Expanding Equitable Access to Assessments in India through Digital and AI-Enabled Testing Systems

Assessments are gateways to education, professional qualifications, and employment, with English proficiency tests often serving as prerequisites for international education. Yet, most EPTs remain tied to physical centres and paper-based formats, creating significant barriers such as long journeys, high costs, and rigid scheduling that disproportionately affect students in Tier-2, Tier-3, and rural regions, women, and candidates with disabilities. The Duolingo English Test (DET) demonstrates how AI and digital technologies can address these challenges by enabling remote, flexible, and secure assessment. DET automates test delivery, scoring, and integrity checks, reducing administrative burden while allowing education systems to scale assessments more efficiently. Its platform allows candidates to take the test from a familiar, comfortable environment, reducing sensory overload and logistical hurdles that often disadvantage neurodivergent learners. Features such as adaptive testing, quicker results, and human review further enhance accessibility and equity. By lowering costs and removing location-based constraints, DET expands access for learners who have traditionally been excluded from standardised testing. This use case highlights how responsible AI, aligned with national priorities, can increase access to opportunities, and promote inclusion in education and beyond.

Background and Context: Assessments play a pivotal role in shaping educational and professional pathways, yet access to reliable, standardised testing remains a challenge. Traditional assessment models, which rely on physical test centres or pen-and-paper based processes can exclude learners' basis location, gender, due to logistical, financial, and social barriers.

AI-enabled digital assessments such as the Duolingo English Test (DET) address these challenges by enabling secure, standardised testing independent of physical locations. By reducing logistical friction and cost, such systems expand access to formal credentialing pathways in higher education and employment while maintaining reliability and integrity.

The AI Use Case in Assessment Models: The DET integrates artificial intelligence across test design, scoring, and integrity assurance.

First, it uses a computer adaptive testing (CAT) model in which question difficulty adjusts in real time based on candidate performance. This allows the test to efficiently estimate proficiency, reduce test length to under an hour, and ensure that no two candidates receive the same test

Second, AI-based scoring evaluates speaking and writing responses at scale by analysing linguistic features such as vocabulary, grammar, coherence, pronunciation, and fluency. These models are trained and calibrated against expert human judgements, with human reviewers retained for quality assurance and edge cases.

Finally, test integrity is maintained through a hybrid approach combining AI monitoring of video, audio, and interaction data with asynchronous human review. Dual-camera recording and remote testing environments reduce variability in proctor decisions while offering flexibility for learners who may struggle in unfamiliar test centres. Together, these mechanisms maintain trust and consistency in high-stakes assessment outcomes.

Deployment & Implementation:

The solution is delivered through a secure online platform accessible via standard digital devices. It incorporates digital onboarding, identity verification, secure test delivery, and AI-supported evaluation with human oversight. It can be accessed via a laptop with stable internet connection. Where needed, deployment can also be undertaken in partnership with educational institutions, government agencies, and authorised testing bodies, which helps integrate the system into existing assessment frameworks and build institutional trust.

Evidence of Scale and Impact:

The DET has demonstrated significant scale and impact in India, with test-takers from over 740 cities, including Tier-2 and Tier-3 locations. In 2023, India became the largest source of DET test-takers globally, reflecting growing demand for accessible English proficiency certification. The test is accepted by over 6,000 higher-education programs worldwide, including all eight Ivy League universities. At approximately one-third the cost of traditional tests and with results delivered within 48 hours, the DET lowers financial and logistical barriers. Institutions have reported increased applications from underrepresented backgrounds, indicating its potential to improve diversity and broaden participation in higher education.

Identified Users:

Primary users include students in secondary and higher education, skilling programs, and certification pathways. Secondary stakeholders include universities, employers, and government bodies that rely on test results for admissions, progression, and credential recognition.

Ethics and Governance:

The DET operates under a formal Responsible AI governance framework grounded in four pillars: validity and reliability, fairness, privacy and security, and accountability and transparency. The framework mandates documentation of models and data, continuous evaluation for bias, and human-in-the-loop oversight at critical decision points, including scoring, security reviews, and appeals. By publishing its standards and treating governance as an auditable, evolving process, the DET embeds accountability into high-stakes assessment operations and builds public trust.

Inclusion:
Inclusivity is at the core of DET. It has significantly reduced geographic, financial, and social barriers to English proficiency testing, making it accessible for learners in remote areas, women facing mobility or caregiving responsibilities, and candidates with disabilities or social restrictions. Its accessible design, flexible scheduling, and remote delivery enable individuals to demonstrate their abilities in familiar environments.

