not require data protection to be integrated into systems from the outset, unlike GDPR, which mandates data protection by design and default.
9. **Enforcement Mechanisms:** Nepal lacks effective monitoring and enforcement mechanisms to ensure compliance with data protection laws, whereas GDPR includes continuous regulatory oversight.

At the same time, the rapid growth of AI heightens the need for stronger data privacy frameworks. AI systems, especially those powered by machine learning, depend on data that often includes personal, sensitive, or confidential information. As these systems collect, process, and analyze data, they create new challenges in managing how data is accessed, shared, and stored. Effective data protection laws are necessary to regulate these practices, ensuring that AI operates within ethical boundaries. Additionally, AI can help improve data privacy by automating compliance, detecting breaches, and securing data storage, reinforcing the relationship between advanced technology and robust data protection. In future, combining AI with sound data privacy practices will be key to balancing innovation with individual rights and security.

2.5 Review of Digital Infrastructure

2.5.1 Role of Digital Infrastructure in AI

Digital infrastructure is pivotal to the development and scaling of AI technologies. As AI systems require vast amounts of data processing, storage, and real-time computational power, a strong digital infrastructure serves as the foundation for their successful implementation. Digital infrastructure includes critical elements such as data centers, internet connectivity, bandwidth, mobile and telephone networks, cloud infrastructure- all of which are essential to AI's widespread use and advancement.

Data centers, which house the physical hardware for computing and storage, are central to processing the enormous datasets used in AI applications. These centers provide the required computational power to train and execute machine learning models, from simple algorithms to complex deep learning systems. Moreover, high-speed internet connectivity and sufficient bandwidth are essential for AI systems to transfer data quickly and efficiently, enabling real-time processing for applications in healthcare, finance, autonomous driving, and more.

Cloud infrastructure enhances digital capabilities by offering scalable resources that AI systems can access remotely. This enables developers and organizations to build, test, and deploy AI

models without the need for large, costly physical infrastructures. Mobile and telephone networks also play a significant role in expanding the reach of AI technologies, enabling applications such as mobile health monitoring, AI-powered customer service, and smart city systems.

2.5.2 Current Scenario of Digital Infrastructure in Nepal

Data center

Nepal is home to over 12 data centers, with a few notable examples listed below:

- Dataspace Putalisadak: Managed by Dataspace Pvt. Ltd., located at Kamaladi Road.
- Cloud Himalaya Data Center: Run by Cloud Himalaya Pvt. Ltd., based on Central Business Park, Thapathali.
- AccessWorld Data Center: Overseen by AccessWorld Tech Pvt. Ltd., found at Krishna Galli.
- Government Integrated Data Center: Managed by the National Information Technology Center (NITC), located in Singhadurbar.
- DataHub Kathmandu: Operated by DataHub Pvt. Ltd., situated at Thapathali Road

Internet and Bandwidth

According to the Nepal Telecommunications Authority's MIS Report for Poush 2080, the total broadband penetration in Nepal reached 140.04% of the population. This significant increase reflects the country's transition from dial-up connections to modern broadband technologies, including 4G and fiber-optic systems, offering speeds ranging from 1 Mbps to over 100 Mbps. These advancements have substantially enhanced both the quality and accessibility of internet services across Nepal (Nepal Telecommunications Authority, 2023).

Mobile

Mobile penetration rate of 122.16% as of Ashadh 2081. This figure reflects the total number of mobile subscriptions relative to the population, not unique users. The overestimation arises from multiple SIM ownership and excludes regions with limited or no connectivity, meaning actual unique user penetration is lower (MIS Report, 2081).

Telephone

According to the Nepal Telecommunications Authority (NTA), the total teledensity in Nepal was 141.13% as of Poush 2080. This represents a slight decrease from 143.62% in Ashar. Teledensity encompasses services such as GSM, WCDMA, and CDMA. The decline may be attributed to factors like market saturation, multiple SIM ownership, and the increasing use of over-the-top

services. Despite this, Nepal's teledensity remains high, indicating substantial penetration of telecommunication services nationwide (Nepal Telecommunications Authority , 2024).

Quality of Service

Nepal has achieved significant growth in internet penetration, reaching 90.6% of its population, and the Network Infrastructure market is projected to grow at 2.40% annually, reaching \$35.99 million by 2029 (*Statista*, n.d.).

However, Quality of Service (QoS) issues persist, with frequent complaints about slow speeds and disruptions. In 2021, Nepal ranked 108th globally for fixed broadband speeds, with averages of 33.87 Mbps for downloads and 29.63 Mbps for uploads (“Nepali Internet User”, 2021)

The government is addressing these challenges through the Digital Nepal Framework and the National Cybersecurity Policy, which includes a National Internet Gateway and government intranet (Internet Society, n.d.)

Partnerships, such as with the USTDA, are helping to enhance resilient infrastructure Despite progress, continued investment and policy focus are essential to improve internet quality and reliability (U.S. Trade and Development Agency (USTDA), 2023). However, On May 2, 2024, Nepal experienced a nationwide internet outage that lasted for several hours. The disruption occurred when Indian telecom company Airtel halted upstream services to Nepal’s private internet service providers (ISPs) due to outstanding payments. This sudden suspension led to a major communication crisis across the country, exposing the vulnerability of Nepal’s internet infrastructure and its heavy reliance on external service providers. The incident also raised concerns about the quality and resilience of internet services in Nepal, highlighting the need for stronger regulatory measures, diversified upstream connections, and improved service reliability to prevent similar disruptions in the future. After approximately five hours, internet services were restored.

Digital literacy

In Nepal, digital literacy has become a key focus for bridging the digital divide, especially in rural and underserved areas. The government launched the Digital Nepal Framework in 2018, aiming to integrate ICT into various sectors such as education, health, and agriculture. In 2024, the Ministry of Education, Science, and Technology introduced the *Digital Nepal for All* initiative, offering free digital literacy lessons to a wide demographic, including students, workers, business owners, and senior citizens. Efforts to integrate ICT into the education system have also been made, with many schools including computer education in their curriculum. However, challenges such as limited internet access, insufficient infrastructure, and a significant urban-rural digital divide remain. Despite these challenges, digital literacy is viewed as crucial for empowering individuals and fostering economic growth, particularly in emerging sectors like e-commerce and IT.

Cloud services

Cloud services are broadly categorized into three primary models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). The leading global providers in this domain include Amazon Web Services (AWS), Microsoft Azure, Google Cloud, IBM Cloud, and Alibaba Cloud, among others.

When it comes to data localization and compliance, various regulations govern how data is managed and stored across different regions. Key regulations include:

- GDPR in Europe, which emphasizes stringent data protection and privacy measures for individuals.
- CCPA (California Consumer Privacy Act) in the United States, focusing on protecting consumer data privacy and granting individuals greater control over their personal information.
- Data Sovereignty Laws, which require that data be stored and processed within the borders of specific countries, ensuring compliance with local legal frameworks.

These regulations are critical for ensuring trust, transparency, and legal adherence in the global cloud ecosystem.

International Bandwidth

As of November 2024, Nepal's fixed broadband internet speeds have shown improvement, with a median download speed of 100.90 Mbps, placing the country at 86th globally. This marks a slight advancement from its previous ranking of 87th, indicating progress in enhancing internet infrastructure and connectivity (Global index: Nepal, 2024).

In contrast, Nepal's mobile internet speeds remain relatively lower, with a median download speed of 25.97 Mbps, ranking the country at 71st globally. This suggests that while fixed broadband services are improving, mobile internet connectivity still faces challenges that need to be addressed to meet global standards (World Population Review, 2024).

These developments highlight the ongoing efforts and challenges in Nepal's digital infrastructure, emphasizing the need for continued investment and improvement in both fixed and mobile internet services to enhance connectivity and support economic growth.

2.5.3 Review of Current Digital Infrastructure with AI Ecosystem Development

A robust digital infrastructure forms the backbone of a sustainable AI ecosystem. This infrastructure includes data centers, internet and broadband networks, mobile and telephone services, cloud computing platforms, and the quality of these services. Globally, countries with advanced digital infrastructure have been able to foster innovation, support large-scale AI applications, and remain competitive in the AI landscape. While Nepal has made progress in developing its digital infrastructure, significant challenges remain, particularly when

benchmarked against global trends. By learning from international best practices, Nepal can take actionable steps to strengthen its digital ecosystem and enable sustainable AI development.

Data Centers and Connectivity for AI

Data centers and high-quality connectivity are critical for storing, processing, and transferring the large volumes of data required for AI applications. Globally, nations like the United States, China, and India have invested heavily in scalable data center infrastructure and generate revenue (Armstrong, 2023). It ensures seamless support for AI technologies. Nepal, on the other hand, is in the early stages of developing such infrastructure. The current data centers are few and have limited capacity, while broadband networks often fall short in reliability and speed required for high-demand AI tasks, with cost being an additional challenge. To move forward, Nepal must address these gaps by investing in scalable data centers, ensuring reliable broadband infrastructure, and adopting cloud-based services in a cost effective manner.

University Infrastructure, AI Startups, and Private Initiatives

Academic institutions play a pivotal role in fostering AI innovation by providing resources such as supercomputers, research facilities, and skilled faculty. Globally, universities like Stanford and MIT lead AI research, often collaborating with private companies to foster innovation. Nepal has seen some progress, with Kathmandu University's supercomputer serving as an example of advanced infrastructure in the academic sector ("Nepal Finally Gets Its First Supercomputer", 2019).

However, universities in Nepal lag behind, with limited digital resources, funding and research opportunities. Despite this, AI-related courses offered by Nepalese universities and colleges have produced a substantial number of AI enthusiasts.

In the global context, private research and companies significantly drive AI innovation, with startups and established firms contributing to product development. Examples include OpenAI, which has led advancements in generative AI, and NVIDIA's role in AI hardware development. In Nepal, however, such private initiatives remain negligible, largely due to limited funding, infrastructure. A notable exception is Fusemachines, which collaborates with academic institutions to promote AI education and projects. Strengthening university-industry partnerships and encouraging private investment in AI startups will be crucial for advancing Nepal's AI ecosystem (Fusemachines, 2024).

AI Usage from End-User Perspectives

The success of AI technologies depends on their accessibility and usability for end users. Globally, the widespread availability of smartphones, affordable internet, and reliable cloud services has democratized AI adoption in sectors such as healthcare, education, and finance. For instance, AI-driven applications like personalized healthcare assistants and predictive analytics tools have transformed end-user experiences (Bajwa, 2021). Access to affordable devices, reliable connectivity, and digital literacy programs is vital for empowering end users and enabling equitable AI adoption in Nepal.

Other Resources: Funding and Sustainability

Funding is a critical enabler for the AI ecosystem, supporting research, development, and deployment. Globally, countries like Japan, South Korea, and the EU have established public-private partnerships and dedicated funding mechanisms to drive AI innovation. Private sector involvement is also noteworthy, with venture capitalists and tech companies playing a significant role in funding AI startups (*NVIDIA*, n.d.). In Nepal, funding for AI initiatives is scarce, and private sector engagement remains limited. Encouraging investment through government incentives, international collaborations, and venture funding is essential to bridge this gap and sustain AI innovation.

Nepal's digital infrastructure is progressing but still falls short of global standards in several key areas. The country requires enhanced connectivity infrastructure, including data centers, content delivery networks (CDNs), and internet exchange points, to ensure data security and privacy. Currently, internet exchange infrastructure is limited to Kathmandu and needs expansion across all seven provinces (Digital Frontiers, 2023). Learning from global best practices—such as fostering university-industry collaborations, improving internet and cloud services, and incentivizing private investment—Nepal can address these challenges and build a sustainable AI ecosystem. Such efforts will not only bolster innovation but also ensure that AI technologies contribute to equitable socio-economic development.

3.6 Desk Review Summary

Nepal's ICT development has evolved significantly over the past several decades, starting with early initiatives such as the introduction of telecommunication systems and computer-based census calculations in the 1960s and 1970s. The 1990s marked the internet revolution, with the introduction of email services and commercial internet. The 2000s saw rapid growth in ISPs and mobile technologies, and by the 2010s, digital transformation gained momentum with the rollout of 4G, the Digital Nepal Framework, and the emergence of e-governance apps and digital payment platforms. Currently, Nepal's ICT sector boasts over 90% internet penetration, a thriving tech startup ecosystem, and emerging fields such as AI and IT outsourcing, bolstered by progressive policies and increasing investments in infrastructure.

Nepal's policy framework has played a crucial role in fostering ICT and AI development, with foundational initiatives like the Information Technology Policy 2057 (2000) and the Electronic Transaction Act 2063 (2008), which laid the groundwork for digital governance and e-commerce. The Digital Nepal Framework 2019 marked a significant step in integrating ICT across various sectors to drive innovation and economic growth. Other critical policies, such as the National Cybersecurity Policy 2023 and the Privacy Act 2075 (2018), address cybersecurity and data protection, while emerging issues related to social media and e-commerce are addressed by recent bills like the Social Media Regulation Bill 2024 and the E-Commerce Bill 2080 (2023). The AI Policy concept paper (2024) further outlines frameworks for ethical AI use, aiming to align with global best practices and integrate AI into Nepal's development goals. However,

while these policies are forward-thinking, cohesive implementation strategies remain a challenge.

A review of Nepal's existing AI policies and international practices reveals several gaps that hinder the effective adoption of AI. While policies address important topics like data privacy, cybersecurity, and equitable access, they lack practical strategies suited to Nepal's unique socio-economic context. Challenges include a lack of skilled professionals, insufficient computational resources, a poorly defined data ecosystem, and weak intellectual property protections. The heavy reliance on imported AI systems further limits local innovation. Additionally, issues like algorithmic transparency, accountability, and inclusivity are underexplored, and the high costs of AI deployment, along with the absence of clear policies on cross-border data transfers, create further barriers. To build a thriving AI ecosystem, Nepal needs comprehensive strategies, robust infrastructure, and workforce-skilling programs aligned with both global best practices and local needs.

Regarding data protection, Nepal's existing frameworks fall short of international standards such as GDPR. Gaps include the lack of extra-territorial applicability, absence of a dedicated regulatory authority, and no mandatory breach notification requirements. Rights like data access, erasure, and portability are not present, and there are no penalties for mishandling personal data. Nepal also lacks regulations for cross-border data transfers and digital data protection guidelines. These gaps pose significant risks as AI technologies, which depend on large datasets, become more prevalent. Strengthening data protection laws will be critical to supporting AI innovation while safeguarding privacy and ensuring ethical practices.

While Nepal's digital infrastructure has made progress, there remain significant gaps in areas essential for AI ecosystem development. Limited data center capacity, unreliable broadband connectivity, and uneven access to cloud services hinder the scalability of AI. Universities lack adequate resources, funding, and research facilities to drive innovation, and private AI startups remain limited. Moreover, end-users face challenges such as low digital literacy, limited access to affordable devices, and inconsistent internet and telephone service quality. Expanding regional connectivity, fostering university-industry partnerships, enhancing funding mechanisms, and improving digital literacy are crucial to fostering equitable AI adoption and long-term growth.

Additionally, ethical concerns regarding AI development in Nepal need further attention. While the draft AI policy emphasizes inclusivity and ethical use, issues like algorithmic transparency, accountability, and fairness are not adequately addressed. Establishing a regulatory framework that ensures AI systems operate without bias and protect user privacy is crucial. Globally, AI ethics frameworks such as those proposed by UNESCO provide valuable insights for creating transparent, inclusive, and accountable AI systems. Adopting such principles will build public trust and promote sustainable AI innovation in Nepal.

The shortage of skilled professionals in AI fields remains one of the most significant barriers to AI adoption in Nepal. Universities lack the necessary infrastructure and advanced curricula to support AI education, and there is a need for stronger collaborations between academia and

industry to create specialized training programs. India's "AI for All" initiative provides a useful model for upskilling diverse groups, and Nepal can adapt similar programs to develop its AI talent pool. Investing in workforce development will ensure that Nepal can build a skilled workforce capable of supporting and driving the AI ecosystem.

Nepal's AI policy framework, while progressive, faces challenges in terms of fragmented implementation and a lack of coordination among stakeholders. A unified long-term vision is needed to harmonize AI initiatives across sectors like education, healthcare, and governance. Establishing a centralized body to coordinate policy execution, research funding, and industry partnerships will be crucial for improving efficiency. Drawing from global examples such as Singapore's AI Governance Framework, Nepal can create a more conducive environment for innovation while addressing practical challenges related to funding, infrastructure, and regulatory barriers. Clear, actionable strategies are necessary to realize the full potential of AI for Nepal's socio-economic development.

Chapter 3

Methodology

This chapter provides an overview of the study methodology flow for this research. Figure 3.1 illustrates the overall methodology, outlining key phases from inception to the final report. The process begins with the inception phase, followed by a desk review to refine the research scope and finalize key research questions. Data collection is conducted through surveys, focus group discussions (FGDs), and key informant interviews (KIIs). The collected data undergoes thorough analysis and integration, leading to the formulation of insights. These findings are then compiled into a draft study report, ensuring a structured and comprehensive research process. The draft report is subsequently reviewed through workshops and peer evaluations, where feedback is gathered. Finally, the report is refined by incorporating the received inputs, culminating in the final study report.

3.1 Inception Phase

The inception phase laid the foundation for the study by developing a structured research outline. This phase involved defining objectives, scope, and key research questions while establishing the methodology, data sources, and analytical approach. Since the inception report has already been completed and submitted, this phase provided a clear framework to guide the subsequent research activities.

3.2 Desk Review

The desk review (Please refer to *Chapter 2. Desk Review* for more in details) evaluates Nepal's AI-driven digital ecosystem by analyzing existing research, reports, and national policies. It examines the country's ICT and AI landscape, covering policy frameworks, regulatory measures, and international best practices. The review assesses internet connectivity, data centers, cloud services, and data policies, emphasizing privacy, security, and data quality—key factors for AI development. Additionally, it explores Nepal's ICT history, AI policies, and governance structures, comparing them with global standards to identify gaps and opportunities. The findings provide a structured foundation for understanding Nepal's digital infrastructure and its alignment with AI ecosystem growth.

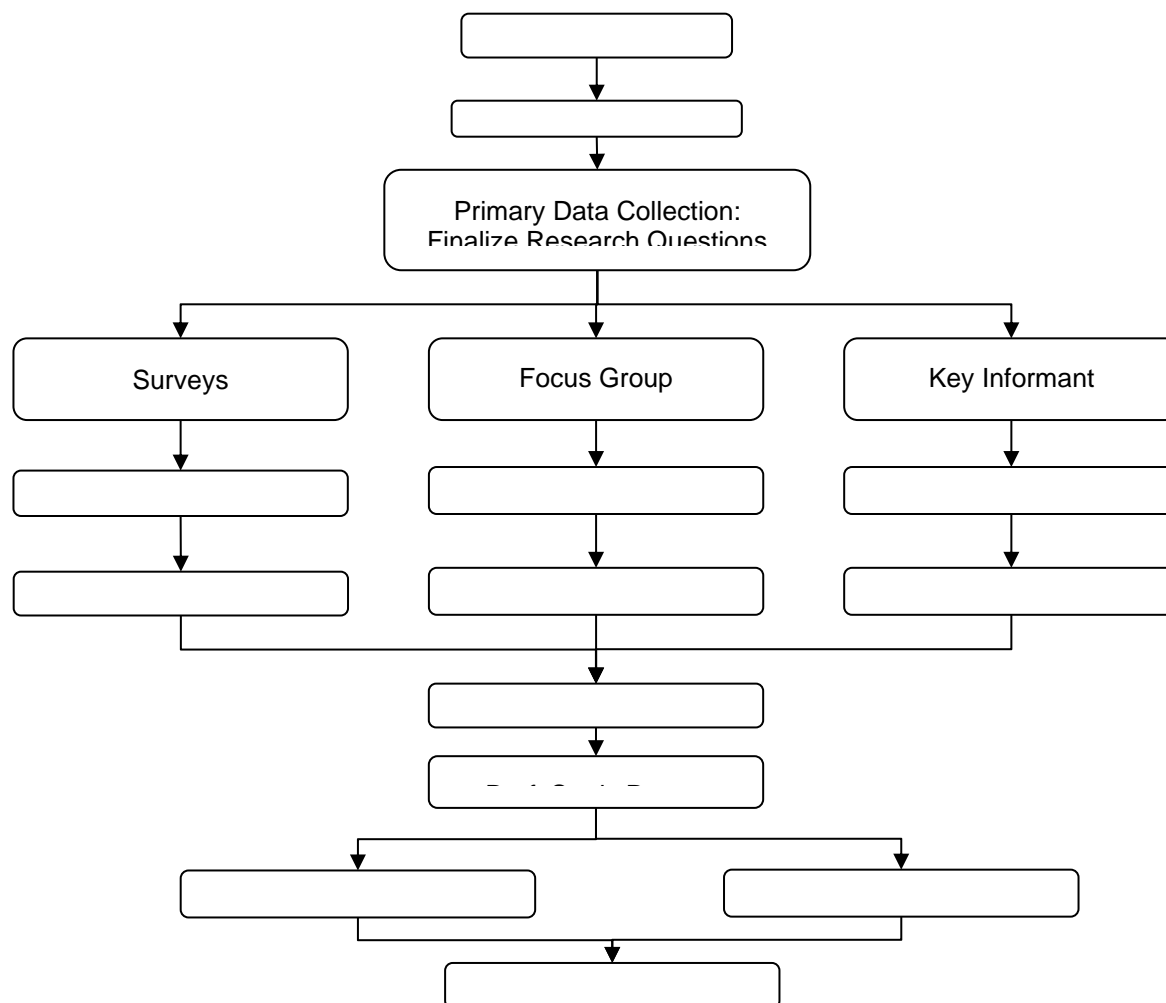


Figure 1: Study Methodology Flow

3.3 Primary Data Collection

The research questions and survey questionnaires were formulated based on gaps identified in the desk review and the defined research scope, ensuring a targeted approach to data collection. These questions serve as a foundation for gathering both qualitative and quantitative insights into Nepal's AI-driven digital ecosystem. Detailed research questions, including those for surveys, FGDs, and KIIs, can be found in *Subsection 1.2, Appendix A, and Appendix B*.

