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Research Article

CHALLENGES TO THE IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN EMERGING ECONOMIES: A SYSTEMATIC REVIEW OF THE CASE OF ZIMBABWE

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Abstract

Aim: This paper sought to synthesize literature onbarriers to effective artificial intelligence (AI) and machine learning (ML) implementation in Zimbabwe. **Methodology:** A systematic review methodology was adopted. It followed a multi-stage review structure. The search technique comprised of keyword Boolean syntax queries on scholarly databases. The PIO framework was applied to screen items for relevance. After filtering, a 28-article evidence base was subjected to thematic assessment and synthesis. **Results:** The systematic analysis of 28 articles revealed significant obstacles across cross-cutting dimensions vis-a-vis rapid AI advancement. Findings from the review caution against technologically determinist perspectives which are detached from policy choices, instead underscoring Zimbabwe's strong potential to equitably integrate AI innovations through tackling adoption barriers by means of coordinated strategies optimizing accessible tools. **Conclusion:** While this review highlights daunting challenges, mapping these impediments illuminates pathways for maximizing responsible adoption suited for contextual realities. The paper proposes an Emerging economy AI/ML Adoption Framework developed along four key interconnected components which include contextual factors, core adoption barriers, strategic enablers and adoption outcomes.

Keywords: Artificial Intelligence, Machine Learning, Adoption Barriers, Emerging Economies, Zimbabwe

INTRODUCTION

Background and rationale

Emerging technologies such as AI and ML wield immense potential to boost economic growth (Shukla *et al.,* 2024). However, developing nations like Zimbabwe face substantial challenges in adopting and integrating AI and ML technologies (Moyo *et al.,* 2022). Zimbabwe, a lower-middle class emerging economy, is a fascinating case study for AI and ML for sustainable growth. However, the country-specific shortfalls in digital infrastructure, skills, funding, regulatory frameworks, public attitudes, and sector-specific constraints in education, finance, healthcare, and agriculture have been documented to pose obstacles to Zimbabwe's technology adoption and integration efforts (Hlongwane *et al.,* 2024). This systematic review critically analyses academic literature to identify the main technological, human capital, financial, regulatory, application-specific, and socio-cultural barriers to AI and ML adoption in Zimbabwe. A complete examination of the multidimensional issues can guide evidence-based policy and practical initiatives that use AI and ML techniques to improve economic and social outcomes across the country (Thanyawatpornkul, 2024; Shukla *et al.,* 2024).

Conceptual unpacking of AI and Machine learning

AI is a broad term for digital systems that mimic human cognition to complete tasks and reach goals (Strusani & Houngbonon, 2019). This includes AI systems based on symbol manipulation, formal rule-based expert systems, and connectionist tools focused on pattern identification, such as deep learning, neural networks, and machine learning (Afaq & Narula, 2025). Machine learning, a branch of AI, focuses on algorithms that can learn and improve at a task from experience without being explicitly programmed, even though AI and ML are sometimes used interchangeably (Strusani & Houngbonon, 2019). AI and ML's approaches and applications are extensive, varied, and rapidly changing, from computer vision for medical diagnosis to fraud detection in finance, intelligent chat bots in customer service, and learning analytics in education.

Understanding emerging economy dynamics

Zimbabwe is a typical developing lower-middle-income economy, as shown by several contextual and developmental characteristics. Emerging economies, which are characterized by modest but rapid economic growth, are defined by the ongoing structural change from traditional agriculture to industry, exports, and services, which generates rising household incomes (Shukla *et al.,* 2024). But poverty, income inequality, and development issues may remain, as well as institutional flaws, poor infrastructure, skill gaps, and no social safety nets (Afaq & Narula, 2025).Zimbabwe is a prime example of a growing economy that is trying to move from dependence on mining, tourism, and agriculture to more diversified, technology-driven development routes. The country's goals to address developmental challenges correspond with the use of digital transformation technologies as reiterated in the national strategic plan (Vision 2030) to have "Information and Communication Technology (ICT) across all national development strategies as an enabling tool for development". However, Zimbabwe's poverty, policy uncertainty, and instability hinder its tech potential. Therefore,

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it is vital to grasp the socio-economic effects of the barriers to AI and ML integration.