Discussion: Success, Challenges, and Lessons:

Experience from the DET demonstrates that AI-enabled assessments can scale without compromising standards, but challenges remain. Uneven digital access and varying levels of digital literacy continue to affect participation, while institutional trust requires sustained engagement and transparency. Integration with legacy systems often necessitates phased adoption.

A key lesson is that accessibility and inclusivity must be embedded by design, not retrofitted. AI functions best as an enabling layer supported by strong human governance. When implemented responsibly, digital assessments can shift educational and professional progression toward demonstrated capability rather than geography or circumstance.

Conclusion:

By integrating adaptive testing and AI-driven integrity, this solution bridges geographic and financial divides for underserved learners. It demonstrates how responsible AI enhances equity, quality, and inclusion. Ultimately, digital assessments modernise education systems unlocking access at scale.

Data Governance Details
For DET, data governance is ensured through secure data storage, encryption, and role-based access controls. User consent is obtained transparently, and data collection is limited to assessment-related requirements. The system adheres to child-safeguarding norms where applicable and incorporates responsible AI practices,

including fairness audits and human oversight. Data sharing follows defined protocols, ensuring compliance with applicable laws and public-interest principles.

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ANNEXURE

(NOTES)

AI Use Case: Expanding Equitable Access to Assessments in India through Digital and AI-Enabled Testing Systems

1. Objective / Purpose

Testing functions as the single most decisive filter in shaping India's educational and professional pathways. Assessments not only measure knowledge and aptitude but also demonstrate proficiency, credibility, and qualification. Tests are used at every stage, starting from primary school, continuing through university admissions and extending till professional certifications. By standardising entry to Higher Education Institutions (HEIs) and regulated professions, assessments create recognised benchmarks that enable individuals to transition into the formal job market. In contrast, the informal labour market is characterised by uncertified skills. Assessments and certifications bridge this gap by providing proof of capability, which employers recognise and award with formal job goers. Thus, assessments don't just shape individual careers, but contribute to the

formalisation of the country's workforce. This can be observed with India slowly transitioning from an informal and unregulated labour force to a more formal workforce which contributes to the socio-economic growth of the country.

The objective of this use case is to demonstrate how digital and **AI-enabled assessment systems can modernise India's testing ecosystem by improving access, equity, scalability, and efficiency, while maintaining assessment integrity and rigour.** The use case highlights how technology-driven testing models can support India's education and skilling priorities by enabling anytime, anywhere assessment, particularly for learners in geographically remote and resource-constrained settings.

Assessment plays a critical role in education, skilling, and workforce mobility. In India, however, testing systems across academic, vocational, and certification contexts have historically relied on centre-based, paper-driven models. These approaches often have imposed logistical, financial, and geographic constraints on learners, disproportionately affecting students from Tier-2, Tier-3, and rural regions

At the same time, India has made significant investments in digital public infrastructure, connectivity, and digital service delivery. Policy frameworks such as the National Education Policy (NEP) 2020 and the Digital India mission emphasise the use of technology to improve access, inclusion, and quality in education. **This convergence creates a strong case for reimagining assessment systems that are digitally native, secure, and learner-centric, while remaining aligned with public interest and regulatory expectations.**

3. AI Use Case Description

a. Solution Description

- Advances in artificial intelligence have enabled adaptive testing, automated scoring, and AI-supported remote proctoring, which reduces time and cost for both test-takers and administrators while maintaining integrity.

Artificial intelligence is applied to:

- Enable adaptive testing, where assessment difficulty responds to user performance. The Duolingo English Test uses a **computer adaptive testing model**, meaning the difficulty of questions adjusts automatically based on how a test taker performs. As you answer

questions, the test algorithm selects items that are more or less challenging depending on your previous responses, allowing the system to hone in quickly and accurately on your English proficiency level. Because the test draws from a large bank of items and adapts dynamically, no two test experiences are the same, and it is not possible to prepare by memorising specific questions. This adaptive design also helps keep the overall test shorter and more efficient than many traditional fixed-form exams, with most candidates completing it in under an hour

- Support automated and assisted evaluation of responses at scale The Duolingo English Test uses AI-based scoring to evaluate speaking and writing responses in a consistent and scalable way. Machine learning models analyse key linguistic features such as vocabulary, grammar, coherence, pronunciation, and fluency, and are trained and calibrated against expert human judgments. This allows the test to produce reliable and standardised scores across large numbers of candidates, regardless of where or when the test is taken. Human reviewers remain involved in quality assurance and in reviewing edge cases, ensuring accountability and fairness. By combining AI with human oversight, the scoring process delivers timely results while maintaining accuracy, comparability, and trust in high-stakes assessment outcomes.