Primary data collection is essential for capturing first-hand perspectives on the current state of AI, digital infrastructure, and data policies in Nepal. This involves direct engagement with key stakeholders, including government officials, industry leaders, academics, civil society representatives, and regulatory bodies, through surveys, focus group discussions (FGDs), and key informant interviews (KIIs). These interactions help identify policy gaps, challenges, and opportunities while ensuring a holistic understanding of AI adoption and its impact on Nepal's

economic and technological landscape. The following subsections outline the key data collection methods:

3.3.1 Surveys

Surveys were conducted to capture quantitative data from a broad range of stakeholders, ensuring diverse representation across sectors. A total of 223 *participants* participated in the survey, representing the following groups:

- Government agencies
- Private sector organizations
- Regulatory bodies
- Technical communities and associations
- Research institutes
- Academia
- Civil society organizations/media
- NGOs/INGOs
- Consultants
- Students and end users
- Other relevant stakeholders

The survey responses provide insights into AI awareness, adoption levels, regulatory challenges, and infrastructure readiness, forming a critical basis for further analysis.

3.3.2 Focus Group Discussions

To develop comprehensive AI policy recommendations, two focus group discussions (FGDs) were conducted, engaging stakeholders from diverse sectors. It ensures that policy recommendations reflect balanced viewpoints from key actors in Nepal's AI ecosystem.

- ***First FGD:*** The first focus group discussion involved 15 participants representing academia, consultants, legal professionals, government agencies, INGOs/NGOs, human rights groups, private sector representatives, AI start-ups, the Nepal Telecom Authority, and the AI Association of Nepal. The discussion facilitated a rich exchange of ideas, highlighting opportunities and challenges in AI policy adoption.

- **Second FGD:** The second focus group discussion included 10 participants from banking, government, start-ups, Nepal Insurance Authority, healthcare, INGO, law enforcement, and consulting sectors. This discussion focused on AI's role in regulated industries, identifying sector-specific needs and policy implications.

The FGDs provided a collaborative platform for stakeholders to discuss key concerns, ensuring that AI policies address technical, ethical, and regulatory considerations.

3.3.3 Key Informant Interviews

In addition to FGDs, KIIs were conducted to gain sector-specific insights into AI adoption, regulatory challenges, and policy development in Nepal. These interviews followed the research questions outlined in *Appendix B* and focused on gathering expert opinions from:

- Academia and research institutions
- Government ministries and regulatory bodies
- Healthcare professionals and AI experts
- Data centers and cloud service providers
- Private sector organizations and start-ups
- Legal professionals and policymakers
- Nepal Rastra Bank and financial sector representatives
- Education and training institutes
- Media and civil society organizations
- Consultants and technology advisors

The KIIs allowed for detailed discussions on policy gaps, infrastructure limitations, and AI governance needs, ensuring that recommendations are well-informed and aligned with international best practices.

3.4 Findings Integration

To ensure a comprehensive and rigorous analysis, findings from multiple data sources: survey, FGDs, KIIs, and desk review will be integrated using the triangulation method. This approach enhances the validity and reliability of the study by cross-verifying insights from different methods. The integration will be structured around each SRQ, allowing for a systematic synthesis of diverse perspectives. For this, the following steps will be considered:

Step 1 (Organizing findings by SRQ): All collected data will be categorized under each SRQ to ensure a structured analysis. This will involve extracting relevant themes and insights from survey responses, FGDs, KIIs, and desk review. Then, these findings will be mapped under the corresponding SRQ to facilitate comparison and synthesis.

Step 2 (Identifying key converges and divergence or partial coverage): Once findings are organized, converging insights (where multiple sources agree) will be identified to strengthen the reliability of findings and diverging, or partial coverage insights (where sources present contradictions or coverage only in few data sources) will be analyzed to explore potential reasons for discrepancies.

Step 3 (Integrating desk review findings): The desk review will be used to (1) validate or challenge primary data findings (survey, FGDs, KIIs) (2) highlight existing knowledge gaps in literature and policies (3) address missing perspectives that may not have emerged from primary data collection.

Step 4 (Synthesizing data to provide a holistic answer to each SRQ): To systematically integrate findings to ensure key patterns are identified across methods, any discrepancies will be critically analyzed, and the final synthesized response to each SRQ reflects a balanced integration of all data sources.

Step 5 (Identifying gaps and Recommendation): Gaps will be identified, and recommendations will be provided for each SRQ.

3.5 Draft Study Report

After the integration of the findings, a draft study report was prepared, consolidating the results from the surveys, FGDs, KIIs, and desk review. This draft provided a comprehensive overview of the key insights, trends, and policy gaps identified throughout the research. It served as the foundation for further review and refinement, ensuring that the study's conclusions were clearly articulated and aligned with the objectives of the research.

3.6 Workshop for Review Draft and Peer Review

Following the preparation of the draft study report, a workshop will be held to review and discuss the draft in detail. This workshop will bring together key stakeholders, experts, and participants to provide feedback and ensure that the report accurately represents the findings and is aligned with the research objectives. The collaborative discussions will help to refine the report by addressing any gaps or inconsistencies. In addition, the draft study report will undergo a peer review process, where external experts critically assess the content for quality, accuracy, and relevance. The feedback from both the workshop and peer review will then be incorporated to finalize the report, ensuring its robustness and credibility.

3.7 Deliverable: Final Study Report

After the review of the draft study, the final report will be prepared, incorporating all relevant feedback and refinements. The final report will be comprehensive and polished, featuring in-depth analysis and actionable recommendations. It will provide a strategic roadmap to enhance Nepal's AI-driven digital ecosystem, addressing key areas such as policy gap analysis, digital infrastructure strategies, data governance frameworks, stakeholder collaboration models, and opportunities for economic growth and innovation. Additionally, the report will emphasize the need for an inclusive and robust regulatory framework to support sustainable AI development.

Chapter 4

Data Analysis, Key Findings, and Actionable Recommendations

This chapter presents a comprehensive analysis of the data collected through multiple research methods, including surveys, FGDs, and KIIs. It begins with an in-depth examination of the survey results, highlighting key trends and quantitative insights. This is followed by a discussion of the FGDs, capturing diverse stakeholder perspectives and thematic findings. The chapter then explores the qualitative insights gathered from KIIs, providing a deeper understanding of sector-specific challenges and opportunities. Subsequently, all findings are systematically integrated, ensuring a holistic interpretation of the research outcomes. Finally, based on these integrated insights, the chapter concludes with strategic recommendations to guide the development of Nepal's AI-driven digital ecosystem.

4.1 Surveys

The survey was conducted among the following groups:

- Government
- Private Sector
- Regulatory body
- Technical Communities and Association
- Research institutes
- Academia
- Civil society association/media
- NGOs/INGOs
- Consultants
- Students and end user
- Others if not mentioned

The survey was conducted with 223 respondents, and the questionnaire used for the survey is provided in Appendix A. To ensure a broad range of perspectives on policy recommendations, heterogeneous purposive sampling was employed as the sampling method. The survey was

administered through Google Forms questionnaire, consisting entirely of close-ended questions. The distribution of questions, aligned with each research question, is outlined in table 1 below:

Table 4.1: Number of Sub-Research Questions

S.N.	SRQ	No. of Questions
1.	SRQ1: Policy Adequacy	6
2.	SRQ2: Regulatory Framework	7
3.	SRQ3: Ecosystem Development	7
4.	SRQ4: Digital Infrastructure, Data, and Governance	7
5.	SRQ5: AI Risks	6
6.	SRQ6: AI for National Priorities	7
7.	SRQ7: Strategic Roadmap	6
Total		46

Organization

The details of the demographic information and related distribution are presented in table 4.2.

Table 4.2: Details of Demographic Information and Related Distribution

	Number of Respondent	Percentage
Academia	29	13.00
Civil society association/media	1	0.45
Consultants	9	4.04
Government	43	19.28
NGOs/INGOs	2	0.90
Others if not mentioned	7	3.14
Private Sector	66	29.60
Regulatory body	1	0.45
Research institutes	4	1.79
Students and end user	60	26.91
Technical Communities and Association	1	0.45

Table 4.2 reveals a diverse distribution of respondents across various sectors, with the Private Sector (29.60%) and Students/End-users (26.91%) forming the largest groups, together representing more than half of the total respondents. The Government sector follows with a notable share of 19.28%. Smaller sectors such as Academia, Consultants, and Research Institutes account for a lesser portion of respondents, while categories like Civil society associations/media, NGOs/INGOs, Regulatory bodies, Technical Communities, and Associations contribute only a small percentage each. Overall, the data highlights a wide range of sectoral representation, with the Private Sector and Students/End-users being the most prominent groups.

Gender

The survey result shows the distribution of gender among 223 respondents. A significant majority, 82%, of the respondents are male, while 18% are female. Overall, the data indicates that the majority of respondents are male.

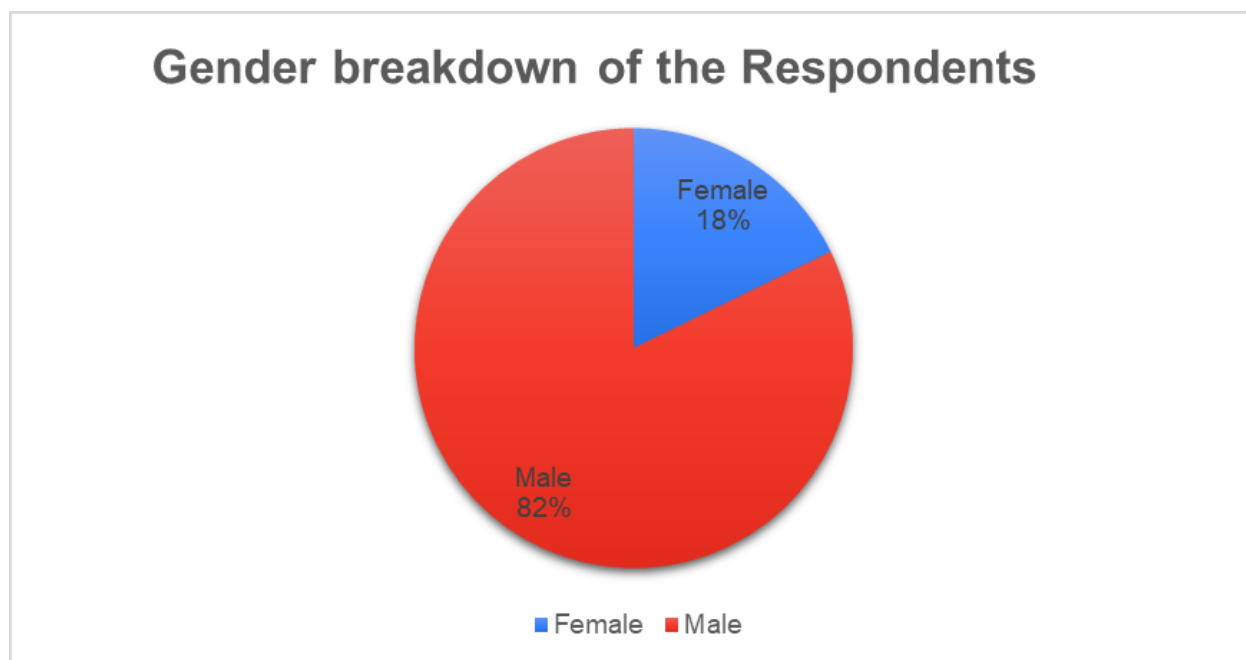


Figure 2: Respondents Based on Gender

Education

Table 4.3: Distribution of Respondents' Educational Qualifications

Education	Number of respondents	Percentage
Bachelor	96	43.05
Master	106	47.54
Masters of Philosophy (M.Phil)	6	2.69
Doctor of Philosophy (Ph.D)	15	6.73

Table 4.3 illustrates the distribution of educational qualifications among 223 respondents. The majority of respondents hold either a Bachelor's or Master's degree, with 43.05% possessing a Bachelor's degree and 47.54% holding a Master's degree. A smaller proportion of respondents have pursued an M. Phil (2.69%) or a Ph. D. (6.73%).

Age

Table 4.4: Distribution of Respondents' Age Group

Age group	Number of respondents	Percentage
18-25	74	33.18
25-35	75	33.63
35-45	62	27.80
more than 45	12	5.38

The survey result in Table 4.4 shows the distribution of ages among 223 respondents. A significant portion of the respondents, 33.18%, are between 18 and 25 years old, while 33.63% fall within the 25-35 age range. Additionally, 27.80% of respondents are between 35 and 45 years old, and 5.38% are older than 45 years.

AI Practitioner

Table 4.5: Distribution of Respondents as AI Practitioner

AI practitioner	Respondent	Percentage
No	79	35.43
Yes	144	64.57

In total, 223 respondents have responded to the question "Are you an AI practitioner?". Among them, a majority, 64.57%, of the respondents are identified as AI practitioners, while 35.43% are found not using AI. Overall, the data indicates that most respondents consider themselves to be AI practitioners. In addition, Table 4.6 provides a more detailed representation of AI practitioners in relation to their educational qualifications.

Table 4.6: Distribution of Respondents as AI Practitioner Vs Educational Qualification

AI practitioner	Education level	Number of respondent
Yes	Bachelor	66
	Master	66
	Masters of Philosophy (MPhil)	2
	Doctor of Philosophy (PhD)	10
	SubTotal	144
No	Bachelor	30
	Master	40
	Masters of Philosophy (MPhil)	4

	Doctor of Philosophy (PhD)	5
	SubTotal	79
	Grand Total	223

4.1.1 Statistical Analysis

The following few cases were conducted for statistical analysis:

Case 1: Gender based differences in AI policy prioritization

To evaluate the presence of a statistically significant difference in opinions on AI policy prioritization between male and female respondents, a Chi-Square test was conducted. The opinions on AI policy prioritization were categorized into four levels: Strongly Agree, Agree, Neutral, and Disagree, with the following distribution:

Table 4.7: Case - Gender Based Differences in AI Policy Prioritization

	Gender		
Opinion on AI prioritization	Female	Male	Grand Total
Agree	21	62	83
Disagree	1	9	10
Neutral	3	11	14
Strongly agree	15	103	118
Grand Total	40	185	225

Hypotheses:

- Null Hypothesis (H_0): There is no significant difference in AI policy prioritization opinions between males and females.
- Alternative Hypothesis (H_1): There is a significant difference in AI policy prioritization opinions between males and females.

Chi-Square Test:

- Degrees of freedom (df) = $(4-1)(2-1) = 3$
- Critical value at $\alpha = 0.05$: 7.815
- Calculated Chi-Square: 3.90

Since the calculated value is less than the critical value, the null hypothesis cannot be rejected. This indicates that there is no statistically significant difference between male and female opinions regarding AI policy prioritization.

Case 2: Age-Based Differences in Economic Growth Prioritization

To examine whether opinions on the prioritization of economic growth vary across different age groups, an ANOVA test was conducted. The data summary is provided below:

Table 4.8: Case- Age-Based Differences in Economic Growth Prioritization

Age Group	Equally prioritize both	Somewhat prioritize economic growth	Strongly prioritize economic growth	Strongly prioritize ethical concerns
18-25	35	15	17	7
25-35	28	24	20	3
35-45	26	16	12	9
More than 45	4	6	3	0

Hypothesis:

- Null Hypothesis (H_0): There is no significant difference in the means of opinions across the age groups.
- Alternative Hypothesis (H_1): There is a significant difference in the means of opinions across the age groups.

The result obtained from anova test is given below:

Table 4.9: Result of Anova Test Regarding Age-Based Differences in Economic Growth Prioritization

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	5328.6	3	1776.2	17.63	0.0005	3.29
Within Groups	3577.4	12	298.12			
Total	8906	15				

Since $p\text{-value} \leq 0.05$, the null hypothesis is rejected. It concludes that there is a significant difference in the opinions about economic growth prioritization across the age groups.

Case 3: AI Practitioners' Views on Public Service Transformation

A Chi-Square test was used to evaluate the association between being an AI practitioner and opinions on whether Nepal should prioritize AI in public service transformation.

Table 4.10: Case- AI Practitioners' Views on Public Service Transformation

Should Nepal prioritize AI in public service transformation?

Count of “Are you an AI practitioner?”	Agree	Disagree	Neutral	Strongly agree	Grand Total
No	31	3	5	40	79
Yes	52	7	9	76	144
Grand Total	83	10	14	116	223

Hypotheses:

- Null Hypothesis (H_0): There is no association between being an AI practitioner and opinion on prioritizing AI in public service transformation.
- Alternative Hypothesis (H_1): There is an association between being an AI practitioner and opinion on prioritizing AI in public service transformation.

Chi-Square Test:

- Degrees of freedom: 3
- Critical value at $\alpha = 0.05$: 7.815
- Calculated Chi-Square: 1.03

Since the calculated value is less than the critical value, the null hypothesis cannot be rejected. This suggests that there is no significant association between being an AI practitioner and opinion on prioritizing AI in public service transformation.

Case 4: AI Policy and Regulation of Disinformation

A Chi-Square test was conducted to determine the association between AI policy prioritization and perceptions of how well regulators address AI-generated disinformation/misinformation.

Hypotheses:

- Null Hypothesis (H_0): There is no association between AI policy prioritization and perceptions of regulatory effectiveness in addressing AI-generated disinformation/misinformation.

- Alternative Hypothesis (H_1): There is an association between AI policy prioritization and perceptions of regulatory effectiveness in addressing AI-generated disinformation/misinformation.

Chi-Square Test:

- Degrees of freedom: 9
- Critical value at $\alpha = 0.05$: 16.919
- Calculated Chi-Square: 26.87

Table 4.11: Case- AI Policy and Regulation of Disinformation

	How well do regulators address the risks of AI-generated disinformation/misinformation?"				
What extent should AI policies prioritize economic growth over ethical concerns?	Don't know	Poorly	Somewhat well	Very well	Grand Total
Equally prioritize both	8	57	22	6	93
Somewhat prioritize economic growth	3	31	20	6	60
Strongly prioritize economic growth	1	27	13	10	51
Strongly prioritize ethical concerns	1	15	2	1	19
Grand Total	13	130	57	23	223

Since the calculated value is greater than the critical value, we reject the null hypothesis. This suggests a statistically significant association between AI policy prioritization and opinions on how well regulators address AI-generated disinformation/misinformation.

Based on these four cases, this statistical analysis provides the following insights:

- No significant gender-based differences were found in AI policy prioritization.
- Significant differences among age groups exist in economic growth prioritization.
- No significant association between being an AI practitioner and opinions on AI prioritization in public service transformation.
- A strong association was found between AI policy prioritization and perceptions of regulatory effectiveness in handling AI-generated disinformation.

4.1.2 Survey Findings

This subsection presents the findings from each survey questionnaire, analyzing responses to provide detailed insights. It then synthesizes the overall findings for each sub-research question, highlighting key trends, patterns, and implications derived from the survey data.

Question 1. Should Nepal prioritize AI in public service transformation?

Table 4.12: Respondent' Prioritization for AI in Public Service Transportation

Response	Number of Respondents	Percentage
Agree	83	37.22
Disagree	10	4.48
Neutral	14	6.28
Strongly agree	116	52.02

The survey result in Table 4.12 shows that a significant majority of respondents (89.24%) believe Nepal should prioritize AI in public service transformation, with 52.02% strongly agreeing and 37.22% agreeing. A smaller portion (6.28%) are neutral on the issue, while only a very small minority (4.48%) disagree. This suggests strong support for integrating AI into public services in Nepal, reflecting a broad belief in its potential to improve efficiency, effectiveness, and innovation in government functions. The minimal opposition indicates that concerns about AI in public service transformation are limited among the respondents.

Question 2. Are there clear policies, frameworks, or guidelines for AI research, innovation, and development in Nepal?

Table 4.13: Status of AI Policies, Frameworks, and Guidelines in Nepal

Response	Number of Respondents	Percentage
No guidelines exist	103	46.19
Partial or vague guidelines exist	62	27.80
Yes, comprehensive guidelines exist	7	3.14
Don't know	51	22.87

The survey result in Table 4.13 reveals a significant gap in the presence of clear policies or guidelines for AI research, innovation, and development in Nepal. Nearly half of the respondents (46.19%) believe that no guidelines exist, while 27.80% think that any existing guidelines are partial or vague. Only 3.14% respondents feel that comprehensive guidelines are in place, and another 22.87% are unsure. These findings indicate a need for clearer, more comprehensive policies to guide AI development in the country. Without such frameworks, there could be uncertainty and potential barriers for researchers, developers, and businesses, which could slow innovation. The results emphasize the importance of creating ethical AI policies to ensure that AI is developed and deployed responsibly for benefiting Nepalese society.

Question 3. Do you think AI policy can address social needs?