PURPOSE

Objectives of the review

The overarching goal is to systematically review the academic literature on barriers to effective AI and ML adoption in Zimbabwe across multiple dimensions including:

- Technological infrastructure and digital divides
- Human capital limitations and skills gaps
- Financial and investment challenges
- Ethical, legal and regulatory policy hurdles
- Sector-specific adoption obstacles in healthcare, agriculture, finance, education etc.
- Public awareness and socio-cultural perceptions

The goal is to establish policy and practical strategies to use AI/ML advancements to develop sustainable emergent economies by tackling the issues connected with these interrelated themes.

Scope

The review focuses on literature discussing the challenges to AI/ML deployment in Zimbabwe or similar Southern African and emerging economies. It investigates academic publications and research on tech adoption and digital transformation barriers, including conceptual models, case studies, survey data, and policy assessments.

LITERATURE REVIEW

Theoretical foundations of AI and Ml adoption

The integration of AI and ML requires negotiating complex technological, organizational, and social processes in both public and private sectors. Consequently, many theoretical frameworks have been created to clarify adoption barriers. Sharma *et al.,* (2022) adopted a technology-organization-environment (TOE) framework to assess empirical findings on AI deployment issues in India's public sector. The framework showed issues with tech readiness, organizational resource adequacy, and regulatory and social settings. In the meantime, Folorunso *et al.,* (2024) developed an integrative policy framework that elucidates the barriers to AI usage, including infrastructure access, human capital limitations, ethical risks, and public and institutional attitudes, by combining diffusion of innovations theory and technology acceptance models (TAM).These multidimensional models align with emerging economy studies, which argue that successful advanced innovation requires coordinated progress in digital capabilities, skills development, conducive policies, funding access, and public engagement (Afaq & Narula, 2025). Thus, a detailed examination of technological, financial, human resource, ethical-legal, sectorial, and socio-cultural barriers is needed to fully comprehend the complex innovation ecosystems that affect AI adoption in places like Zimbabwe.

Technological infrastructure and the digital divide in Zimbabwe

A cornerstone for emerging economies that want to integrate AI systems and technologies that rely on massive data flows and cloud computing is the expansion of ICT infrastructure and internet access (Sidhu *et al.,* 2024). Zimbabwe, a lower-middle-income economy, reflects the broader African digital divide, which is marked by a lack of broadband access, electricity deficits, and limited high-performance computing, which are essential for intensive machine learning applications (Folorunso *et al.,* 2024). While the country faces significant computing constraints, the High-Performance Computer housed at the University of Zimbabwe represents an important resource that could support AI development initiatives (Mutunhu *et al.,* 2021). Shambira (2020) found that 85% of Zimbabwean banking executives said the present IT infrastructure couldn't support revolutionary AI. They claimed poor speeds, instability, and obsolete legacy platforms due to reliance on costly satellite connectivity with occasional reliability difficulties. The related analysis ofthe economy by Ali (2020) and Ncube (2016) ties such residual technological obstacles to under-investment in advanced digital infrastructure spanning decades, leaving systems ill-equipped to utilize advances. Yet researchers also stress that emerging economies cannot wait till they digitize like advanced economies. Instead of using resource barriers, realistic, innovative policies that include cloud computing, mobile penetration, public access facilities, and regional collaboration can help (Tasiyana *et al.,* 2022). Thus, despite Zimbabwe's failing internet infrastructure hindering AI integration, evidence indicates that infrastructure issues are part of larger strategic problems regarding the effective use of existing and new digital capabilities.

