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MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY

AI IMPACT SUMMIT भारत 2026 INDIA

INDIAai

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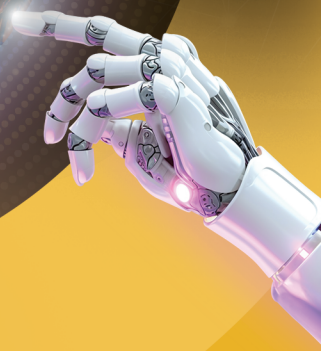

INDIA AI IMPACT SUMMIT 2026

COMPENDIUM

Real-World Impact of AI in Accessibility

एलिम्को ALIMCO

International Institute of Information Technology Bangalore

CHANGE IMAK

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FOREWARD

India's success in driving AI adoption for socio-economic impact has uniquely positioned us to host the fourth Global AI Summit, after the United Kingdom, South Korea and France, and the first to be held in the Global South.

The Summit will convene governments, innovators, researchers, industry leaders, and international organisations to showcase scalable AI solutions for public good, advance responsible and inclusive AI frameworks, strengthen global cooperation, and collectively shape an impactful AI future rooted in the sutras of people, planet, and progress.

The use of AI to advance inclusion for social empowerment is a key focus of the Summit. India continues to advocate for the democratisation of AI, ensuring that technology serves as an equaliser rather than a divider. At the national level, the IndiaAI Mission has made significant progress in enabling AI solutions in priority areas, such as addressing learning disabilities, ensuring that the benefits of the AI revolution reach every citizen, regardless of ability.

The Casebook on the Real-World Impact of Artificial Intelligence in Accessibility, developed in partnership with ALIMCO, IIIT-Bangalore, and ChangeInkk Foundation, represents a key milestone in these efforts. This casebook serves as a comprehensive reference for policymakers, innovators, and researchers. By documenting high-impact interventions that advance accessibility, it offers a practical blueprint for replication. Our objective is to empower stakeholders to adapt these proven successes to their unique local contexts, thereby accelerating the scaling of solutions across the Global South and supporting societal transformation.

It stands as an example of how collaboration can deliver practical and scalable outcomes for developing economies. As India prepares to host the AI Impact Summit 2026, the Ministry of Electronics and Information Technology reaffirms its commitment to fostering an AI ecosystem that is inclusive, ethical, and firmly grounded in real-world impact.

We acknowledge with appreciation the leadership of the Department of Empowerment of Persons with Disabilities, Ministry of Social Justice & Empowerment, Government of India, the partnership of ALIMCO, IIIT-Bangalore, and ChangeInkk Foundation, and the leadership of the innovator and research communities in advancing responsible AI for accessibility. Together, these collective efforts demonstrate that artificial intelligence can serve as a powerful instrument for equitable development—transforming lives while upholding the highest standards of safety, transparency, and human dignity.

Shri S. Krishnan,
Secretary
Ministry of Electronics and
Information Technology
Government of India

FOREWARD

The rapid advancement of Artificial Intelligence (AI) presents a transformative opportunity to advance inclusion and equity for persons with disabilities. When accessibility is embedded at the core of design and deployment, AI can enhance autonomy, improve access, and enable an equitable fuller in the social and economic lifecycle of a growing nation. As governments increasingly integrate AI into governance and service delivery, it is essential that these technologies are guided by the principles of accessibility, equity, safety, and dignity. This national commitment was reaffirmed in the Union Budget speech delivered on 1st February 2026, wherein the Hon'ble Finance Minister announced the Divyang Sahara Yojana, stating that the initiative "will support the Artificial Limbs Manufacturing Corporation of India (ALIMCO) to scale up production of assistive devices and strengthen investments in research and development, including the integration of advanced and AI-enabled technologies." This announcement reflects the Government's resolve to harness innovation for empowering persons with disabilities at scale.

For the Department of Empowerment of Persons with Disabilities (DePwD), inclusion extends beyond assistive devices to encompass access to education, employment, healthcare, mobility, communication, and independent living. Responsibly deployed AI-enabled solutions can strengthen each of these domains. Applications such as computer vision for independent navigation, speech and language technologies for real-time communication, and adaptive learning tools for persons with learning and neurodevelopmental disabilities demonstrate how innovation can address long-standing barriers.

At the same time, technological progress does not automatically ensure inclusive outcomes. A disability-inclusive approach to AI requires intentional design, ethical governance, and continuous engagement with persons with disabilities.

The Casebook on the Real-World Impact of Artificial Intelligence in Accessibility, developed by the IndiaAI Mission in collaboration with ALIMCO, IIIT-Bangalore, and ChangeInkk Foundation, presents practical and scalable examples of inclusive AI and serves as a valuable reference for advancing measurable, real-world impact.

Ms. V. Vidyavathi,
Secretary
Department of Empowerment of Persons
with Disabilities (DEPwD)
Government of India

FOREWARD

Artificial Intelligence (AI) has the potential to be a key enabler of a country's development journey, with its ability to strengthen governance, improve public service delivery and catalyse social and economic inclusion for all citizens. The India AI Impact Summit is guided by this vision to ensure that AI serves People, Progress and the Planet.

Central to this vision is the potential for AI applications to improve accessibility, autonomy, communication and independent living for nearly 16% of the global population living with disabilities.

The IndiaAI Mission's emphasis on democratised access to AI resources reflects the conviction that solutions developed in one context are being adapted and scaled across regions and nations. This commitment to accessibility is visible in IndiaAI Mission's initiatives which have prioritised the creation of AI applications for early identification of learning disabilities, ensuring that intervention happens early at the right time.

The *Casebook on the Real-World Impact of Artificial Intelligence in Accessibility*, developed in partnership with Artificial Limbs Manufacturing Corporation of India (ALIMCO), IIIT Bangalore, and ChangeInkk Foundation, represents the realisation of this collaborative vision.

This joint initiative invited contributions from researchers, innovators and institutions worldwide resulting in an enthusiastic response of over 83-chapter submissions across geographies. Submissions underwent a multi-stage screening and technical evaluation process, assessed for relevance, quality and alignment with the objectives of ethical AI adoption and digital inclusion. Each chapter was reviewed by an expert Evaluation Committee with representatives from Department of Empowerment of Persons with Disabilities, Ministry of Social Justice & Empowerment, Government of India, ALIMCO, IIIT-Bangalore and ChangeInkk Foundation, to secure the inclusion of the most impactful, evidence-based and replicable solutions were included.

The resulting Casebook presents a curated set of 18 AI with use-cases ranging from vision and mobility aids, communication tools for hearing and speech impairments, to neurodiversity support tools such as adaptive education, and emotion recognition.

We extend our sincere appreciation to the Department of Empowerment of Persons with Disabilities, Ministry of Social Justice & Empowerment, Government of India for their leadership, ALIMCO, IIIT-Bangalore and ChangeInkk Foundation for their partnership in advancing responsible AI for inclusion. Together, these collective efforts reaffirm that AI, when developed and deployed responsibly, ethically and inclusively, can serve as a powerful instrument for strengthening social systems and advancing global equity for persons with disabilities.

Shri Abhishek Singh,

CEO, IndiaAI Mission
Additional Secretary
Ministry of Electronics
and Information Technology
Government of India

TECHNICAL NOTE

The right to live with dignity is inseparable from meaningful inclusion, autonomy, and equal participation in society. For persons with disabilities, accessibility is not an optional accommodation but a foundational requirement for exercising fundamental rights. In this context, Artificial Intelligence (AI) has the potential to emerge as a powerful enabler, capable of addressing long-standing barriers in mobility, communication, education, and access to public services when designed with responsibility, empathy, and real world relevance.

In collaboration with IndiaAI Mission, the Ministry of Electronics and Information Technology (MeitY) announced the *Casebook on the Real-World Impact of Artificial Intelligence in Accessibility*, in partnership with ALIMCO, IIIT-Bangalore, and ChangeInkk Foundation as knowledge partners, with the objective of identifying, evaluating, and promoting AI-driven solutions that enhance access and independence for persons with disabilities.

A comprehensive and rigorous evaluation rubric was developed by the three knowledge partners to ensure fairness and consistency, covering criteria such as thematic relevance, robustness of design and methodology, novelty and originality, privacy and ethical considerations, scalability and sustainability, accessibility by design principles, and real world impact, with IIIT-Bangalore reviewing submissions mainly related to vision and hearing impairments, ALIMCO focusing on locomotor disabilities, and ChangeInkk Foundation assessing neurodiversity related solutions.

The submissions demonstrated a strong commitment to AI for social good and encompassed a wide range of applications, including smart vision assistance glasses, AI driven navigation and obstacle detection systems, online AI-based scribe platforms, sign language interpretation systems supporting Indian languages, integrated AI ecosystems, and innovative approaches to improving STEM access for Braille readers and visually impaired learners.

Each submission was evaluated using a comprehensive set of criteria, including relevance to the theme, robustness of design methodology, novelty and originality, adherence to privacy and ethical standards, scalability and sustainability, accessibility features, and potential real world impact. The overall quality of the submissions was exceptionally high, with many demonstrating thoughtful design, technical depth, and a strong understanding of user needs, making the evaluation process both engaging and challenging. A key differentiating factor in the final assessment was the maturity of the projects, particularly whether they had advanced beyond conceptual or prototype stages into pilot level implementation.

Submissions supported by end user feedback, structured user studies, and quantitative and empirical analyses, such as evaluations of system latency, real time responsiveness, and clearly articulated limitations stood out significantly. These aspects provided concrete evidence of usability, feasibility, and effectiveness in real world contexts. The review process at the summit highlighted not only the innovative potential of AI driven accessibility solutions but also emphasized the importance of user centered design, validation through real world testing, and measurable outcomes. Collectively, the submissions reinforced the transformative role of AI in advancing accessibility and inclusion, demonstrating how technology, when guided by empathy and evidence, can meaningfully support dignity and improve the quality of life for persons with disabilities.

IIIT-Bangalore
ALIMCO
ChangeInkk Foundation

GLOSSARY

Term	Definition
Accessibility	The ability of persons with disabilities to independently perceive, understand, navigate, and use information, environments, and services without reliance on others.
Assistive Technology	Devices, software, or AI-enabled systems designed to enhance independence, learning, communication, mobility, rehabilitation, or daily living for persons with disabilities.
Artificial Intelligence (AI)	Computational technology used to interpret information, enable interaction, provide contextual assistance, and support inclusive access across education, employment, public services, and daily life.
Audio Output	Spoken delivery of information that enables access to printed, digital, or environmental content without visual interaction.
Augmentative and Alternative Communication (AAC)	AI-enabled communication support for individuals with limited or no speech, enabling expression of needs, intent, and interaction with caregivers, teachers, or service providers.
Bias Mitigation	Efforts to reduce errors, exclusion, or unfair outcomes in AI systems through inclusive datasets, monitoring, and usability testing.
Caregiver and Educator Support	Training, onboarding, and assistance provided to caregivers, teachers, and facilitators to enable effective use of assistive solutions.
Co-Creation	Development of accessibility solutions in collaboration with persons with disabilities and stakeholders to ensure usability and real-world relevance.