Table 4.14: Perceptions on AI Policy Addressing Social Needs

Response	Number of Respondents	Percentage
Not effectively	13	5.83
Somewhat effectively	130	58.30
Yes, very effectively	75	33.63
Don't know	5	2.24

The survey result in Table 4.14 indicates strong support for the potential of AI policy to address social needs, with 91.93% of respondents believing AI policy can be effective. Of these, 33.63%

think it can address social needs very effectively, while 58.30% believe it can do so somewhat effectively. Only 5.83% think AI policy cannot effectively address social needs, and just 2% are unsure. These findings suggest a positive outlook on AI's role in solving social issues, which could encourage the development of AI policies focused on social impact. The results also point to the need for collaboration between policymakers, AI researchers, and social scientists to create inclusive, equitable policies that maximize AI's benefits for society.

Question 4. Should Nepal benchmark its AI policies with international standards?

The survey result in Table 4.15 shows strong support for Nepal benchmarking its AI policies with international standards, with 89.24% of respondents either "Strongly Agree" (43.5%) or "Agree" (45.74%). Only 8.52% are neutral, and just 2.24% disagree. This widespread support suggests that policymakers should consider adopting international best practices to shape Nepal's AI policies. Doing so could foster collaboration with other countries, improve AI governance, and help Nepal build a responsible AI ecosystem aligned with global norms.

Table 4.15: Need for Benchmarking Nepal's AI Policies with International Standards

Response	Number of Respondents	Percentage
Agree	102	45.74
Disagree	5	2.24
Neutral	19	8.52
Strongly Agree	97	43.50

Question 5. Are education, academia, and training programs sufficient to support AI ecosystem development?

Table 4.16: Sufficiency of Education and Training for AI Development

Response	Number of Respondents	Percentage
Not sufficient	94	42.15

Partially sufficient	99	44.39
Yes, fully sufficient	24	10.76
Don't know	6	2.69

The survey result in Table 4.16 indicates that 44.39% of respondents believe current education, academia, and training programs are only partially sufficient to support AI ecosystem development, while 42.15% think they are not sufficient at all. Only 10.76% believe these programs are fully sufficient, and 2.69% are unsure. This suggests a clear need for improvement in educational and training initiatives to effectively support Nepal's AI ecosystem. To address this, there should be investments in AI education at all levels, with curricula aligned to industry needs. Collaboration between academia, industry, and government is essential to ensure relevant, accessible, and effective programs that equip individuals with the skills needed for AI development.

Question 6. To what extent should AI policies prioritize economic growth over ethical concerns?

Table 4.17: Prioritization of Economic Growth vs. Ethical Concerns in AI Policies

Response	Number of Respondents	Percentage
Equally prioritize both	93	41.70
Somewhat prioritize economic growth	60	26.91
Strongly prioritize economic growth	51	22.87
Strongly prioritize ethical concerns	19	8.52

The survey result in Table 4.17 shows a mixed perspective on prioritizing economic growth versus ethical concerns in AI policies. While 22.87% of respondents strongly prioritize economic growth and 26.19% somewhat prioritize it, 41.70% believe both economic growth and ethical concerns should be equally prioritized, and 8.52% strongly prioritize ethics over economic growth.

Question 7. Are existing regulatory frameworks (e.g., NRB, NIA, ERC, CAAN) sufficient to address AI data security and privacy?

The survey result in Table 4.18 shows that 50.22% of respondents believe the existing regulatory frameworks (NRB, NIA, ERC, CAAN) are insufficient to address AI data security and privacy. A further 32.29% think the frameworks are only partially sufficient, while 3.59% believe they are fully sufficient, and 13.90% are unsure. These findings suggest a clear need to strengthen and update the current regulations to effectively address AI-related data security and privacy concerns. Possible implications include the necessity of reviewing and enhancing existing laws to tackle AI-specific risks such as data bias, algorithmic discrimination, and misuse.

Table 4.18: Effectiveness of Existing Regulatory Frameworks in AI Data Security and Privacy

Response	Number of Respondents	Percentage
Not sufficient	112	50.22
Partially sufficient	72	32.29
Yes, fully sufficient	8	3.59
Don't know	31	13.90

Question 8. What types of ethical guidelines should be prioritized in Nepal for future AI development?

Table 4.19: Prioritizing Ethical Guidelines for AI Development in Nepal

Response	Number of Respondents	Percentage
Fairness and non-discrimination guidelines	16	7.17
Privacy and data protection guidelines	51	22.87

Transparency and accountability guidelines	17	7.62
All of the above	139	62.33

The survey result in Table 4.19 indicates strong support for prioritizing ethical guidelines in Nepal's future AI development. A majority (62.33%) of respondents believe all types of ethical guidelines—privacy and data protection, fairness and non-discrimination, and transparency and accountability - should be prioritized. Smaller portions specifically emphasize privacy and data protection (22.87%), fairness and non-discrimination (7.17%), and transparency and accountability (7.62%). These findings suggest that Nepal should develop a comprehensive ethical framework for AI that addresses a broad range of concerns, ensuring responsible AI development. This may involve establishing clear regulations for data privacy, fairness in algorithms, and ensuring transparency and accountability in AI systems.

Question 9. Should Nepal implement stricter laws to prevent the misuse of AI?

Table 4.20: Perspectives on Stricter AI Regulations in Nepal

Response	Number of Respondents	Percentage
Agree	64	28.70
Disagree	3	1.35
Neutral	12	5.38
Strongly Agree	144	64.57

The survey result in Table 4.20 shows overwhelming support for implementing strict laws to prevent the misuse of AI in Nepal, with 93.27% of respondents either "Strongly Agree" (64.57%) or "Agree" (28.70%). Only 5.38% are neutral, and no respondents disagree with the need for strict regulations. These findings suggest that policymakers should prioritize the development and implementation of AI regulations to address potential risks, such as data privacy violations and misuse of data in critical sectors like healthcare and law enforcement. Strict laws could also help build public trust, ensuring the ethical and responsible development of AI in Nepal.

Question 10. How well do regulators address the risks of AI-generated disinformation/misinformation (e.g., in social media)?

The survey results in Table 4.21 reveals that 58.30% of respondents believe regulators are addressing the risks of AI-generated disinformation/misinformation poorly, while 25.56% think they are addressing it somewhat well, and 10.31% feel it is being handled very well. A small portion (5.83%) is unsure. This suggests that there is widespread concern about the inadequacy of current regulatory efforts to manage AI-generated disinformation, particularly on social media.

Table 4.21: Regulatory Effectiveness in Combating AI-Generated Disinformation

Response	Number of Respondents	Percentage
Poorly	130	58.30
Somewhat well	57	25.56
Very well	23	10.31
Don't know	13	5.83

Question 11. Should cross-border data sharing involving AI be regulated more strictly in Nepal?

Table 4.22: Perspectives on Sharing Cross-border Data involving AI

Response	Number of Respondents	Percentage
Agree	79	35.43
Disagree	10	4.48
Neutral	28	12.56
Strongly Agree	106	47.53

The above survey result in Table 4.22 reveals overwhelming support for stricter regulation of cross-border data sharing involving AI in Nepal, with 82.96% of respondents either "Strongly Agree" (47.53%) or "Agree" (35.43%). Only 12.56% are neutral, and 4.48% disagree. This suggests a broader consent that more strict rules are needed to manage the flow of AI-related data across borders. The findings imply that policymakers should prioritize the development of comprehensive regulations to govern cross-border data sharing, ensuring that it protects Nepal's privacy, security, and national interests.

Question 12. What type of AI governance framework is needed in Nepal to enhance inclusivity and transparency?

Table 4.23: AI Governance Framework for Inclusivity and Transparency in Nepal

Response	Number of Respondents	Percentage
Accountability-focused with ethical standards	99	44.39
Stakeholder-inclusive and participatory	31	13.90
Transparency-driven with data and AI model openness	65	29.15
Don't know	28	12.56

Table 4.23 shows the results of a survey with 223 people about how they think AI should be governed. Most people (44.39%) prefer an approach focused on accountability and ethical standards. The second choice, with 29.15%, is for an approach that involves many different people in decision-making. 12.56% of people like the idea of making AI more transparent and open. However, 13.9% of people were not sure about their preference. These findings suggest that Nepal should prioritize an AI governance framework that includes broad stakeholder engagement, involving civil society, industry, academia, and government and accountable to make an ethical AI framework.

Question 13. How important is it to create a regulatory framework to safeguard AI's impact on human rights?

Table 4.24: Regulatory Framework for Safeguarding AI's Impact on Human Rights

Response	Number of Respondents	Percentage
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Not important	3	1.35
Somewhat important	44	19.73
Very important	173	77.58
Don't know	3	1.35

Table 4.24 shows strong support for creating a regulatory framework to protect human rights from AI impacts. 77.58% of respondents think it's "Very Important," and 19.73% say it's "Somewhat Important." Only a small percentage (1.35%) think it's "Not Important," and 1.35% are unsure. This suggests that most people want regulations to ensure AI respects human rights.

Question 14. What factors are most needed to build a robust AI ecosystem in Nepal?

Table 4.25: Key Factors for Building a Robust AI Ecosystem in Nepal

Response	Number of Respondents	Percentage
Comprehensive training programs and skill development	8	3.59
Funding for AI research, innovation, and startups	40	17.94
Improved digital infrastructure and regulatory support	33	14.80
All of the above	142	63.68

The survey in Table 4.25 shows that building a strong AI ecosystem in Nepal needs a well-rounded approach. Most people (63.68%) think that better digital infrastructure and supportive laws are very important. This means having good internet access, data centers, and rules that help AI development. Some respondents (17.94%) also believe funding for AI research and startups is needed to push things forward. Additionally, 14.80% feel that training programs to develop AI skills in the workforce are key. These results suggest that enhancing digital infrastructure, like

better internet and data centers, and creating clear, supportive regulations should be the top priorities for developing AI in Nepal. While funding and training are also important, the overall digital environment and regulatory framework are seen as more critical for fostering a robust AI ecosystem.

Question 15. Should the government incentivize startups to invest in AI?

Table 4.26: Government Incentivizing Startups for AI Investment

Response	Number of Respondents	Percentage
Agree	76	34.08
Disagree	7	3.14
Neutral	14	6.28
Strongly Agree	126	56.50

Table 4.26 reveals overwhelming support for the government incentivizing startups to invest in AI, with 90.58% of respondents either "Strongly Agree" (56.50%) or "Agree" (34.08%). Only 6.28% are neutral, and 3.14% disagree. This suggests that policymakers should consider implementing policies for funding opportunities to encourage AI startups.

Question 16. Should public-private partnerships be prioritized to promote AI development in Nepal?

Table 4.27: Prioritizing Public-Private Partnerships for AI Development in Nepal

Response	Number of Respondents	Percentage
Not necessary	8	3.59
Somewhat necessary but not critical	65	29.15
Yes, they are most necessary for progress	147	65.92
Don't know	3	1.35

The result in Table 4.27 shows the strong support for prioritizing public-private partnerships to promote AI development in Nepal, with 65.92% of respondents believing they are "most necessary for progress." An additional 29.15% think they are "somewhat necessary but not critical," while 3.59% believe they are "not necessary," and 1.35% are unsure. These findings suggest that policymakers should focus on fostering public-private partnerships, as they could bring together the resources, expertise, and innovation needed to accelerate AI development.

Question 17. To what extent should AI policy address gender and geographical disparities in Nepal?

Table 4.28: Addressing Gender and Geographical Disparities in Nepal's AI Policy

Response	Number of respondents	Percentage
Not at all	19	8.52
To a great extent	76	34.08
To some extent	100	44.84
Don't know	28	12.56

The survey result in Table 4.28 shows strong support for AI policies that address gender and geographical disparities in Nepal. A total of 78.92% of respondents believe AI policy should address these issues to some (44.84%) or great (34.08%) extent. Only 12.56% think it should not address these disparities, and 8.52% are unsure. These findings suggest that policymakers should focus on making AI more inclusive by promoting equity in its development and deployment.

Question 18. Should Nepal focus more on AI skill development to close workforce gaps?

The survey result in Table 4.29 shows strong support for prioritizing AI skill development in Nepal, with 82.06% of respondents either "Agree" (37.22%) or "Strongly Agree" (44.84%). Only 13.45% are "Neutral," and 4.48% "Disagree." This result suggests policy should focus on enhancing AI education and training programs to address workforce gaps. It could encourage collaboration between academia, industry, and government to create effective skill development initiatives.

Table 4.29: Enhancing AI Skill Development to Bridge Workforce Gaps in Nepal

Response	Number of respondents	Percentage
Agree	83	37.22
Disagree	10	4.48
Neutral	30	13.45
Strongly Agree	100	44.84

Question 19. Are there sufficient funding opportunities for AI research and innovation in Nepal?

Table 4.30: Funding Opportunities for AI Research and Innovation in Nepal

Response	Number of respondents	Percentage
No funding exists	79	35.43
Some funding exists	68	30.49
Yes, sufficient funding exists	12	5.38
Don't know	64	28.70

The result in Table 4.30 shows that a majority of respondents believe funding opportunities for AI research and innovation in Nepal are insufficient. 35.43% think there is no funding available, while 30.49% feels that some funding exists. Only 5.38% believe there is sufficient funding, and 28.70% are unsure. These findings highlight the need for increased investment in AI research and innovation.

Question 20. What type of AI awareness initiatives should be included in Nepal's AI policy to foster its adoption?

Table 4.31: AI Awareness Initiatives for Fostering Adoption in Nepal's AI Policy

Response	Number of respondents	Percentage
Collaboration with academic institutions and AI-related institutions for AI training	32	14.35
Educational programs and workshops	24	10.76
Public awareness campaigns and media outreach	19	8.52
All of the above	148	66.37

The survey results show strong support for a comprehensive approach to AI awareness in Nepal, with 66.37% of respondents believing that all types of initiatives (educational programs, public awareness campaigns, and collaboration with academic institutions) should be included in AI policy. Smaller portions of respondents prioritize specific initiatives like educational programs (10.76%), public awareness campaigns (8.52%), and collaboration with academic institutions (14.35%). These findings suggest that a different strategy is needed to build AI awareness. Policymakers could focus on creating AI literacy programs, organizing workshops and public events, and fostering partnerships between academia, industry, and government.

Question 21. Is the current digital infrastructure (e.g., data centers, internet) adequate to support AI development in Nepal?

Table 4.32: Assessing Nepal's Digital Infrastructure for AI Development

Response	Number of respondents	Percentage
Not adequate	123	55.16
Somewhat adequate	73	32.74
Yes, fully adequate	12	5.38
Don't know	15	6.73

The survey results indicate that the majority of respondents (55.16%) believe Nepal's current digital infrastructure is not adequate to support AI development. Another 32.74% feel it is

somewhat adequate, while only 5.38% consider it fully adequate. A small portion (5.38%) are unsure. These findings highlight the need for significant investments in digital infrastructure, including improving internet access, expanding data centers, and enhancing overall infrastructure quality.

Question 22. How can data governance policies in Nepal balance privacy and support AI development?

Table 4.33: Balancing Privacy and AI Development Using Data Governance Policies in Nepal

Response	Number of respondents	Percentage
Creating frameworks for secure data sharing	35	15.70
Establishing clear data privacy regulations	35	15.70
Implementing data storage standards tailored for AI	9	4.04
All of the above	144	64.57

Table 4.33 shows that most people (64.57%) believe that to balance privacy and support AI development in Nepal, we need a combination of three key actions: clear data privacy rules, secure ways to share data, and AI-specific data storage standards. A smaller group of respondents (15.70%) think secure data sharing is most important, while 15.70% prioritize data storage standards for AI. Only a few (4.04%) think just having data privacy regulations is enough. Overall, the results suggest that a well-rounded approach, covering all three areas, is the best way to protect privacy while allowing AI to grow.

Question 23. Should local public datasets be made easily accessible to AI researchers and innovators for promoting AI in the context of Nepal?

Table 4.34 shows strong support for making local public datasets easily accessible to AI researchers and innovators in Nepal. A significant portion of respondents (31.84%) strongly agree, while 37.22% agree that these datasets should be available. Together, 69.06% of respondents support this idea, indicating widespread enthusiasm for using public data to promote AI development. However, 21.52% of respondents are neutral, and 9.42% disagree with making the datasets easily accessible.

Table 4.34: Enhancing AI Innovation in Nepal: Accessibility of Local Public Datasets

Response	Number of respondents	Percentage
Agree	83	37.22
Disagree	21	9.42
Neutral	48	21.52
Strongly Agree	71	31.84

Question 24. How well does current infrastructure ensure data privacy for AI applications?

Table 4.35: Evaluating Data Privacy in Nepal's AI Infrastructure

Response	Number of respondents	Percentage
Poorly	126	56.50
Somewhat well	48	21.52
Very well	19	8.52
Don't know	30	13.45

Table 4.35 shows that most respondents believe current infrastructure does not adequately ensure data privacy for AI applications. The largest group, 56.50%, feel that data privacy is ensured poorly, while 21.52% think it is ensured somewhat well. Only 13.45% believe it is handled very well, and 8.52% are unsure. Overall, these findings suggest a significant concern about the state of data privacy infrastructure in Nepal for AI applications.

Question 25. What should the government prioritize in data governance to promote AI technologies?

Table 4.36: Government Priorities in Data Governance for AI Advancement

Response	Number of respondents	Percentage
Ensuring equitable access to AI technologies	20	8.97
Establishing transparent and inclusive data-sharing frameworks	10	4.48
Implementing strong data privacy and protection measures	50	22.42
All of the above	143	64.13

Table 4.36 shows that most respondents (64.13%) believe the government should prioritize all three aspects of data governance: ensuring equitable access to AI technologies, implementing strong data privacy and protection measures, and establishing transparent and inclusive data-sharing frameworks. Smaller portions of respondents emphasize the need for specific actions, such as 22.42% prioritizing data privacy and protection, 4.48% focusing on data-sharing frameworks, and 8.97% highlighting equitable access to AI technologies. These findings suggest a strong preference for a complete approach to data governance that addresses accessibility, privacy, and data sharing to promote AI technologies in Nepal.

Question 26. Are investments in Nepal's digital infrastructure (e.g., data centers, internet) aligned with AI growth needs?

Table 4.37: Aligning Digital Infrastructure Investments with AI Growth in Nepal

Response	Number of respondents	Percentage
Not aligned	62	27.80
Partially aligned	96	43.05
Yes, fully aligned	37	16.59
Don't know	28	12.56

Table 4.37 indicates that many respondents (43.05%) believe investments in Nepal's digital infrastructure are only partially aligned with the needs of AI growth. A significant portion

(27.80%) feel that these investments are not aligned with AI growth needs at all, while a smaller group (16.59%) thinks they are fully aligned. Additionally, 12.56% of respondents are unsure about the alignment. These findings suggest that Nepal may need to rethink its digital infrastructure investments to better support AI development.

Question 27. How well is the quality of public data collected by government, banks, and private sectors maintained and utilized for AI purposes?

Table 4.38: Quality and Utilization of Public Data for AI in Nepal

Response	Number of respondents	Percentage
Moderately maintained and somewhat useful for AI	94	42.15
Poorly maintained and not useful for AI	68	30.49
Well-maintained and highly useful for AI	17	7.62
Don't know	44	19.73

Table 4.38 reveals a mixed perception about the quality and usefulness of public data for AI purposes in Nepal. 42.15% of respondents believe public data is moderately maintained and somewhat useful for AI, while 7.62% feel it is well-maintained and highly useful. 30.49% think the data is poorly maintained and not useful for AI, while 19.73% are unsure about its quality and usefulness. These findings suggest that while some public data is useful for AI, there is room for improvement in terms of quality and accessibility.

Question 28. How can AI risks such as bias and misuse be effectively minimized?

Table 4.39 shows strong support for a multi-pronged approach to minimizing AI risks such as bias and misuse. 66.37% of respondents believe that all three approaches - establishing ethical guidelines, conducting regular audits, and promoting education on ethical AI use - are necessary to effectively manage these risks. 15.25% prioritize audits and monitoring of AI systems, 13.45% emphasize education and awareness on ethical AI use, and 4.93% focus on establishing clear ethical guidelines and standards. These findings suggest that respondents favor a comprehensive framework that combines ethical standards, oversight, and public education to manage AI risks.

Table 4.39: Minimizing AI Risks: Addressing Bias and Misuse Effectively

Response	Number of respondents	Percentage
Conducting regular audits and monitoring of AI systems	34	15.25
Establishing clear ethical guidelines and standards	30	13.45
Promoting education and awareness on ethical AI usage	11	4.93
All of the above	148	66.37

Question 29. Should Nepal develop stricter measures to counter AI-driven misinformation and disinformation?

Table 4.40: Strengthening Measures to Combat AI-Driven Misinformation in Nepal

Response	Number of respondents	Percentage
Agree	85	38.12
Disagree	6	2.69
Neutral	12	5.38
Strongly Agree	120	53.81

Table 4.40 reveals strong support for developing stricter measures in Nepal to combat AI-driven misinformation and disinformation. 53.81% of respondents strongly agree, and 38.12% agree, totaling 91.93% in favor of such measures. Only 5.38% are neutral, and 2.69% respondents

disagree with the proposal. These findings suggest that there is widespread concern about the potential harm of AI-generated misinformation and a clear demand for action.

Question 30. How can human rights considerations be effectively integrated into Nepal's AI policies?