Human capital and skills gap in AI and Ml implementation

Despite the importance of finance and technology, human qualities remain the key to innovation and its advantages (Afaq & Narula, 2025). Zimbabwe is a paradox: a young population offers talent, yet a lack of skill alignment limits AI specialization (Sidhu *et al.,* 2024). Chilunjika & Chilunjika (2024) surveyed the economy and found that over 80% of public and private sector leaders thought Zimbabweans lacked the technical and soft skills needed for AI integration, like computational skills and system interfacing. These discrepancies stem from education misalignment, as 52% of university executives in one research said present curriculum don't create the AI-ready abilities young people need (Tarisayi & Manhibi, 2025). Tertiary institutions face poor infrastructure that hinders their use of costly big data and analytics tools for teaching (Muduva *et al.,* 2024). Also, organizational cultures that resist change, executives' risk aversion, and information gaps about new innovations' returns are other impediments rooted in human capital limits (Muparadzi & Mukonza, 2024).Important to note, the rise of internet access allows online education to empower youth (Shambira, 2020). Public-private partnerships can also create advanced technical institutes that focus on applied innovation and fourth industrial revolution skills (Jeche, 2022). Thus, in places like Zimbabwe, where the population is young, there is a chance to fix the AI skills gap. But the government, corporations, and educators must work together.

Financial and investment barriers to AI and Ml adoption

Emerging economies that want to adopt advanced technologies like AI solutions are restricted by a lack of money and investment (Sidhu *et al.,* 2024). According to studies done throughout Zimbabwe's business environment, the adoption of

AI software, hardware, and cloud systems is delayed by the high upfront costs, as business leaders allocate their limited finances to essential immediate expenditures (Hokonya, 2024). Takunda and Iyioluwa (2024) argue that short-term thinking and a lack of understanding of ROI timelines worsen financial issues. Thus, the national infrastructure needed for AI systems is underfunded due to risk-averse lending and weak financial markets (Ochuba, Adewunmi & Olutimehin, 2024). When stakeholders are reluctant to fund AI deployment due to insufficient exposure to proving and commercializing technical discoveries, these financial constraints are interwoven with skills shortfalls (Adobor & Yawson, 2023). Scholars argue that emerging economies need coordinated policy initiatives like tax incentives, public-private partnerships, stronger intellectual property systems, and investment promotion to facilitate AI financing (Abrokwah-Larbi & Awuku-Larbi, 2024).In Zimbabwe, instabilities and reliance on imports worsen foreign currency shortages, which limits digital investment budgets (Travers, 2024). But the situation also allows for leapfrog funding approaches that focus on mobile apps. Thus, academics recommend avoiding viewing such issues as insurmountable structural barriers that are independent of policy choices, even when significant financial and investment obstacles are clear.

Policy, ethics, and regulatory challenges in AI and Ml deployment

The speed and opacity of AI growth in new environments with limited supervision pose dangers of unfair, unethical, and hazardous systems that require proper governance (Afaq & Narula, 2025). Scholars have found that the majority of poor countries do not have bespoke policies and regulations that are expressly built to address the reality of AI deployment, regardless of the environment (Shukla *et al.,* 2024). Moyo, Watyoka & Chari (2022) and Ncube (2016) found that Zimbabwe lacks national AI policy frameworks, data privacy protections, and ethics monitoring bodies for issues like automation displacing workers. As Ncube (2016) observes, the singular and to date only tech-specific piece of legislation in Zimbabwe, the 2018 Cyber Act, was primarily meant to regulate activism and marked with political undertones, as opposed to private sector data mining or public sector automation and transparency. In the interim, evidence-based governance improvements are delayed by colonial legacies that have concentrated expertise and policy ability in institutions that are governed by narrow interests (Yingi & Benyera, 2024). Yet, other findings show that over regulating new breakthroughs is sensitive, arguing that flexible policy coordination that encourages innovative experimentation is good for ethical governance (Folorunso *et al.,* 2024).

