



BRIDGING THE DISABILITY GAP

An opportunity to make
a positive impact



FOREWORD

Truly inclusive financial services must cater to the special needs of persons with disabilities



Equality of opportunity is one of the foundational values that enable the building of fairer, more inclusive communities. The 2030 Agenda for Sustainable Development that includes 17 Sustainable Development Goals (SDGs), which have guided both policy and action since they were adopted in 2015, are based on "leaving no one behind."¹ The SDGs reference disabilities in education, employment, inequality, accessibility of settlements, data collection and monitoring.

Data show that about a billion people, or 15% of the global population, experience a form of disability, constituting the largest minority group in the world. Financial exclusion is a fallout of disability, potentially affecting access to education, healthcare and employment, and leading to higher poverty rates.

Solutions that cater to the needs of this large but marginalized section of the population are needed. The search for solutions

that cater to the needs of persons with disabilities starts with thoughtfully crafting the user experience in a manner that increases ease-of-use and accessibility, without sacrificing value and function. It is of paramount importance that products serving persons with disabilities provide a complete and enjoyable experience to the end-user that is as good, if not better than, the services offered to the rest of the population.

Specific solutions designed to address this involve tools, technologies, and best practices. Global standards such as the Web Content Accessibility Guidelines 2.0 (WCAG) serve as a foundational element in user experience design. Artificial intelligence (AI) and chat-bots make it accessible to navigate, for example, banking tasks, using text interfaces assisting those with hearing or speech difficulties.

Text-to-speech and speech-enabled digital processes based on Natural Language Processing (NLP) provide accessibility for those with visual limitations, making it possible to "talk" to a mobile banking or mobile money menu, rather than use USSD or

~ 1 bn

people in the world experience some form of disability, constituting the largest minority group globally

Apps. Contactless technology and interfaces enable users to interact with a familiar device such as an accessible smartphone rather than a kiosk for cash disbursement.

At Mastercard, diversity, equity, and inclusion are part of who we are, and we bring this to life through products, services, and partnerships that solve real problems and empower all people. At Mastercard Product and Engineering, a customer-centric approach enables us to find solutions for the pain points faced by persons with disabilities. For instance, a thoughtful change in design included in the Mastercard Touch Card enables a person to distinguish between a credit, debit, or prepaid card using tactile notches carved into one side. The Mastercard Conversational Commerce for the Visually Impaired, uses NLP and AI to allow visually impaired users to access mobile money and mobile banking services.

With advances in payments technology, and with the support of public sector institutions, Mastercard continues to work with financial institutions, mobile network operators, fintechs, and other partners to develop and offer solutions that help make financial services more accessible and inclusive for all.

Umar Hashmi
Vice President,
Global Product & Engineering,
Mastercard



KEY FINDINGS

PROBLEMS



A billion people, or 15% of the world's population, experience some form of disability, due to which they may face financial exclusion.



Financial exclusion of persons with disabilities takes many forms. Physical and other barriers in accessing institutions and services prevent many from banking independently.



Assistive and adaptive technologies are often out of reach of persons with disabilities in low- and middle-income countries due to cost and availability issues.



The time taken to develop or remediate an accessible product is one of the biggest challenges for scalable and universal digital accessibility.

SOLUTIONS



Accelerated digitalization of financial services that deliver the benefits of inclusion to various populations needs to include persons with disabilities.



With digitalization as a strategic imperative across countries, national policy and global standards are aligned to mandate accessibility in financial services.



In much of the Middle East and Africa region, a mobile-first approach to financial inclusion has proven effective, with uncluttered, simple user interfaces.



Governments, technology developers, MNOs, and other organizations need to partner for solutions that bring persons with disabilities into the financial mainstream.



Bridging the disability gap in financial inclusion

- Inclusion is a combination of intention and innovation
- Smartphones can drive inclusion among persons with disabilities
- Government initiatives and mandates provide a platform
- Many disabled persons are excluded from financial services

Introduced in 1959, tactile, embossed numbers and names on credit cards were based on global standards prescribing characters per inch, thickness of lines, and character spacing². These were developed to make it possible to take an imprint of the card on a manually operated machine, before the advent of digitalization.

Quite accidentally, the embossing also helped blind and visually impaired persons identify their cards, so they could shop unassisted.

With a majority of transactions now being electronic, embossing is no longer required, and card issuers stopped using raised characters. In what is known as the 'law of unintended consequences'³, this compromised the financial independence of a whole population of partially sighted and blind card holders. Where they could once touch and feel their card before handing it out for payments, now they found themselves dependent on others to pick out the right card from their wallet. For a visually challenged person, this was a step backward.

Making possible financial inclusion and independence for persons with disabilities begins with intent. Often the solution is simple. In one instance, Mastercard reimaged the form, or shape, of the card, to make it accessible for visually challenged persons, who are estimated to number 2.2 billion worldwide⁴.

2.2bn

visually challenged persons globally stand to be financially excluded due to products that are not inclusive



The Mastercard Touch Card has tactile notches carved into one side, which enable the person to distinguish between a credit, debit, or prepaid card. Credit cards have a trapezoidal notch, debit cards have a rounded notch, and prepaid cards have a triangular notch. The standard has been designed to work with point-of-sale terminals and ATMs, ensuring it can be deployed at scale⁴.

According to the latest available data, one billion people, or 15% of the world's population, experience some form of disability. They form the largest minority group in the world. Individuals can experience different types of disability, including visual, hearing, speech, mobility, cognitive, and psycho-social.