GLOSSARY

Term	Definition
Computer Vision	AI capability that interprets images, printed text, objects, gestures, and surrounding environments to generate meaningful assistance.
Consent-Based Data Handling	Collection and processing of user data with permission and privacy safeguards.
Contextual Assistance	AI-generated explanations or guidance that interpret documents, environments, or situations in a meaningful and situational manner.
Daily Living Independence	The ability of persons with disabilities to perform routine activities such as reading labels, navigating spaces, accessing services, and managing personal tasks without assistance.
Deaf and Hard-of-Hearing Communication Support	Technologies that enable understanding of spoken language through sign language translation, text, or visual representation.
Document Reading Assistance	AI-enabled interpretation of printed, scanned, handwritten, or digital documents into accessible spoken or structured formats.
Edge or On-Device AI Processing	Execution of AI functions locally on a device, enabling offline usability, privacy, and real-time response in low-connectivity environments.
Emotional and Behavioural Regulation Support	Interventions designed to reduce agitation, support calmness, and improve emotional stability in neurodiverse or psychosocial disability contexts.
Environmental Awareness	AI-based understanding of surroundings to detect obstacles, recognise objects, and interpret spatial context for safe navigation and interaction.

GLOSSARY

Term	Definition
Ethical and Responsible AI Use	Deployment of AI with safeguards for privacy, fairness, transparency, accountability, and user dignity.
Gesture Recognition and Interpretation	Recognition of hand or body movement for communication or interaction within accessibility systems.
Hands-Free Interaction	Operation of assistive systems through voice, sensing, or automated processing without manual control or screen dependence.
Haptic Feedback	Use of vibration or tactile signals to communicate alerts, direction, or risk during navigation or interaction.
Human-in-the-Loop Oversight	Inclusion of human monitoring or validation within AI systems to ensure reliability and accountability.
Inclusive Education	Learning environments where students with disabilities can independently access textbooks, tactile materials, notes, and classroom information.
Independent Communication	Ability of persons with disabilities to express needs and interact socially without mediation.
Independent Navigation	Safe movement through indoor or outdoor environments using assistive sensing, alerts, or audio guidance.
Indian Sign Language (ISL)	Visual language used for communication by Deaf individuals in India.
Institutional Deployment	Distribution of accessibility solutions through schools, NGOs, rehabilitation centres, workplaces, or government systems to enable scale and sustained adoption.

GLOSSARY

Term	Definition
Low-Connectivity or Low-Resource Usability	Design of assistive solutions to function reliably in environments with limited internet, infrastructure, or specialised support.
Multilingual Support	Capability of systems to operate across multiple Indian and global languages to enable inclusive access.
Multimodal Interaction	Combination of voice, text, image, gesture, audio, or sensor input within a single assistive system.
Natural Language Processing (NLP)	AI capability enabling conversational interaction, understanding, and generation of human language.
Offline Functionality	Operation of assistive features without continuous internet connectivity.
Optical Character Recognition (OCR)	Technology that converts printed or handwritten visual text into machine-readable and accessible formats.
Persons with Disabilities (PwDs)	Individuals with visual, hearing, speech, cognitive, psychosocial, or physical impairments affecting participation in daily life.
Privacy Protection	Safeguards ensuring that personal or sensitive information is securely handled and not misused.
Public Service Accessibility	Ability of persons with disabilities to independently access government, healthcare, banking, or civic services through inclusive interfaces.
Real-World Deployment	Implementation and validation of assistive technology in everyday environments rather than controlled settings.

GLOSSARY

Term	Definition
Scalable Accessibility Solutions	Technologies designed for replication across institutions, regions, or populations without major infrastructure requirements.
Screen-Free or Non-Visual Interaction	Use of assistive systems without reliance on visual displays.
Sign Language Translation	Conversion between spoken or written language and sign language representation using AI.
Speech-to-Text (STT)	Conversion of spoken language into written text.
Tactile Learning	Understanding spatial or structural information through touch-based diagrams or maps.
Text-to-Speech (TTS)	Conversion of written content into spoken audio.
User Independence and Dignity	Improved autonomy, confidence, and participation resulting from accessible technology.
Voice-Based Interaction	Control of systems and access to information through spoken commands and conversational interfaces.

Case Study 1

SMARTON: AI-Powered Voice-First Platform for Independent Education and Living

Author: Suket Amin, Organisation: Sunbots Innovations, Location: Gujarat, India

In India, a large number of blind and visually impaired citizens face persistent barriers in accessing education, employment, and everyday information. Despite the growth of smartphones and digital platforms, most content—such as scanned PDFs, textbooks, tables, diagrams, notices, images, and official documents—remains inaccessible without human assistance.

This dependency limits academic progress, workplace participation, privacy, and personal dignity. The core challenge is not the availability of information, but the lack of accessible interpretation of visual and document-heavy content in formats that blind users can independently understand.

SMARTON addresses this gap through an AI-powered, voice-first accessibility ecosystem designed specifically for users who are blind or visually impaired.

The solution consists of three integrated components: the SMARTON mobile application, SMARTON Glasses, and the SMARTON Web Application. Together, they function as a unified accessibility layer, enabling users to independently access digital and physical information through voice-based interaction.

The system is designed for Indian conditions, taking into account multilingual diversity, affordability, and uneven internet connectivity. The SMARTON mobile application serves as the primary interface, allowing users to read documents, understand images, ask questions, and receive contextual information using natural voice commands.

The SMARTON Glasses extend this capability into the physical world through a lightweight, camera-based wearable that can be attached to any regular pair of spectacles. The glasses capture visual information from the user's surroundings and send it to the mobile application for real-time AI processing. This enables hands-free use cases such as understanding surroundings while walking, identifying objects, reading printed text, and navigating unfamiliar environments. The wearable is designed without complex controls, ensuring ease of adoption even for first-time technology users.

15,000

Users across NGOs, CSR programs, and educational institutions.

At the core of SMARTON is the applied use of artificial intelligence, combining computer vision, natural language processing, and speech technologies. Computer vision models interpret printed text, scanned PDFs, tables, diagrams, charts, images, and real-world scenes. Unlike basic OCR tools that read content sequentially, SMARTON understands document structure. Tables are explained row-by-row and column-by-column, diagrams are described contextually, and visual layouts are converted into structured audio explanations. This capability is critical for education and professional use, where blind users often struggle with inaccessible academic and workplace materials. Natural language processing enables conversational interaction with content. Users can ask questions such as "Find this topic," "Explain this table," or "Summarise this chapter," instead of listening to entire documents. This significantly reduces cognitive load and improves comprehension.

SMARTON's dedicated voice assistant is designed specifically for accessibility use cases, enabling seamless interaction without navigating complex menus. Speech-to-text and text-to-speech technologies ensure that all interactions are voice-based and intuitive.

The SMARTON Web Application complements the mobile experience by enabling users to access their documents, bookmarks, and reading progress from a computer. This is particularly useful for students and professionals who use laptops or desktop systems in classrooms, offices, or training centres. The web platform allows continuity across devices, enabling users to start reading on a phone and continue on the web, or vice versa. This cross-platform design ensures that accessibility is not limited to a single device but is integrated across digital workflows.

Multilingual support is a core design principle of SMARTON. The platform supports more than 50 languages, including 10 Indian languages, allowing users to consume information in their mother tongue. Core features such as object detection and basic reading also work offline using edge AI, making the solution usable in rural and low-connectivity environments.

SMARTON delivers measurable impact across education, employment, and independent living. Students use SMARTON to independently read scanned textbooks, exam papers, tables, and diagrams, improving learning outcomes and exam confidence. Professionals use it to read emails, Excel sheets, reports, and contracts, enhancing productivity and reducing dependence on colleagues. In daily life, users read medicine labels, bills, invitations, and notices privately, identify currency, understand images shared on messaging platforms, and navigate spaces safely. Across these use cases, the outcome is increased independence, confidence, and dignity.

SMARTON is already deployed at

India through partnerships with NGOs, CSR programs, and educational institutions, serving over 15,000 users. Its smartphone-based architecture, optional wearable integration, and web access make it scalable without requiring specialised infrastructure. Training and usage monitoring ensure sustained adoption rather than one-time deployment.

From an IndiaAI perspective, SMARTON demonstrates how artificial intelligence can be applied responsibly and inclusively to solve real societal challenges. It aligns strongly with national priorities on digital inclusion, accessibility, education, and employment for persons with disabilities. By integrating AI across mobile, wearable, and web platforms, SMARTON showcases a practical, scalable model of inclusive innovation that advances the vision of the IndiaAI Mission—using AI to empower citizens and enable full participation in India's digital growth story.

Case Study 2

NeuroDrishti - AI Smart Glasses for Enhancing Independence of Persons with Visual Impairments

Author: Ashwani Yadav, Organisation: Neuro Drishti Private Limited, Location: Delhi, India

NeuroDrishti addresses the everyday challenges faced by persons with visual impairments by providing an AI-powered assistive solution that supports independent living, mobility, and social participation. Individuals with visual impairments often encounter difficulties in reading printed and handwritten text, navigating unfamiliar environments, understanding their surroundings, and engaging confidently in social interactions. Existing assistive tools typically address only isolated needs, requiring users to rely on multiple devices or external assistance, which limits autonomy and convenience.

NeuroDrishti offers a comprehensive, wearable solution in the form of AI-enabled smart glasses integrated with a companion mobile application. The system delivers real-time, audio-based contextual assistance using multimodal artificial intelligence that combines computer vision, audio processing, and sensor data. Through hands-free operation and intuitive interaction, users receive immediate feedback about their environment without the need for screens or physical controls. In practical use, NeuroDrishti supports several core activities.

The Reading Mode enables users to convert printed, handwritten, and digital text into clear audio output, allowing independent access to books, signs, menus, and official documents. Navigation and environment, and understanding features help users detect obstacles, recognise objects, and interpret spatial layouts, enhancing safety in both indoor and outdoor settings. The system also supports person recognition and basic facial expression identification, helping users better understand social contexts and interact with confidence.

The use case has been validated through real-world deployment involving over 100 visually impaired users across schools, vocational institutes, higher education campuses, and community organisations in India. Participants, including individuals with partial and complete vision loss, used the system over structured two-week periods in daily environments such as classrooms, public spaces, and homes.

100+

Real-world users across schools, vocational

institutes, higher education campuses, and community organisations for use case validation.

User feedback highlighted meaningful improvements in independence, confidence, and ease of access to information. Insights from these deployments informed iterative improvements in usability, comfort, audio clarity, and battery performance.

NeuroDrishti is designed with affordability, multilingual support, and ethical, human-centred AI principles at its core, making it suitable for deployment in diverse socio-economic and linguistic contexts. By integrating advanced AI capabilities into a practical, wearable form factor, the use case demonstrates how assistive technology can move beyond experimental solutions to deliver real, scalable impact for persons with visual impairments.

Case Study 3

Able Glasses: AI-Powered Accessible Hearing Care for Everyone

Author: Pratik Raghuwanshi, Organisation: Ksham Innovation, Location: Maharashtra, India

The Able Ecosystem, comprising Able Glasses and the Able Assistant App, provides a comprehensive solution for hearing healthcare. Its value proposition is tailored to distinct customer segments based on their specific medical and lifestyle needs. Its primary niche segment includes individuals with mixed or conductive hearing loss caused by conditions like pinna deformities, chronic ear discharge, or cases where traditional hearing aids no longer fit. For these users, standard in-ear devices are often medically unsuitable or physically impossible to wear.

Able Glasses serve as the go-to solution for this group, providing effective hearing support where conventional aids fall short. By transmitting sound directly through the mastoid bone to the cochlea, the product bypasses the outer ear issues entirely. The solution has a direct use case for students and working professionals who demand a fashionable, discreet and affordable solution compatible with their active lifestyles. They often reject the stigmatising look of traditional aids. Able Glasses meet their needs with a sleek design and essential smart features. The device offers 16-channel digital programmability for personalised hearing, Bluetooth connectivity for seamless calls and and a 12+ hour rechargeable battery. This ensures they remain productive and connected without compromising on aesthetics.