Table 4.41: Integrating Human Rights Considerations into Nepal's AI Policies

Response	Number of respondents	Percentage
By addressing biases and promoting fairness in AI systems	24	10.76
By ensuring AI policies include privacy and data protection measures	35	15.70
By establishing accountability for AI-related human rights violations	16	7.17
All of the above	148	66.37

Table 4.41 indicates a strong preference for integrating human rights considerations into Nepal's AI policies, with 66.37% of respondents believing that all three approaches (privacy and data protection, addressing biases and promoting fairness, and establishing accountability for violations) are necessary. 10.76% prioritize addressing biases, 15.70% emphasize accountability for human rights violations, and 7.17% focus on privacy and data protection. These findings suggest that a comprehensive approach to AI policy is needed, where human rights are central.

Question 31. Is there a significant risk of AI being used unethically in Nepal?

Table 4.42 reveals a strong concern about the ethical risks associated with AI in Nepal. 59.19% of respondents believe there is a very significant risk of AI being used unethically, while 33.18% consider the risk moderately significant. Only 30.14% feel the risk is insignificant, and 4.48% are unsure. Overall, 92.38% of respondents perceive some level of significant ethical risk related to AI use. These findings highlight the need for effective measures to address the ethical concerns surrounding AI in Nepal.

Table 4.42: Assessing the Risk of Unethical AI Use in Nepal

Response	Number of respondents	Percentage
Insignificant	7	3.14
Moderately significant	74	33.18
Yes, very significant	132	59.19
Don't know	10	4.48

Question 32. Should privacy concerns be prioritized over innovation in AI policies?

Table 4.43: Balancing Privacy Concerns and Innovation in AI Policies

Response	Number of respondents	Percentage
Agree	83	37.22
Disagree	7	3.14
Neutral	37	16.59
Strongly Agree	96	43.05

Table 4.43 indicates that a majority of respondents (80.27%) believe privacy concerns should be prioritized over innovation in AI policies. 43.05% strongly agree, and 37.22% agree, suggesting strong support for prioritizing privacy in AI policymaking. A smaller portion, 16.59%, remain neutral, while only 3.14% disagree with this viewpoint. The findings suggest that while there is significant support for safeguarding privacy, respondents also recognize the need for innovation in AI.

Question 33. Is the absence of ethical safeguards a barrier to AI development in Nepal?

Table 4.44: Impact of Ethical Safeguards on AI Development in Nepal

Response	Number of respondents	Percentage
Agree	100	44.84
Disagree	19	8.52
Neutral	42	18.83
Strongly Agree	62	27.80

Table 4.44 shows a strong consensus that the absence of ethical safeguards is a significant barrier to AI development in Nepal. 44.84% of respondents "Agree", and 27.80% "Strongly Agree", meaning that 72.65% of respondents believe ethical safeguards are crucial for responsible AI development. Only 18.83% remain Neutral, and a small portion (8.52%) "Disagree". These results suggest that ethical considerations are viewed as central to the future of AI in Nepal.

Question 34. Should AI be utilized more effectively to address national priorities like education and healthcare?

Table 4.45: Leveraging AI for National Priorities: Education and Healthcare

Response	Number of respondents	Percentage
Agree	80	35.87
Disagree	2	0.90
Neutral	16	7.17
Strongly Agree	125	56.05

Table 4.45 shows overwhelming support for utilizing AI more effectively to address national priorities like education and healthcare. A significant 56.05% of respondents "Strongly Agree",

while 35.87% "Agree", bringing the total to 91.93% who support this approach. Only 7.17% are Neutral, and a very small portion (0.90%) "Disagree". These results highlight a strong belief in the potential of AI to improve key sectors like education and healthcare.

Question 35. Should AI adoption in public services be accelerated?

Table 4.46: Accelerating AI Adoption in Public Services

Response	Number of respondents	Percentage
Agree	93	41.70
Disagree	5	2.24
Neutral	20	8.97
Strongly Agree	105	47.09

Table 4.46 indicates strong support for accelerating AI adoption in public services. 47.09% of respondents "Strongly Agree", and 41.70% "Agree", leading to an overwhelming total of 88.79% who favor this approach. Only 8.97% are Neutral, and a very small percentage (2.24%) "Disagree". These findings suggest that policymakers could be encouraged to prioritize AI integration in public services.

Question 36. Should AI-driven solutions be made more accessible to underserved communities?

Table 4.47 shows strong support for making AI-driven solutions more accessible to underserved communities. A significant 34.53 % of respondents "Strongly Agree", and 49.78% "Agree", bringing the total to 84.30% who support this initiative. Only 13.90% are Neutral, and a very small 1.79% "Disagree". This indicates a strong desire for policymakers and organizations to work towards inclusivity in AI solutions.

Table 4.47: Expanding AI Access to Underserved Communities

Response	Number of respondents	Percentage
Agree	111	49.78
Disagree	4	1.79
Neutral	31	13.90
Strongly Agree	77	34.53

Question 37. Should the government focus more on AI adoption in Small and Medium Scale Enterprises?

Table 4.48: Promoting AI Adoption in Small and Medium Enterprises

Response	Number of respondents	Percentage
Agree	100	44.84
Disagree	7	3.14
Neutral	32	14.35
Strongly Agree	84	37.67

Table 4.48 shows overwhelming support for the government to focus more on AI adoption in Small and Medium Scale Enterprises (SMEs). 37.67% of respondents "Strongly Agree", while 44.84% "Agree", bringing the total to 82.51% who support this approach. A smaller portion, 14.35%, are Neutral, and 3.14% "Disagree". These results suggest that policymakers should prioritize AI adoption in SMEs.

Question 38. Are current AI uses, implementations, and research creating measurable value in Nepal's economy?

Table 4.49: Assessing the Economic Impact of AI in Nepal

Response	Number of respondents	Percentage
No value	38	17.04
Some value	106	47.53
Yes, significant value	48	21.52
Don't know	31	13.90

Table 4.49 reveals a mixed perception about the current impact of AI on Nepal's economy. 47.53% of respondents believe that AI implementations and research are creating some value, while 17.04% think that AI is not contributing any measurable value. A smaller portion, 21.52%, see AI as generating significant value, and 13.90% are unsure. These results indicate that while there is some recognition of AI's potential, many believe it has not yet translated into meaningful economic benefits for Nepal.

Question 39. Should disparities in AI accessibility across regions be prioritized?

Table 4.50: Prioritizing Regional Equity in AI Accessibility

Response	Number of respondents	Percentage
Agree	116	52.02
Disagree	7	3.14
Neutral	49	21.97
Strongly Agree	51	22.87

Table 4.50 indicates strong support for addressing disparities in AI accessibility across regions in Nepal. 22.87% of respondents strongly agree, and 52.02% agree that these disparities should be prioritized. This totals 74.89% of respondents advocating for action on this issue. A smaller portion, 21.97%, are neutral, and only 3.14% disagree. These findings suggest that policymakers should focus on bridging the digital divide by enhancing AI accessibility in underserved regions.

Question 40. How can AI initiatives be made more inclusive of all socio-economic groups?

Table 4.51: Ensuring Socio-Economic Inclusivity in AI Initiatives

Response	Number of respondents	Percentage
By ensuring equal access to AI technologies	27	12.11
By prioritizing marginalized communities in AI initiatives	22	9.87
By reducing digital literacy gaps through education and training	32	14.35
All of the above	142	63.68

Table 4.51 highlights a strong preference for a comprehensive approach to making AI initiatives more inclusive across socio-economic groups in Nepal. 63.68% of respondents believe that all three strategies: ensuring equal access to AI technologies, prioritizing marginalized communities, and reducing digital literacy gaps. A smaller proportion of respondents prioritize each of the individual approaches: 14.35% focus on education and training, 9.87% emphasize prioritizing marginalized communities, and 9.87% emphasize ensuring equal access to AI technologies. These findings suggest that to make AI more inclusive, policymakers should focus on reducing the digital divide and ensuring equitable access.

Question 41. How important is it to develop a clear strategic roadmap for AI development in Nepal at this stage?

Table 4.52 reveals strong support for developing a clear strategic roadmap for AI development in Nepal. A significant majority, 78.92%, of respondents believe that it is very important to have such a roadmap, reflecting overwhelming support for the idea. Additionally, 18.83% consider it somewhat important, indicating moderate backing. Only a small minority of 1.79% think it is

either not very important or not important at all. Overall, these findings suggest a clear consensus on the necessity of a well-defined strategic plan to guide the future of AI development in Nepal.

Table 4.52: The Importance of a Strategic Roadmap for AI Development in Nepal

Response	Number of respondents	Percentage
Not important at all	1	0.45
Not very important	4	1.79
Somewhat important	42	18.83
Very important	176	78.92

Question 42. Should Nepal's AI policy align with international best practices at this stage, or is it not necessary to prioritize this?

Table 4.53: Aligning Nepal's AI Policy with International Best Practices: A Priority or Not

Response	Number of respondents	Percentage
No, alignment with international best practices is not a priority	14	6.28
Partial alignment with best practices is sufficient	76	34.08
Yes, it should fully align with international best practices	118	52.91
Don't know	15	6.73

Table 4.53 shows strong support for aligning Nepal's AI policy with international best practices. A majority of respondents, 52.91%, believe the policy should fully align with these practices. Additionally, 34.08% think partial alignment is sufficient, reflecting moderate support for a more flexible approach. Only a small minority, 6.28%, feel that alignment with international standards is not a priority. Overall, the data suggests a clear consensus in favor of aligning Nepal's AI policy with global best practices.

Question 43. Should Nepal establish a dedicated body for AI governance?

Table 4.54: The Need for a Dedicated AI Governance Body in Nepal

Response	Number of respondents	Percentage
Agree	67	30.04
Disagree	5	2.24
Neutral	25	11.21
Strongly Agree	126	56.50

Table 4.54 indicates strong support for the establishment of a dedicated body for AI governance in Nepal. A majority of respondents, 56.50%, strongly agree with this idea, while an additional 30.04% express agreement. Only 11.21% remain neutral, and a small 2.24% disagree with the proposal. Overall, the data suggests a clear consensus in favor of creating a dedicated organization to oversee AI governance in Nepal.

Question 44. Should ethical concerns be prioritized and well-integrated into Nepal's AI strategy?

Table 4.55 shows strong support for prioritizing and integrating ethical concerns into Nepal's AI strategy. A significant majority, 71.75%, believe that ethical considerations should be fully prioritized and well-integrated into the strategy. Additionally, 19.28% feel that ethical concerns should be partially prioritized, while only a small percentage, 5.38%, believe they should not be a priority at this stage. Overall, the data suggests a broad consensus in favor of giving ethical concerns a central role in shaping Nepal's AI strategy.

Table 4.55: Prioritizing Ethical Considerations in Nepal's AI Strategy

Response	Number of respondents	Percentage
No, they are not a priority at this stage	12	5.38
They should be partially prioritized and integrated	43	19.28
Yes, they should be fully prioritized and integrated	160	71.75
Don't know	8	3.59

Question 45. Is there a need for more actionable plans for AI adoption in public sectors?

Table 4.56: Enhancing AI Adoption in Public Sectors with Actionable Plans

Response	Number of respondents	Percentage
Agree	90	40.36
Disagree	4	1.79
Neutral	8	3.59
Strongly Agree	121	54.26

Table 4.56 indicates strong support for the development of more actionable plans for AI adoption in public sectors. A majority of respondents, 54.26%, strongly agree with the need for such plans, while an additional 40.36% also express agreement. Only 3.59% remain neutral, and 1.79% disagree. Overall, the data suggests a clear idea in favor of creating more actionable strategies for AI adoption in Nepal's public sectors.

Question 46. Should long-term sustainability be prioritized in Nepal's AI strategies?

Table 4.57: Prioritizing Long-Term Sustainability in Nepal's AI Strategies

Response	Number of respondents	Percentage
Agree	75	33.63
Disagree	2	0.90
Neutral	5	2.24
Strongly Agree	141	63.23

Table 4.57 shows strong support for prioritizing long-term sustainability in Nepal's AI strategies. A majority, 63.23%, strongly agree that sustainability should be a central focus, while 33.63% also agree with this idea. Only 2.24% of respondents are neutral, and 0.90% disagrees. Overall, the data suggests a clear consensus in favor of incorporating long-term sustainability into Nepal's AI strategies.

4.1.2 Overall Findings from Sub-Research Questions

SRQ1 (Policy Adequacy): For the successful advancement of AI in Nepal, it is crucial to establish clear and comprehensive policies for AI research, innovation, and development, addressing the current gap in guidelines. Collaboration between policymakers, AI researchers, and social scientists is needed to create inclusive AI policies that effectively address social challenges. Aligning AI policies with international standards will improve governance, foster global cooperation, and ensure responsible AI practices. Additionally, investments in AI education and training programs are essential to equip a skilled workforce, addressing the current insufficiencies in educational initiatives. Finally, AI policymaking should prioritize economic growth while maintaining a strong emphasis on ethical considerations.

SRQ 2 (Regulatory Framework): Nepal should enhance its regulatory framework for AI to safeguard data security and privacy, with particular attention to addressing challenges such as data bias and misuse. The establishment of clear ethical guidelines for AI is essential to ensure fairness, privacy, and transparency, with input from the government, businesses, and the public stakeholders. Strict laws should be introduced to prevent the misuse of AI, especially in sensitive domains like healthcare. Furthermore, the government must take proactive measures to combat AI-generated misinformation by implementing stricter regulations and promoting public awareness. Cross-border sharing of AI-related data should be tightly regulated to protect national

security interests, and the government should formulate policies that protect human rights and foster public trust in AI technologies.

SRQ 3 (Ecosystem Development): To build a strong AI ecosystem in Nepal, the government should prioritize enhancing digital infrastructure and formulating clear regulatory frameworks to foster innovation. It is essential to provide funding opportunities to support the growth of AI startups and to promote collaborative partnerships among the government, private sector, and other stakeholders to facilitate resource and knowledge sharing. AI policies must ensure equitable access to AI education and employment opportunities for all individuals, irrespective of gender or geographic location. Increased investment in AI training programs is necessary to equip the workforce with the skills required for future job markets. Additionally, the government should also increase funding allocation for AI research and innovation.

SRQ4 (Digital Infrastructure, Data, and Governance): The government should prioritize enhancing digital infrastructure, including expanding internet access and establishing additional data centers, to facilitate AI development. It is also crucial to update and strengthen data privacy laws and security measures to protect personal information. Making public data more accessible and improving its quality would help researchers and innovators create AI solutions. Additionally, a comprehensive approach to data governance is essential, balancing access to AI technologies, strong privacy protections, and clear data-sharing policies.

SRQ 5 (AI Risks): The government should prioritize responsible AI development in Nepal, adopting a comprehensive approach to managing AI risks through ethical guidelines, audits, and public education. Stricter measures to counter AI-driven misinformation are essential, with strong emphasis on integrating human rights considerations such as privacy, fairness, and accountability into AI policies. Ethical concerns are widely acknowledged, with significant risks in AI usage being a primary concern. Privacy should be a major concern while making a sustainable AI policy. The lack of safeguards is identified as a major obstacle to AI development.

SRQ 6 (AI for National Priorities): The survey findings highlight a strong public mandate for the Nepal government to prioritize AI adoption across key national sectors like education, healthcare, and public services, recognizing its potential to drive significant improvements. There is broad support for making AI solutions accessible to underserved communities and small and medium enterprises (SMEs), emphasizing the importance of inclusivity and economic growth. Respondents also stress the need to address disparities in AI accessibility across regions and to bridge the digital divide through equitable access and digital literacy initiatives. Although some perceive AI as contributing value to the economy, many believe its potential remains underutilized, signaling the need for strategic interventions to maximize its impact. A comprehensive approach to inclusivity, encompassing equal access, prioritization of marginalized communities, and closing digital literacy gaps, is strongly recommended to ensure equitable benefits from AI development.

SRQ7 (Strategic Roadmap): The survey results indicate a strong consensus among respondents that Nepal requires a clear and structured plan for AI development. The government should formulate a comprehensive and well-organized strategy to guide AI growth. In addition, aligning

with international AI standards is crucial for Nepal to ensure global competitiveness. Many respondents emphasized the need for a dedicated regulatory body to oversee AI governance and ensure that ethical considerations are adequately addressed. There is also strong support for making clear plans for focusing on long-term sustainability. Furthermore, there is significant support for the development of clear, long-term plans that prioritize sustainability in AI initiatives.

4.2 Focus Group Discussion

To develop comprehensive AI policy recommendations for Nepal, two focus group discussions (FGDs) were conducted, engaging diverse stakeholders from various sectors.

The first FGD involved 15 participants representing academia, consultants, lawyers, government officials, international and non-governmental organizations (INGOs and NGOs), human rights groups, private sector representatives, AI start-up companies, the Nepal Telecom Authority, and the AI Association of Nepal. This diverse mix of participants provided a rich exchange of ideas and viewpoints, shedding light on the opportunities and challenges in adopting AI policies in the country.

The second FGD brought together 10 participants from sectors including banking, government, start-up companies, the Nepal Insurance Authority, health, INGOs, insurance, law enforcement, and consulting. This group contributed valuable perspectives on AI's role in highly regulated and service-oriented industries, highlighting the specific needs and implications of AI policy for these sectors.

The discussions facilitated the collection of varied stakeholder views, which were integrated to generate actionable findings. These findings serve as the foundation for developing holistic and inclusive AI policy recommendations tailored to Nepal's unique context. The key takeaway of both FGDs as per sub-research questions are as follows:

4.2.1 SRQ1(Policy Adequacy)

Nepal's current AI policies are insufficient to address the country's technological, societal, and economic needs, particularly as AI continues to evolve rapidly. Key issues include the lack of international standards for AI patient rights in healthcare, limited public understanding of AI patents and intellectual property (IP) rights, and poor communication between stakeholders, such as the government, private sector, and academia. Additionally, existing policies do not promote open AI or encourage innovation, and there is a pressing need for timely reviews to keep up with technological advancements. Nepal also faces infrastructure challenges, with high adoption costs and unequal access to AI tools, contributing to a widening digital divide. The lack of robust data protection, privacy laws, and guidelines for generative AI further exacerbates these issues, leaving citizens vulnerable to data misuse. To address these gaps, Nepal must develop a comprehensive national AI strategy focused on public awareness, data protection, and infrastructure development. The government should make investment agendas addressing the

cultural impacts of AI. For example, the government should invest in AI education to build local talent and promote open AI initiatives to foster innovation. A unified AI policy should ensure that AI development aligns with societal needs and supports sustainable economic growth, addressing issues such as intellectual property, digital rights, and data security. By improving communication between key stakeholders and addressing the cultural context of AI, Nepal can create an ecosystem that promotes equity, reduces the AI divide, and allows AI to contribute meaningfully to the country's growth.

4.2.2 SRQ2(Regulatory Framework)

To ensure responsible, transparent, and inclusive AI development and deployment in Nepal, a comprehensive regulatory and governance framework is urgently needed. Currently, there are no clear guidelines for the deployment and development of AI, leading to gaps in ethical, legal, and practical considerations. In this regard, ethical guidelines should be established to ensure AI systems are developed and implemented in a manner that aligns with societal values, respects human rights, and promotes fairness. One critical area of focus is data privacy and protection. The introduction of robust data protection laws is also essential to safeguard individual privacy, especially with the increasing use of AI in sectors like healthcare, education, and finance. Additionally, a strong data privacy framework should be designed, ensuring that the collection, storage, and processing of personal data is done transparently and securely, with mechanisms for individuals to exercise control over their own data. A localized approach to AI regulation is necessary, as policies should reflect Nepal's unique societal frameworks, cultural beliefs, and priorities. While AI can bring substantial benefits to society, such as in healthcare and education, it is essential that these benefits are aligned with the values of the local population. Policymakers should be well-versed in AI and its potential impacts, and thus, the right people must be involved in crafting these laws. Regulatory bodies, potentially including specialized attorneys and experts, should be formed to oversee the development and deployment of AI systems. The role of these bodies would be to ensure that AI is used responsibly and that laws are enforced. Given the rapid advancement of AI technology, it is essential for the government to establish a strong, accountable AI policy that includes clear guidelines and frameworks for the ethical use of AI in all sectors.

One of the core challenges in Nepal is misinformation and the ethical implications of AI, including bias and discrimination. Misinformation about AI capabilities and risks must be countered with proper public awareness and education campaigns. AI training, certification, and education programs should be widely implemented to ensure that stakeholders at all levels understand the ethical considerations surrounding AI deployment. Additionally, the AI systems themselves must be designed with fairness and safety in mind, following guidelines such as those developed in the EU for AI safety and ethical considerations. These safety designs should aim to reduce risks, ensure AI systems are unbiased, and guarantee that AI does not inadvertently harm marginalized groups or individuals.

Furthermore, the question of accountability, especially in sectors like healthcare, needs to be addressed. AI policies should also address the specific needs of various sectors, with certain

restrictions in place for areas where AI risks are higher, such as in the medical field, while allowing more flexibility in less critical applications. Moreover, the issue of data quality cannot be overlooked; AI models need access to balanced and accurate datasets to prevent biases that could result in discriminatory outcomes. This requires policies that ensure the source of data is trustworthy and that datasets used in AI training are comprehensive and representative.

Lastly, it is essential that AI policies connect with existing laws and policies, especially those related to cybersecurity, intellectual property, and public safety. As AI technology is interconnected with global networks, cross-border regulations, such as those being developed by the Nepal Rastra Bank (NRB) for financial applications, should be explored and integrated into the national regulatory framework. AI governance in Nepal should not be siloed but rather involve multi-stakeholder collaboration, including the government, private sector, academia, and civil society, to create a balanced and inclusive approach. In conclusion, a well-rounded regulatory framework is crucial for ensuring that AI in Nepal is developed and deployed in an ethical, transparent, and accountable manner, with careful attention to safety, fairness, data protection, and societal benefits.