Financial exclusion is just one of the fallouts of many socioeconomic factors – less education, poorer access to healthcare, lower levels of employment, and higher poverty rates⁵.



Financial exclusion takes many forms, beginning with physical inaccessibility and lack of universal design in digital content

Financial exclusion of persons with disabilities takes many forms, beginning with physical inaccessibility. A combination of physical constraints in accessing financial institutions and services prevents many persons with disabilities from banking independently.




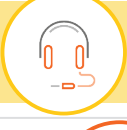


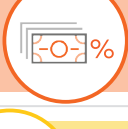


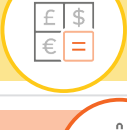

Depending on the type of disability, this includes being unable to travel to and enter a financial institution, branch, or ATM, not perceiving and understanding what is written on paper or electronic devices, being unable to hear, understand, and communicate with banking service providers, and being unable to access paper or digital content.

A 2019 UN report cites data that show persons with disabilities consider 28% of banks in developed countries, and between 8% and 64% banks in some emerging economies, to be inaccessible⁶.

Other contributors to financial exclusions include lower employment rates and lower educational attainment of persons with disabilities. Households with disabled members spend more on healthcare.



How accessible are various types of financial services worldwide?

	For visually disabled	For hearing disabled	For speech disabled	For physically disabled	For cognitively disabled
 Branch banking	50%	25%	25%	67%	33%
 Online banking	80%	40%	50%	50%	20%
 ATMs & kiosks	60%	50%	40%	40%	20%
 Phone banking	80%	40%	20%	60%	20%
 Mobile banking	60%	60%	60%	30%	20%
 Digital wallet	33%	33%	33%	33%	33%
 Loans	50%	50%	50%	50%	38%
 Debit/credit cards	63%	63%	50%	50%	25%
 Statements	89%	56%	56%	56%	22%
 Investing/trading	44%	56%	44%	33%	22%
 Insurance	67%	83%	83%	83%	33%

Source: Inclusive Financial Services For Seniors and Persons with Disabilities: Global Trends in Accessibility Requirements, G3ict. 2015.

63%

of the world's population is now online, an increase of 17% from 2019

58%

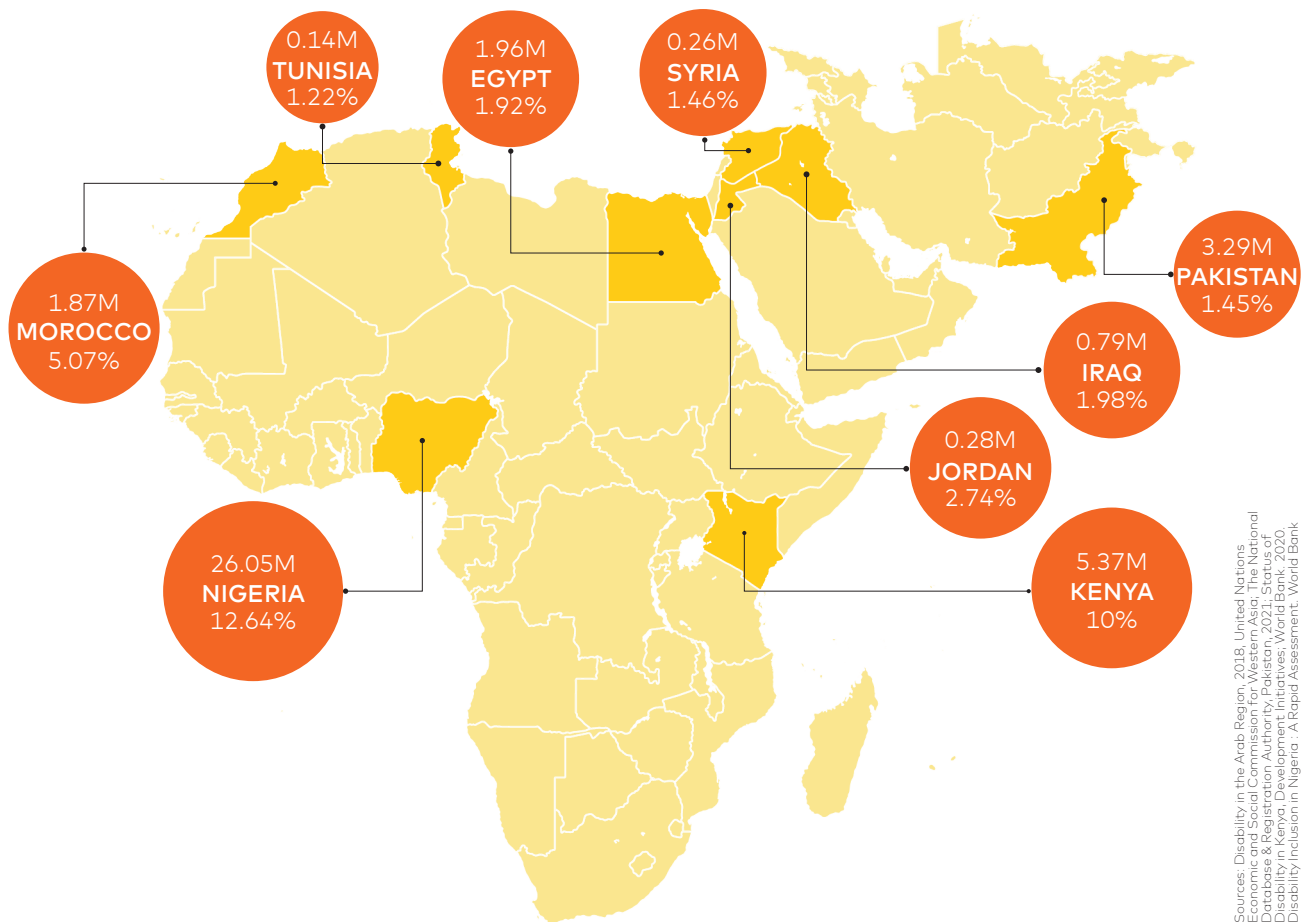
of adults with disabilities in Pakistan own a mobile phone