A growing population of middle-aged and elderly Indians suffers from both vision and hearing challenges, often due to age-related hearing loss or presbycusis. Managing two separate devices, spectacles and hearing aids, is physically uncomfortable and inconvenient. Able Glasses offer an integrated solution by combining vision support and hearing rehabilitation in one convenient device. Users can fit their required prescription lenses into the frames, solving both impairments simultaneously with a single product.

Lastly, the solutions are suitable for the large segment which includes people with mild to moderate hearing loss who typically avoid rehabilitation due to high cost, social stigma or lack of awareness. For them, the prospect of wearing a visible medical device is overwhelming. The Able Ecosystem lowers this barrier by presenting the solution as smart eyewear rather than a hearing aid. This provides a frictionless, socially acceptable solution that encourages early adoption. By normalising the form factor, the company helps this hesitation-prone group seek help sooner.

6000+

Network of certified audiologists across India to support high-quality hearing care.

The Able Assistant App plays a crucial role across all these segments. The Able Assistant App acts as a personal hearing assistant. It allows users to conduct audiometry screenings at home and generate a WHO grade report. The app's LLM-based virtual audiologist answers hearing-related questions in over 12 Indian languages, ensuring that users from any segment can access support in their preferred language, and connects users to 6000+ RCI certified audiologists across India for high-quality hearing care. The company will reach out to users through its B2B2C Distribution model. To ensure clinical accuracy and trust, it follows an ethical B2B2C business model. It partners directly with Audiologists, Speech Therapists and ENT specialists to dispense and fit the device. This ensures that while the product offers a lifestyle appeal to the user, the hearing rehabilitation remains medically precise and supervised by certified professionals.

Case Study 4

AiSee: From Accessibility Tool to Intelligent Companion

Author: Suranga Nanayakkara , Organisation: AiSee Pte Ltd, Location: Singapore

Imagine navigating the world without sight. Everyday tasks such as reading medication labels, identifying the correct bus, checking food expiry dates, scanning menus, locating restrooms, or confirming appliance settings become constant barriers. Independence depends not only on mobility, but on access to real time, contextual information. AiSee was created to address these daily challenges and restore autonomy through intelligent assistance.

AiSee began with a simple, urgent problem: our blind classmates were struggling to access lecture notes. A decade ago, assistive tools were bulky, fragmented, or unreliable. Applications that claimed to "see" the world were cumbersome and required awkward workarounds. Instead of beginning with technology, we began with conversations. Through extensive discussions with people with visual impairment, one insight became clear: most did not want smart glasses. They already wore headphones daily, comfortably, confidently. The form factor chose itself.

This led to the creation of a new kind of device: a smart headphone designed for hands free, screen free access to the world. A system capable of understanding surroundings, describing what is happening, and supporting intuitive, conversational interaction. From the outset, AiSee has been co- designed with people with visual impairment (PVI), ensuring that real-world practicality guides every design decision.

End-user testing has been central to product validation. More than 50 research conversations were conducted to understand lived experiences and unmet needs. Five headset testers and eight app testers have used AiSee in real world environments, providing structured feedback that directly shaped navigation guidance, response clarity, personalization, and interaction design. Trials with PVI participants have been pivotal in refining both hardware and software, confirming that AiSee addresses real daily challenges. Users consistently report feeling more secure and confident when navigating public spaces, shopping, reading signage, and using public transport.

AiSee operates through four integrated capability pillars:

• AiSee Visual Intelligence extracts visual content: including text, signs, and scenes, from both images and live video and answers user questions conversationally.

For example, when viewing a grocery item, AiSee can respond, "These bananas are from the Philippines, and they are $3 per kg."

• AiSee Smart Assistance handles broader queries by conducting web searches when necessary, remembering user preferences, and delivering context aware recommendations. For instance, it may say, "You are at the bus stop near your house. The bus to Vivo City is number 105, and it will arrive in five minutes."

• AiSee Automation performs actions on third party applications through voice commands, enabling seamless task execution. A user can say, "I would like to book a Grab taxi from home to the airport," and the system completes the booking.

• AiSee Navigator provides personalized routing within partner sites such as botanic gardens, delivers obstacle alerts, and supports live bus number reading. In practice, it might guide a user by saying, "The restroom nearest to the orchid garden is 200 meters ahead on your left. Watch out for a low railing on your right."

Beyond these core capabilities, AiSee offers B2B site specific modules that provide curated, context rich information tailored to individual venues. In a garden setting, for example, it might explain, "You have some bright orange tulips in front of you. There are about 75 species of tulips. Tulips were cultivated in Persia from the 10th century."

AiSee is currently being deployed at Singapore Botanic Gardens, funded by Singapore's Enabling Lives initiative. This marks the first UNESCO site bringing outdoor heritage to life for visually impaired visitors through AI guided navigation and contextual storytelling.

The company has built a strategic intellectual property portfolio combining licensed foundational patents in AI and hardware design from the National University of Singapore (NUS) with proprietary software, trade secrets, and valuable user interaction data.

Beyond visual impairment, AiSee is expanding into eldercare in response to a rapidly aging population. The eldercare market increasingly emphasizes whole person well being rather than focusing solely on medical needs. There is growing demand for solutions that cater to individual preferences, daily activities, and community involvement while providing tools that help older adults maintain autonomy and dignity. AiSee's intelligent companion model are capable of memory support, contextual reminders, navigation, and conversational assistance; positions the platform to address these broader needs in aging societies.

With a B2B2C launch strategy, AiSee partners with enterprise clients while offering a consumer app and OEM licensing opportunities for smart device manufacturers.

Operated by a world-class founding team and supported by advisors from MIT, NUS, and SG Enable, AiSee is not simply addressing an accessibility gap, it is setting a new standard for intelligent, inclusive interaction.

The vision is to create visual intelligence that extends the limits of human perceptual and cognitive capabilities, empowering individuals to navigate the world with independence, dignity, and confidence across every stage of life.

Case Study 5

Meta AI Glasses: Empowering Independence for People with Disabilities

Author: Prachi Bhatia, Organisation: Meta, Location: Delhi, India

Accessibility remains a critical challenge for millions of people with disabilities worldwide. Barriers in mobility, communication, and information access can limit opportunities for education, employment, and social participation. Traditional assistive devices can be bulky, stigmatising, or limited in functionality. Meta's AI glasses, Ray-Ban Meta, Oakley Meta Vanguard, and Meta Ray-Ban Display Ray-Ban Meta, glasses offer a hands-free form factor and features that help people with disabilities navigate daily life.

Meta's AI glasses allow for hands-free support so that blind and low vision users can make phone calls, send text messages, translate speech, and capture photos and videos, all by the sound of their voice. Meta AI can also provide detailed descriptions of its environment. Users can interact hands-free in multiple languages. Meta has created a Call a Volunteer feature, in partnership with Be My Eyes, that connects blind or low-vision individuals with a network of sighted volunteers who can describe what blind or low-vision users are seeing and help them complete everyday tasks. Some examples are mentioned below:

1) Noah Currier, a Marine Corps veteran with quadriplegia and founder of Oscar Mike, a non-profit that benefits injured and disabled veterans, said that taking voice-prompted photos and videos is "changing the game" for physically disabled and vision-impaired people. "I'm a wheelchair user, and I'm a quadriplegic, so my hands don't work. I probably have much fewer photos and videos in my phone than anybody else in the world. Being able to take photos and videos hands-free was incredible," he said. "The very first thing I did was take a picture of my baby when I got home, and it was awesome."

2) James Rath, a filmmaker and content creator who is blind, incorporates Ray-Ban Meta and Meta AI in his workflow to capture first-person perspectives in outdoor settings. "I'll use them as more of my eyes. I'll ask the AI, 'Is my setting set to the right ISO, to the right aperture?' Just [to] make sure my camera settings are what I believe and what I think I see," he said. "When I'm filming a scene, I'll describe how I want it to look and ask the glasses if there's anything in the background I need to remove. That saves me a lot of time in post production." The AI technology embedded in Meta's glasses also

helps Rath check in on his guide dog, Hoagie. Rath can get feedback from Meta AI about what Hoagie is doing, or if he's looking for his leash or food bowl.

3) Jezz Chung, a writer and performer who has ADHD and autism, said that the technology in Ray-Ban Meta glasses can give people with disabilities more autonomy in their lives. She said that taking photos and videos from her point of view can help others learn how she experiences the world. Chung said that Ray-Ban Meta's AI capabilities will help her stay present in her environment whenever she's curious about what she sees, like an animal or nature, without having to use her phone. At a moment's notice, Chung said that she can take photos to find a cafe or identify a landmark, and avoid being distracted by her phone, especially when she is with a friend.

4) Meta's AI glasses can monitor user activity, keep track of their training, and help get the most out of a workout when connected to a Garmin device. Users can ask Meta AI how they're doing on your run or ride, or get updates on specific stats in real time, all hands- and screen-free so you can stay present while you train. Nick Mayhugh, a Paralympic athlete with cerebral palsy, uses Meta AI glasses to monitor the quality of his workouts and keep track of his training. With Meta AI, he can find out how far along he is in his workouts without having to look at his phone.

5) Meta is testing UPI QR code payments on AI glasses for payments of less than INR 1000. Users will be able to pay using UPI Lite by looking at the QR code and saying, "Hey Meta, scan and pay", with no need to reach for a phone or wallet. Payments will be processed through WhatsApp-linked bank accounts, making everyday transactions quicker and more seamless than ever. This pilot was showcased at the Global Fintech Fest recently.

6) Veterans Affairs Blind Rehabilitation Centres in the United States use Ray-Ban Meta glasses to support blind and low-vision veterans. Meta has partnered with the Blinded Veterans Association of America to develop a training guide for those veterans. The guide explains how to use the glasses while navigating the world with more autonomy and confidence, activating voice commands, reading documents, answering phone calls, and more.

Case Study 6

PathPal: Offline Edge-AI for Inclusive Mobility and Literacy Assistance

Author: Kanika Sharma, Organisation: KA Iksanatech, Location: Haryana, India

For visually impaired individuals, independence in daily life is shaped not only by personal capability but by how accessible the surrounding environment is. In India, this challenge is amplified by crowded streets, uneven footpaths, poor lighting, informal markets, handwritten signage, and inconsistent internet connectivity. While smartphones and assistive apps have improved access to information, they often fall short in real-world navigation scenarios where users need hands-free, low-latency, and context-aware support. Additionally, most existing solutions address either mobility or reading in isolation, forcing users to switch between tools or rely on human assistance for basic tasks.

This fragmentation directly affects safety, confidence, and dignity. Tasks such as identifying a step, avoiding a hanging object, reading a notice, or recognising currency become frequent points of dependence. Through field interactions with visually impaired students and institutions, it became evident that the problem was not a lack of technology, but a lack of integrated, reliable, and environment-aware solutions that work consistently in Indian conditions.

PathPal was developed as an all-in-one assistive device that combines mobility assistance and literacy support into a single system, powered by offline, edge-based artificial intelligence. The core idea behind PathPal is to reduce device dependency and cognitive load by offering multiple assistive functions through a simple, intuitive interface that works without continuous internet access. The device integrates a camera and proximity sensors with embedded AI models that process information locally. Instead of visual outputs, PathPal communicates with users through directional vibration patterns and audio alerts, making it suitable for continuous, real-world use.