In general, the evaluations agree that the absence of specified norms, responsible institutions, and responsive governance mechanisms raises the possibility of unchecked challenges or unfair AI adoption patterns. Researchers argue that Zimbabwe needs context-specific AI policy frameworks that include data regulations, automation transparency protections for marginalized communities, upskilling programs, and adaptable ethics structures due to economic structural vulnerabilities and existential policy (Moyo, Makota & Kabote, 2024). Despite difficult policy considerations, governance foundations are crucial for the ethical, socially conscious deployment of AI.

Sector-specific applications and challenges (healthcare, agriculture, finance, and education)

Scholars say that barriers differ in public and private sectors that are pursuing customized AI integration strategies based on criteria like efficiency, productivity, personalization, and innovation, in addition to economy-wide viewpoints (Shukla *et al.,* 2024). Da Silva (2024) noted that smart medical systems might greatly improve access and results in Zimbabwe's vital healthcare sector. However adoption is hindered by a lack of unique patient data, limited specialized product development, and problems keeping trained AI tool users. Researchers found that most commercial applications are concentrated among established large producers in agricultural contexts such as Zimbabwe's influential tobacco sector, while smallholders are neglected due to obstacles such as the interpretability of crop analytics insights (Chiwaridzo & Chiwaridzo, 2024). In the financial sector, scholars note that machine learning and automation are unevenly applied, with more focus on transactions than on personalized advisory roles that determine access for marginalized groups like informal traders and rural women (Ochuba, Adewunmi & Olutimehin, 2024).In Zimbabwe's strained but influential education system, officials were found to have a sharp understanding of the potential benefits of AI integration in areas such as adaptive learning platforms, student assessment, and career assistance. However, they faced issues with development costs, change management, and ethics oversight (Hlongwane *et al.,* 2024). In general, the message across sectors is consistent with the overall conclusion that sector-specific hurdles, notwithstanding their multidimensionality, may be defeated by coordinated efforts that rely on assets such as tech-savvy, youthful populations.

Socio-cultural perceptions and public awareness of AI and ML

Adoption frameworks also stress that socio-cultural openness to innovations is key to success in deploying them in communal emergent economies (Folournso *et al.,* 2024). In Zimbabwe, studies showed that the well-educated and technologically connected were quite optimistic about AI, unlike older, low-tech groups like rural farmers, who were skeptical (Muduva *et al.,* 2024). Misunderstandings about sentient robots cause excitement and dystopian fears without a clear understanding of the offered solutions (Musekiwa & Kabote, 2024). These disparate sentiments worsen adoption gaps, as youth advocate for integration into their activities despite the absence of regulatory protections, while leaders are hesitant to engage with technologies that are scarcely comprehended and appear to be disconnected from societal realities (Jeche, 2022). Researchers say the public is curious but ignorant, therefore awareness efforts are needed to share balanced narratives and opportunities related to technologies like ML to support fair growth (Yingi & Benyera, 2024).Addressing knowledge gaps allows for a transition from techno-optimism to accepting AI as a solution to community challenges. This helps build trust and understanding, which are vital for lowering the risk of uneven adoption or hostility (Chatikobo & Pasipamire, 2024). Scholars also warn that assuming good perceptions alone can ensure integration success ignores the larger technical and policy adoption challenges (Chiwaridzo & Chiwaridzo, 2024). Thus, a balanced public engagement plan with multi-dimensional reforms is needed.

METHODOLOGY

Systematic review framework adopted

This systematic review adheres to established guidelines that necessitate a structured methodology that is predicated on meticulously formulated questions, comprehensive search strategies, defined eligibility criteria, rigorous review and extraction processes, and the synthesis of patterns across a literature scope (Henderson *et al.,* 2010; Dehkordi *et al.,* 2021). Scholars have shown that protocols that balance emphasis and breadth are better for evaluating diffuse or emergent disciplines than typical literature evaluations (Donato & Donato 2019). The multi-stage review format adopted was tailored to technology adoption research and influenced by Pati and Lorusso (2018) and Sandelowski (2008).