184

countries have ratified the Convention on the Rights of Persons with Disabilities



Number of people with disabilities in select MEA countries (millions, % of population)



Persons with disabilities are less likely to own a mobile device and significantly less likely to own a smartphone compared to other populations, making digital financial inclusion tougher⁷. Lack of financial access means that even when countries provide cash benefit programs, the reach is uncertain due to a variety of factors, including those listed above⁶.

2.9bn
people, or 37% of the world's population, have never used the internet

Data from 2021 show that 2.9 billion people – 37% of the global population, 96% of which live in developing countries – have never used the internet. However, the UN report also records a sharp increase in global internet use – from an estimated 4.1 billion in 2019 to 4.9 billion in 2021. Approximately 63% of the world's population is now online, an increase of 17%. Internet penetration increased more than 20% on average in Africa, in Asia and the Pacific, and in the UN-designated Least Developed Countries (LDCs)⁸.

During the COVID-19 pandemic of 2020 and 2021, digitalization of financial services and the acceleration in electronic wallets has been used to deliver the benefits of financial inclusion by distributing financial support, reducing cost of transactions, and increasing size limits. Research in select low- and middle-income countries in the Middle East and Africa region shows that despite a large mobile disability gap, widening at each stage of the user's journey, 62% of adults with disabilities own mobile phones and 21% own smartphones.



Of these, in Kenya and Nigeria, where mobile money has been an instrument of financial inclusion, 80% and 76% of adults with disabilities own a mobile phone. In Pakistan, 58% of adults with disabilities own a mobile phone⁷.

A solution-based approach to financial inclusion of persons with disabilities often relies on government initiatives and mandates. With digitalization as a strategic imperative across countries, national policy and global standards are aligned to mandate accessibility in financial services.

Governments and banking associations around the world are introducing plans to improve accessible services for persons with disabilities. Countries are implementing a mix of laws, regulations, standards, and guidelines for accessible financial services in the public and private sectors. Compliance with accessibility requirements is the first step in the process. This provides a platform for public and private sector financial institutions, mobile network operators, fintech providers, and other organizations to develop and apply solutions.

In the UK, for instance, under the Equality Act 2010, banks must provide equal access to all products and services. These include changing policies, procedures, or practices that disadvantage persons with disabilities, such as removing a “no dogs” rule for customers with guide dogs, or providing seats if customers are expected to queue.

Banks were also expected to provide a way to access a service when there is a barrier to a disabled customer, such as providing video calls instead of branch appointments, statements and other correspondence in Braille, or “talking ATMs”⁹.

The UAE has enforced a federal law concerning the Rights of People with Disabilities¹⁰. Emirates NBD bank has imparted Disability Equality Training to over 2,100 of its staff and also taught them American Sign Language.

The bank’s Disability Friendly Branch project, implemented in 2016, aims to facilitate and ease the banking experience. The three-phase transformation integrates infrastructure, technology, and services to enable and enhance accessibility¹¹.

In June 2021, State Bank of Pakistan announced a comprehensive policy framework to promote financial inclusion of persons with disabilities¹². It advises banks in the country to minimally ensure availability of accessibility infrastructure, including stationery forms and documents in Braille and sign language interpretation of services through digital or virtual means and ramps at the entrances of branch premises and ATM cabins.

It also requires accessibility audits of premises as part of branch audit to ensure there is infrastructure to ensure inclusion for persons with different types of disabilities. The policy framework also mandates that banks invest in capacity building of staff to promote inclusion – at the customer as well as staff levels.

80%

of adults with disabilities in Kenya own a mobile phone



'Accessibility tech' used for inclusion of persons with disabilities includes assistive and adaptive technologies such as screen reading software, magnification devices, augmentative and alternative communication (AAC) devices that aid persons with difficulties in verbal communications, and telecommunication relay devices, which facilitate video phone calls from hearing impaired persons.

However, these are often out of reach of persons with disabilities in low- and middle-income countries due to cost and availability issues⁵. Information and Communications Technology (ICT) has been recognized as an enabler in the Convention on the Rights of Persons with Disabilities (2006) (CRPD), which has been ratified by 184 countries as of January 6, 2022¹³.

The 2030 Agenda for Sustainable Development clearly states that disability cannot be the block to development programs and the realization of human rights. The Sustainable Development Goals (SDGs) framework includes seven targets that explicitly refer to persons with disabilities, and six further targets on persons in vulnerable situations, which include persons with disabilities¹⁴.

This has spurred governments, technology developers, MNOs, and other organizations to create solutions that bring as many persons with disabilities as possible into the financial mainstream.



Emerging solutions address diverse disabilities in the 'new normal'

- Scalable solutions by multinational companies can be applied globally
- Technology solutions using AI can be designed to be inclusive
- Smartphones and contactless payments promote enablement
- Intuitive solutions have great potential for accessibility



AI and chat-bots are helping customers navigate banking functions using conversational interfaces

Since a diverse range of factors contribute to the lack of financial access for persons with disabilities, financial inclusion requires that each form of disability be addressed via innovative solutions, formulated for specific use cases. While solutions by stakeholders with an international presence such as Mastercard have the potential to be applied globally, the varied landscape of opportunities and challenges across regions necessitates a localized approach. For example, in much of the Middle East and Africa region, a mobile-first approach to financial inclusion has proven effective.