A typical PathPal user is a visually impaired student or adult navigating public spaces such as streets, educational campuses, offices, or local markets. As the user walks, the device continuously monitors the surrounding environment. When it detects obstacles—such as pits, stairs, uneven surfaces, hanging objects, or uplifted barriers—it immediately alerts the user through distinct vibration patterns indicating direction and risk level.

Audio cues provide additional context when needed, allowing users

to react quickly and safely. Beyond navigation, PathPal supports independent reading and information access. Users can point the device toward printed or handwritten text—such as classroom notes, notices, labels, or forms—and receive spoken output in their preferred language.

This is particularly impactful in educational and institutional settings where handwritten material is still widely used. The device also recognises Indian currency denominations, enabling users to identify notes independently during transactions, reducing reliance on others and increasing financial confidence. All of these functions operate offline, ensuring consistent performance in areas with poor connectivity. This design choice is critical for deployment in semi-urban and rural areas, where cloud-dependent solutions often fail.

PathPal's design has been shaped through iterative pilot testing with visually impaired users and institutions. Early feedback highlighted the importance of ergonomics, minimal buttons, and non-intrusive alerts. Users expressed a preference for vibration-based cues over continuous audio, especially in public spaces, leading to the development of differentiated haptic feedback patterns. Multilingual voice support was incorporated to accommodate users from different linguistic backgrounds. The hardware was refined to be compact and lightweight, ensuring it could be comfortably used for extended periods without fatigue.

PathPal is primarily deployed through NGOs, schools for the visually impaired, rehabilitation centres, CSR programs, and government-supported initiatives. This institutional-first approach ensures structured onboarding, user training, and long-term support. It also allows the solution to reach users who may not have direct access to consumer assistive technology markets. By positioning PathPal as a low-regulatory, scalable assistive system, the solution aligns well with public accessibility goals and inclusive infrastructure initiatives.

Through pilot deployments, PathPal has demonstrated tangible social impact by enabling safer navigation, independent reading, and improved confidence among users. The integration of multiple assistive functions into a single device reduces dependency on smartphones and human assistance, especially in mobility-critical situations. From a technological perspective, PathPal showcases how edge-AI can be effectively applied in assistive contexts, prioritising reliability, privacy, and low-latency interaction over cloud-based complexity.

The solution highlights a practical pathway for deploying AI in disability-focused applications at scale, particularly in Global South environments.

PathPal represents a shift from feature-based assistive tools to system-level assistive solutions designed around real-world constraints.

By combining offline AI, human-centred design, and institutional deployment models, PathPal demonstrates how artificial intelligence can meaningfully enhance independence, dignity, and inclusion for persons with disabilities. This use case underscores that impactful AI in disability contexts is not defined by cutting-edge algorithms alone, but by how thoughtfully technology is adapted to everyday human realities.

Case Study 7

AI Accessibility Ecosystem: Jyoti AI, Shruti AI & Vaani AI for Inclusive Education, Communication and Independent Living

Author: Hunny Bhagchandani, Organisation: Torchit Electronics, Location: Gujarat, India

Persons with disabilities—particularly in emerging and developing economies—experience exclusion due to structural barriers in access to education, communication, mobility and employment.

For visually impaired persons, printed content (textbooks, forms, medicine labels, workplace documents) remains largely inaccessible due to the limited availability of Braille, large-print formats, and trained human support.

Persons with hearing impairment face daily communication barriers in schools, hospitals, government offices and workplaces due to a lack of real-time Indian Sign Language access. Persons with autism and speech impairments often require Augmentative and Alternative Communication (AAC) support but face high costs, limited contextualisation to Indian languages, and inadequate caregiver integration.

These challenges result in reduced autonomy, increased dependency, lower employability and limited participation in society. Torchit developed a deployable AI ecosystem to address these gaps AI is used for Torchit's AI Accessibility Ecosystem and includes three deployed solutions:

(A) Jyoti AI Ecosystem (for visual impairment/print disability): Jyoti AI Smart Glass and Jyoti AI Reader use AI-based OCR and computer vision to convert printed and digital content into accessible speech output. The system supports document reading, scene understanding, navigation cues and contextual assistance for independent learning, daily living and workplace inclusion.

(B) Shruti AI (for hearing impaired): Shruti AI provides AI-powered voice-to-Indian Sign Language translation to enable inclusive communication. The model has been trained on 12,000+ words and prioritises commonly used phrases in education, healthcare and public services to reduce communication gaps for deaf users.

(C) Vaani AI (for autism/speech impairment): Vaani AI is an AI-powered AAC solution designed for users who cannot speak or have limited speech. It supports personalised expression, intent prediction and contextual prompts (e.g., location-based or time-based needs), helping users communicate with caregivers, teachers and service providers.

Torchit deployed the ecosystem through a mix of institutional onboarding and CSR-driven distribution, partnering with disability schools, NGOs, training centres, government bodies and social programmes. Implementation includes user onboarding, training sessions for PwDs and caregivers/ teachers, helpline support and iterative model improvements based on user feedback. Solutions are designed for low-resource settings with emphasis on ease of use, language relevance and minimal dependency on specialist infrastructure.

The ecosystem is deployed across India through multi-stakeholder partnerships. Torchit has impacted hundreds of thousands of people with disabilities globally through assistive solutions. The deployment model enables replication across districts and institutions, making it suitable for scale through public programmes and CSR ecosystems.

Identified Users are:

•Visually impaired persons, low vision users and persons with print disabilities (students, job-seekers, employees)

•Deaf and hard-of-hearing persons requiring sign language access

•Persons with autism and speech impairments requiring AAC support

•Caregivers, special educators, disability schools, skilling centres, employers and service providers

Jyoti AI users report improved independence in reading textbooks, filling forms, interpreting printed material and accessing digital workplace information without reliance on others. Shruti AI enables improved communication access, supporting inclusion in classrooms and public services by translating voice into sign language representation.

Vaani AI supports expression and social inclusion by helping non-speaking users communicate intent and daily needs, reducing frustration and dependence. Torchit adopts responsible AI practices, including: user consent-based deployment, privacy-aware handling of sensitive data, minimisation of personally identifiable information, and continuous monitoring for model errors. Bias mitigation efforts focus on inclusive datasets, Indian context language coverage and disability-centred usability testing. Human-in-the-loop feedback from special educators and PwD users supports accountability.

The ecosystem is designed for accessibility and equity in low-resource environments through affordability, ease of onboarding, multilingual relevance and caregiver-integrated workflows. Solutions are built with disability communities to ensure contextual usability. The model supports inclusive scaling through partnerships with government and CSR programmes, enabling access beyond urban centres.

Key successes include high adoption due to practical utility, strong user independence outcomes, and scalable distribution through institutions

and CSR. Challenges include variability in digital literacy among users, uneven infrastructure in rural areas, and the need for continuous language/sign dataset improvement.

Accessible AI solutions scale faster when combined with training, local champions (special educators/ community leaders), after-sales support and measurable impact reporting. Multi-disability ecosystems reduce fragmentation and improve efficiency for government/CSR implementers.

Torchit's AI Accessibility Ecosystem demonstrates how deployable AI—when designed for affordability, contextual relevance and inclusion can significantly improve participation of persons with disabilities in education, independent living, communication and employment. By integrating AI for vision, sign language translation and AAC, the ecosystem offers a scalable model for inclusive AI adoption across emerging economies.

Case Study 8

Kibo (Knowledge in a Box): AI-Powered Assistive Document Intelligence for Inclusive Education and Employment

Author: Akshita Sachdeva, Organisation: Trestle Labs, Location: Karnataka, India

In many education and employment systems, inclusion breaks down at the point of printed and handwritten materials - textbooks, handwritten notes, exam-preparation study materials, forms and office files. For persons with visual impairment and other print disabilities, this creates a continuous barrier across the education-to-employment pathway: reduced learning continuity, reduced exam readiness, and reduced workplace productivity.

The World Health Organization estimates 2.2 billion people live with vision impairment, and the challenge is amplified in multilingual and low-resource contexts where accessible content in local languages is limited. Workforce-participation gaps also remain wide; in India, persons with disabilities have a substantially lower workforce-participation rate than non-disabled adults, highlighting that education alone does not remove access barriers. Addressing this requires AI solutions that provide real-time, multilingual, audio-first access to learning and workplace materials at scale, without demanding specialised infrastructure or complex workflows.

Kibo (Knowledge in a Box) is a patented, Made-in-India AI-powered assistive technology delivered as a talking table-lamp-like device plus secure cloud. Users place printed pages or handwritten notes under the device; Kibo reads content aloud in real-time, converts it into accessible digital formats (searchable PDF, ePub, DOC/DOCX/TXT), and supports translation into 100+ languages. Its audio-first interaction reduces dependence on human assistance and enables independent access to both academic content and workplace documents.

Kibo goes beyond conventional OCR by using computer vision, layout-understanding and contextual language-intelligence tuned for academic and administrative documents. It preserves document structure (headings, tables, multi-column layouts, equations and annotations) so outputs remain usable for study, revision and screen-reader navigation, and practical for workplace use such as reading letters, forms and files.

Kibo is deployed through a one-to-many institutional model across government and private schools, colleges, universities, public libraries, blind schools, NGOs and workplaces, directly, as well as through Government and CSR Partnerships.

Rollout includes stakeholder-orientation, hands-on onboarding for educators, librarians and learners, and a train-the-trainer approach to build local champions. Engagement is sustained through routine use, help-desk and refresher trainings. Institutions integrate Kibo into existing workflows for accessible learning material creation and document access for education and employment readiness.

Kibo has been deployed across 850+ institutions spanning schools, colleges, universities, public libraries and workplaces across 12+ countries. Government-led scale includes Karnataka (15 rural libraries piloted, expanded to 50, and approved for rollout to 2,000 libraries under the Beacon Library Initiative), Tamil Nadu (state-funded rollout to 64 district libraries following deployment at Anna Centenary Library), Arunachal Pradesh (20 government-funded deployments followed by additional deployments after evaluation), and Delhi (a pilot leading to recommendation for broader adoption through the Inclusive Education Branch).

Across states, pilots have consistently transitioned into larger district- and state-level programs, demonstrating scalability and institutional trust.

Primary adopters are institutions (schools, colleges, libraries, NGOs, workplaces and government departments). Day-to-day users include educators, librarians and learners & workers with visual impairment, print disabilities, low literacy and language barriers who require independent access to educational, examination and workplace documents.

2 Lakh +

Beneficiaries currently have access to printed and handwritten content in over 60 languages.

Quantitatively, Kibo has enabled 200,000+ beneficiaries to access printed and handwritten content independently, converting millions of pages into accessible digital and audio formats across 60+ languages. Qualitatively, learners report improved continuity and confidence: students access textbooks and handwritten notes in real time; candidates prepare for and clear competitive examinations; and visually-impaired educators evaluate handwritten answer-sheets independently.

In employment contexts, users report improved independence in reading and processing official documents, supporting productivity and participation in workplace tasks. International deployments across multiple Global South countries demonstrate transferability across regional languages and diverse geographies.

Kibo follows responsible AI practices,

including consent-based processing, role-based access controls and secure handling of institutional content. Institutions retain ownership of their materials, and content is not used for model training without explicit permission. Deployments align with child-safeguarding norms and accessibility standards, with accountability embedded through institutional-administration and controlled-access.

Kibo is designed for low-resource settings with minimal infrastructure needs and an audio-first interface usable by first-time technology users. Multilingual support enables inclusion across regional languages, supporting learners and workers in diverse geographies and reducing dependence on scarce specialised accessible-format production.

