AI Access and Proficiency: The Role of Smartphone Device Tiers in Global AI Equity

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Introduction

The rapid advancement of AI technologies has widened the digital divide, exacerbating inequalities in access and opportunities. Currently, there is a scarcity of globally representative and comparable data about AI users proficiency levels across regions, communities and socioeconomic groups—particularly with regard to literacy, barriers and usability [1].

In this context, the device in which users access and engage with this technology plays a critical role. With approximately half of the global population owning smartphones, these devices serve as the primary gateway to AI technologies. However, smartphones can vary greatly in their capabilities—here referred to as device tier—highlighting significant disparities in access to technology, and consequently AI, around the world [2-3].

In the Global South, where the average selling price (ASP) of smartphones is lower, entry-level devices dominate the market. Many users rely exclusively on smartphones for internet access due to limited broadband infrastructure and unaffordable alternative devices. In contrast, the Global North, characterized by higher ASPs, sees greater adoption of mid-range and premium smartphones and more diversified internet access options, including laptops, desktops and smart devices [4-5].

These distinct economic and technology realities are likely to profoundly influence AI adoption and literacy. Entry-level device users can face significant barriers to engaging with AI technologies due to hardware limitations and varying levels of digital proficiency. Meanwhile, premium device users benefit from seamless integration of advanced AI features and higher levels of digital proficiency, increasing adoption and familiarity.

This research will explore the correlation between device capabilities and AI proficiency, assessing whether device tier could serve as an effective proxy for evaluating and comparing global AI user habits—becoming a complementary and novel way to measure AI Equity at scale. Ultimately, this research aims to create a comprehensive set of actionable insights and guidelines for a fair distribution of benefits of AI to protect against worsening inequality.

Research Questions

- What are the most relevant and common technical and economic variables to consider when classifying smartphone device tiers at a global level?
- What is the relationship between smartphone device tier and populational demographic factors (e.g. socioeconomic status, age, educational level)?
- How does AI proficiency vary among users from different device tiers and regional contexts?
- What are the critical user journeys of the most widely used AI technologies and services—including awareness, usage, use cases, and frequency—and how do they differ by device tier and region?
- How do AI applications perform across device tiers, and what impact do disparities and hardware limitations have on user experience and engagement?
- What strategies, guidelines and policies can make AI technologies equitably accessible across all device tiers?

Objectives

- **Establish a standardized, universally applicable methodology for classifying smartphone devices for AI research and analytical purposes:** Considering a range of variables (e.g. average selling price, operating system version, NPU, RAM, storage).
- **Evaluate Smartphone Device Tier as a Proxy for AI Equity:** Assess the effectiveness of using device tier to measure and compare AI proficiency across different groups of users and regions, taking into account its correlation with additional factors.
- **Analyze Performance Disparities**: Investigate how device tiers affect AI applications actual and perceived performance, user experience, and engagement.
- **Provide a Global User Perspective on AI Equity**: Identify regional disparities and propose context-sensitive recommendations to address gaps.
- **Develop Design Strategies and Recommendations:** Provide principles, guidelines and design recommendations to support the development of AI applications that serve equitably to users across distinct device tiers.

Methodology

- **Smartphone Device Tier:** Combine a comprehensive literature review of existing classification schemes with quantitative analysis of smartphone specifications and market data, along with qualitative insights from expert interviews, to identify key variables, inform the framework, and provide feedback and validation.
- **Performance Analysis**: Test widely-used AI applications across device tiers, measuring actual and perceived performance across different attributes through quantitative metrics and user feedback.
- **AI Proficiency Surveys**: Conduct surveys and interviews to assess users' understanding and use of AI tools, identify barriers, and evaluate both actual and perceived proficiency levels.
- **Global Collaboration**: Partner with researchers, NGOs, and technology providers to gather diverse insights at a global level, leveraging existing renowned research and frameworks for validation and execution.

Significance

As AI continues to transform societies, a deeper understanding is needed to ensure its opportunities and benefits are equitably distributed. A holistic, global approach to measuring users'AI proficiency is essential. Existing digital divide metrics—mainly focused on internet access, structural limitations and government actions—although extremely important and relevant fall short in capturing the complexities of AI readiness from the user perspective [6-7].

This study explores smartphone device tiers as a complementary, effective proxy for assessing AI disparities. The hypothesis is that incorporating device capabilities alongside other metrics could provide a more nuanced understanding of the AI divide.

This approach would reveal inequalities tied to the primary devices users rely on to access AI, providing a novel, scalable way to understand consumer behaviors, measure and track progress, and ultimately serve as a key factor in shaping new policies and design strategies to foster equitable access to AI's benefits.

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