The use of mobile banking – especially in the aftermath of the COVID-19 pandemic and the emergence of the 'new normal' – has given rise to user interfaces that are uncluttered, simple, and distilled to display core information in a user-friendly manner. Artificial intelligence (AI) and chat-bots are bridging the information gap by helping customers navigate banking tasks using conversational interfaces.

Contactless payments promote greater enablement, not only in stores but also at ATMs. Users can choose to interact with a familiar device such as an accessible smartphone rather than the kiosk when requesting cash withdrawals.



Text-to-speech or speech-enabled digital processes based on natural language processing (NLP) have profound implications for accessibility for those with sensory limitations.

Intuitive, personalized tools such as those that implement debit card spending controls and transaction monitoring can prove valuable for financial independence.

AI for accessibility

Technologies such as machine vision are being used to help customers deposit checks with a photograph taken on their smartphone. Biometrics are used to make security simpler and more effective via fingerprint access to a banking app, or a saved voice-print to access telephone banking.



Having a banking app that works around my disability could make my financial life easier. It could reduce the stress of going to the bank and make it easier for me to send and receive money and communicate with people."

CASE STUDY

FATIMA IBRAHIM

Occupation: Student

Location: Ikorodu, Lagos, Nigeria

In the low-income neighborhood of Omitoro in Ikorodu, a town northeast of Lagos, Nigeria, Fatima Ibrahim wakes up to help her mother around the house. The 18-year-old has just finished secondary school and is saving money for her college education. Coming from a less privileged family, she relies on well-wishers who donate money toward her education and other expenses.

Fatima was born with a condition in which the top of the foot is twisted downward or inward and the hand is turned inward, causing limited range of motion. She cannot use her right hand and right leg properly and cannot pick things up.

With this permanent condition, Fatima has trouble performing tasks that require her hands, and getting around is difficult. Using devices like smartphones is a challenge, so she only has a basic iTel phone to do simple things like receive calls.

With the help of her elder brother, she visited a local bank headquartered in Lagos with branches all over Nigeria, where she opened a savings account. "I have just opened a bank account to save money for my education. I use the debit card to withdraw money from the ATM. I don't have a smartphone. I've never made any transactions over the phone or online and I don't know how to transfer money through mobile devices," she says.

Fatima's main financial needs are to receive money from Good Samaritans and transfer money to family members. But she needs to visit the bank or ATM to do these transactions. The nearest branch is about 17 minutes' drive from where she lives.

Even if she did purchase a smartphone, mobile banking would be tricky as she can't use her right hand properly, and lacking financial literacy, she would need to learn how to use mobile banking.

"Having a banking app that works around my disability could make my financial life easier. It could reduce the stress of going to the bank and make it easier for me to send and receive money and communicate with people."

Voice commands for mobile banking can make things easier for people like Fatima, but this feature is not widely available from Nigerian banks. Right now, only two banks offer this service: Zenith Bank introduced interactive voice banking in 2020 and Stanbic IBTC launched a voice assistant app in the same year.



Voices of frustration: online banking

"The payment was impossible due to buttons on the page being graphical in nature. My screen reader was unable to tell which button was back, cancel, continue, or confirm..."

"I was afraid that I was sending my gas and electric company the much higher amount I send to my landlord... I would like the ability to swipe ... and hear the information that the screen actually displays..."

"To set up a payment I had to click on things with a mouse and it couldn't be done with the keyboard or JAWS cursor. I had to ask a sighted person for help. Mostly, if I can't do it myself, I would simply not do it rather than ask for help."

63.6%

say an accessibility problem has prevented them from accessing the banking/finance system

76.5%

say they need to ask someone else for help to access and navigate a banking/finance system

54.3%

say accessibility problems prevented them from conducting simple bill payments on websites or apps

"All buttons need to be usefully labeled. All elements and images and banners need to be labeled and placed in a way that allow voiceover to be understandable... Creating tables [with] headers will make long tables readable. Add clear directions before any field, and making all error messages describe exactly what needs to be fixed."



"Pop-up menus such as those for selecting an account when transferring funds are not always read by a screen reader ... making it hard to select an account. The focus also jumps to different parts of the page when trying to select one of these menu options. No way to get beyond the initial page to send money to a person..."

Source: Wentz, Brian; Pham, Dung (June); Tressler, Kailee. Exploring the accessibility of banking and finance systems for blind users. First Monday, Volume 22, Number 3 – 6, March 2017



At Mastercard, Labs as a Service hosts innovation teams working on new solutions and experiences. Using ideation and concepts, the team helps distill solutions to problems, taking them to the prototype and market testing phase.

Jaycee Wolfswinkel, Director of XR Solutions, Labs as a Service, says, "AI has resulted in a crossover from the physical to the digital worlds. For the best solution, everything does not have to be digital; sometimes crossover solutions work well."

One of the applications of AI is in accessibility. "Conversational AI can be used to interact with a process by persons who have limitations in seeing the screen," Wolfswinkel says.

Conversational AI works with bots to interpret a question and match it with an answer. For instance, if a user needs to know their balance, they may ask for the amount of money in the account, or whether there is enough money to buy a coffee, or how much money there is in the account. The bot can run a query for balance enquiry and provide the answer.