Success factors include plug-and-play deployment, strong institutional ownership, and government adoption beyond pilots. Challenges include varying digital readiness and the need for ongoing capacity-building, addressed through train-the-trainer models and periodic refresher trainings.

Inclusive AI is most effective when embedded into everyday systems - libraries, educational institutions, and workplaces - rather than an afterthought. Designing for local-languages, low-literacy and real-time access is critical for both education outcomes and employability.

Kibo demonstrates how AI-powered assistive document-intelligence can reduce exclusion across the education-to-employment continuum by turning inaccessible print into real-time audio, accessible digital formats and multilingual translations. By integrating into institutions and public systems, it offers a scalable pathway to inclusive learning, job-readiness and workplace-participation for persons with disabilities.

Case Study 9

Sarthi AI: Multimodal AI-Powered Public Service Navigator for Enhanced Accessibility and Inclusion of Persons with Disabilities in India.

Author: Vanshika Rupeja, Organisation: IIT Madras, Location: Uttar Pradesh, India

India's 2.68 crore Persons with Disabilities (PwDs) face significant systemic barriers in accessing critical public services, stemming from persistent communication gaps and inaccessible infrastructure. This widespread inaccessibility severely undermines their rights to equal participation and independent living, presenting a major societal challenge that existing solutions frequently fail to address comprehensively.

Sarthi AI provides a powerful, multimodal AI system that serves as an intelligent interface for public services. Its core features include a Computer Vision (CV) module for real-time, bidirectional Indian Sign Language (ISL) interpretation. Furthermore, a Natural Language Processing (NLP) engine is integrated with India's Bhashini to facilitate seamless multilingual voice-to-text and text-to-voice communication.

To address the needs of individuals with cognitive disabilities, Sarthi AI incorporates an Adaptive User Interface (AUI), powered by a Large Language Model (LLM). This AUI simplifies complex information, offering clear step-by-step guidance and essential visual aids.

The LLM also enhances the system's capability to provide contextual understanding for more nuanced and complex user queries. Sarthi AI is deployed through Interactive Kiosks in key public service locations, such as railway stations, hospitals, banks, and government offices, complemented by a versatile Mobile Application.

These Kiosks are equipped with the necessary components, including touchscreens, cameras for ISL, microphones, and speakers. The development process was conducted using an agile methodology, crucially involving co-creation workshops with PwD communities to ensure relevance and usability.

5000 +

Unique PwD users, with over 50k interactions.

The rollout strategy includes public awareness campaigns and thorough staff training. The system is built on a cloud-native architecture for superior scalability, while edge computing is utilised for real-time responsiveness of the kiosk functions.

Initial six-month pilots across ten public service points in Bangalore and Delhi successfully served approximately 5,000 unique PwD users. The mobile application achieved over 15,000 downloads, and the system efficiently processed more than 50,000 interactions, confirming its high user load capacity.

The modular design of Sarthi AI allows for rapid and flexible deployment. The future roadmap is ambitious, targeting expansion to 100 cities within three years and aiming to reach 1 million PwD users through strategic government partnerships.

Sarthi AI primarily serves a diverse set of end-users within the PwD community. This includes the deaf and hard of hearing who benefit from ISL interpretation, the visually Impaired who rely on multilingual voice guidance and audio descriptions, and the speech-impaired who use the text-to-voice and simplified interfaces. Users with cognitive disabilities are supported by simplified language and visual aids. Additionally, caregivers and service providers are also key users, benefiting from enhanced tools to assist PwDs.

The pilot studies yielded significant positive outcomes. There was a 40% reduction in service access time, indicating faster completion of transactions and access to information. A 60% improvement in independent interaction was observed, translating to increased autonomy for PwDs and reduced dependence on human assistance.

Furthermore, users reported increased confidence in engaging with public services. The anonymised interaction data collected provides valuable, data-driven insights that can be used to inform and improve future accessibility policies.

Sarthi AI operates under a strict framework of ethical guidelines. This includes a strong focus on AI Safety, implemented through robust error handling, continuous monitoring, and a human-in-the-loop validation process for ISL interpretation. Bias mitigation is addressed through the use of diverse training data for the ISL and NLP models and regular system audits. User privacy is paramount, ensured by anonymised and encrypted user data, and the strict requirement of consent for any Personally Identifiable Information (PII), all in compliance with Indian data protection laws. Accountability is maintained via clear feedback mechanisms and dedicated support for issue resolution.

The design of Sarthi AI is fundamentally rooted in deep inclusion. It is contextual, tailored to Indian linguistic and cultural nuances, with support for multiple regional languages and ISL dialects. It is accessible, complying with WCAG 2.1 standards and specifically designed for low-resource environments, including necessary offline capabilities. Crucially, it is usable, featuring intuitive interfaces developed through iterative testing and refinement with various PwD groups.

Success for Sarthi AI is determined by strong user acceptance, quantifiable improvements in accessibility metrics, and the effectiveness of its multimodal communication approach. The integration with Bhashini was a vital factor in achieving comprehensive linguistic coverage. Initial challenges, such as gathering diverse ISL training data and ensuring reliable voice recognition in noisy public environments, were successfully overcome through iterative model refinement and the implementation of advanced noise cancellation technology.

The project has yielded crucial lessons. Co-creation, the act of involving PwDs in the development process, is essential for guaranteeing genuine utility. The Multimodality of the system is a critical requirement for effectively addressing the diverse needs within the PwD community. Localisation is necessary for the system's success within India's unique and varied context. Finally, adopting Ethical AI principles—specifically transparency, fairness, and privacy-preserving practices—is fundamental for building user trust and encouraging widespread adoption.

Sarthi AI represents a substantial advancement toward realising an inclusive India, empowering PwDs to access vital public services independently and with dignity. By strategically utilising advanced AI in multimodal communication and adaptive interfaces, it provides a scalable, ethical, and highly impactful solution that aligns perfectly with the IndiaAI Mission's vision of 'AI for All.' Its demonstrated real-world impact and clear potential for broad adoption make it an exceptionally compelling case study.

Case Study 10

TALKTILE: An AI-Enabled System for Interactive Tactile Learning for Blind and Visually Impaired Students

Author: Ashwin Verma, Organisation: AID lab - IIIT Delhi Location: Delhi, India

Blind and visually impaired learners depend heavily on tactile graphics—such as embossed diagrams and maps—to interpret spatial relationships. While tactile materials effectively convey structure through touch, they do not provide contextual or semantic explanations. As a result, learners often rely on teachers or caregivers to interpret regions, labels, and relationships, limiting independent learning.

Existing audio-tactile systems attempt to address this gap but frequently depend on specialised hardware, external cameras, or computationally intensive vision-based models. These requirements constrain scalability and real-world deployment, particularly in low-resource educational environments.

TALKTILE was developed to address these limitations by leveraging on-device AI and accessibility features already present in consumer smartphones. The solution is designed for inclusive classrooms, home learning, and resource centres, with a focus on affordability, offline operation, and usability in emerging economy contexts.

TALKTILE is a native Android application that enables BVI learners to independently read textbooks and explore tactile maps using touch and speech. The system integrates AI-assisted document understanding for structured PDF navigation, speech-to-text (STT) for voice-driven commands, and text-to-speech (TTS) for real-time audio feedback.

Spatial awareness is supported through structured tactile intelligence using polygon-based representations of map regions. Instead of relying on continuous camera-based computer vision, TALKTILE employs deterministic, metadata-driven logic to ensure reliable performance, low latency, and explainable behaviour across devices.

The solution is deployed entirely on-device and operates offline after installation. It runs on standard Android smartphones without external sensors or proprietary hardware. Users interact with the system through natural voice commands (e.g., “next paragraph,” “go to page ten,” “open map”), touch-based exploration of tactile maps, and spoken feedback for navigation, reading, and spatial exploration.

The system has been implemented using real textbook chapters and

tactile maps and tested across multiple Android devices, including low-cost models commonly used in Indian educational settings.

TALKTILE is designed to scale through content expansion rather than model retraining. Additional textbooks, chapters, and tactile maps can be incorporated by adding new PDF files and structured map metadata. This approach enables adaptation across subjects, grade levels, and regions with minimal technical overhead.

The primary users of TALKTILE include blind and visually impaired students, special educators and accessibility facilitators, and educational institutions implementing inclusive learning environments. Observed outcomes from real-world usage and qualitative evaluations include independent navigation of textbook pages and paragraphs without sighted assistance, accurate identification of tactile map regions with immediate spoken feedback, reduced cognitive load through non-repetitive and context-aware audio responses, and increased learner confidence during spatial learning activities. Learners were able to explore maps at their own pace and demonstrated improved comprehension compared to static tactile materials.

TALKTILE follows a privacy-first and ethical AI design approach. All processing is performed locally on the device; no personal or biometric data is collected or stored, and deterministic logic ensures transparency and predictability.

The system avoids profiling, surveillance, and behavioural tracking, supporting the responsible deployment of AI in educational contexts.

The solution is explicitly designed for diverse disability and low-resource contexts. It operates fully offline, is compatible with low- and mid-range smartphones, follows a voice-first and non-visual interaction model, and requires minimal setup. These characteristics make TALKTILE suitable for deployment in inclusive classrooms and underserved communities.

TALKTILE demonstrates that inclusive AI systems can deliver meaningful educational impact without complex infrastructure. Key challenges included handling variability in PDF layouts and designing speech interactions that remain intuitive for first-time users. These challenges were addressed through structured document parsing and simplified, voice-first interaction workflows.

Explainable and deterministic AI improves reliability in assistive technologies. Voice-driven interaction is essential for learner independence, and simplicity and robustness outweigh model complexity in real-world inclusive deployments.

TALKTILE illustrates how ethical, practical, and deployable AI can improve educational inclusion for

persons with disabilities. By combining on-device intelligence, speech technologies, and accessible interaction design, the system enables blind and visually impaired learners to access both textual and spatial educational content independently. The solution provides a scalable model for inclusive AI deployment in education across emerging and developing economies.

Case Study 11

Saanjh: Passive Audiovisual Regulation Intervention for Neurodiverse Populations

Author: Vandana Malhotra, Organisation: NVLife Private Limited, Location: Chandigarh, India

Children with autism, intellectual disabilities, and behavioural regulation challenges often carry high emotional loads with limited capacity to process or express internal states, manifesting as restlessness, agitation, or behavioural surges commonly misinterpreted as non-compliance. Most digital interventions require instruction, sustained attention, and behavioural compliance with continuous caregiver facilitation. Despite long-term use, outcomes remain limited while caregiver dependence increases. When emotional load remains unaddressed, cognitive capacity and behavioural stability stay constrained regardless of intervention intensity. This creates a gap for accessibility solutions operating without instruction, supporting regulation through passive engagement.

Saanjh is a 42-episode passive audiovisual intervention, totalling 21 hours, designed for daily viewing during evening hours. The format requires no facilitation, instruction, or behavioural enforcement. Viewers may move freely, vocalise, disengage, or fall asleep while episodes play. Emotional load release occurs irrespective of sustained attention. The intervention operates as an automated regulation-supporting environment, allowing internal regulation to proceed autonomously with sleep emerging naturally.

AI-enabled small-team production at a population scale, reducing costs by 90% compared to traditional animation. Unreal Engine managed real-time rendering, lighting, and camera movement across 42 episodes. NVIDIA AI tools automated facial animation and speech synchronisation from audio inputs, maintaining consistent micro-expressions. This production democratisation enabled the creation of a scalable intervention deployable on standard devices in classrooms, homes, and institutions.