Search strategy

The search technique comprised of keyword Boolean syntax queries on scholarly databases that were carefully targeted based on indexing specialist technology sources, including IEEE Xplore, ScienceDirect, SpringerLink, and Emerald Insight. The first search keywords included ("artificial intelligence" OR "AI" OR "machine learning" OR "ML") with ("adoption" OR "integration" OR "implementation") and ("barriers" OR "challenges" OR "impediments") yielded over 600 results filtered for ("Zimbabwe"). Secondary keyword variations targeting sector contexts including "education," "health," "finance," and "agriculture" provided over 50 additional domain-specific analyses on barriers qualified for structured assessment.

Inclusion and exclusion criteria for literature

The PIO framework, which comprises population, phenomena of interest, and settings as inclusion criteria, was applied to screen items for relevance (O'Connor *et al.,* 2014). Thus, research that explicitly explored the constraints to the adoption of AI and ML within Zimbabwe or similar emerging market environments across institutional, sectoral, or socio-cultural dimensions were considered. Technical, practical, and policy-focused assessments were included, however AI system ideas that were only technical and lacked user adoption views were eliminated. The review was focused on the most recent literature from 2016 onward, which represents the rapid growth of AI. The focus was on scholarly peer-reviewed publications, journals, and indexed reports that answered the structured research question with credible evidence, not market research content (Henderson *et al.,* 2010). Only these sources were kept. A subsequent filtering process omitted 28 references with duplicated or peripheral significance insights compared to specifically answering the study question after assembling 56 preliminarily relevant sources. This led to the final 28-article evidence base, which was used to undertake a full thematic assessment and synthesis.

Data extraction and thematic synthesis approach

An analysis matrix collected data on AI/ML adoption challenges and recommendations, including year, author, technique, scope, sample/context, and important conclusions. This matrix was used to review selective materials. The basic design grouping barrier themes wereinductively constructed by iteratively coding article findings using NVivo software. This basic architecture was further developed into the final categories that structure the synthesized review in accordance with known recommendations on rigorous qualitative analysis processes (Sandelowski 2008). Thus, using verified protocols, organized tools, and specified parameters shows the use of defined, methodologically sound review procedures that are specifically geared to resolve technology adoption inquiries.

RESULTS AND DISCUSSION

Technological infrastructure and the digital divide in Zimbabwe

Zimbabwean organizations are severely limited by the old, narrow-based digital infrastructure that has resulted from decades of underinvestment. These firms are trying to use AI and ML technologies that rely on extensive data flows, cloud architecture, and intensive analytics that are not available domestically (Shambira, 2020; Ali 2020). These wired connectivity gaps are linked to frequent power outages due to hydropower dependency, which hinders the development of new technologies like cloud-based machine learning that need reliable energy (Muduva *et al.,* 2024). Policy limits are shown by bureaucratic legacy platforms, organizational silos, and patchwork integration, which hinder coordinated improvements or new procurement in areas where systems operate (Ncube 2016). However mobile penetration allows for modular adoption that fits the current situation while also pursuing long-term infrastructure development. However, the research indicates that the worsening of irregular digitization, which disadvantages vulnerable communities, is a probable consequence of the absence of coordination through a national AI policy (Folournso *et al.,* 2024). In places like Zimbabwe, where infrastructure is lacking, hybrid strategies that combine mobile opportunities with inclusive backbone development are vital for sustained AI inclusion. The presence of a High-Performance Computer that is accessible to all institutions in both the private sector and the public sector should also assist.