In an advanced use of voice-based banking, AI can be used for security authentication at contact centers for phone banking to make possible transactions and not just basic services such as balance enquiry. Many users experience accessibility and security issues with knowledge-based questions or with needing to type in a PIN.

A voice biometric platform can authenticate the voice once it is enrolled, or a passphrase is added to the voice print for a two-factor authentication. AI has the capability to authenticate the voice actively and passively. This solution can be implemented for persons with disabilities who cannot use other channels to conduct transactions.



AI voice-biometric solutions can be implemented for persons who cannot use other channels to conduct transactions



The solution can be implemented via apps as well because mobile phones allow technology solutions to tap into their native capabilities. Globally, many effective solutions offer a mix of digital and human capabilities.

Some examples:

- A trial was undertaken in 2019 to offer blind or low-vision customers banking support and assistance through an app called BeMyEyes. The free app for iOS and Android phones has grown to become the largest online community for people who are blind or have low vision across 150 countries¹⁵. There are an estimated 4.8 million volunteers and 313,000 visually impaired users on the app, which was selected as one of the projects under the Expo Live initiative of the Expo 2020 Dubai, which aims to inspire visitors to become change-makers¹⁶.



You should be able to access financial services in privacy; no one should know the details of your banking transactions, your balance, and how much you are spending. This is still missing ... especially with people who have visual and hearing disabilities, because they rely on other people or even the bank employee to do these tasks."

CASE STUDY

MOAFFAK ALKHAFAJI

Occupation: Head of the Iraqi Association of Disability Organizations (IADO)

Location: Baghdad, Iraq

Moaffak Alkhafaji knows exactly how challenging life is for persons with disabilities in Iraq. The former Iraqi military officer lost his leg to a cluster bomb in the Iran-Iraq War. Years later, he started working with representatives of humanitarian aid organizations to unite the voices of Iraqi persons with disabilities. With their support, he established the Iraqi Association of Disability Organizations (IADO) in 2008, which became the first nationwide association for PwDs.

Based in Baghdad, Moaffak travels frequently to attend conferences. For this reason, he has a debit card to enable him to make payments abroad. Inside Iraq, he mainly uses his bank account to make manual withdrawals and cash deposits. To collect his social welfare payments every month, he uses the Qi card, an Iraqi debit card.

Doing transactions in person is not easy for Moaffak as his disability makes it difficult to navigate public places and access financial services. "Facilitation and empowerment of persons with disabilities have not been taken into consideration in Iraq, and modern services and technology have not yet reached buildings, pathways, roads, and public transportation. This affects the daily lives of persons with disabilities," he says.

"We need more specificity for the issues of persons with disabilities. Most banking services are on the second floors of buildings with no elevators. This goes back to the lack of accessibility infrastructure. Also, there are no facilities that enable people with visual, hearing, and speech disabilities to access financial services."

IADO advocates for the rights of persons with disabilities by proposing draft laws and legislation and running awareness campaigns where community members gain knowledge, skills, and confidence. Iraq has one of the largest populations of persons with disabilities in the world. Yet, according to Moaffak, the country has no ATMs that operate in Braille or offer headphones to ensure confidentiality when dealing with PIN numbers and withdrawn amounts.

Moaffak says persons with disabilities in Iraq make fewer financial transactions because of limited income. Their monthly social welfare payment does not exceed IQD 100,000 (~USD 70) per person per month, and a caregiver's salary is about IQD 170,000. "They usually withdraw these amounts using a Qi card from their nearest bank branch. Transactions such as payments, withdrawals, and selling or buying are done mostly in cash," he says.



- Financial sector advocacy group Kenya Bankers' Association (KBA) has entered a partnership with Financial Sector Deepening Trust (FSD Kenya) and software engineering firm Deaf eLimu Plus to create the first bank-environment Kenyan Sign Language (KSL) self-training mobile application. The app relies on human-centric banking to providing software support to bank employees for learning basic KSL to facilitate better communication¹⁷.
- Mastercard Sonic brand architecture contains a signature melody, which is implemented at checkout counters worldwide, a signal to everyone – the sight impaired in particular – that their card transaction has gone through successfully⁴.
- US-based Kramer Wealth Managers have created a whole library of financial articles in American Sign Language, which informs users about definitions of common finance and investment terms such as bear market, diversification, yield, power of attorney, etc¹⁸.
- December 2020 saw the launch of Purple from youBelong, which claims to have built the first social network for persons with disabilities. Purple provides a spending account and debit card tailored for all kinds of disabilities, including families with special needs children¹⁹.



My main financial requirements are to pay my personal attendant and daily life expenses. I generally make transactions using Easypaisa or my mobile banking app. I need to make payments in cash but my branch, for example, has stairs and there is no ramp for wheelchairs, so I can't reach the ATM on my own."

CASE STUDY

SAIMA ASLAM

Occupation: Program Manager at Saaya Association and Freelance Disability Consultant

Location: Islamabad, Pakistan

It's another busy morning in the Pakistani capital of Islamabad, and a young woman waits for her personal attendant to help her shower, eat breakfast, change her clothes, and get ready for work.

Saima Aslam suffers from muscular dystrophy, a group of inherited diseases that damages and weakens muscles over time. For mobility, she uses an electric wheelchair. Over the years, Saima has learnt how to manage herself to become more independent and productive. With the help of her wheelchair, she now moves more freely, playing an active part in society and helping others improve their lives.