4.2.3 SRQ3(Ecosystem Development)

To cultivate a thriving AI startup ecosystem in Nepal, it is crucial to bring together key stakeholders, including the government, private sector, educational institutions, and the startup community. Collaboration across these sectors is essential for providing the necessary resources and support. Public-private partnerships should be encouraged, with the government playing an active role in funding early-stage startups, setting up research-focused labs, and providing infrastructure. Additionally, the government should create flexible frameworks that can adapt to the rapidly evolving AI landscape, ensuring long-term growth and innovation. The involvement of both private companies and public institutions will create a more unified approach to AI development in Nepal.

A major challenge in Nepal is the lack of skilled AI talent. To address this, capacity building and human development programs should be prioritized, focusing on AI education from the ground up. AI should be integrated into university curricula, with practical, hands-on training, and the upskilling of the existing workforce. Collaboration between educational institutions and AI companies will ensure that students are equipped with relevant skills for the market. Furthermore, a common understanding of AI's potential and challenges must be established among all stakeholders, fostering alignment on shared goals and visions for the ecosystem.

Funding and infrastructure are also critical to the success of AI startups. The government can help by adopting a funding-based system, offering loans, grants, and venture capital to AI-driven enterprises. A structured 3-5 year funding plan would provide long-term support for research, development, and commercialization of AI. At the same time, infrastructure needs such as high-speed internet, cloud computing, and AI-specific hardware must be addressed to ensure developers have the tools they need. Standardization and ethical guidelines should be integrated into the ecosystem to promote fairness, transparency, and consistency. By focusing on talent

development, funding, infrastructure, and collaboration, Nepal can build a robust AI startup ecosystem that benefits various sectors and contributes to the country's technological and economic growth.

4.2.4 SRQ4(Digital Infrastructure, Data and Governance)

To support AI innovation while ensuring privacy, accessibility, and equitable access to AI technologies in Nepal, a comprehensive approach to data security, data governance, cybersecurity, and digital infrastructure policies is crucial. Currently, Nepal's data infrastructure faces significant challenges, with the existing GIDC being insufficient for the growing demands of AI. High-speed, scalable data centers are essential to support the large volumes of data AI systems require, but the current infrastructure, including cloud services, is not ready to meet these needs. The government must prioritize investment in upgrading infrastructure and providing sustainable, high-performance data centers. In addition, data standardization is necessary to ensure that data used for AI development is consistent, high-quality, and accessible across sectors. At the same time, data openness must be promoted to facilitate innovation, but the lack of open data and local datasets remains a challenge. Open contracting for data access, where transparency and access are prioritized, would be an important step toward addressing this issue.

To mitigate risks such as bias, misinformation, and the misuse of AI, strong data governance frameworks are essential. Data protection laws should be put in place to ensure the privacy and security of individuals' information while fostering an environment where AI research and development can flourish. The government should mandate that all government data is stored within secure government-owned data centers, ensuring control over sensitive national data. A collaborative ecosystem, where multiple stakeholders—including government agencies, private sector entities, academia, and startups—work together to share data and avoid duplication, will be key to driving AI innovation. Establishing clear guidelines for data usage and access, particularly for research purposes, will help ensure that data is used responsibly and ethically. Additionally, it is important to create a legal framework that defines who owns and is responsible for the data, especially for emerging AI startups, to protect them from data misuse and ensure they have the necessary support to thrive.

The government needs to invest in skill development programs to bridge the gap in AI talent, and AI positions should be created within public institutions to ensure a skilled workforce. For instance, dedicated positions like AI engineers and data analysts should be created in government services, and specialized AI professionals should be recruited from relevant fields. At the same time, universities and educational institutions should provide AI-focused curricula, ensuring that the next generation of AI experts is well-equipped with the knowledge and skills necessary to drive innovation. Additionally, local vendors and developers should be supported, with protections in place to encourage domestic AI talent and prevent the outsourcing of key technological development. The government can also offer financial incentives, such as grants or tax benefits, to stimulate AI innovation and make the sector more accessible to local businesses.

The financial sector, particularly banks, faces unique AI risks related to data security and the potential misuse of AI technologies. The Nepal Rastra Bank, which governs national financial operations, must develop clear compliance guidelines to manage AI risks, particularly around the potential for financial crimes facilitated by AI systems. Banks and financial institutions must ensure that sensitive transaction data is handled securely, and AI-related breaches must be closely monitored to prevent misuse. Policies need to be put in place to ensure that AI in the financial sector adheres to stringent cybersecurity measures to avoid vulnerabilities that could expose sensitive financial data. The development of ethical guidelines to mitigate AI-driven financial crimes should also be prioritized to protect both individuals and the financial system. In parallel, AI risks related to other sectors—such as healthcare, education, and transportation—should be mitigated through comprehensive data governance and cybersecurity policies, ensuring that the public is protected from unintended harms and that the benefits of AI are accessible to all.

To facilitate all of these efforts, a clear identification of stakeholders is essential. The roles and responsibilities of various stakeholders—government bodies, private companies, academic institutions, and civil society—must be clearly defined to avoid confusion and duplication of efforts. This includes defining the roles of regulatory bodies responsible for monitoring AI risks, data protection, and privacy. Establishing a responsible, accountable leadership structure is key, where key decision-makers, such as data protection officers and cybersecurity experts, are designated within government and private institutions. Collaboration is paramount to avoid redundancy and to ensure a well-coordinated AI ecosystem. At the same time, awareness and education on AI and data privacy should be prioritized, with public campaigns aimed at educating citizens about the benefits and risks associated with AI technologies.

In conclusion, Nepal must develop a multifaceted policy framework that includes strong data security, governance, and cybersecurity measures to support AI innovation while safeguarding privacy, accessibility, and equity. This framework must address the ethical dilemmas, societal impacts, and risks associated with AI, such as bias, misinformation, and misuse, by creating clear guidelines for responsible data usage, promoting collaboration, and protecting both individuals and businesses from harm. By investing in infrastructure, building local talent, supporting AI startups, and ensuring that government data is securely managed, Nepal can build a thriving, equitable AI ecosystem that promotes innovation while ensuring privacy and fairness for all.

4.2.5 SRQ5(AI Risks)

To minimize AI risks such as bias, misuse, and ethical concerns while balancing innovation, privacy, and human rights, Nepal must develop AI policies that take a comprehensive and balanced approach. A critical first step is identifying, classifying, and categorizing AI-related risks, including ethical issues like biased datasets, misuse in business, and potential societal harm such as the spread of inappropriate content. For example, the AI system must be equipped to detect and prevent the misuse of AI-generated business tools or the spread of harmful content, similar to how certain types of websites (e.g., pornography) are regulated.

One of the primary concerns is bias in AI datasets, which can result in unfair or discriminatory outcomes. To address this, AI models should use balanced and representative data that reflect the diversity of the population. In order to prevent cultural or spiritual risks, the policies should emphasize the importance of respecting Nepal's cultural values and spirituality in AI development. Moreover, AI models should be developed with a multi-stakeholder approach, involving government agencies, technology developers, academics, and civil society groups to create a well-rounded policy framework that balances the promotion of innovation with the protection of human rights. This will also include mechanisms for ensuring that sensitive transactions, such as those in banking, are thoroughly checked for authenticity and validity before being processed by AI systems.

Furthermore, data governance policies must be implemented to safeguard privacy while allowing for innovation. Publicly available datasets should be filtered and anonymized to protect individuals' personal information. AI policies must be flexible enough to adapt to both local needs and international standards. A key challenge will be determining how to localize global AI models from places like Europe or the US to make them applicable and culturally appropriate for Nepal's unique context. By considering these risks and implementing culturally sensitive AI policies, Nepal can foster an AI ecosystem that minimizes harm, upholds ethical standards, and respects privacy and human rights while enabling responsible innovation.

4.2.6 SRQ6(AI for National Priorities)

To strategically leverage an AI-driven digital ecosystem for Nepal's national priorities—such as education, healthcare, agriculture, economic growth, human rights, regional inclusivity, and tourism - it is crucial to develop an AI policy that aligns with the country's socio-economic context and ensures broad access to AI technologies. AI can significantly enhance sectors like tourism by offering personalized services, optimizing resources, and driving sustainable growth. AI can improve disaster management efforts by enabling more accurate early warnings, efficient response strategies, and real time data analytics to mitigate the effects of natural disasters.

However, AI adoption in Nepal must be balanced with careful consideration of risks, ethical concerns, and societal impacts. Ethical values and human-centric AI should be prioritized, with an emphasis on fairness, transparency, and accuracy in AI models. The policy should promote the use of AI systems that are reliable and ensure accuracy through rigorous validation methods, such as the Turing Test, to avoid potential misuse. In sectors like education, AI can improve access and personalize learning experiences, but it also brings risks such as misuse by students. Therefore, awareness about AI's ethical use should be integrated into school curricula, with teachers empowered to guide students responsibly. AI's potential in education extends to content-based assessments and innovative learning tools, which could transform the way students learn. However, efforts should focus on ensuring AI systems are user-friendly, device-compatible, and accessible to students in both urban and remote areas, bridging the digital divide.

AI's broader socio-economic benefits can be maximized by fostering inclusivity, equity, and accessibility. AI adoption should extend beyond urban centers and reach remote regions of Nepal, ensuring that all areas benefit from AI's capabilities. Policies should focus on equity, ensuring that AI technologies are accessible to people across different regions and demographic groups. Capacity-building efforts should focus on skill development and training to prepare the workforce for AI-driven jobs. The government must facilitate AI innovation challenges to identify and solve local problems in healthcare, agriculture, and other critical sectors. To further empower citizens and encourage AI adoption, success stories and positive marketing should be used to inspire trust and engagement with AI technologies. Furthermore, AI should be adaptable to Nepal's unique cultural context, ensuring that local values and customs are respected while using AI to address national priorities. Through a balanced and inclusive approach, AI can become a powerful tool for advancing Nepal's social, economic, and cultural goals while mitigating risks and promoting ethical standards.

4.2.7 SRQ7(Strategic Roadmap)

To effectively achieve Nepal's AI goals, it is essential to develop a strategic roadmap that spans both the short term and long term, aligning with international standards while addressing ethical, societal, and legal concerns. In the short term, immediate steps should include the development and deployment of AI-powered systems such as an AI-embedded Learning Management System (LMS) portal, which can enhance educational access, engagement, and effectiveness. AI can also be utilized in sectors like fishery, where predictive analytics can optimize fish stock management and resource allocation. A focus on developing chatbots for public service and customer interaction in government services can be an excellent initial application of AI technologies, improving efficiency and accessibility. Ensuring that AI tools are introduced with proper balance, where control is given to both teachers and students in an educational setting, is also essential. As AI technologies are adopted, it is important to regulate their usage and manage risks through appropriate frameworks, ensuring that both the benefits and potential threats are carefully addressed.

For the long-term strategy, the establishment of a dedicated government body to oversee AI development, implementation, and regulation is crucial. This AI-focused body should have a clear mandate to address the evolving AI landscape, with a dedicated human resource team, including AI engineers and experts, to implement policies effectively. Furthermore, digital governance should be integrated into national strategies, ensuring that AI aligns with the broader goals of digital Nepal. A central body would also be necessary to address issues like data duplication, ensuring that data is consistently managed and high-quality datasets are used across sectors. Maintaining high data quality and avoiding unnecessary duplication will be vital to ensuring that AI systems remain effective and efficient over time. A clear strategy to protect patient rights, particularly in the healthcare sector, should also be outlined, ensuring ethical use of AI in sensitive areas such as medical diagnostics and treatment.

A critical long-term goal is the integration of AI into governance and societal frameworks. AI should be used to connect the performance of digital Nepal initiatives, enhancing government

services, resource allocation, and public engagement through data-driven decision-making. However, it is important to note that current implementation mechanisms for AI in Nepal are weak, and therefore, the establishment of a separate, well-equipped body to oversee AI policy, development, and monitoring is essential. Additionally, the policy framework should be aligned with international standards, addressing ethical, legal, and societal concerns to ensure that AI adoption in Nepal does not only focus on innovation but also upholds the highest standards of human rights, privacy, and fairness. By establishing a robust strategic roadmap with clear short-term and long-term goals, Nepal can effectively harness AI technologies to drive economic growth, improve governance, and address societal challenges while mitigating associated risks.

4.3 Key Informant Interviews

To complement the focus group discussions, KIIs were conducted with experts and representatives from diverse sectors, focusing on the same research questions outlined in Annex B. These interviews provided detailed, sector-specific insights into the challenges, opportunities, and strategies for AI adoption in Nepal, ensuring a robust foundation for policy recommendations.

The KIIs engaged stakeholders from academia, government ministries, healthcare, AI experts, data centers, private sector organizations, media, legal professions, Nepal Rastra Bank, education and training institutes, start-up companies, and consultants. Each informant offered valuable perspectives from their respective domains, highlighting unique needs, priorities, and potential contributions to the development of a national AI policy.

The responses were systematically documented, analyzed, and consolidated to identify key themes and actionable insights. By exploring the research questions through these expert lenses, the findings provide a comprehensive understanding of the cross-sectoral implications of AI, helping to craft inclusive and effective policy recommendations tailored to Nepal's evolving AI landscape.

4.3.1 SRQ1(Policy Adequacy)

The existing AI-driven digital ecosystem policies, laws, and procedures in Nepal are currently in their early stages and are not sufficiently robust to meet the country's technological, societal, and economic needs. At present, the policies mainly focus on broad concepts without addressing the detailed implications of AI technologies in the Nepali context. The potential of AI to address various societal challenges—such as improving healthcare access, enhancing education systems, and optimizing public service delivery—remains underutilized due to the absence of a comprehensive and cohesive policy framework. While the Ministry of Communications and Information Technology (MoCIT) has developed an AI concept paper, an AI policy has not yet been fully formulated, leaving a gap in the regulatory structure.

Moreover, the current policy landscape primarily emphasizes capacity-building and the utilization of AI tools, without addressing crucial components like governance, regulation, and

ethical standards. The lack of clear guidelines and standards operating procedures leaves the government ill-prepared to effectively manage AI technologies and their deployment. The establishment of such frameworks—especially ones focused on data management, privacy, and the ethical use of AI—is urgently needed to ensure that AI technologies are deployed responsibly and for the benefit of society.

To address these gaps, Nepal must focus on creating an AI policy that aligns with international standards while customizing it to meet the unique needs of the country. Such a policy should not only focus on the economic aspects of AI but also incorporate ethical guidelines to ensure that AI adoption does not lead to widening inequality or loss of public trust. It should include provisions for transparency, accountability, and safeguarding against negative consequences such as job displacement or privacy breaches. At the same time, the policy must be designed in a way that promotes innovation and investment, avoiding the risks of excessive regulation that could stifle growth.

Additionally, the policy must consider broader societal needs, such as the accuracy of AI applications in the Nepali language, which remains an underdeveloped area, particularly in natural language processing. Policies must also address emerging sectors, including the integration of AI with green energy initiatives and the circular economy, while ensuring cross-border interoperability in a globalized digital environment.

To ensure that AI technologies are used to their full potential, comprehensive risk assessments and identification of potential use cases within the Nepali context are crucial. The government must engage in extensive consultations with stakeholders from various sectors to assess the risks and implications of AI on society, and use this data to shape the policies being formed. With AI advancing rapidly on the global stage, Nepal must act swiftly to develop an inclusive, future-ready AI policy that promotes ethical innovation, strengthens public trust, and supports sustainable economic growth.

4.3.2 SRQ2(Regulatory Framework)

To ensure responsible, transparent, and inclusive AI development and deployment in Nepal, a robust and comprehensive regulatory and governance framework is essential. Currently, existing policies are insufficient to address the ethical, legal, and societal implications of AI. A new, forward-thinking policy framework is needed, one that prioritizes human rights, privacy, data protection, and the ethical use of AI technologies. Privacy concerns are a critical issue, and a Personal Data Protection Policy should be established to safeguard individuals' privacy and ensure that personal data is handled securely and ethically. This policy should also address clear guidelines on the handling of national data, specifying at what level data should be disclosed and ensuring that data protection standards meet international norms.

Ethical guidelines should focus on ensuring that AI development aligns with the cultural values of Nepal while protecting individuals' rights. This includes addressing the ethical concerns related to the use of AI in sensitive sectors like healthcare, where a sector-specific AI policy is

necessary to ensure the proper use of AI technologies in line with patient privacy and safety. Furthermore, there should be clear ethical standards for AI products, including requirements for registration and regulation to prevent misuse and ensure accountability.

One significant challenge is the rising threat of misinformation and disinformation facilitated by AI, which can have harmful societal consequences. Therefore, a regulatory framework must be established to monitor and mitigate these risks through content moderation. Public awareness and literacy regarding AI technologies are also vital to ensure that individuals can critically assess the information they encounter. Public trust can be reinforced through transparency and accountability in AI systems, preventing biases and ensuring that AI serves the public good.

Cross-border data sharing poses another complex issue, requiring careful regulation. Data sharing should only occur under strict protocols to protect individuals' privacy. Bilateral and multilateral agreements should be pursued to ensure compliance with international data protection standards. Moreover, cross-border data sharing should not compromise human rights, such as privacy, freedom of expression, and non-discrimination. AI's impact on human rights should be continually monitored, with regulations in place to prevent violations and protect marginalized communities.

In addition to privacy and data protection, AI development in Nepal should focus on ensuring fairness, accountability, and transparency in AI systems. A certification system for AI products should be established to ensure compliance with international standards and foster trust in AI technologies. The government should also consider sector-specific guidelines for the ethical use of AI, such as in aviation, where agencies like the Civil Aviation Authority of Nepal (CAAN) could play a role in defining AI frameworks for the sector. Overall, the regulatory framework should be flexible, adaptable, and culturally aligned while also prioritizing the protection of human rights and equitable access to AI technologies for all sectors of society.

4.3.3 SRQ3(Ecosystem Development)

To cultivate an innovative AI startup ecosystem in Nepal, the country must adopt targeted strategies and frameworks that address critical challenges such as talent development, funding, industry collaboration, infrastructure, AI awareness, and support for emerging AI-driven enterprises. One of the key foundational steps is investing in AI infrastructure, which includes establishing research hubs, developing innovation-driven research, and building an environment conducive to startup growth. This can be facilitated by public-private partnerships (PPP) that encourage collaboration between the government, private sector, and academic institutions.

A crucial element for nurturing AI startups is creating a supportive funding ecosystem. The government should prioritize funding arrangements, including seed money, grants, and venture capital (VC) incentives, to provide the financial backing needed for early-stage startups. A PPP funding model could be an effective way to leverage both government and private sector resources to foster innovation. In addition, the government should focus on attracting foreign

direct investment (FDI) and establish funding mechanisms that provide grants, tax incentives, and other financial support to AI startups and emerging enterprises.

The AI ecosystem in Nepal also requires a legal framework that fosters innovation while protecting rights and encouraging ethical development. Clear AI policies, ethical guidelines, and transparent regulations should be established to ensure that AI development is aligned with national interests, human rights, and global standards. These frameworks must also address gender and geographical disparities, with targeted programs that promote inclusivity and equal opportunities in the AI sector. For example, initiatives like women's empowerment programs in AI could include scholarships, mentorship, and targeted support to encourage gender diversity in this rapidly evolving field.

Collaboration between industries, government, and academia is essential for driving AI innovation. Universities can partner with startups to offer incubators, accelerators, and internships, helping to bridge the gap between academic research and industry applications. Additionally, promoting AI awareness across various sectors is key to ensuring that stakeholders—from government officials to aspiring entrepreneurs—understand the potential of AI technologies. Motivating aspiring AI professionals and entrepreneurs through government incentives, mentorship programs, and professional development opportunities will help create a dynamic and inclusive AI ecosystem.

Finally, to address the unique challenges of Nepal, the government should ensure that AI policies are inclusive and suitable for all genders and social groups, reducing disparities in access and opportunity. Addressing these issues through targeted programs and promoting regional AI industries will help create a more equitable and innovative AI landscape. By adopting these strategies, Nepal can build a thriving AI startup ecosystem that encourages innovation, supports emerging enterprises, and ultimately positions the country as a leader in AI development in the region.

4.3.4 SRQ4(Digital Infrastructure, Data and Governance)

Designing effective data security, data governance, cybersecurity, and digital infrastructure policies in Nepal to support AI innovation while ensuring privacy, accessibility, and equitable access requires a comprehensive approach that addresses multiple critical areas. Given the current gaps in infrastructure and the lack of sufficient policies around data governance and cybersecurity, the country needs to create an overarching framework that balances innovation with the protection of individual rights and societal impacts. First and foremost, Nepal must prioritize the development of local datasets to support AI applications, ensuring that data is high-quality, complete, and unbiased. These local datasets must be carefully managed and processed to ensure their relevance and accuracy, as AI models depend heavily on reliable data. The government should introduce guidelines for data collection, management, and quality control, ensuring that these datasets are diverse and representative of the entire population. Standardization of data is essential to prevent inconsistencies and biases that can undermine AI's effectiveness and fairness. Data privacy is a crucial concern, and the existing legal frameworks

need to be strengthened to provide robust protections. This includes developing policies for data encryption, data anonymization, and user consent.