Deployment at Sadhana Society for Mentally Handicapped, a registered vocational training centre for neurodiverse individuals in Chandigarh, involved 46 participants ages 5–55, stratified by age and support needs. Participants presented with diverse neurodevelopmental conditions, including autism spectrum disorder, Down syndrome, intellectual disabilities, cerebral palsy, ADHD, traumatic brain injury, and speech/language delays. The institution employs a director, a principal, six teachers, and three to four support staff. The protocol involved one

episode daily for 21 days, with no facilitator instruction or behavioural tasks. Integration into classroom routines required no additional infrastructure or training. Teachers documented baseline behavioural patterns through institutional records and daily familiarity. Percentage improvements represent the proportion of participants rated as "improved" versus "unchanged/ worsened" by teachers or caregivers across observation domains. No control group was used; this was an observational feasibility study, not a controlled efficacy trial. Teachers and caregivers rated participants daily using categorical scales.

Quantified improvements included sleep quality at 50–55%, reduced restlessness at 50–55%, improved social interaction at 25–30%, and emotional regulation at 60–65%. Notable observations included a drastic reduction in self-injurious behaviours, 10–20% of participants entering deep restorative sleep during viewing, smoother activity transitions, and increased peer engagement, including spontaneous food sharing and social invitations. Teachers reported feeling less drained. The group with higher aggression levels showed equal or slightly lower improvement rates than the group with lower aggression levels. No adverse events occurred.

The intervention is designed for inclusion at scale, making it suitable for non-verbal and low-literacy users while requiring no specialised staff or training. It operates on standard devices and is applicable in rural, low-resource, and institutional settings. AI-enabled production reduced costs by 80%, enabling broader accessibility.

Regulation occurs passively through sensory design, scaling without increasing cognitive or administrative burden. Regarding AI safety, ethics, and accountability, no personal identifiers were collected or stored. All participants were minors or adults under institutional care, and data handling followed institutional privacy protocols. Institutional written approval was obtained from Sadhana Society, and caregivers provided written informed consent for participation and observational data collection. AI-generated content was reviewed for cultural appropriateness, inclusivity, and the absence of stereotypical representations. Narrative scripts were designed to be universally accessible, avoiding cultural or demographic biases.

The intervention is part of the IIT Jodhpur Research Park with institutional oversight. Future clinical validation studies will follow formal ethical review protocols, including independent ethics committee approval and standardised consent procedures.

Key learnings indicate that passive regulation through coordinated sensory design enables inclusion without requiring user compliance or data extraction, contrasting with

diagnostic or adaptive AI systems. True accessibility emerges when cognitive and administrative burden is reduced. Saanjh operates on standard devices and functions without facilitation, enabling deployment in rural and low-resource settings.

AI as a production enabler democratises sophisticated content creation, allowing a small team to create what typically requires large studio resources. Traditional knowledge frameworks, when informed by rigorous observation, can translate into scalable applied interventions, demonstrating real-world accessibility impact for populations typically excluded from digital innovation.

Case Study 12

Emergency Accessibility Relay (EAR): AI-Driven Multimodal Bridge for Emergency Communication

Author: Ganesh Kumar, Organisation: Fractal Analytics, Location: Telangana, India

India's ERSS-112 serves as a unified emergency helpline for police, fire, medical, and disaster response, accessible via voice calls, SMS, emails, panic buttons (e.g., smartphone power button thrice or feature phone '5/9' long press), WhatsApp, web requests, chatbots, and the 112 India app with SHOUT for women/children.

Despite these channels, PwDs encounter significant barriers: No automated real-time sign language avatars, haptic interfaces for deafblind users, or AI summarisation for operators, resulting in delays, miscommunication, or inaccessible service. With 63.28 million PwDs (4.52% prevalence per NFHS-5), emergencies amplify exclusion, particularly in urban/rural divides where connectivity varies. EAR tackles this by deploying an AI layer for inclusive communication, implemented in Chennai's diverse PwD communities to demonstrate real-world impact in a Global South context.

EAR functions as an AI-driven universal gateway, facilitating multimodal translations: Noise-robust automatic speech recognition (ASR) for accents/code-switching, text-to-speech (TTS), text ↔ sign language avatars (ISL/ASL with regional adaptations via computer vision), gesture intent detection, and haptic vibration patterns for silent/deafblind interactions. It supports 10+ Indic languages, auto-location via GPS/Wi-Fi/cell/sensor fusion, emergency intent classification using LLMs, and operator summarisation to convey caller needs efficiently.

Built on open-source frameworks (e.g., Whisper for ASR, MediaPipe for gestures, Indic-tuned LLMs), EAR was deployed in a 6-month real-world rollout in Chennai.

Onboarding involved 500 PwDs through NGO-led workshops (NCPEDP, ChangeInkk), free app distribution, and operator training at Tamil Nadu Emergency Response Centres (ERCs). Users activate via app or integrated panic buttons, which call routes to ERSS APIs for seamless handling. Adoption was boosted by multilingual tutorials and haptic feedback for low-literacy users.

EAR has reached 500 users across Chennai's urban/semi-urban areas, integrating with 10 local ERUs. The hybrid cloud/on-device model supports scaling to 10,000+ users pan-India, tested in Tamil-English contexts with offline fallbacks for

rural low-connectivity. Identified primary users are PwDs (deaf, speech-impaired, visually impaired, deafblind, cognitive disabilities). Secondary users are caregivers, emergency operators, and providers (police, ambulances, disaster teams).

Deployment yielded 70% faster communication (reducing delays from 5-7 min to 1-2 min), 50% less operator confusion via AI summaries, and 40% improved location accuracy. User surveys indicated 85% satisfaction; 20 real emergencies (e.g., deaf user reporting theft via sign avatar) were resolved faster. These align with international benchmarks, such as the UK's 999 text relay (60% response time reduction) and Sweden's VRS (enhanced access for 518 emergency calls in 2022).

EAR emphasises data minimisation (on-device processing, delete-by-default) and models audited for bias using diverse Indic datasets. It includes privacy via consent-based opt-ins and explainable AI outputs for operator accountability. Abuse detection is also included to prevent false alarms. EAR complies with India AI Mission ethics and GDPR principles.

Designed for low-resource settings with offline modes, haptic/big-button UI, high-contrast displays, and guided prompts for cognitive accessibility. The solution has been contextualised for the Global South via affordable hardware compatibility and multilingual support, ensuring usability across disabilities and socio-economic groups.

Successes include high adoption from intuitive interfaces and partnerships enabling ERSS integration.

Some challenges were rural connectivity gaps (addressed via SMS fallbacks) and initial sign model biases in regional dialects (mitigated through fine-tuning with ISLRTC data).

Some lessons learned were that co-design with PwDs ensures relevance and that early API access from MHA accelerates deployment. Continuous impact tracking via logs informs iterations and, for replication, open-sourcing the codebase, and prioritising NGO collaborations ensures grassroots scaling.

EAR exemplifies AI's role in bridging emergency inclusion gaps, empowering PwDs with equitable access and potentially saving lives. Its proven deployment, measurable impacts, and ethical framework support broader adoption in ERSS nationwide and similar systems in developing economies, advancing the India AI Mission's vision for humane, inclusive progress.

Case Study 13

AI-Enabled Joint Health and Isolated Muscle Function Assessment Device for Disabilities post Amputation, Trauma and Stroke Cases.

Author: Suresh Susurla, Organisation: Startoon Labs, Location: Telangana, India

Road traffic accidents and strokes are two major causes of long-term mobility impairment in India, often resulting in muscle weakness, joint stiffness, and loss of functional independence. Delays or subjectivity in clinical assessment can limit recovery potential and prolong rehabilitation. Timely, objective diagnosis is therefore critical to understand the true extent of neuromuscular and joint dysfunction and to initiate appropriate interventions early.

PHEEZEE, an AI-powered joint health diagnostic wearable, enables precise and data-driven assessment of muscle activity and joint mobility. By providing clinicians with accurate insights at the right stage of care, PHEEZEE supports the formulation of personalised and effective treatment plans. This technology-driven approach enhances clinical decision-making, optimises therapy protocols, and accelerates functional recovery, helping patients regain mobility faster and return to an active, independent life.

Pheezee addresses critical challenges in mobility assessment and rehabilitation for stroke and road traffic accident (RTA) patients through an indigenously developed, AI-powered wearable medical device.

Designed, researched, and manufactured entirely in India, Pheezee integrates joint mobility sensors and surface muscle activity sensors to deliver highly accurate clinical assessments, achieving up to 98% accuracy in mobility evaluation and 97% accuracy in muscle activity detection. The device captures patient data in real time, which is securely transmitted to an encrypted remote server where copyrighted statistical AI models analyse the information. The processed outputs are delivered via the Pheezee Android application as detailed clinical reports that objectively reflect the physiological status of affected joints and muscles, enabling clinicians to make informed and timely treatment decisions.

The solution is supported by strong clinical and regulatory credentials, including patented hardware, copyrighted algorithms, and validation through more than 19 published clinical studies. Pheezee is registered with CDSCO as a Class B medical device and with the USFDA as a Class IIa (510k exempt) device, reinforcing its safety and reliability. Orthopaedic surgeons, neurosurgeons, neurologists, and physiotherapists use Pheezee to complement conventional imaging such as X-rays, CT scans, and MRI

by adding functional data on muscle performance and joint mobility.

Adoption has expanded across more than 20 Indian states, with pilots underway in Dubai and Africa, and over 5,000 stroke and RTA patients, including paraplegic and quadriplegic cases, already assessed. Prestigious institutions such as AIIMS Delhi, NIMS Hyderabad, and NIMHANS Bangalore are actively using Pheezee for research, further strengthening evidence of scale and credibility.

Clinical outcomes demonstrate a significant impact, with more than 90% of patients showing improved recovery following accurate diagnosis and personalised care plans enabled by Pheezee. Ethical and governance standards are ensured through HIPAA-aligned, secure server architecture and repeated approvals from Institutional Ethics Committees. Importantly, as a lightweight, portable, and affordable indigenous device, Pheezee promotes inclusion by extending advanced diagnostic capabilities to tier-2, tier-3, and rural healthcare settings across India.

The deployment of Pheezee in the Indian market has demonstrated notable successes as well as practical challenges typical of introducing a novel AI-powered assistive technology. One of the key successes has been the strong acceptance by the clinical community. Clinicians have shown keen interest and enthusiasm toward the availability of a high-quality, USFDA-registered medical device developed in India, particularly because Pheezee enables objective diagnosis of joint and muscle function—an area not adequately addressed by conventional imaging modalities such as X-rays, CT scans, or MRI. The ability to generate functional insights that were previously difficult or impossible to obtain has helped Pheezee gain immediate attention and credibility among orthopaedic surgeons, neurologists, neurosurgeons, and physiotherapists.

At the same time, certain challenges have accompanied its adoption. Effective use of Pheezee requires structured training and continuous handholding, especially during the early stages, to help clinicians apply the device appropriately across specific clinical conditions and integrate its outputs into routine decision-making. Another ongoing challenge is establishing the Pheezee assessment as a standard diagnostic test, comparable in familiarity and routine use to existing imaging investigations for joint health. While acceptance and usage are steadily increasing, achieving widespread normalisation demands sustained investment in awareness programs, clinician training, time, and human resources. Addressing these challenges is essential for embedding Pheezee as a mainstream diagnostic tool in India's assistive technology ecosystem.