For the last 10 years, Saima has been volunteering as program manager for the empowerment of women with disabilities at Saaya Association, a cross-disability association that supports persons with disabilities in Pakistan. In her role, she helps support women with disabilities and works on mobilizing financial and non-financial resources from the private sector, individuals, and NGOs. As compensation, the association covers her transportation costs and the salary of her personal attendant.

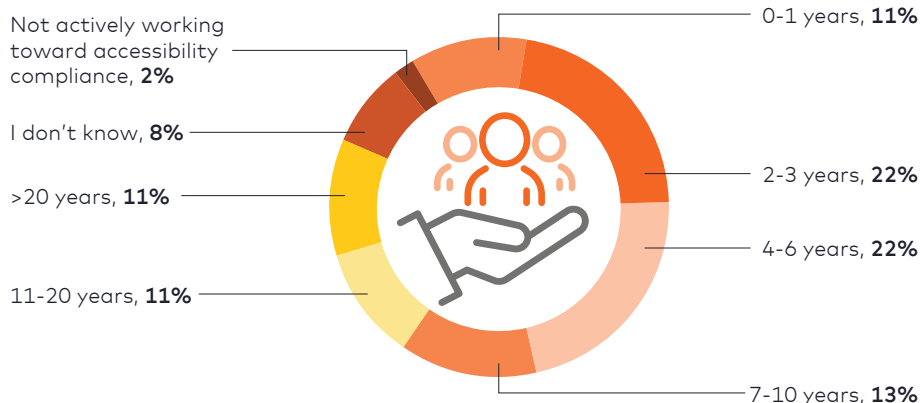
She also volunteers at the National Forum of Women with Disabilities in Pakistan and was chosen as a member of the 2021 Henry Viscardi Achievement Awards Selection Committee. To augment her income, she occasionally offers disability consultation services for companies using her mobile phone.

While she has a bank account and a mobile banking app from her Android phone, she prefers to receive her monthly compensation in cash and pay her personal attendant in cash as well. "In Pakistan, most buildings and ATMs are not accessible for persons with disabilities, so I depend on others like family members, friends or my personal attendant for any in-person transactions," she says.

For everyday transactions, Saima uses her mobile banking app or Easypaisa, a Pakistani provider of mobile wallet, mobile payments, and branchless banking services. Easypaisa also provides digital payment services and is the only GSMA mobile money-certified service in Pakistan.



How long has your organization been actively working toward accessibility compliance?



Source: 2021 Survey Report: The State of Digital Accessibility: Level Access

According to G3ict, an organization that advocates for and promotes awareness of the need for digital accessibility, the time to develop an accessible product — or remediate an inaccessible one — is a common challenge. It ranked as the No. 5 challenge in 2019, the No. 3 challenge in 2020, and climbed to the No. 1 challenge in 2021.

The State of Digital Accessibility Report 2021, developed by G3ict in partnership with the not-for-profit International Association of Accessibility Professionals (IAAP), identifies the barriers to financial access depending on the type of disability. Some of these are:



The time taken to develop or remediate an accessible product is one of the biggest challenges for digital accessibility

Barriers for persons with hearing impairments

- Voice-based communication with bank officials or tellers even for simple tasks like withdrawing money or depositing checks excludes the hearing impaired unless it's face-to-face and the person is proficient at reading lips.
- A solution is to have technology that relies on auditory cues and signals to convey error messages, or for security questions on multimedia-based banking services such as alerts on a bank's website, videos or audio guides, or ATM machines.

Barriers for persons with visual impairments

- Navigation of physical infrastructure and accessing services available only in print or inaccessible electronic formats.
- For persons using screen readers, the use of complicated terms and conditions and catchy marketing speak is tough to follow.
- Checks and other financial instruments with no physically distinguishable marks.
- ATMs that rely on touch screens, without keys with recognizable lettering in Braille or audio output. Instructions on screen on how to bypass marketing to make a transaction.
- Websites which convey content through images without alternative text or image elements that do not get translated through a screen reader. Form and search elements with missing labels cannot be correctly identified by screen readers.





Biometrics such as voice prints and fingerprints make security checks less of a barrier for persons with disabilities

- Security requirements where users need to input CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart) codes in order to validate their payment or to register for a particular service. Audio CAPTCHA is a barrier due to the speed of narration and non-local accents.
- Virtual keyboards for password entry.
- Mobile apps that cannot be accessed by screen readers on phones due to incorrect labelling.

Barriers for persons with physical disabilities

- Lack of ramps and elevators in all public buildings and the neighborhood itself.

Barriers for persons with cognitive disabilities

- Poor website organization, cluttered content, scrolling and flashing texts, and confusing navigation.

The challenges faced by the world's population during the COVID-19 pandemic and the resulting exponential growth of virtual activities has made digital inclusion a priority across sectors. The emerging 'new normal' has the potential to increase inclusion for a wide range of disabilities as well.



Accessibility is at the forefront of human development

- Data and knowledge are the first steps in creating better products
- Affordability is key to making products and services accessible
- Reducing the smartphone ownership gap is crucial
- Fintech as an enabler is making a difference to inclusion

The coronavirus pandemic has brought digital accessibility to the forefront of human development. Working and studying from home have spawned new delivery channels and technologies; businesses have shifted sales and operations online; and governments have used digital payments to reach vulnerable populations.

Organizations such as Mastercard, many MNOs, and financial services companies have come together or partnered with governments and other stakeholders to achieve inclusion.