- Enhance test integrity through anomaly detection and remote monitoring the Duolingo English Test uses AI to strengthen test security by continuously monitoring behaviour during the exam and identifying patterns that may indicate cheating. AI systems analyse video, audio, and interaction data in real time to detect anomalies such as suspicious eye movement, unusual audio cues, off-screen activity, or inconsistent typing patterns. These automated checks flag potential security issues that might be missed in traditional test centre environments, where a single proctor watches many candidates at once. Rather than acting alone, the AI outcomes are reviewed by trained human evaluators to confirm whether a security violation has occurred, which reduces false positives and ensures fair treatment. By combining automated detection with human judgment, AI makes cheating more difficult to execute and easier to catch, leading to greater integrity and trustworthiness in the scoring process.

- Generate insights for continuous improvement of assessment design

The Duolingo English Test (DET) challenges traditional in-person language exams by building security and fairness into every aspect of its design. Unlike test centers, which rely on a single human proctor to watch many test takers at once leading to missed cheating cues, inconsistent oversight, and even potential misconduct the DET uses **AI-enhanced monitoring, dual-camera recording, and thorough asynchronous human review** to make cheating far more difficult to carry out or conceal. Test Center+1

Traditional test centers also suffer from highly **variable testing conditions** from noisy environments and outdated equipment to proctors with differing attentiveness which can unfairly affect performance. The DET eliminates these inconsistencies by letting test takers choose a comfortable, quiet space of their own and delivering a **standardized digital testing experience** for everyone. Test Center

Furthermore, Duolingo's research highlights that even trained proctors can vary in how they interpret rule-breaking behaviors, which could impact score fairness. By **measuring and reducing this variability over time** through retraining, clear guidelines, and the support of automated tools — DET ensures more consistent and equitable decisions. Test Center

he DET's **technology-and-human hybrid approach** not only improves detection of subtle misconduct (e.g., unnatural typing or hidden aids) but also creates a fairer, more reliable context

for assessing real English proficiency — one that adapts to the realities of remote testing while protecting honest test takers.

The approach shifts assessments from fixed-location, high-overhead systems to flexible, scalable digital delivery models.

b. Deployment & Implementation

The solution is deployed through a secure online platform accessible via standard digital devices, enabling scalable and flexible implementation across contexts. Core elements include digital onboarding and user verification mechanisms, secure test delivery with built in safeguards to protect assessment integrity, AI supported evaluation pipelines complemented by human review where required, and continuous system monitoring to support quality assurance and ongoing improvement based on performance data. Deployment can be carried out in partnership with educational institutions, government agencies, and authorised testing bodies, helping ensure contextual relevance, institutional trust, and alignment with existing assessment ecosystems.

C. Evidence of Scale

The Duolingo English Test (DET) has achieved truly global reach by enabling English-proficiency certification from anywhere with an internet connection, rather than at physical test centers. According to distribution data, test takers have come from **over 12,000 cities worldwide**, spanning every continent except Antarctica, demonstrating its extensive geographical footprint beyond traditional testing infrastructure. In key markets, the DET's reach is remarkable — for example, students in India have taken the test in hundreds of cities (over 740), China in more than 850, Canada in over 530, Brazil in over 520, and the U.S. in more than 2,300 cities — highlighting both its broad accessibility and deep penetration across urban and regional areas globally. This widespread distribution reflects strong global demand for accessible English-proficiency testing and underscores how the DET has expanded opportunities for learners irrespective of their location by making the *world their test center*

Indian students are increasingly recognising the benefits of the DET and leveraging it to open up higher education pathways for themselves. In 2023, India became the top country by volume of DET test-takers globally, reflecting both a rising demand for international education and the test's ability to reach a wider pool of aspirants. Students from Tier-2 and Tier-3 cities such as Warangal, Khammam, and Durgapur are increasingly using DET, illustrating its role in bridging the geographic divide in accessing global education. More and more universities are also accepting the DET with its acceptance rising to more than 6,000 respected higher education programs worldwide.

d. Identified Users

- Primary users of the assessment include students across secondary education, higher education, and skilling programmes, as well as candidates undertaking certification, aptitude, or eligibility assessments. In addition to individual test takers, key secondary stakeholders include educational institutions and training providers that rely on standardised assessment outcomes for admissions and progression decisions, government departments and examination authorities responsible for administering or recognising assessments at scale, and employers and credential recognition bodies that use test results to evaluate language proficiency and readiness for academic or professional environments.

e. Evidence of Impact

A digital assessment approach such as the Duolingo English Test delivers system level benefits for both learners and institutions. By enabling secure remote testing, it expands access to assessments regardless of location, allowing candidates in smaller towns, remote regions, and areas without testing infrastructure to participate on equal terms. This reduces geographic concentration and helps decentralise access to global education pathways.