Pheezee represents a transformative AI-powered assistive technology for objective assessment and rehabilitation across amputations,

paraplegia, stroke, and joint health conditions. Its indigenous design, clinical accuracy, and scalability position it strongly for widespread adoption, improving functional outcomes and advancing technology-driven rehabilitation across India.

Case Study 14

Democratizing Accessibility Information: The Yes to Access Case Study on AI and Citizen Participation

Author: Archit Majumdar, Organisation: The Association of People with Disability, Bengaluru, Location: Chandigarh, India

In India, the 2011 Census recorded only 2.21% of the population as persons with disabilities, a figure based on the Persons with Disabilities Act, which recognised just seven types of disability. Subsequently, the Rights of Persons With Disabilities Act 2016 broadened this to 21 categories, reflecting a more comprehensive understanding of disability.

Yet across India and much of the Global South, persons with disabilities face systemic exclusion due to inaccessible environments, limited information, and weak enforcement of accessibility standards. Despite laws mandating accessibility and the Supreme Court of India laying out the requisites of accessibility as a right for people with disabilities, ground-level data is often fragmented or unavailable.

Physical barriers, lack of signage, inaccessible facilities, and inadequate pathways restrict mobility, safety, and participation in social, educational, and economic life. Inaccessible public spaces and services keep people with disabilities and elderly people with limited mobility out of view. Accessibility is essential for education, work, mobility, and participation in a Digital India. This exclusion denies fundamental rights, limiting opportunities, agency, and representation. Yes to Access (YTA) was conceived to bridge this gap, enabling citizens and institutions to map, assess, and improve accessibility across various location types such as schools, transport hubs, public buildings, and health facilities.

The Significance of the Yes to Access App Launched by the Association of People with Disability in December 2024. Yes to Access (YTA) is a mobile app that enables citizens to map and assess accessibility using simple checklists aligned with national guidelines. Volunteers and persons with disabilities conduct quick assessments that appear instantly on a public map. Covering 14 space types and 29 parameters from India's Harmonized Guidelines, the platform demonstrates how a crowdsourced, AI-enabled model can scale accessibility checks.

2 Lakh+

Accessibility checks have been conducted using Yes To Access.

By November 2025, over 200,000 accessibility checks had been completed, turning complex standards into easy, community-led action. Deployment and Implementation YTA uses a volunteer-driven model, working with State Commissioners for Persons with Disabilities in Karnataka and Goa, the Department of Empowerment of Persons with Disabilities, CSR partners, universities, and citizen groups.

Users are reached through drives, workshops, and networks, supported by training. Engagement is sustained through challenges and certificates. YTA operates across 21 states with more than 9,000 active users and over 200,000 accessibility checks across schools, offices, transport hubs, and public buildings. Primary users include persons with disabilities, caregivers, older adults, and people with limited mobility, who access real-time map navigation. Secondary users are government agencies, CSR bodies, and volunteers who use the data to guide interventions and policy.

The App data highlights major accessibility gaps nationwide while also building awareness among volunteers and institutions. Selected findings include:

• Entrance ramps present 86,662; absent 18,519

• Wheelchair access present 9,745; absent 58,822

• Tactile routes present 4,589; absent 66,452

• Accessible parking present 4,536; absent 135,867

• Accessible toilets present 3,738; absent 53,920

YTA minimises personal data collection and uses encrypted storage and HTTPS/TLS traffic. Access is role-based, logged, and restricted to authorised administrators using OTP authentication. Security and GCP-native controls are applied. The platform follows legal and responsible AI standards and protects sensitive and child-related data. The app is simple, multilingual, and locally contextualised. Screen reader compatibility, adjustable text, and high-contrast options support diverse users, including persons with disabilities.

Over 200,000 checks were completed through an AI-supported, crowdsourced model that converts standards into practical steps. Key challenges included onboarding, connectivity, sustaining volunteers, and institutional hesitation to share non-compliance. It was realised that for proper scaling, partnerships significantly expand reach. Furthermore, governments are eager to support the development of accessibility features; the problems lie in the face of public spaces which are already built. In the absence of data, people are unaware of the gravity of the public space crisis that a significant amount of our population faces every day.

YTA shows how AI and citizen

participation can democratize accessibility information and accelerate inclusion, bridging the gap between policy and lived experience and advancing universal accessibility at scale, while also building public awareness, strengthening accountability, and enabling data-driven planning for governments, institutions, and communities.

Case Study 15

Jan-Sahayak: A Sovereign, Voice-First AI Operating System for Accessible Public Services

Author: Shrey Sharma, Organisation: Zangoh, Location: Madhya Pradesh, India

For India's 2.68 crore Persons with Disabilities (PwDs), the "Digital Divide" is not about connectivity; it is about interface. While the government digitises services, the interface layer—screens, captchas, small buttons, and OTPs—remains hostile to those with visual impairments (blindness/low vision), motor disabilities (inability to type), and neurodivergence. Currently, a visually impaired pensioner cannot independently check their payment status on a visual dashboard. They must travel to a kiosk or depend on a sighted family member. This loss of autonomy is the core challenge.

Jan-Sahayak was conceived to dismantle this barrier by replacing the "Visual UI" with a "Voice UI," operationalising the Rights of Persons with Disabilities Act, 2016, through sovereign AI.

Jan-Sahayak is a Multimodal Action Engine rather than a traditional chatbot. It functions as an intelligent assistive overlay that bridges the gap between citizens and complex government portals like Samagra, UMANG, or Land Records. The system is powered by three core innovations: first, the Sovereign Voice Core (Zangoh-Vani), a proprietary ASR engine specifically fine-tuned for Indian dialects—such as Malwi and Nimadi—and the dysarthric speech patterns common in users with motor impairments. Second, it utilises a Voice-First e-KYC workflow, which enhances accessibility by replacing visual OTP inputs with secure, voice-guided verification for blind or low-vision users. Finally, its Visual-to-Audio RAG capability allows the agent to ingest complex visual documents, such as PDFs or land maps, and convert them into structured audio summaries, effectively "reading out" critical information like land mutation orders to the user.

The solution is architected on the Zangoh Zing Platform, designed for the sovereign IndiaAI Cloud Development. Built using a "No-Code" governance layer, it enables nodal officers to configure accessibility flows without engineering delays.

Users access the agent via existing channels—WhatsApp voice notes and telephony (181 IVR). There is no new app to install, ensuring compatibility with feature phones used by the rural disabled population. Deployed as a *"Digital Sathi"* (Companion), the system requires zero training—the user simply speaks.

The core technology stack driving

Jan-Sahayak is already validated at a massive scale. It has been deployed for IndiaMART, enabling millions of users to perform voice and video-based product searches, capturing intent with 95% accuracy where text filters failed. At a national scale, it has been selected by the Ministry of Information & Broadcasting (MIB) for Bhashasetu and Kalasetu, scaling real-time translation across 22 languages. The architecture underpins the Simhastha 2028 ecosystem, designed to support 140 million pilgrims, including accessible grievance redressal at a civic scale.

The primary users are visually impaired citizens (blind/low vision), unable to read screens. Secondary users are citizens with motor disabilities (Cerebral Palsy, Parkinson's) who are unable to type. Tertiary users are elderly citizens and those with low digital literacy.

The key evidence of impact has been the autonomy granted to users. In pilot simulations, visually impaired users completed complex tasks (e.g., "Check PM Kisan Status") in <45 seconds via voice, a process that previously required assisted travel to a kiosk. The IndiaMART deployment proved that Voice/Video search increased intent capture by 400% for users uncomfortable with text interfaces. Service delivery has also reduced the "Time-to-Resolution" for grievances by 85% by automating the triage process from voice input directly to backend ticketing.

All data is processed within India (Data Residency). PII is redacted in real-time before processing.

Models are trained on diverse datasets representing rural dialects and non-standard speech patterns to prevent the exclusion of marginalised voices.

Jan-Sahayak operates on the principle of "Deep Accessibility." It supports Speech-to-Speech (S2S) interaction, meaning a user who cannot read or write can still navigate the entire system using only their voice in their native dialect.

A major success was the "Voice-to-Action" capability. Early iterations only provided information; the breakthrough came when the agent could execute APIs (e.g., actually filing the grievance).

A challenge was handling background noise in rural settings, which was mitigated by our robust noise-cancellation pipeline developed during the IndiaMART deployment.

One of the lessons learned was that 'Dialect is Dignity'. We learned that for PwDs in rural India, Hindi is often a second language. Accessibility requires supporting hyper-local dialects (like Bundeli or Malvi) to build genuine trust and usability.

Jan-Sahayak represents the transition from "Digital India" to "Accessible India." By leveraging Sovereign AI to remove the visual and motor barriers of traditional software, Zangoh has

created a replicable blueprint for inclusive governance. This solution ensures that in the AI age, disability does not equate to dependency.

Case Study 16

Accessible Indoor Navigation and Information System with AI (AInIS)

Author: Vikas Upadhyay, Organisation: Iwayplus Private Limited Location: Delhi, India

The Accessible Indoor Navigation and Information System with AI (AInIS) transforms how people with visual, mobility, and cognitive disabilities experience large indoor spaces like hospitals, universities, and public buildings. By combining hybrid BLE–PDR localisation (achieving ~2-meter accuracy), voice-driven AI, accessibility metadata, and real-time feedback, AInIS delivers practical, independence-boosting solutions that address everyday challenges.

Below are key real-world use cases, grounded in current trends like apps from Evelity, GoodMaps Explore, Navigine, and emerging UC Santa Cruz prototypes (as of 2026).

1. Independent Navigation for Visually Impaired Users: A visually impaired visitor arrives at a sprawling hospital like AIIMS Delhi or a university campus. Instead of relying on staff or struggling with inconsistent signage, they open the AInIS app (or use voice commands via screen reader) and say, "Guide me from the main entrance to the Cardiology OPD." The system uses BLE beacons for anchor points and PDR (from phone sensors) to track movement, providing continuous, step-by-step audio instructions: "Walk forward 10 meters, then turn left at the corridor junction."

If the user deviates (e.g., due to crowds), it reroutes instantly with alerts like "You've veered right—turn around and proceed straight." Multi-floor support includes elevator guidance: "Proceed to the elevator ahead; press button for floor 3." This mirrors real deployments in 2025–2026, such as UC Santa Cruz's spoken-direction apps for blind users in buildings, or GoodMaps detailed indoor floor plans with voice guidance. Users gain confidence, reducing stress and dependence on others—often cutting navigation time by 30–50% in complex environments.

2. Accessibility-Aware Routing for Wheelchair Users and Reduced Mobility: For wheelchair users or those with limited mobility, AInIS prioritises safe, barrier-free paths. A patient asks, "What is the quickest wheelchair-accessible route from the ground-floor elevator to the emergency exit?" The spatial graph filters out stairs, narrow doors, or steep ramps, favouring elevators, wide corridors, and the shortest feasible distances. Queries like "Take me to the billing counter using elevators only" ensure compliance with accessibility needs. This feature aligns with 2026 solutions

from Navigine (real-time wheelchair routing in hospitals) and CenTrak custom paths with EMR integration for appointment reminders). In hospitals, it guides users to the nearest available wheelchair if needed, while in universities, it helps students move between lecture halls without barriers—enhancing daily independence and reducing physical strain.