Cybersecurity is another vital aspect of this policy landscape. The lack of adequate cybersecurity acts and regulations, especially concerning cross-border data protection, poses significant risks, particularly when outsourcing data for public-private partnerships (PPP). To mitigate these risks, Nepal should implement strict cybersecurity measures, including regular audits, vulnerability assessments, and penetration testing, to detect and address security vulnerabilities. In addition, an umbrella act or comprehensive data security law should be introduced to cover various aspects of data governance, privacy, and security in AI applications. Blockchain technology could also be integrated to enhance transparency and data integrity, helping to establish trust in digital transactions.

For digital infrastructure, Nepal needs to establish scalable, high-speed connectivity, advanced computing systems, and secure cloud platforms to support AI-driven technologies. The development of local data centers should be a priority to ensure that the country has the capacity to handle the growing volume of AI-related data security. Additionally, the government should promote the establishment of secure and efficient cloud platforms, ensuring they meet global cybersecurity and data privacy standards. Moreover, policies must be designed to address the ethical dilemmas and societal impacts of AI technologies. This includes the potential for AI-driven bias, misinformation, and misuse. To counter these risks, the government should develop guidelines for the responsible use of AI, particularly in managing social media platforms, where the spread of misinformation and hate speech can have profound effects on society. Collaboration with private sectors to ensure AI technologies are aligned with ethical standards is also crucial. The Ministry of Communications and Information Technology (MoCIT) can play a pivotal role by setting guidelines for the registration and management of social sites, as well as establishing procedures for monitoring and addressing misinformation.

Additionally, the issue of equitable access to AI technologies must be tackled. Policies should ensure that the benefits of AI are distributed fairly across different regions and social groups, addressing gender and geographical disparities. Programs to support marginalized communities in accessing and benefiting from AI technologies should be implemented, including capacity-building initiatives, scholarships, and mentorship programs for women and other underrepresented groups in the AI field. In summary, Nepal needs to create an integrated and transparent framework for data security, data governance, cybersecurity, and digital infrastructure that supports AI innovation while ensuring privacy, security, and ethical usage. This framework must address the challenges posed by local dataset quality, cybersecurity risks, and ethical concerns, ensuring that AI is developed and deployed in a manner that promotes fairness, accountability, and accessibility for all citizens.

4.3.5 SRQ5(AI Risks)

To effectively minimize AI risks such as bias, misuse, and ethical concerns, while balancing innovation, privacy, and human rights, Nepal must develop a comprehensive and multi-

dimensional AI policy framework. This framework should draw on global best practices while being tailored to Nepal's unique social, economic, and technological context. One of the first steps is to address the significant gap in privacy legislation, particularly regarding private data protection. At present, no comprehensive law exists to safeguard personal data, and this must be urgently addressed to ensure that citizens' privacy is protected in AI applications. The government should introduce strong data protection laws that regulate the collection, processing, and storage of personal data, ensuring that both individual privacy and institutional privacy are clearly defined and protected.

Ethical concerns must be woven into every aspect of the policy. AI applications often raise issues such as bias and discrimination, privacy violations, job displacement, and security vulnerabilities. To mitigate these risks, the policy should include provisions for the ethical use of AI, requiring AI systems to be transparent, accountable, and designed to avoid harmful consequences. Bias in AI systems, especially in decision-making processes, is a critical issue that needs to be addressed head-on. This can be done by enforcing strict standards for data quality, ensuring that datasets are diverse, representative, and free from discriminatory patterns. The policy should mandate regular auditing and monitoring to ensure fairness, transparency, and accountability in AI systems.

The issue of misuse and ethical concerns around AI should also be a central focus of the policy. This includes addressing the potential for AI-driven surveillance, automation, and decision-making systems that could infringe on human rights. Clear guidance should be provided on the ethical use of AI in these contexts, with strict regulations and penalties for misuse. Furthermore, the government should establish robust mechanisms for enforcing these policies, including regular audits and penalties for unethical activities. To prevent AI misuse, the policy should define clear boundaries for how AI technologies can be applied, ensuring that they respect privacy, freedom, and equity.

The balance between privacy and innovation is also a key challenge. While AI has the potential to drive economic growth and technological advancement, it should not come at the expense of fundamental rights and freedoms. To strike this balance, the policy should align with international standards for privacy and data protection, ensuring that innovation is pursued responsibly. Transparent, adaptive regulations that evolve with technological advancements will help Nepal remain at the forefront of AI innovation while safeguarding citizens' rights.

Additionally, AI policies should be holistic and include provisions for human rights. Ethical considerations must be embedded from the early stages of AI development to prevent harmful outcomes, such as discrimination, surveillance misuse, and exploitation. The policy should not be viewed as a barrier to AI innovation, but rather as a framework that enables the creation of trustworthy AI technologies that align with societal values. This includes a clear legal framework with punishments for data misuse, unethical AI use, and violations of privacy. In summary, Nepal needs to adopt a robust, ethical, and transparent AI policy that addresses the risks of bias, misuse, and ethical concerns while enabling innovation. By ensuring strong data protection laws, embedding ethical considerations from the outset, and adopting international standards for

privacy and fairness, Nepal can create an AI ecosystem that fosters trust, promotes equity, and advances technological development without compromising human rights or societal values.

4.3.6 SRQ6(AI for National Priorities)

Nepal can strategically leverage an AI-driven digital ecosystem to address its national priorities by aligning AI solutions with the country's socio-economic realities and infrastructure challenges. This requires a holistic approach that integrates AI into key sectors such as education, healthcare, agriculture, economic growth, and regional inclusivity. Given Nepal's unique socio-economic context, prioritizing sectors that directly impact the majority of its population—like healthcare, agriculture, and education—is essential for maximizing AI's benefits across society. For education, AI can be used to enable personalized learning, making education more accessible and tailored to individual needs, especially in remote areas. AI-powered platforms can help bridge the gap in educational access, enabling students in underserved regions to receive quality education remotely through online learning, adaptive learning systems, and educational chatbots. To ensure widespread access, digital literacy initiatives should be implemented, particularly targeting marginalized groups and rural populations, to bridge the AI knowledge divide. Government policies should also promote AI accessibility, ensuring that all socio-economic groups benefit from AI technologies.

In the healthcare sector, AI can significantly improve medical delivery by enabling telemedicine, diagnostic support systems, and personalized care, particularly in rural areas where access to healthcare is limited. AI-driven technologies like predictive analytics can be used to anticipate disease outbreaks, manage healthcare resources more efficiently, and offer virtual consultations. AI can also assist in enhancing the efficiency of medical facilities through inventory management systems, fraud detection in healthcare systems, and streamlining administrative processes. For agriculture, AI can be leveraged to enhance productivity through smart farming techniques. AI-powered systems can provide real-time data on crop conditions, weather patterns, and soil health, helping farmers make informed decisions and improve yields. AI can also assist in the efficient management of agricultural supply chains, reducing waste and increasing overall agricultural output, which is crucial for Nepal's largely agrarian economy. Nepal's economic growth can be strengthened by applying AI in public service delivery, tourism, and industries. AI solutions can streamline public services, making them more efficient, transparent, and accessible to the public. In tourism, AI can be used to create personalized experiences for travelers, recommend destinations, and enhance the country's competitiveness as a tourist destination. In industries and SMEs, AI can help improve productivity, optimize supply chains, and increase competitiveness. However, there is a need to educate and incentivize small and medium-sized enterprises (SMEs) to adopt AI. Government policies should focus on empowering SMEs by offering AI tools, training programs, and financial support to enable their growth. To ensure regional inclusivity, AI technologies should be made accessible to people across different socio-economic backgrounds and regions. The digital divide is a significant challenge in Nepal, and policy measures should focus on expanding internet connectivity, particularly in remote areas, and providing affordable access to AI tools and technologies. The government should also prioritize regional collaboration between universities, startups, and the private sector to drive

innovation in AI and develop solutions that are region-specific and culturally relevant. Young researchers and professionals should be encouraged to enter the AI field, as they can bring fresh perspectives and innovative solutions to local challenges. The government, through initiatives like AI research hubs, should foster talent development and collaboration between academia, industry, and government.

4.3.7 SRQ7(Strategic Roadmap)

To achieve its AI goals in both the short and long term, Nepal needs a comprehensive and adaptable policy framework that aligns with international standards while addressing its unique socio-economic context. In the short term, a crucial step is the establishment of a dedicated AI governance body. This entity should be responsible for overseeing AI policies, ensuring ethical standards are maintained, and coordinating efforts between the public and private sectors. The government must prioritize developing foundational policies, including the E-Governance Act, Data Protection and Privacy Laws, and an ethical AI framework. These policies should address key concerns such as data privacy, bias, and transparency in AI systems. However, it is important to note that while international models like those from the US, India, and Malaysia provide useful references, Nepal must adopt a hybrid approach—taking best practices from these countries but customizing them to suit its socio-economic and cultural context. This will help avoid the issues of simply replicating foreign systems without considering Nepal’s unique challenges.

Alongside these foundational policies, Nepal should focus on building capacity and increasing AI awareness across the population. Public awareness campaigns, educational programs, and professional development initiatives can help build an AI-literate society and workforce. In particular, integrating AI education into school curricula and higher education institutions will ensure the development of a skilled talent pool in the long run. This strategy will help create a sustainable AI ecosystem that not only fosters innovation but also prepares Nepal’s workforce for the AI-driven economy. In the long term, the roadmap must include building a sustainable AI ecosystem supported by robust infrastructure, funding mechanisms, and talent development. The government should prioritize investments in high-speed internet, secure cloud platforms, and advanced computing resources, which are necessary for AI innovation. Public-private partnerships (PPP) can be instrumental in creating this infrastructure, especially in critical sectors like healthcare, education, and agriculture. For AI to succeed in Nepal, the ecosystem must also be supported by adequate funding, both from the government and private sector, to enable AI startups, research, and innovation. Additionally, talent development through initiatives like scholarships, mentorship, and research grants will help cultivate the necessary expertise in the country.

Moreover, Nepal needs to develop a comprehensive ethical and regulatory framework that ensures AI technologies are developed and deployed responsibly. This includes addressing concerns such as fairness, transparency, accountability, and the potential for AI-driven bias. A living document approach to policy is essential, where AI regulations are periodically reviewed and updated based on technological advancements and societal feedback. Independent bodies

should be created to regularly audit AI systems for compliance with ethical and regulatory standards. Regional inclusivity and bridging the digital divide are also essential components of the long-term strategy. AI technologies should be accessible to all, especially marginalized and rural communities. Expanding internet connectivity, providing affordable digital devices, and fostering local AI education centers will help ensure that the benefits of AI are evenly distributed. Special programs targeting underserved areas and socio-economic groups can help bridge the gap and promote equitable access to AI. International collaboration will play a key role in ensuring Nepal's AI policies remain aligned with global standards. Nepal should engage with international AI forums and foster collaborations with neighboring countries for knowledge exchange. This global engagement will help Nepal stay ahead in the rapidly evolving AI landscape while ensuring its policies comply with international regulations and best practices.

In conclusion, Nepal's roadmap for AI should be built around creating a dedicated AI governance body, developing comprehensive policies and frameworks, investing in infrastructure and talent, and ensuring inclusivity. By aligning with international standards while considering Nepal's unique needs, the country can create a robust AI ecosystem that drives ethical innovation, supports national priorities, and promotes equitable growth. This strategic approach will enable Nepal to harness the transformative potential of AI for its long-term development while addressing ethical, societal, and legal concerns.

4.4 Integration of Findings

This subchapter presents a comprehensive analysis of the strategic roadmap for AI development in Nepal, synthesizing insights from various primary data sources, including surveys, FGDs, and KIIs, along with findings from a desk review of international best practices. It identifies the key themes and diverging perspectives regarding AI strategy, governance, ethical considerations, stakeholder engagement, and capacity building. It also highlights the challenges and gaps in the current AI ecosystem in Nepal and provides actionable recommendations to shape a long-term, sustainable AI strategy that aligns with global standards while addressing local needs. Through this analysis, the subchapter aims to provide a clear direction for Nepal's AI policy development and implementation.

SRQ1: Policy Adequacy

1. Key Convergent Themes

- **Need for clear and comprehensive policies:** Across surveys, FGDs, and KIIs, there is consensus that the development of AI in Nepal requires clear, well-structured policies. All sources emphasize the importance of a comprehensive framework that addresses various dimensions of AI, such as research, development, and ethical considerations.
- **International standards alignment:** A recurring theme in all findings is the necessity for AI policies to align with international standards. This would help Nepal ensure its AI strategies are globally competitive and effective.

- Collaboration and stakeholder involvement: Multiple sources stress the need for collaboration between policymakers, AI researchers, academia, civil society and social scientists etc. This cross-sector involvement is seen as crucial for developing effective, balanced policies.
- Education and training: A strong focus on AI education and training, including developing skilled human resources, is mentioned across surveys, FGDs, and KIIs as a foundational element for AI success in Nepal.
- Ethical balance: There is a shared recognition of the need to balance economic growth and ethical considerations. Ethical AI governance, including considerations of fairness, transparency, and societal impact, emerges as a crucial point.

2. Notable Divergences and Partial Coverage

- Perception of existing policies: KIIs reflect a more critical view of current policies, describing them as being in early stages and lacking concrete details. In contrast, survey and FGD findings note that existing policies are insufficient, but there is less emphasis on them being "early-stage" and more focus on their inadequacy in addressing current needs.
- Specific ethical concerns: While the need for balancing ethical considerations is broadly agreed upon, there is divergence on the specifics. FGDs raise concerns around AI patents and patient rights.
- Green AI: implement policies that support green AI initiatives to reduce the environmental impact of AI development, which often demands substantial computational resources.
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3. Desk Review Validation/Challenges

- Gaps in diverse perspectives: The desk review highlights several gaps that align with the primary data, including the need to address diverse perspectives such as data privacy, protection, and cybersecurity. This supports the survey, FGD, and KII findings calling for a comprehensive policy framework.
- International standardization and Nepal-specific challenges: The desk review also confirms the importance of international standard alignment but challenges the adequacy of current frameworks in Nepal, pointing out the need for policies that cater to the country's unique context such as federal, central and local structure of Nepal, cultural aspects.
- Workforce development: The gap in workforce development strategies in the desk review highlights a critical issue that primary data also raises.

- The desk review shows that most countries first establish their position on AI and, based on their priorities and standpoint, formulate policies for the country's advancement.

4. Overall Synthesis

The integration of findings from all research methods suggests that while there is a general understanding of the need for robust AI policies, Nepal's existing policies are considered inadequate. There is strong alignment on the need for clear guidelines, collaboration across sectors, international standards, and ethical considerations. It should promote the development of energy efficient AI models and AI driven solutions for national priorities like climate related challenges, including disaster management, agriculture, and conservation. However, gaps remain in specific areas like sectoral guidelines, patient rights, data privacy, and workforce development. The desk review provides valuable insights into the broader issues of aligning policies with international standards while also addressing local challenges.

5. Gaps and Recommendations

- Sector-specific guidelines: Policies should be more detailed and sector-specific, especially in areas like healthcare and intellectual property.
- Data privacy and protection: There is a need to strengthen laws around data protection and privacy, as these remain major concerns in the findings.
- Workforce development: AI policies should focus on educational frameworks and strategies to build a skilled workforce, as this remains an underdeveloped aspect in the current policy landscape.
- Inclusivity and marginalized groups: Strategies should ensure that the benefits of AI development reach underserved communities, especially marginalized groups.
- Cross-border data governance: The current gaps in cross-border data governance need to be addressed, as this will play a crucial role in the internationalization of AI technologies in Nepal.
- The primary focus should be defining Nepal's stance on AI before developing policies to ensure alignment with national priorities and capabilities like climate related challenges, disaster management, agriculture and conservation.
- Implement policies that support green AI initiatives to reduce the environmental impact of AI development, which often demands substantial computational resources.
- Ethical AI: There is a shared recognition of the need to balance economic growth and ethical considerations. Ethical AI governance, including considerations of fairness, transparency, explainable and societal impact, emerges as a crucial point.

SRQ2: Regulatory Framework

1. Key Convergent Themes

- Need for stronger data security and privacy regulations: Survey, FGD, and KII findings all agree on the necessity for robust data protection laws, with a focus on privacy, data security, and protecting human rights. There is a strong call for clear ethical guidelines to prevent AI misuse and manage ethical challenges like misinformation.
- Ethical guidelines: There is consensus that AI should be developed responsibly, with ethical frameworks addressing fairness, transparency, and accountability. Both the public and private sectors must adhere to these guidelines.
- Cross-border data sharing and governance: Multiple findings highlight the need for regulations around cross-border data sharing and international cooperation. Given the global nature of AI development, these guidelines are considered crucial for the long-term sustainability of AI systems in Nepal.
- Human rights and public trust: A strong emphasis is placed on protecting human rights through AI regulations. Public trust can only be sustained if people feel that their data and privacy are safeguarded.

2. Notable Divergences and Partial Coverage

- Penalties and enforcement: The survey and KII findings provide more detailed discussions on penalties and enforcement mechanisms, whereas this aspect is not covered in the FGDs.

3. Desk Review Validation/Challenges

- Cross-border data sharing and governance: The desk review confirms the necessity for cross-border regulations, particularly around data processing and sharing. The review underscores that Nepal's current legal framework does not fully account for the complexities of international data exchange, reinforcing the need for stronger regulation in this area.
- Data protection mechanisms: The desk review highlights critical gaps in data breach notification, data subject rights, and data processing definitions. These gaps are corroborated by the findings, especially from the KIIs, which call for clearer data protection laws.
- Extra-territorial effect and regulatory authority: The desk review identifies challenges regarding the extra-territorial effects of AI regulations and the lack of a central regulatory body, both of which were also pointed out in the findings. This further stresses the need for a clear regulatory authority and framework.

4. Overall Synthesis

The integration of findings across all research methods paints a clear picture of the need for a robust regulatory framework that addresses data security, privacy, AI misuse, and cross-border data governance. While the need for ethical guidelines is agreed upon, there are varying levels of specificity in the findings, particularly regarding the cultural alignment of ethics and penalties for breaches. The desk review confirms and builds on the findings, validating the importance of strengthening laws and developing a regulatory body to oversee AI development in Nepal.

5. Gaps and Recommendations

- **Regulatory authority:** An independent regulatory body should be established to oversee AI development, ensure enforcement of ethical guidelines, data protection laws, and penalties for breaches, misuses and coordinate with other related ministries.
- **Cross-border data sharing regulations:** There is an urgent need to develop specific regulations around cross-border data sharing, ensuring Nepal's compliance with international standards.
- **Penalties and enforcement:** More detailed discussions are needed on the penalties for breaches in AI regulations, particularly in data protection and privacy.
- **Sector specific guidelines:** The regulatory framework should include industry-specific guidelines, such as for healthcare, finance, and education, to ensure that AI technologies align with sectoral needs and risks.
- **Transparency and accountability:** The policy should address fairness, mitigate bias in AI, human-in-the-loop and ensure accountability.
- **Human rights and public trust:** A strong emphasis is placed on protecting human rights through AI regulations. Public trust can only be sustained if people feel that their data and privacy are safeguarded.
- **Regulatory framework:** It should set ethical standards and security measures while fostering an environment that supports entrepreneurship, research, and AI-driven innovation.

SRQ3: Ecosystem Development

1. Key Convergent Themes

- **Need for infrastructure investment:** All findings agree on the importance of improving digital infrastructure, including high speed internet, data centers, and cloud services, to support AI development.

- **Public private partnerships:** There is widespread support for fostering collaborations between the government, private sector, and academia to build a sustainable AI ecosystem.
- **Funding and resources for AI startups:** Surveys, FGDs, and KIIs all stress the need for government funding and a supportive environment for AI startups, allowing room for innovation, including financial support and access to resources.
- **Talent development:** Education and capacity building, including providing equal access to AI jobs and training, are highlighted as crucial components for developing a strong AI ecosystem.
- **Standardization and ethical guidelines:** Standardization of AI technologies and the establishment of ethical guidelines are emphasized as important to foster trust in the ecosystem.

2. Notable Divergences and Partial Coverage

- **Focus on gender and geographical disparities:** The KIIs place significant emphasis on addressing gender and geographical disparities in access to AI education and job opportunities.
- **IP protections:** The survey findings discuss IP protections as a key concern.

3. Desk Review Validation/Challenges

- **Infrastructure gaps:** The desk review confirms that Nepal faces significant challenges in digital infrastructure, including limited data center capacity, unreliable broadband connectivity, and poor cloud service access. These challenges are aligned with the findings from all methods, which call for infrastructure improvements.
- **IP protections and local innovation:** The desk review points out gaps in IP protections and highlights the country's reliance on imported AI systems, both of which are mentioned in the survey and KII findings. These issues need to be addressed to foster local innovation.
- **Skills shortage:** The desk review also confirms the shortage of skilled professionals, validating the findings from the survey and KIIs about the need for improved AI education and workforce development strategies.

4. Overall Synthesis

The integration of all research methods highlights the need for a well-developed AI ecosystem in Nepal, which requires strong infrastructure, a supportive funding environment, and a skilled workforce. Public-private partnerships are identified as crucial for accelerating AI innovation.

The desk review underscores the infrastructure challenges, skills shortages, and IP protection gaps, reinforcing the call for greater investment in local AI talent and resources.