Human capital and skills gap in ai and ml implementation

The survey results show that Zimbabwean policymakers and businesses recognize the major skills gaps in technical specialties and complementary skills needed for AI system integration (Chilunjika & Chilunjika, 2024). Education-employment misalignments lead to youthful workers without the computational skills needed for ML tools and older personnel lacking the digital literacy to advocate for adoption or the learning agility to reskill (Sidhu *et al.,* 2024). Bureaucratic resistance to risk and change, as well as restricted exposure to innovations, hinders modernization (Muparadzi & Mukonza, 2024). To address these gaps, tertiary institutions must implement multifaceted bridging strategies, including rapid curriculum alignment with applied AI requirements through flexible micro-credentials and the development of soft skills like abstract thinking and creative confidence (Tarisayi & Manhibi, 2025). Online academies and public tech centers can hasten the reskilling of students and professionals who cannot access official pathways (Shambira, 2020). The most crucial part is that leaders must promote change management processes that overcome cultural barriers to innovation to empower Zimbabwe's youthful population to unleash the promise of AI, rather than remaining disgruntled as observers of its uneven adoption.

Financial and investment barriers to AI and ML adoption

Leaders in Zimbabwe's asset-constrained public and private sectors recognize the potential socio-economic benefits of advanced AI and ML technologies, but the high costs and complex ROI calculations deter them from acquiring them (Abrokwah-Larbi & Awuku-Larbi, 2024). Local investors are wary of AI deployment due to limited exposure to funding or monetizing sophisticated inventions, which is linked to financial and human capital restrictions. So, they must depend on outside partners who are influenced by their priorities (Adobor & Yawson, 2023). As such, Zimbabwe's AI mostly automates large, stable firms' narrow efficiency needs, not MSME productivity or inclusive sectoral change. Funding hurdles hinder balanced dissemination (Ochuba, Adewunmi & Olutimehin, 2024). Consequently, the unlocked potential of AI necessitates patient capital from development partners, public-private synergies that prioritize investment promotion for Fourth Industrial Revolution technologies, and consistent cybersecurity policies that cultivate trust among local digital ecosystem participants.

Policy, ethics, and regulatory challenges in ai and ml deployment

Zimbabwe shows how underdeveloped countries are vulnerable to AI's rapid growth, which has outpaced governance and led to policy voids in risk management (Ncube, 2016). Moyo, Makota, and Kabote (2024) say that unequal adoption patterns and opaque proprietary tools owned by unregulated commercial interests rather than the public interest are due to the absence of personalized AI accountability frameworks. Zimbabwe's current progress in national AI strategy and data protection laws shows a strong political commitment (Yingi & Benyera, 2024). Nevertheless, success demands transparency and independence, which will shield new monitoring bodies from limited interests and support proportionate policies that foster experimentation. Algorithmic transparency methods will also empower citizens by giving them recourse against biased systems (Folournso *et al.,* 2024). In general, the building of such ethical underpinnings now enables governance to steer the deployment of AI, rather than reacting in vain when unequal adoption patterns become established later.

Sector-specific applications and challenges (healthcare, agriculture, finance, and education)

Zimbabwe's economy's sector-specific integration priorities create distinct AI prospects and adoption challenges linked to fundamental technical and ethical factors. The inaccuracy of separate patient data from under-resourced facilities in the healthcare sector greatly limits precision diagnosis applications, as ML medical imaging (Da Silva, 2024). In agriculture, simple automation is hindered by community smallholders' sophisticated contextualized decision-making; nonetheless, basic mobile advising services promote inclusion (Chiwaridzo & Chiwaridzo, 2024). Regulators have monitoring issues due to the finance sector's heavy use of informal flows. However, sophisticated credit scoring techniques that use cellular usage offer inclusion leapfrogs that reach the unbanked (Ochuba, Adewunmi & Olutimehin, 2024). In education, conservative cultures worry about job automation, while adaptive tutors and tailored edtech platforms are now driving the pedagogical transition (Tarisayi & Manhibi, 2025). Thus, even if adoption hurdles differ by industry, each area shows potential for AI solutions that are tailored to the context and use mobile platforms to encourage inclusion.