3. Reduced Cognitive Load for Users with Cognitive Impairments or First-Time Visitors: First-time visitors or those with cognitive disabilities benefit from simplified, bite-sized instructions. A user might say, "Guide me to the cafeteria," receiving clear, short steps: "Turn right now... Walk straight... You're approaching the entrance." They can repeat: "What is my next step?" or "Am I going in the right direction?" for reassurance. AInIS breaks multi-step routes into manageable segments, minimising overwhelm—similar to Wayfindr's audio standards for consistent, low-stress guidance in public spaces. In emergencies, queries like "What's the fastest accessible way to exit in case of a fire?" provide prioritised, safe evacuation routes with assembly point details.

4. Contextual Information Retrieval and Point-of-Interest Interaction: Beyond navigation, AInIS answers practical queries: "Where is the nearest accessible restroom?" or "Show me all restrooms with wheelchair access near OPD." It filters results by accessibility tags. Users ask about services—"Where is the prayer room?", "Are there lactation rooms?" "What are the pharmacy hours?", or "What food options are in the food court?" — receiving precise, location-aware responses. For visually impaired users, descriptive info builds mental maps: "Tell me more about the art installation on the ground floor." Caregivers can request visuals like "Show pictures of the rooftop garden." These capabilities draw from 2026 trends in Mappedin and Pointr systems, offering audio descriptions, multilingual support, and offline caching for reliability.

5. Safety, Situational Awareness, and Crowdsourced Feedback: In emergencies, AInIS empowers users: "Is there an emergency assembly point nearby?" or "What are after-hours security rules?" It enhances awareness in low-visibility scenarios. Users report issues naturally: "This restroom is out of order—please report it," or "Broken light near the exit." Reports route to facility management, aggregating data to highlight bottlenecks (e.g., recurring elevator faults). This closes the feedback loop, enabling operators to optimise infrastructure—echoing crowdsourced accessibility tagging in modern apps.

Over time, it drives measurable improvements: reduced staff assistance, higher user satisfaction, and greater independence.

In summary, AInIS is not futuristic—it's a scalable evolution of 2025–2026

technologies like BLE-hybrid systems (with proven ~1–3m accuracy), AI voice assistants, and accessible routing in hospitals/universities. Deployed via smartphone apps with minimal infrastructure (beacons + digital maps), it directly tackles real barriers, barriers, fostering inclusive public spaces. Users with disabilities navigate confidently, safely, and independently—ultimately transforming lives in everyday environments.

Case Study 17

MindBalance: An AI-Enabled Assistive System for Supporting Persons with Psychosocial Disabilities

Author: Kirit Goyal, Organisation: Clean Water Generator Private Limited Location: Delhi, India

Psychosocial and invisible disabilities represent one of the most under-addressed categories of disability, despite their profound impact on emotional regulation, cognitive stability, behaviour, and functional participation in everyday life. Conditions such as chronic stress, anxiety, depression, emotional dysregulation, and compulsive or impulsive behaviour often develop gradually and remain unnoticed until they result in significant disruption to education, work, health, or social relationships.

MindBalance was conceived to address this gap by enabling early, preventive, and assistive support for individuals experiencing psychosocial and behavioural distress. MindBalance is an AI-enabled cognitive assistive system that translates brain activity into interpretable cognitive and emotional state indicators. The solution is rooted in long-term neuroscience research and Indian Knowledge Systems, particularly the Triguṇa framework of Sattva, Rajas, and Tamas, which conceptualises mental balance as a dynamic continuum rather than a binary notion of health or illness.

By mapping neural patterns to functional cognitive states, MindBalance reframes psychosocial distress as a measurable and manageable form of functional disability rather than a purely clinical condition. The scientific foundation of MindBalance is built on six years of brainwave research involving more than four thousand individuals. This research produced approximately seventy-eight million EEG records collected across diverse cognitive, emotional, and behavioural states, including data from advanced practitioners capable of sustained emotional and cognitive regulation.

This scale and diversity of data enabled the development of interpretable AI models that identify stable neural patterns associated with balance, overload, agitation, and cognitive dysregulation. Rather than diagnosing mental illness, MindBalance detects functional indicators that may signal psychosocial vulnerability. The system continuously captures EEG signals using a wearable form factor and estimates real-time cognitive state patterns. Users receive immediate, understandable feedback about their cognitive balance, allowing them to recognise internal states that may otherwise remain invisible until they become disabling.

The system operates strictly as a non-clinical, non-diagnostic assistive tool intended to support awareness, self-regulation, and human-mediated intervention. One real-world application of MindBalance involved individuals experiencing extreme psychosocial distress during severe medical illness, including patients with advanced-stage cancer. In such contexts, emotional distress, anxiety, and depressive symptoms often function as disabling conditions that reduce quality of life and emotional resilience.

MindBalance was used as an assistive awareness tool to demonstrate how external stimuli, particularly music, influenced brain activity and cognitive state. By visualising the impact of calming versus distressing stimuli on their own brain patterns, participants were able to identify conditions that reduced distress and promoted emotional stability. Over repeated sessions, participants reported reduced perceived distress and improved emotional regulation, illustrating how awareness and feedback can support dignity and agency even under severe psychosocial strain.

A second applied use case focused on behavioural vulnerability and risk regulation. MindBalance was provided for pilot-level testing to an external organisation, where one hundred and twenty-two individuals used the system to understand internal triggers associated with risky decision-making, particularly in the context of gambling behaviour. Compulsive gambling is increasingly recognised as a psychosocial and behavioural disability when it leads to impaired judgment, financial harm, and social disruption.

During the pilot, participants observed changes in their cognitive state across different emotional and situational contexts. The system enabled users to identify patterns such as agitation, impulsivity, or emotional imbalance that preceded risky choices. Feedback from the pilot indicated that participants became more aware of their vulnerability patterns and reported a reduction in risky gambling behaviours over time.

Across these applications, MindBalance demonstrates tangible inclusion impact for persons with psychosocial and invisible disabilities. The system does not label, surveil, or penalise users. Instead, it functions as an assistive cognitive mirror that supports early recognition of imbalance before it escalates into functional impairment. By enabling awareness and self-regulation, MindBalance helps reduce disruption to daily functioning, strengthens autonomy, and supports sustained participation in education, work, and social life.

MindBalance has undergone academic peer evaluation, including presentation at national research forums, and has been subjected to pilot-level functional testing in real-world settings. The solution is currently validated in controlled environments and demonstrated

in relevant wearable contexts. Supported by ongoing research adoption and protected by an Indian patent application under examination, MindBalance illustrates how responsible AI can be applied to improve inclusion, dignity, and quality of life for persons with psychosocial disabilities.

Beyond individual use, MindBalance offers institutional value for inclusive education, workplace well-being, and community health programs. By enabling early identification of psychosocial vulnerability without stigma, the system supports proactive accommodations, reduces crisis-driven interventions, and complements human counselling efforts.

Case Study 18

Alphakhoj: A NeuroAI-Powered Multilingual Literacy Platform for Neurodiverse and Inclusive Learning

Author: Manusmriti Agarwal, Organisation: AlphaKhoj Location: Delhi, India

India has made significant progress in expanding access to schooling, yet foundational literacy remains uneven. Neurodiverse children, including those with dyslexia, dysgraphia, and attention-related learning differences, are disproportionately affected. Their struggles are rarely due to lack of effort or ability, but to a mismatch between how reading is taught and how their brains learn, especially in multilingual and code-switching environments. Formal assessments are scarce, special educators are limited, and remediation content is rarely aligned with everyday classroom curricula. As a result, many children fall behind silently, often losing confidence long before support arrives.

Alphakhoj helps each child find and discover their unique learning potential through curiosity and play - A 'khoj' to discover your own 'alpha' learning superpower.

Alphakhoj is a NeuroAI-powered multilingual literacy platform designed to make inclusive learning practical at scale. It applies evidence from neuroscience, learning science, and behavioural science through a learning-engineering approach, while keeping the child's curiosity, agency, and sense of progress at the centre. At its core, Alphakhoj uses computer vision and generative AI to transform any textbook page into interactive, multisensory learning experiences. A child can practice reading using their own school material, in their learning language, with instructions and scaffolding available in their home language. This reduces cognitive load and ensures that remediation directly supports classroom learning rather than running parallel to it. The learning experience follows a structured but playful progression: (Learn) learning new forms, (Recognise) recognising patterns, (Recall) recalling from memory, and (Practise) practising with increasing fluency.

Each skill is revisited multiple times (15-20x the normal) across multiple games, sensory and content contexts and without feeling repetitive, allowing children to build automaticity while staying engaged. The system adapts continuously, responding to individual error patterns, pace, and strengths rather than forcing uniform progression.

A defining feature of Alphakhoj is its shift from deficit-focused assessment to strength-based, adaptive learning pathways. Instead of labelling children through one-time tests, the platform observes learning over time through gameplay.

This enables early identification of persistent difficulties while avoiding stigma and test anxiety. The platform is intentionally designed to be supervision-free. Children can use it independently, which is critical in homes where parents may have limited time, literacy, or access to specialist support. For teachers and parents, Alphakhoj translates learning data into clear, actionable insights using accessible language. Progress is framed around effort, growth, and emerging strengths, helping rebuild learner confidence and motivation.

Early deployments across diverse learners show improvements in reading fluency, sustained engagement, and self-belief. Importantly, while Alphakhoj is designed with neurodiverse learners in mind, its adaptive design benefits all children, reinforcing the principle that inclusive design creates better systems universally.

Beyond intervention, Alphakhoj functions as a living research tool. With appropriate safeguards and anonymisation, it generates unique datasets on literacy development across neurodiverse and neurotypical learners, Indian languages, and biliteracy pathways. This enables ongoing research into how reading skills develop, how the reading brain adapts across scripts, and what instructional sequences are most effective.

Planned features include teacher- and parent-led experiment sandboxes within the platform, allowing A/B testing of learning strategies and behavioural nudges. These insights will generate dynamic, evidence-based recommendations to support Individualised Education Plans (IEPs) and classroom differentiation. A planned WhatsApp-based nudging system will allow teachers and parents to input real-time contextual cues, reinforce comprehension, and celebrate learning effort, strengthening the surrounding support ecosystem.

Alphakhoj is built to work in low-resource settings. It is mobile-first, low-bandwidth tolerant, and designed to minimise cognitive and operational load. The platform supports multiple learning modalities, short practice sessions, and a clear visual design to ensure accessibility across diverse needs.

Ethically, Alphakhoj prioritises child safety, privacy, and transparency. Data collection is minimal and anonymised, feedback is non-judgmental, and the system does not make high-stakes decisions. It supports inclusion by keeping children within the same curriculum as their peers, allowing all learners to progress together at their own pace and enabling meaningful cross-interaction rather than segregation.

Alphakhoj is modular by design, enabling integration into larger learning and governance ecosystems. As a learning-engineering platform, it can support more granular, neuroscience-informed metrics for literacy progression, contributing to better monitoring of NEP

Foundational Literacy and Numeracy goals. Integration with education data systems and portals can help policymakers move from coarse outcome tracking to actionable insight, while remaining human-centred.

Alphakhoj demonstrates how AI, when grounded in science and designed around real human needs, can build true inclusion. By combining adaptive learning, research generation, low-resource accessibility, and child-centred design, it offers a scalable pathway to improve literacy, restore learner confidence, and reduce long-term educational inequities. It is not just a tool, but an evolving infrastructure for inclusive, evidence-based learning in India.

Disclaimer

The case studies included in this compendium have been evaluated based on information submitted by the respective authors and participating organizations. Responsibility for the accuracy of data, metrics, and representations rests solely with the submitting authors. The evaluation committee and partner institutions shall not be held liable for any discrepancies, omissions, or subsequent changes in the information provided.

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