5. Gaps and Recommendations

- Infrastructure development: Focus on building scalable data centers, improving broadband access, and expanding cloud services.
- IP protection: Develop stronger IP laws to protect local innovations and encourage AI startups.
- Gender and geographical inclusivity: Implement policies that address gender and geographical disparities in access to AI education, jobs, and opportunities.
- Talent development: Establish programs to attract, train, and retain AI talent.
- Collaborative funding models: Promote public-private partnerships to create funding opportunities for all size projects such as AI startups, allowing room for the innovation of small and medium enterprises.
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SRQ4: Digital Infrastructure, Data, and Governance

1. Key Convergent Themes

- Infrastructure enhancement: All findings agree that improving digital infrastructure, including better internet access, high-speed data centers, and scalable cloud services, is crucial for AI development.
- Data privacy and governance: The importance of robust data governance frameworks, data privacy laws, and clear guidelines for data usage are consistently mentioned.
- Access to public data: The need for making public data accessible and ensuring data transparency is emphasized, as it can drive innovation in AI applications.
- Ethical and collaborative data usage: Clear guidelines on ethical data usage, data-sharing protocols, and collaborative efforts between the government, private sector, and academia are highlighted as critical components.

2. Notable Divergences and Partial Coverage

No significant divergences in the theme are observed.

3. Desk Review Validation/Challenges

- **Data center and cloud infrastructure:** The desk review validates the infrastructure challenges, pointing out gaps in data center capacity and broadband connectivity, which align with the survey, FGD, and KII findings.
- **Data privacy and security gaps:** The desk review echoes the need for stronger data privacy protections, pointing out that current laws are insufficient in addressing emerging challenges.
- **Data sharing and transparency:** The review reinforces the importance of public data accessibility and transparent data-sharing frameworks, validating the findings.

4. Overall Synthesis

The findings from all methods agree that significant improvements in digital infrastructure, data privacy, and governance are essential for the successful development of AI in Nepal. The desk review further substantiates these points, highlighting gaps in infrastructure, data protection, and governance that need to be addressed to support AI initiatives.

5. Gaps and Recommendations

- **Digital infrastructure investment:** Prioritize the development of high-speed data centers and scalable cloud infrastructure.
- **Data privacy legislation:** Strengthen data privacy laws and develop frameworks for data sharing that balance transparency with privacy while developing AI models.
- **Regional accessibility:** Ensure that AI infrastructure and resources are accessible in underserved and rural areas.
- **Local Data for AI Policy:** Policies should encourage the publication of local data to enable AI-driven solutions for Nepal's unique challenges. Additionally, fostering a research ecosystem focused on solving country-specific problems is crucial. Local data plays a vital role in training AI models and is an essential component of a robust AI ecosystem.
- **Financial Sector Data Governance:** Focus on sector-specific regulations such as financial industry, ensuring compliance with data privacy standards.

SRQ5: AI Risks

1. Key Convergent Themes

- **Bias and discrimination:** All findings converge on the risks of AI systems perpetuating biases, particularly in areas such as hiring, lending, and law enforcement. There is

widespread concern about AI systems reinforcing societal inequalities if not properly designed or regulated.

- **Privacy violations:** The risks of privacy breaches and unauthorized data usage are emphasized across all research methods. Concerns about personal data being misused for AI model training or other purposes without user consent are prevalent.
- **Job displacement:** The fear of job displacement due to AI automation is a consistent theme in surveys, FGDs, and KIIs. Participants highlight the need for policies to manage transitions in the workforce.
- **Security threats:** The risk of AI being used for malicious purposes, such as cyberattacks or deep fakes, is widely acknowledged. The need for secure AI systems is emphasized to prevent misuse.
- **Lack of accountability:** A significant concern across all research methods is the difficulty in assigning responsibility for AI errors or failures. There is a call for clear accountability frameworks that ensure developers, companies, and users are held responsible.

2. Notable Divergences and Partial Coverage

- **Focus on ethical implications:** While the KIIs emphasize ethical risks like AI perpetuating societal inequalities or being misused for surveillance, the survey and FGD findings focus more on operational risks such as job displacement and privacy violations.

3. Desk Review Validation/Challenges

- **Bias and discrimination:** The desk review supports the concerns about AI bias, highlighting cases of biased AI in real-world applications such as recruitment tools, facial recognition software, and credit scoring systems.
- **Privacy and security risks:** The review points out that AI systems pose significant privacy risks, especially when large-scale datasets are used without adequate consent mechanisms. The potential for AI systems to inadvertently expose sensitive information or be hacked is also noted.
- **Job displacement and economic impact:** The review also reflects concerns about the economic impact of AI on jobs, especially in sectors vulnerable to automation. However, it underscores that while job displacement is a valid concern, AI also has the potential to create new jobs in emerging sectors.
- **Accountability and legal framework:** The desk review notes that current legal frameworks do not adequately address the unique challenges posed by AI, particularly with respect to accountability for misuse of AI system.

4. Overall Synthesis

The research across all methods consistently highlights the multifaceted risks associated with AI. Bias and discrimination, privacy violations, and job displacement are central concerns. The desk review validates these concerns, particularly emphasizing the real-world consequences of AI failures, such as discrimination in recruitment and biases in decision-making systems. The findings from surveys, FGDs, and KIIs reinforce the need for stronger governance mechanisms to ensure that AI systems are fair, secure, and accountable.

5. Gaps and Recommendations

- **Bias mitigation frameworks:** Policy should ensure the guidelines for diverse and representative data collection to overcome the biases.
- **Privacy protections:** Strengthen data protection laws, including mechanisms for obtaining informed consent and ensuring data privacy during AI model training and usage.
- **Job transition and reskilling:** Implement government-backed programs for workforce reskilling and retraining, particularly for workers in industries most susceptible to AI-induced automation. Create policies to mitigate AI-driven job displacement by promoting reskilling and upskilling initiatives.
- **AI security measures:** Develop stronger cybersecurity protocols for AI systems, including measures to prevent misuse such as deepfakes, cyberattacks, and AI-driven misinformation campaigns.
- **Accountability frameworks:** Introduce regulation that clarifies accountability in AI systems, particularly for errors or decisions made by autonomous AI. This includes creating liability standards for AI developers, users, and stakeholders.

SRQ6: Opportunities for AI Development in Nepal

1. Key Convergent Themes

- **Sector specific AI integration:** There is a shared emphasis across surveys, FGDs, and KIIs on the potential of AI to enhance key sectors such as healthcare, agriculture, and education. AI is seen as a tool to improve efficiency, productivity, and service delivery in these critical areas.
- **Economic growth and innovation:** AI is recognized as a significant driver of economic growth, with opportunities for Nepal to innovate in areas like fintech, logistics, and digital services. The desire to foster a startup ecosystem around AI innovation is a common theme.
- **Educational and skills development:** Across all methods, there is a strong focus on the need for AI education and capacity building. Ensuring that both the existing workforce and students are equipped with AI related skills is crucial for the country's future.

- **Inclusive development:** The opportunity to use AI for reducing regional disparities and improving accessibility for underserved communities is frequently mentioned. AI could help bridge the gap between rural and urban areas by providing better access to education, healthcare, and economic opportunities.
- **Public private partnerships:** Collaboration between the government, private sector, and academia is seen as essential for AI development. The role of startups and innovation hubs is also emphasized in fostering a vibrant AI ecosystem.

2. Notable Divergences and Partial Coverage

- **Focus on rural vs. urban areas:** While the survey respondents emphasize the importance of addressing regional disparities, the FGDs focus more on sectoral innovations like healthcare and agriculture in rural areas. KIIs, on the other hand, discuss a broader national perspective, stressing the need for AI development in both urban and rural settings but also pointing out the challenges of scaling AI solutions in rural areas.
- **Sector specific vs. cross sectoral approach:** While the KIIs focus on developing AI in specific sectors such as agriculture, healthcare, and education, the surveys suggest that a more cross sectoral approach to AI development could be beneficial. Integrating AI across various sectors might help build a more interconnected ecosystem.

3. Desk Review Validation/Challenges

- **Sectoral AI opportunities:** The desk review aligns with the findings from the primary data, validating the importance of sectoral AI integration, particularly in agriculture and healthcare. It points to international success stories, like AI driven agricultural solutions and healthcare diagnostics, that could be replicated in Nepal.
- **Economic growth and innovation:** The review highlights the potential of AI to contribute to economic growth, especially in tech-driven industries. However, it also points to challenges like the lack of infrastructure and skilled human resources that may hinder the effective application of AI.
- **Inclusivity:** The desk review reinforces the idea that AI can be a powerful tool for inclusive growth, particularly in addressing the needs of marginalized communities. However, it also raises concerns about digital divides and unequal access to AI technologies, which could exacerbate existing inequalities.
- **Public private collaboration:** The desk review supports the need for public private partnerships but also cautions that a lack of coordination between stakeholders could impede progress. It underscores the importance of a national AI strategy to align efforts across sectors.

4. Overall Synthesis

The research consistently highlights the opportunities AI presents for Nepal, particularly in enhancing key sectors like agriculture, healthcare, and education. Both primary data and desk review findings align on the potential of AI to drive economic growth and foster innovation. However, there is a shared recognition of challenges such as the need for infrastructure, a skilled workforce, and inclusivity in AI development. While sector-specific approaches dominate the findings, a cross-sectoral approach might be more effective in building a robust AI ecosystem that benefits all sectors simultaneously.

5. Gaps and Recommendations

- **Infrastructure investment:** The government and private sector should prioritize investments in digital infrastructure to support AI development. This includes high-speed internet, data centers, and cloud computing resources.
- **Skilled workforce development:** Initiate national programs to upskill the workforce, focusing on AI, data science, and related fields, along with AI awareness programs. Universities and vocational institutes should offer specialized courses in AI and machine learning.
- **Cross sectoral AI strategy:** Develop a comprehensive AI strategy that integrates AI across various sectors, ensuring that AI is not siloed but rather supports innovation and growth across the economy.
- **Inclusive AI:** Ensure that AI solutions are accessible to all communities, particularly those in rural and underserved areas. This could include creating digital literacy programs and developing low cost AI solutions that address local needs.
- **Public private sector collaboration:** Establish frameworks for collaboration between the government, private sector, and academia to foster innovation. National AI innovation hubs and startup ecosystems could also be promoted to create a thriving AI community.

SRQ7: Strategic Roadmap for AI Development

1. Key Convergent Themes

- **Clear national AI strategy:** Across surveys, FGDs, and KIIs, there is a consistent call for the development of a comprehensive and clear national AI strategy. This strategy should provide long term direction, set priorities for AI development, and ensure alignment with international standards for automated decision-making and law enforcement such as UNESCO AI ethics recommendation. The most important thing is where Nepal should stand on AI.
- **AI governance and oversight:** The establishment of a dedicated body for AI governance is a common theme.

- Ethical considerations: A strong focus on integrating ethical considerations into the roadmap emerges across all data sources. Issues like fairness, privacy, transparency, and accountability need to be central in the AI development process. For this, the government can encourage open-source AI models.
- Stakeholder engagement: The necessity of involving multiple stakeholders in the process, including government, private sector, academia, and civil society, is a shared theme. This approach would ensure that the roadmap reflects diverse interests and expertise.
- Capacity building: Another key area highlighted in all findings is the need for capacity building at all levels: policy makers, developers, and users. It's essential to have the necessary skills and knowledge to support AI development and integration.

2. Notable Divergences

- Short term vs. Long term planning: There is a divergence between the FGDs, which prioritize short-term actions such as immediate AI systems deployment and setting up foundational infrastructure, and the surveys and KIIs, which advocate for a more long-term vision and strategic planning. KIIs in particular stress the importance of laying out a clear 10-15 year roadmap with sustainable goals.

3. Desk Review Validation/Challenges

- National AI strategy: The desk review validates the need for a national AI strategy, echoing the importance of a clear and structured roadmap for AI development. It also points out that many successful countries in AI adoption, such as Canada and the UK, have laid down long-term national AI strategies that Nepal could learn from.
- Ethical governance: The desk review highlights the importance of embedding ethical principles into the AI strategy. It challenges the primary data's optimism about the current state of AI ethics and points to existing gaps in AI ethics frameworks in Nepal. Global practices in AI ethics, including algorithmic transparency, accountability, and the need for ethical audits, should be included.
- Multi stakeholder engagement: The review validates the importance of engaging a wide range of stakeholders. However, it warns that achieving coordination between government and private sector entities may be difficult due to competing interests. A clear delineation of roles and responsibilities is critical for the roadmap's success.

4. Overall Synthesis

The research points to the critical need for a structured and long-term strategic roadmap to guide AI development in Nepal. There is a shared recognition of the importance of governance, ethical frameworks, stakeholder involvement, and capacity building. However, primary data from FGDs suggests that there is urgency for immediate action, while KIIs stress a long-term perspective

that incorporates sustainability and forward thinking. The desk review highlights international best practices and challenges faced by other nations, which should inform Nepal's approach. A key synthesis is that the roadmap needs to be both comprehensive and flexible, accommodating both short term actions and long term goals.

5. Gaps and Recommendations

- **Clear governance framework:** Establish a dedicated AI governance body that is responsible for the oversight of AI development, ethical standards, and policy implementation. This body should have clear responsibilities and should involve multiple stakeholders, ensuring inclusivity in decision making.
- **Clear national AI strategy:** There is a need for the development of a comprehensive and clear national AI strategy. This strategy should provide long term direction, set priorities for AI development, and ensure alignment with international standards for automated decision-making and law enforcement such as UNESCO AI Ethics Recommendation. The most important thing is where should the Nepal's stand on AI.
- **Long term vision with short term milestones:** Develop a strategic AI roadmap that includes both long-term goals (e.g., 10-15 years) and short-term milestones to achieve quick wins, like setting up data infrastructure or piloting AI solutions in key sectors.
- **Public private academia collaboration:** Strengthen collaboration between the government, private sector, and academia. This will help ensure that AI policies are both practical and reflective of the realities on the ground. Formalize partnerships through joint working groups and councils.
- **Capacity building programs:** Invest in capacity building at all levels, particularly for policy makers, AI developers, and the broader workforce. This could include targeted AI education programs, workshops, and certifications, particularly in AI ethics and governance.
- **Monitoring and evaluation framework:** Implement a monitoring and evaluation framework that tracks the progress of the AI roadmap, ensures adherence to ethical guidelines, and adjusts the strategy as needed based on emerging trends and technologies.

4.5 Overall Recommendation

The following summary presents the overall findings, synthesized from surveys, FGD, KII, and desk reviews. Each recommendation is categorized using the following indicators: X: No existing policy, ✓: Limited policies exist, and ✓✓: enough policy exists. Here, *policies* refers not only to AI policy but also to other existing ICT policies, which are covered in the desk review section.

Policy Adequacy:

1. The key consideration is determining Nepal's position on AI before formulating policies to ensure alignment with national priorities and capabilities. [X]
2. Nepal should establish a comprehensive with sector-specific AI policies and guidelines for industries such as healthcare, education, and finance. These policies must address the unique challenges, risks, and opportunities associated with AI adoption within each sector, ensuring responsible and effective implementation. [X]
3. Develop a comprehensive AI strategy that integrates AI across various sectors, ensuring that AI supports innovation and economic growth across the board. [X]

Strategic Roadmap:

4. Create a strategic AI roadmap that includes both long-term goals and short-term milestones to achieve tangible progress, like setting up data infrastructure or piloting AI solutions in key sectors.[X]
5. Implement a robust monitoring and evaluation mechanism to track the progress of AI initiatives, ensuring adherence to ethical guidelines and adjusting strategies as needed based on emerging technologies and trends. [X]
6. Enhance AI literacy by implementing nationwide digital education programs aimed at policymakers, industry professionals, and the public. [X]
7. Create national programs to upskill the workforce, focusing on AI, data science, and machine learning. These programs should be designed to reach underserved communities, particularly marginalized groups, and ensure equitable access to opportunities in AI. [✓]

AI for National Priorities:

8. Promote gender and geographical inclusivity in AI education, jobs, and training to bridge disparities in access to AI-related opportunities. [✓]
9. Prioritize linguistic and cultural diversity by encouraging AI applications in local and indigenous languages. [X]
10. Promote the development of energy efficient AI models and AI driven solutions for national priorities like climate related challenges, including disaster management, agriculture, and conservation. [X]
11. Implement policies that support green AI initiatives to reduce the environmental impact of AI development, which often demands substantial computational resources. [X]

Regulatory Framework:

12. Set up an independent regulatory body (small and smart) to oversee AI development, ensuring the enforcement of ethical guidelines, data protection laws, and penalties for breaches. It will coordinate with different ministries for coordination and collaboration. [X]
13. Encourage the development of responsible AI practices to address potential errors made by AI models. Educate stakeholders, including developers and users, about the possibility

of AI mistakes. Implement a human-in-the-loop approach for critical decision-making to help mitigate biases and minimize erroneous AI-driven outcomes. [X]

14. Establish comprehensive cross-border data sharing regulations to ensure compliance with international standards and foster global AI integration. [X]
15. Ensure that AI policy is regulated rather than overly controlled, allowing room for innovation and the growth of AI startups. A regulatory framework should set ethical standards and security measures while fostering an environment that supports entrepreneurship, research, and AI-driven innovation. [✓]

Ecosystem Development:

16. Foster public-private partnerships to create funding opportunities for AI startups, SMEs, and larger projects. Encourage collaboration between government, private sector, and academia to stimulate innovation. [✓]
17. Strengthen collaboration between the government, private sector, academia, and other related stakeholders to ensure that AI policies are practical and reflective of the realities on the ground. [X]
18. Support the establishment of national AI innovation hubs and startup ecosystems to promote a thriving AI community in Nepal. [X]
19. Promote open-source AI development for sustainability, transparency, accessibility, and ethical AI. [✓]
20. Establish bias mitigation mechanisms to ensure diverse and representative data collection, reducing AI biases in decision-making processes. [X]

Digital Infrastructure, Cyber Security, Data and Governance:

21. Focus on building scalable infrastructure, such as high-speed data centers, broadband access, and cloud computing resources, to support AI development. The government may give subsidies to promote AI growth. [✓]
22. Policies should encourage the publication of local data to enable AI-driven solutions for Nepal's unique challenges. [X]
23. Ensure AI policies uphold fundamental human rights, including privacy, freedom of expression, and protection against discrimination. [✓]
24. Strengthen laws surrounding data privacy and protection, ensuring clear frameworks for data sharing that balance transparency with privacy, especially during AI model training and usage. [✓]
25. Strengthen AI cybersecurity governance with robust policies, standardized protocols, and compliance measures to prevent misuse and misinformation such as deepfakes, cyberattacks, and AI-driven misinformation campaigns. [✓]
26. Develop guidelines that encourage AI practitioners to conduct ethical AI research, ensuring models are explainable, auditable, and compliant with both national and international ethical standards. [X]

27. Create policies to mitigate AI-driven job displacement by promoting reskilling and upskilling initiatives. [X]
28. Establish regulations to combat the spread of deepfakes and AI-generated misinformation, protecting public trust and safeguarding democratic institutions. [✓]
29. Establish mechanisms for obtaining informed consent and protecting user privacy in all AI-related activities. [✓]
30. Ethical guidelines should prevent AI misuse in surveillance, automated decision-making, and law enforcement while aligning with international standards such as the UNESCO AI Ethics Recommendation. [X]
31. Develop stronger IP laws to protect local innovations and encourage AI startups. [✓]

4.6 Scope and Limitation of Study

- *Time Constraint*: A key limitation of this research is the restricted time frame, which limits the ability to collect extensive data from various sectors.
- *AI Policy Development Scenario*: At the outset of this research, the Nepalese government had published an AI concept paper, serving as a foundational reference for the study and its recommendations. However, recently, a draft AI policy was released by the government. Since the study was designed around the concept paper, the draft AI policy has not been considered in the analysis. The separate feedback on the AI policy draft is presented in chapter 5.
- *Bias reflection*: This study may present the following biases:
 - *Selection Bias*: The study sample may not comprehensively represent all sectors or regions in Nepal, potentially leading to skewed results.
 - *Response Bias*: Participants' responses may reflect personal opinions rather than neutral or objective findings, influencing the study's conclusions.
 - *Sampling Bias*: An imbalance in sector representation within the sample could affect the findings and limit generalizability.
 - *Cultural Bias*: Cultural norms and pre-existing beliefs may influence responses, introducing bias into the results.

Chapter 5

Recommendations to National Artificial Intelligence Policy Draft 2081

As the study progressed, the Nepalese government released a draft AI policy, marking a significant step toward formalizing AI governance in the country. While the research was originally based on the AI concept paper, this chapter provides a separate analysis of the newly introduced draft policy. Based on the assessment, the following additional recommendations are presented to enhance the policy's effectiveness and alignment with global best practices.

1. **Lack of Sectoral Prioritization:** The National Artificial Intelligence Policy 2081 lacks sectoral prioritization, which is crucial for the effective development and implementation of AI. Identifying key sectors can help ensure a more strategic and impactful adoption of AI. Below are top four priority sectors where AI implementation could begin:
 - *Government:* AI can support informed decision-making in areas such as budgeting, planning, and project prioritization. It can also have the potential to enhance public services by improving efficiency and responsiveness, allowing citizens to experience tangible and immediate benefits. Additionally, AI can automate government processes, monitor workflows, and analyze public data to provide better services. AI serves as an effective cost-reduction tool, enabling governments to allocate resources more efficiently and minimize operational expenses. Nepal can integrate AI into its diplomatic strategy by analyzing global trends, predicting geopolitical risks, and enhancing decision-making. Additionally, collaboration with global AI initiatives can help Nepal leverage technology for diplomatic efficiency and policy formulation. The government can improve public service delivery through various AI initiatives. Additionally, AI can be utilized to develop a framework for a Government, Risk, and Compliance (GRC) engine to assess the cybersecurity compliance status of organizations.
 - *Healthcare:* Nepal's healthcare sector faces significant challenges, including a shortage of medical professionals, inadequate public funding, and fragmented data systems. The absence of standardized treatment protocols and siloed data further exacerbates these issues. AI has the potential to enhance service delivery, streamline processes, and improve systems such as health insurance. To address these challenges, policies should promote the adoption of global best practices, such as Fast Healthcare Interoperability Resources (FHIR), for efficient data exchange. By leveraging FHIR, AI can support better clinical decision-making, enable personalized care, and provide predictive insights. This integration will enhance healthcare workflows, improve data interoperability, and ultimately lead to better patient outcomes.
 - *Tourism:* The policy should promote AI adoption in Nepal's tourism sector to improve service delivery and sustainability. This includes implementing government chatbot systems for information and security, using AI for language

translation, predicting tourism trends, and incorporating relevant location information to facilitate tourists etc. Additionally, AI can help utilize tourism data to improve policy, marketing, and decision-making.