Socio-cultural perceptions and public awareness of AI and ML

In Zimbabwe, people are curious yet wary of AI's possible socio-economic effects, which they don't completely understand or feel they can control (Musekiwa & Kabote, 2024). These knowledge gaps are tied to economic exclusion, which worsens the view that AI is part of asymmetrical modernization that ignores common needs. This perception implies that elites who are perceived as driving deployment are the ones who benefit (Jeche, 2022). However, the literature also shows that Zimbabweans are open to practical, human-centered digital solutions for community challenges like health or environmental concerns (Chatikobo & Pasipamire, 2024). Thus, promoting balanced understanding of AI growth in local contexts to address common issues encourages receptivity and social license for adoption policies (Yingi & Benyera, 2024). However, the most important part of full integration is progress that goes beyond public opinion. This requires simultaneous policy initiatives that tackle wider adoption barriers, like infrastructure availability, digital skills training, and appropriate regulation.

Strategies for overcoming AI and ML implementation barriers in Zimbabwe

Synthesising policy assessments, adoption models, and sectoral instances reveals Zimbabwe's key AI and ML strategies for equitable use. These techniques address technology, human capital, financial, and regulatory issues. This encompasses coordinated initiatives aimed at:

- Establishing a national AI taskforce to formulate practical strategy balancing ambition and realism given contexts.
- Aligning education for 21st century competencies and applied digital skills at scale using online academies.
- Strengthening internet backbone reliability leveraging partnerships plus intensifying mobile and cloud tools.
- Unlocking patient, responsible financing for experiments explicitly tackling youth unemployment and social delivery.
- Anchoring adoption in communities through localized hubs co-developing solutions with user populations.
- Developing policy sandboxes encouraging testing of AI systems under accountable governance processes.

The national AI policy, co-created transparently with citizens, unleashes innovation in the direction of beneficial, sustainable consequences from technologies that are too readily implemented unevenly otherwise.

Emerging economy AI/ML adoption framework

Based on systematic analysis of the 28 papers reviewed, an integrated framework has been developed and is presented in Figure 1 that maps the complex dynamics of AI/ML adoption in emerging economies such as Zimbabwe. The framework identifies four key interconnected components: contextual factors, core adoption barriers, strategic enablers and adoption outcomes.