Data and knowledge

Gathering reliable data on types of disability and the effectiveness of solutions and services available for persons with disabilities among consumer groups can help stakeholders understand and address barriers to inclusion.

Universal design and content

Inclusive products and services based on universal design practices are the first step toward this. This is a two-fold process that involves a retrofitting of existing products and services and ensuring that new products and services meet the criteria defined for inclusion.



Global standards for universal design have charted a roadmap for organizations who wish to make web content more accessible



Apart from regulatory changes and SDGs, global standards such as the Web Content Accessibility Guidelines 2.0 (WCAG) released in 2008 and updated since have led to many organizations including accessibility in their programs. The documents describe how to make web content more accessible to persons with disabilities²⁰.

Digital inclusion as the first step

If digital inclusion is the pathway to financial inclusion for persons with disabilities, particularly among the countries of MEA, there is an urgent need to reduce the gap in smartphone ownership, mobile internet use, and digital literacy. Digital skill literacy programs need to be made more inclusive to ensure their benefits reach those who need them most.

Mastercard’s partnership with U-Demy in Pakistan and the Levant, for instance, ensures discounted access to solutions that upskill young people as they enter the workforce by enabling e-learning platforms. These can be made accessible for persons with disabilities using WCAG guidelines²¹.

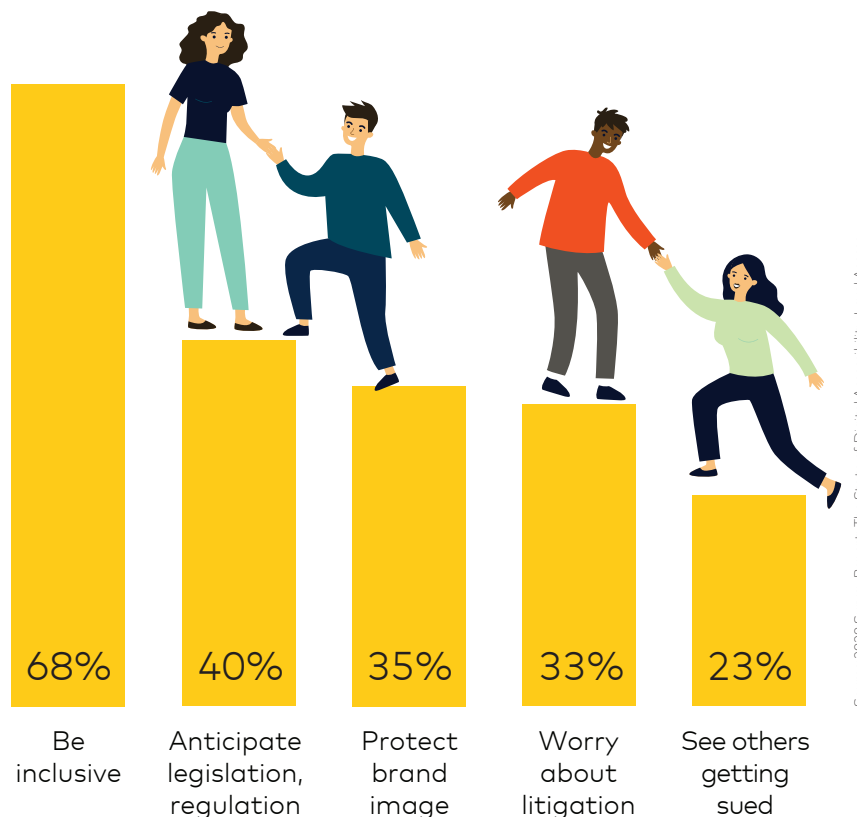


Many persons with disabilities need more than one type of assistive technology solution to enhance their financial inclusion

Affordability

Affordability is a crucial part of making solutions and services available more widely. The use of models such as pay-on-demand promote digital inclusion among the unbanked. With the mobile phone as a platform to deliver inclusion, the task ahead is to adopt an intentionally inclusive approach to develop financial solutions for persons with disabilities.