- *Social Security*: AI can enhance safety and security in Nepal by preventing road accidents, scams, financial fraud, and cyber threats while improving disaster response and crime prediction. AI-powered traffic monitoring can detect violations and predict accident-prone areas, while smart systems optimize traffic flow. In finance, AI detects fraudulent transactions and phishing attempts, alerting users to scams. AI-driven early warning systems predict and monitor floods, landslides, enabling faster disaster response. AI-powered drones assist in search and rescue, while chatbots and social media monitoring provide real-time alerts and combat misinformation. AI also helps law enforcement analyze crime patterns for proactive policing. By integrating AI in these areas, Nepal can enhance security and public safety through smart, data-driven solutions.

2. **AI Ecosystem and Scope**: The term "ecosystem" is appropriately chosen; however, its scope in the policy draft remains ambiguous. It is unclear whether the ecosystem is limited to technical aspects, such as data generation and AI model utilization, or if it also encompasses the required workforce. Additionally, the extent of its coverage, ranging from AI startups to established corporations, needs further clarification.
3. **Government Infrastructure**: The AI policy draft should provide clear guidelines for the development and utilization of infrastructure by both private and public organizations. To ensure sustainability, the policy should focus on making locally developed AI infrastructure more cost-effective than imported alternatives, fostering long-term economic benefits. The government can encourage private sector investment in infrastructure by offering subsidies, tax incentives, or public-private partnerships (PPPs), making it financially attractive for businesses to contribute. These incentives should be clearly defined to ensure that private companies can benefit from the development of national infrastructure, while also helping the government reduce reliance on foreign providers. Additionally, the policy should outline how private and public sectors can collaborate to ensure infrastructure is optimally used and aligned with national goals. By adopting these strategies, Nepal can build a self-sustaining AI infrastructure ecosystem and reduce external dependencies.
4. **Human in the Loop**: To ensure accuracy, security, and ethical AI practices, human intervention should be integrated within the AI loop. This strategy promotes transparency, accountability, and trust in AI systems. The policy should establish clear guidelines for categorizing the sensitivity and criticality of data and applications, ensuring that human oversight is prioritized in high-risk areas. By defining when and where human involvement is required, the policy can strike a balance between automation and human control, ensuring reliable, ethical, and secure AI usage.
5. **Domain - Specific AI Adoption**: A base AI policy provides the foundational guidelines for AI development and use, but domain-specific policies(guidelines, strategy) are essential to address the unique challenges and sensitivities of sectors like healthcare,

finance, and others. In sectors such as healthcare and finance, data privacy and security are critical, making it necessary to create tailored AI policies that go beyond general AI regulations. These policies should account for the specific needs of sensitive data, ensuring that AI models are developed and maintained with the highest standards of accuracy, security, and ethical considerations. For instance, healthcare data must adhere to strict confidentiality requirements, while financial data demands compliance with regulatory standards to protect against fraud and misuse. By introducing domain-specific AI policies, Nepal can ensure that AI applications in these sectors are not only effective but also secure, reliable, and aligned with sector-specific requirements, complementing the base AI policy and addressing the complexities of sensitive data.

6. **Integration with Other Policies:** The AI policy should be aligned with existing policies on data privacy, unethical practices, and other regulatory frameworks. However, the current policy draft lacks a clear connection between AI governance and these related policies. Establishing these links is crucial to ensure consistency and coherence in the overall regulatory approach to AI.
7. **Ethical AI:** AI applications should be developed in line with ethical principles. To support this, the government should take the initiative to facilitate collaboration among various stakeholders, acting as a guide rather than imposing strict controls. The policy should focus on helping stakeholders by providing guidelines for ethical AI practices, offering training, raising awareness, and ensuring a balanced approach. Over regulation or excessive control could stifle innovation, which must be avoided. The policy should clearly outline the principles for the ethical development, deployment, and use of AI, ensuring that its implementation is responsible, fair, and conducive to innovation.
8. **Transparent AI:** Extension the *Ethical AI*, building trust in AI requires transparency, ethical practices, legality, accessibility, and ease of use, among other factors. These elements should align with established ethical guidelines and promote transparent AI development and deployment.
9. **National AI Index and International Practices:** The policy draft lacks clarity on the purpose of the National AI Index and whether it aims to rank Nepal's AI development internationally. If it's intended to measure AI progress, it should align with global standards to ensure competitiveness and effectiveness. By adopting international best practices, the policy can guide Nepal's AI development and enhance its standing on the global stage.
10. **Regulatory and Responsible Body:** The policy draft proposes a council as the regulatory body for the AI policy, but the proposed size of the council is big. The regulatory body, or AI Council, should be small in size, yet possess significant authority to effectively oversee and enforce the policy. Also, The sector-specific responsible entity should be designated to facilitate work decentralization and establish an effective problem-solving mechanism.
11. **Academia and Industry Gap:** While academia is the primary source for developing AI talent, there remains a gap in aligning academic practices with the rapidly evolving industrial needs. To bridge this gap, the government can act as a mediator, collecting real-world challenges from industries, government, society, and the environment, and

presenting these problems to academia for solutions. Academia can then address these issues through projects, thesis, and research, with necessary funding and guidance from the government. This collaboration would not only help solve societal problems but also ensure that academia stays aligned with current industry trends, creating mutual benefits for both sectors.

The following section discusses the overall mapping of recommendations from this research with those covered in the AI Concept Paper 2081 and the AI Policy Draft 2081. Table 5.1 presents the recommendations from this research, as outlined in Subchapter 4.5 (*Overall Recommendation*). The symbols indicate coverage in relevant reports: **X** means not covered, **✓** indicates partial coverage, and **✓✓** signifies full coverage. This research is based on the AI Concept Paper rather than the AI Policy Draft and serves as a foundational reference, providing research backed insights to support the policy development process.

Table 5.1: AI Policy Recommendation Mapping Table

S.N.	Recommendation	AI Concept Paper	AI Policy Draft
1.	Determining Nepal's position on AI before formulating policies	X	X
2.	Sector-specific AI policies and guidelines for industries such as healthcare, education, and finance	X	X
3.	Comprehensive AI strategy that integrates AI across various sectors	X	X
4.	Strategic AI roadmap that includes both long-term goals and short-term	✓	X
5.	Monitoring and evaluation mechanism to track the progress of AI initiatives	✓✓	✓
6.	AI literacy by implementing nationwide digital education programs	✓✓	✓

7.	National programs to upskill the workforce, focusing on AI, data science, and machine learning	✓✓	✓
8.	Promote gender and geographical inclusivity in AI education, jobs, and training to bridge disparities	✓	✓
9.	Prioritize linguistic and cultural diversity by encouraging AI applications in local and indigenous languages.	✓	✓
10.	Promote the development of energy efficient AI models and AI driven solutions for national priorities like climate related challenges, including disaster management, agriculture, and conservation	✓	✓
11.	Policies that support green AI initiatives to reduce the environmental impact	X	X
12.	Independent regulatory body (small and smart) to oversee AI development, ensuring the enforcement of ethical guidelines, data protection laws, and penalties for breaches	✓	✓
13.	Encourage the development of responsible AI practices to address potential errors	✓	✓
14.	Establish comprehensive cross-border data sharing regulations to ensure compliance with international standards and foster global AI integration.	✓	X
15.	AI policy is regulated rather than overly controlled, allowing room for innovation and the growth of AI startups	X	✓
16.	Foster public-private partnerships to create funding opportunities for AI	✓	✓

17.	Strengthen collaboration between the government, private sector, academia, and other related stakeholders	✓	✓
18.	Establishment of national AI innovation hubs and startup ecosystems	✓	✓
19.	Promote open-source AI development for sustainability, transparency, accessibility, and ethical AI	✓	✓
20.	Establish bias mitigation mechanisms to ensure diverse and representative data collection,	✓	X
21.	Focus on building scalable infrastructure, such as high-speed data centers, broadband access, and cloud computing resources, to support AI development	✓✓	✓
22.	Policies should encourage the publication of local data to enable AI-driven solutions for Nepal's unique challenges	X	X
23.	Ensure AI policies uphold fundamental human rights, including privacy, freedom of expression, and protection against discrimination	✓	✓
24.	Strengthen laws surrounding data privacy and protection, ensuring clear frameworks for data sharing that balance transparency with privacy	✓	✓
25.	Strengthen AI cybersecurity governance with robust policies, standardized protocols, and compliance measures	✓	X

26.	Develop guidelines that encourage AI practitioners to conduct ethical AI research, ensuring models are explainable, auditable, and compliant with both national and international ethical standards	✓	✓
27.	Create policies to mitigate AI-driven job displacement by promoting reskilling and upskilling initiatives	✓	✓
28.	Establish regulations to combat the spread of deepfakes and AI-generated misinformation, protecting public trust and safeguarding democratic institutions	✓	X
29.	Establish mechanisms for obtaining informed consent and protecting user privacy in all AI-related activities	✓	✓
30.	Ethical guidelines should prevent AI misuse in surveillance, automated decision-making, and law enforcement while aligning with international standards such as the UNESCO AI Ethics Recommendation.	✓	✓
31.	IP laws to protect local innovations	X	X

Chapter 6

Conclusion

This study conducted a comprehensive desk review covering various aspects of the AI-driven digital ecosystem, including Nepal's ICT history, existing policies, AI practices, data privacy, digital infrastructure, and international benchmarks. The analysis revealed significant gaps in AI governance, data protection, cybersecurity and digital infrastructure that hinder Nepal's AI ecosystem. Additionally, surveys, FGDs, and KIIs were conducted to incorporate diverse perspectives from stakeholders across multiple sectors. Insights from these data collection methods were systematically analyzed, ensuring a holistic understanding of Nepal's AI landscape.

To ensure accuracy and reliability, the findings were integrated using triangulation methods, combining the desk review with empirical data from surveys, FGDs, and KIIs. This approach validated the key gaps and opportunities in AI policy development. The most critical aspect is defining Nepal's stance on AI before drafting policies to ensure alignment with national priorities. Strengthening legal frameworks for data privacy, establishing cross-border data-sharing regulations, fostering AI education and workforce development, mitigating biases, and setting up regulatory oversight mechanisms are essential steps toward a robust AI ecosystem.

In this context, Nepal must formulate detailed AI policies tailored to specific sectors such as healthcare, education, and finance while promoting innovation through public-private partnerships. A national AI roadmap should outline clear long-term and short-term goals, ensuring scalable digital infrastructure, regulatory oversight, and ethical AI practices. Policies should encourage local data availability for AI-driven solutions and promote a research ecosystem to address Nepal-specific challenges. A well-defined AI strategy, supported by strong governance and stakeholder collaboration, will be crucial in positioning Nepal as a competitive player in the AI landscape.

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Appendix A: Survey Questions

Thank you for participating in this survey by Facet Technology Pvt. Ltd., conducted in association with South Asia Foundation and Data for Development (D4D) in Nepal. Your responses will remain strictly confidential and anonymized, with data reported only in summary form. The survey aims to assess Nepal's policies, digital infrastructure, and practices related to AI, data privacy, and governance, supporting the Nepal government with AI policy recommendations. Your insights are vital to shaping meaningful outcomes. The survey takes about 20 minutes, and we greatly appreciate your time and effort.

Demographic information

- Name (optional)
- Email
- Age group
- Gender
- Organization
 - Government
 - Private Sector
 - Regulatory body
 - Technical Communities and Association
 - Research institutes
 - Academia
 - Civil society association/media
 - NGOs/INGOs
 - Consultants
 - Students and end user
 - Others if not mentioned
- Education
 - Bachelor

- Masters
 - Masters of Philosophy (MPhil)
 - Doctor of Philosophy (PhD)
 - Are you an AI practitioner?
 - Yes
 - No
-

SRQ1: Policy Adequacy

1. Should Nepal prioritize AI in public service transformation?
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
2. Are there clear policies, frameworks, or guidelines for AI research, innovation, and development in Nepal?
 - Yes, comprehensive guidelines exist
 - Partial or vague guidelines exist
 - No guidelines exist
 - Don't know
3. Do you think AI policy can address social needs?
 - Yes, very effectively
 - Somewhat effectively
 - Not effectively
 - Don't know
4. Should Nepal benchmark its AI policies with international standards?
 - Strongly Agree

- Agree
 - Neutral
 - Disagree
5. Are education, academia, and training programs sufficient to support AI ecosystem development?
- Yes, fully sufficient
 - Partially sufficient
 - Not sufficient
 - Don't know
6. To what extent should AI policies prioritize economic growth over ethical concerns?
- Strongly prioritize economic growth
 - Somewhat prioritize economic growth
 - Equally prioritize both
 - Strongly prioritize ethical concerns
-

SRQ2: Regulatory Framework

1. Are existing regulatory frameworks (e.g., NRB, NIA, ERC, CAAN) sufficient to address AI data security and privacy?
- Yes, fully sufficient
 - Partially sufficient
 - Not sufficient
 - Don't know
2. What types of ethical guidelines should be prioritized in Nepal for future AI development?
- Privacy and data protection guidelines
 - Fairness and non-discrimination guidelines
 - Transparency and accountability guidelines

- All of the above
3. Should Nepal implement stricter laws to prevent the misuse of AI?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
4. How well do regulators address the risks of AI-generated disinformation/misinformation (e.g., in social media)?
- Very well
 - Somewhat well
 - Poorly
 - Don't know
5. Should cross-border data sharing involving AI be regulated more strictly in Nepal?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
6. What type of AI governance framework is needed in Nepal to enhance inclusivity and transparency?
- Stakeholder-inclusive and participatory
 - Accountability-focused with ethical standards
 - Transparency-driven with data and AI model openness
 - Don't know
7. How important is it to create a regulatory framework to safeguard AI's impact on human rights?
- Very important
 - Somewhat important

- Not important
 - Don't know
-

SRQ3: Ecosystem Development

1. What factors are most needed to build a robust AI ecosystem in Nepal?
 - Improved digital infrastructure and regulatory support
 - Funding for AI research, innovation, and startups
 - Comprehensive training programs and skill development
 - All of the above
2. Should the government incentivize startups to invest in AI?
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
3. Should public-private partnerships be prioritized to promote AI development in Nepal?
 - Yes, they are most necessary for progress
 - Somewhat necessary but not critical
 - Not necessary
 - Don't know
4. To what extent should AI policy address gender and geographical disparities in Nepal?
 - To a great extent
 - To some extent
 - Not at all
 - Don't know
5. Should Nepal focus more on AI skill development to close workforce gaps?

- Strongly Agree
 - Agree
 - Neutral
 - Disagree
6. Are there sufficient funding opportunities for AI research and innovation in Nepal?
- Yes, sufficient funding exists
 - Some funding exists
 - No funding exists
 - Don't know
7. What type of AI awareness initiatives should be included in Nepal's AI policy to foster its adoption?
- Educational programs and workshops
 - Public awareness campaigns and media outreach
 - Collaboration with academic institutions and AI-related institutions for AI training
 - All of the above
-

SRQ4: Digital Infrastructure, Data, and Governance

1. Is the current digital infrastructure (e.g., data centers, internet) adequate to support AI development in Nepal?
- Yes, fully adequate
 - Somewhat adequate
 - Not adequate
 - Don't know
2. How can data governance policies in Nepal balance privacy and support AI development?
- Establishing clear data privacy regulations

- Creating frameworks for secure data sharing
 - Implementing data storage standards tailored for AI
 - All of the above
3. Should local public datasets be made easily accessible to AI researchers and innovators for promoting AI in the context of Nepal?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
4. How well does current infrastructure ensure data privacy for AI applications?
- Very well
 - Somewhat well
 - Poorly
 - Don't know
5. What should the government prioritize in data governance to promote AI technologies?
- Ensuring equitable access to AI technologies
 - Implementing strong data privacy and protection measures
 - Establishing transparent and inclusive data-sharing frameworks
 - All of the above
6. Are investments in Nepal's digital infrastructure (e.g., data centers, internet) aligned with AI growth needs?
- Yes, fully aligned
 - Partially aligned
 - Not aligned
 - Don't know
7. How well is the quality of public data collected by government, banks, and private sectors maintained and utilized for AI purposes?

- Well-maintained and highly useful for AI
 - Moderately maintained and somewhat useful for AI
 - Poorly maintained and not useful for AI
 - Don't know
-

SRQ5: AI Risks

1. How can AI risks such as bias and misuse be effectively minimized?
 - Establishing clear ethical guidelines and standards
 - Conducting regular audits and monitoring of AI systems
 - Promoting education and awareness on ethical AI usage
 - All of the above
2. Should Nepal develop stricter measures to counter AI-driven misinformation and disinformation?
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
3. How can human rights considerations be effectively integrated into Nepal's AI policies?
 - By ensuring AI policies include privacy and data protection measures
 - By addressing biases and promoting fairness in AI systems
 - By establishing accountability for AI-related human rights violations
 - All of the above
4. Is there a significant risk of AI being used unethically in Nepal?
 - Yes, very significant
 - Moderately significant
 - Insignificant

- Don't know
5. Should privacy concerns be prioritized over innovation in AI policies?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
6. Is the absence of ethical safeguards a barrier to AI development in Nepal?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
-

SRQ6: AI for National Priorities

1. Should AI be utilized more effectively to address national priorities like education and healthcare?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
2. Should AI adoption in public services be accelerated?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
3. Should AI-driven solutions be made more accessible to underserved communities?
- Strongly Agree

- Agree
 - Neutral
 - Disagree
4. Should the government focus more on AI adoption in Small and Medium Scale Enterprises?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
5. Are current AI uses, implementations, and research creating measurable value in Nepal's economy?
- Yes, significant value
 - Some value
 - No value
 - Don't know
6. Should disparities in AI accessibility across regions be prioritized?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree
7. How can AI initiatives be made more inclusive of all socio-economic groups?
- By ensuring equal access to AI technologies
 - By prioritizing marginalized communities in AI initiatives
 - By reducing digital literacy gaps through education and training
 - All of the above
-

SRQ7: Strategic Roadmap

1. How important is it to develop a clear strategic roadmap for AI development in Nepal at this stage?
 - Very important
 - Somewhat important
 - Not very important
 - Not important at all
2. Should Nepal's AI policy align with international best practices at this stage, or is it not necessary to prioritize this?
 - Yes, it should fully align with international best practices
 - Partial alignment with best practices is sufficient
 - No, alignment with international best practices is not a priority
 - Don't know
3. Should Nepal establish a dedicated body for AI governance?
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
4. Should ethical concerns be prioritized and well-integrated into Nepal's AI strategy?
 - Yes, they should be fully prioritized and integrated
 - They should be partially prioritized and integrated
 - No, they are not a priority at this stage
 - Don't know
5. Is there a need for more actionable plans for AI adoption in public sectors?
 - Strongly Agree
 - Agree

- Neutral
 - Disagree
6. Should long-term sustainability be prioritized in Nepal's AI strategies?
- Strongly Agree
 - Agree
 - Neutral
 - Disagree

Appendix B: FGD and KII Research Questions

- **SRQ1 (Policy Adequacy):** Are the existing *AI-driven digital ecosystem* related policies, laws, procedure guidelines in Nepal sufficient to address the country's technological, societal, and economic needs, and what improvements are necessary to meet future demands?
- **SRQ2 (Regulatory Framework):** What regulatory and governance frameworks, including ethical and legal considerations, are required to ensure responsible, transparent, and inclusive AI development and deployment in Nepal?
- **SRQ3 (Ecosystem Development):** What strategies and frameworks should Nepal adopt to cultivate an innovative AI startup ecosystem, addressing critical challenges such as talent development, funding, industry collaboration, infrastructure, AI awareness, and support for emerging AI-driven enterprises?
- **SRQ4 (Digital Infrastructure, Data and Governance):** How can Nepal design data security, data governance, and digital infrastructure policies that support AI innovation while ensuring privacy, accessibility, and equitable access to AI technologies in Nepal, including ethical dilemmas, societal impacts, bias, misinformation, and misuse, and how can these risks be mitigated through policy?
- **SRQ5 (AI Risks):** How can Nepal develop AI policies that effectively minimize risks such as bias, misuse, and ethical concerns while balancing innovation, privacy, and human rights considerations?
- **SRQ6 (AI for National Priorities):** How can an AI-driven *digital ecosystem* be strategically leveraged to address Nepal's national priorities, such as education, healthcare, agriculture, economic growth, human rights, and regional inclusivity, while considering the country's unique socio-economic context?
- **SRQ7 (Strategic Roadmap):** What actionable policy recommendations and strategic roadmaps should Nepal implement to achieve its AI goals over the short term and long term, aligning with international standards and addressing ethical, societal, and legal concerns?