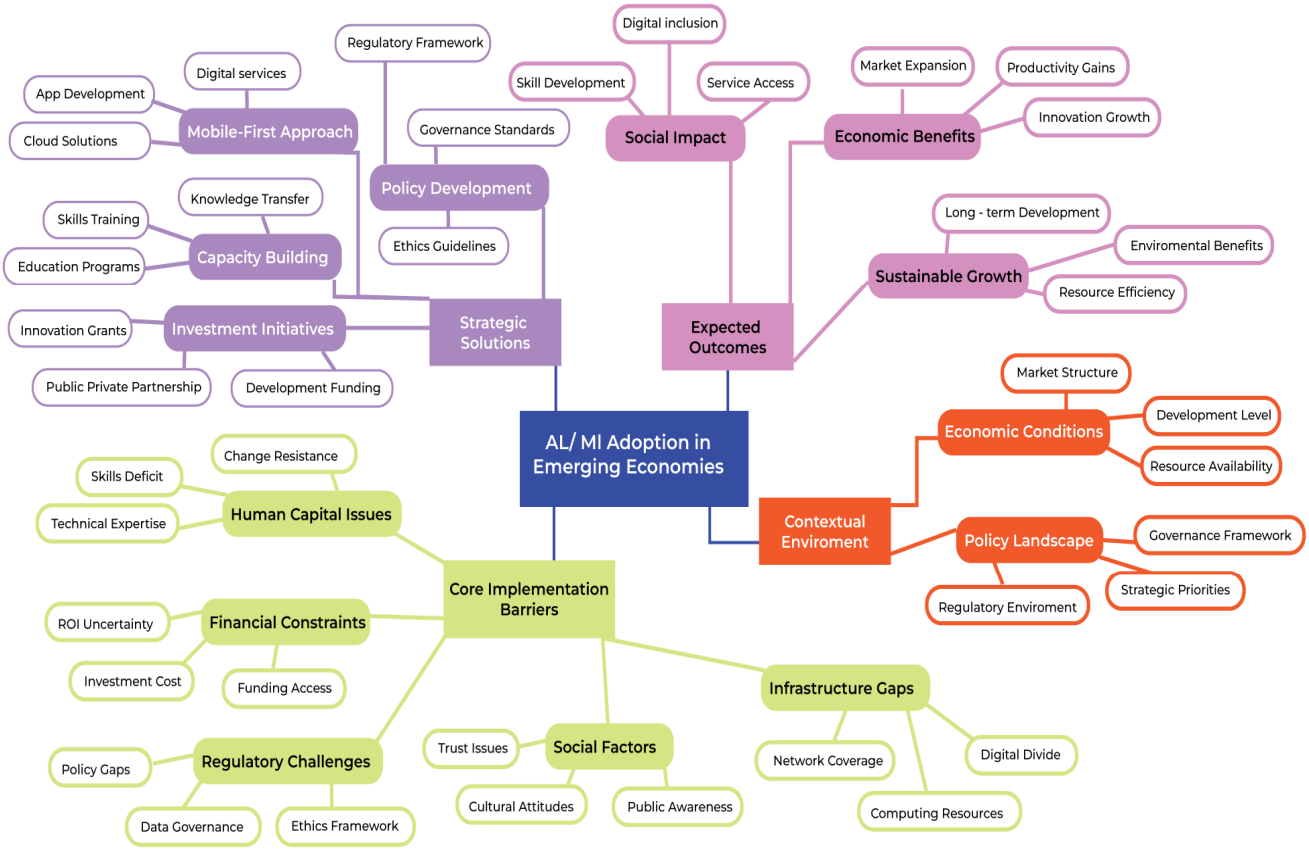

Fig. 1. Emerging Economy AI/ML Adoption Framework

The framework in Figure 1 serves to demonstrate that AI/ML adoption and effective implementation is essentially shaped and underpinned by an interplay between environmental conditions and specific implementation challenges. The contextual environment encompasses economic conditions and the policy landscape. Such contextual factors influence core implementation barriers, which correspondingly manifest across infrastructure, human capital, financial, regulatory as well as social dimensions. The emergent framework proposed identifies strategic solutions which are meant to bridge that gap between current challenges and desired outcomes. These solutions represent evidence-based pathways that have been derived from successful cases across the emerging economy domain. Expected outcomes span economic benefits, social impact and sustainable growth, effectively highlighting the multifaceted potential that successful AI/ML integration wields.

Conclusion

This systematic review examined 28 technology adoption and emerging economy articles to identify the main barriers to the effective, ethical, and inclusive integration of AI and ML innovations in Zimbabwe across technological, human resource, financial, regulatory, and socio-cultural dimensions. Zimbabwe shows how underdeveloped countries are vulnerable to AI's rapid growth due to a lack of digital infrastructure, skills misalignment, financial limits, and data governance capacities. However, the research warns against technologically determinist views that view integration challenges as abstract inevitabilities unaffected by policy. The evidence shows that adolescent, tech-savvy groups can promote leapfrog adoption if coordinated through prudent national plans that eliminate multiple hurdles and optimise mobile platforms.

Thus, rigorous evaluations of hurdles are essential for identifying equitable AI integration paths and maximising Zimbabwe's potential within restrictions while revealing challenges. It offers hope and insights for ethical innovation situations worldwide.

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