Digital delivery also significantly reduces costs for test takers by lowering test fees and eliminating indirect expenses such as travel, accommodation, and time away from work or studies. At the same time, administering bodies benefit from reduced reliance on physical test centres, venue logistics, and manual supervision, resulting in more efficient use of resources.

Faster result processing is another key advantage. Automated scoring and streamlined review processes allow results to be delivered more quickly and consistently, improving administrative efficiency for institutions that rely on timely and reliable data for admissions and decision making. This responsiveness also helps applicants meet application deadlines with greater certainty.

From an inclusion perspective, digital assessments support greater participation by underrepresented and first generation learners who may otherwise face financial, logistical, or informational barriers to testing. Flexible scheduling and the ability to test from a familiar environment reduce intimidation and access gaps, helping ensure that assessment outcomes reflect ability rather than circumstance.

Qualitatively, learners benefit from flexibility, predictability, and a reduced logistical burden, while institutions benefit from wider reach, scalable administration, and greater operational resilience in the face of disruptions. Together, these features position digital assessments as a more inclusive and sustainable model for large scale, high stakes testing systems.

f. Ethics & Governance

The Duolingo English Test operationalises ethical AI through a formal governance framework that defines how artificial intelligence is designed, deployed, and overseen in a high-stakes assessment context. Its Responsible AI Standards are anchored in four governance pillars—**validity and reliability, fairness, privacy and security, and accountability and transparency**—which together ensure that AI systems support accurate measurement, equitable outcomes, lawful data use, and clear institutional accountability. The framework requires systematic documentation of AI models and data sources, continuous evaluation for bias and unintended impacts, and **human-in-the-loop oversight** at all critical decision points, including scoring, test security, and appeals. By treating responsible AI as an auditable, evolving process rather than a static policy—and by publishing these standards as a living document open to public scrutiny—the DET demonstrates a governance-led approach to ethical AI that aligns assessment integrity with broader principles of transparency, risk mitigation, and public trust

g. Inclusion

The Duolingo English Test promotes inclusion by reducing multiple barriers that have historically limited access to English proficiency assessments. Geographically, traditional test centres are often concentrated in large cities, requiring candidates from smaller towns or rural areas to travel long distances, arrange accommodation, and take time away from work or studies. The Duolingo English Test allows candidates to take the test from their own location, significantly expanding reach to learners outside urban hubs and enabling participation across regions where physical testing infrastructure is limited.

From a cost perspective, the Duolingo English Test lowers the overall financial burden associated with testing. In addition to a lower test fee, candidates avoid indirect costs such as travel, lodging,

meals, and repeat visits to test centres. Flexible scheduling and faster result delivery also reduce opportunity costs, making it easier for students to retake the test if needed without incurring substantial additional expenses.

In terms of gender inclusion, the ability to test from home can be particularly important for women and girls who may face mobility constraints, caregiving responsibilities, safety concerns, or social restrictions on travel. Remote testing reduces reliance on family support or overnight stays in unfamiliar cities, enabling more women to attempt the test independently and on equal terms. The Duolingo English Test also supports inclusivity through accessible design and accommodations, ensuring that test takers are evaluated on language ability rather than external circumstances.

By standardising test delivery through secure digital systems while offering flexibility in where and when the test is taken, the Duolingo English Test helps ensure that English proficiency assessment is based on merit rather than geography, financial capacity, or social constraints.

This ensures relevance across socio-economic contexts and geographies.

4. Discussion

Successes and Challenges

Successes include improved reach, scalability, and alignment with India's digital education vision.

Challenges include addressing digital access disparities, building trust in new assessment models, and ensuring interoperability with existing institutional systems.

Lessons Learned

- Digital assessments can enhance both equity and efficiency when designed responsibly
- AI is most effective when used as an enabling layer with strong human governance
- Cross-stakeholder collaboration is essential for sustainable adoption

5. Conclusion

AI-enabled digital assessment systems offer a forward-looking pathway to strengthen India's education and skilling ecosystem. By combining technology, policy alignment, and responsible governance, such solutions can support inclusive growth, learner mobility, and national scale, consistent with India's broader digital public infrastructure and innovation objectives.

6. Data Governance Details (≤100 words)

Data governance is ensured through secure data storage, encryption, and role-based access controls. User consent is obtained transparently, and data collection is limited to assessment-related requirements. The system adheres to child-safeguarding norms where applicable and incorporates responsible AI practices, including fairness audits and human oversight. Data sharing follows defined protocols, ensuring compliance with applicable laws and public-interest principles.