Top five drivers for organizations implementing accessibility

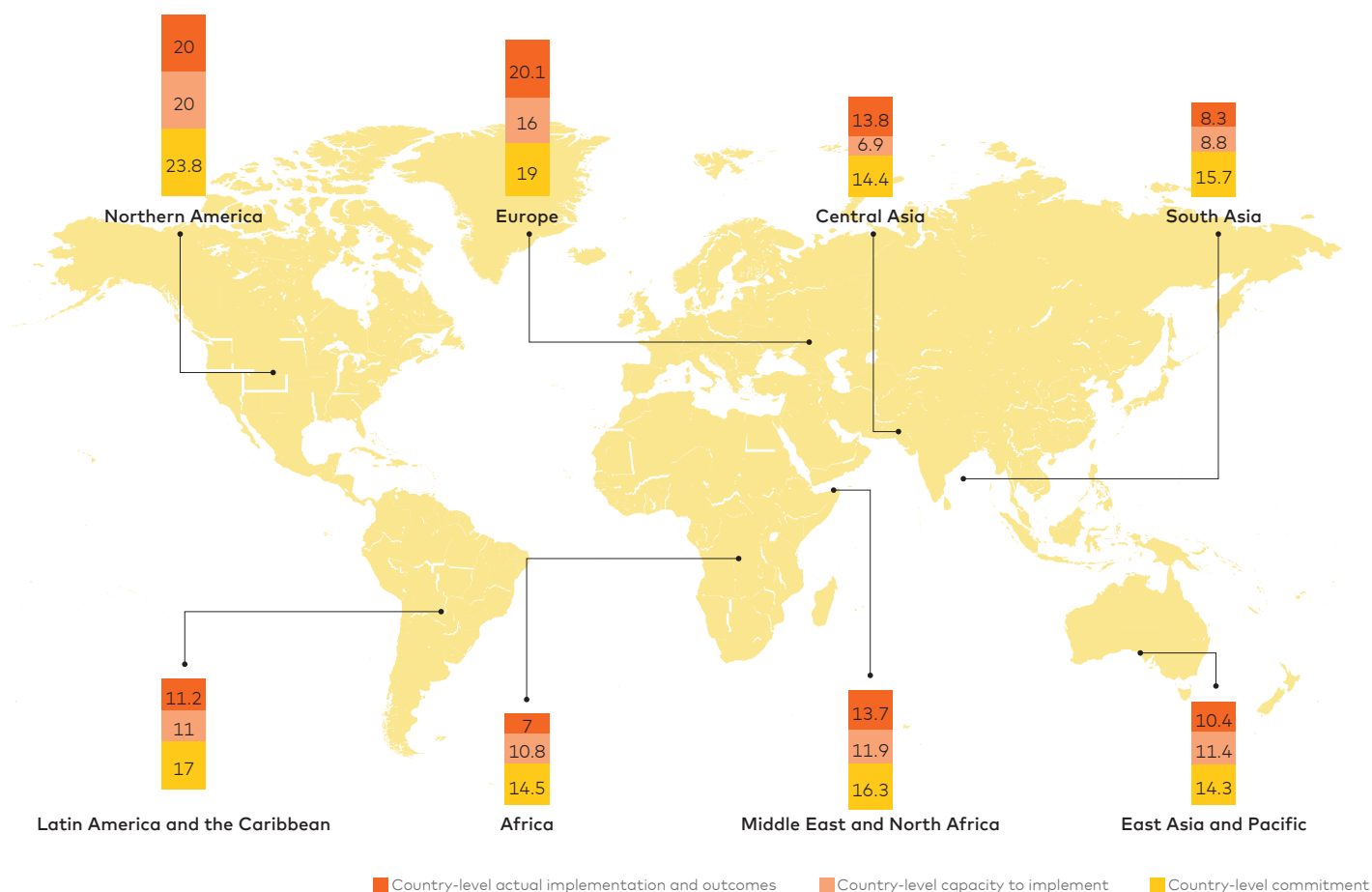


Source: 2020 Survey Report: The State of Digital Accessibility: Level Access



Average DARE Index 2020 scores by region

The DARE Index tracks and reports global progress in digital accessibility implementation. It is compiled by G3ict



Fintech

Financial technologies have emerged as one of the key enablers of inclusion among persons with disabilities. Mastercard programs such as Start Path support late-stage startups in maximizing their opportunity for success to facilitate a simple, single entry point to Mastercard's wide fintech portfolio and access to everything startups need to grow quickly. As an industry-wide collaboration, Start Path convenes banks, merchants, and startups to scale new technology solutions for the financial services and payments industries.

Many persons with disabilities need more than one type of assistive technology solution to enhance their financial inclusion, leading to a higher degree of participation in socioeconomic activities.

The emergence of multiple technologies – as part of the Fourth Industrial Revolution – such as artificial intelligence, machine learning, robotics, and the internet of things have the potential to be delivered through apps and web-enabled services.

Multiple assistive features can be bundled into a single device to increase affordability, efficiency, and portability of solutions that address the needs of persons with disabilities worldwide as well as in a localized format.



Multiple assistive features can be bundled into a single device to increase affordability, efficiency, and portability of solutions



Conclusion

Accessibility of financial services was a concern even in the normal pre-COVID circumstances, affecting a broad range of people, including persons with disabilities. The impact of COVID-19 brought large numbers of people to the brink of financial crisis.

A compassionate approach to the financial needs of persons with disabilities, supported by innovative technology solutions, has the potential to address the needs of the most vulnerable. The design – or potential redesign – of financial products and services needs to reflect the specific real-life needs of all sections of society, instead of using a “one size fits all” approach. Inclusivity can become the fundamental principle on which products and services are developed.

Looking ahead, there is still much to be done to bring the most disadvantaged people into the ambit of financial services and security, although several forward-thinking organizations and institutions have made a start in addressing the needs of persons with disabilities. There is a clear opportunity for the industry to work collaboratively to make a positive impact on millions of lives across the world.



References

FOREWORD: Truly inclusive financial services must cater to the special needs of persons with disabilities

1. United Nations. Department of Economic and Social Affairs, Disability. #Envision2030: [17 goals to transform the world for persons with disabilities](#).

Bridging the disability gap in financial inclusion

2. Mastercard press statement. Hyman Vicki. [Swiping left on magnetic stripes](#). August 12, 2021.
3. Norton, Rob. [Unintended Consequences](#). University of Pennsylvania.
4. Mastercard Press Statement. [Mastercard introduces accessible card for blind and partially sighted people](#). October 25, 2021.
5. The World Bank. [Disability Inclusion](#).
6. United Nations. [Disability and Development Report](#). 2018.
7. Satari, Armita. GSMA. [The Mobile Disability Gap Report 2021](#). December 2021.
8. UN-ITU press statement. [2.9 billion people still offline](#). November 30, 2021.
9. Government Equalities Office and Equality and Human Rights Commission. [Guidance Equality Act 2010](#). February 27, 2013.
10. Information on U.AE. [Protection, support and assistance of people of determination](#).
11. Emirates NBD [website](#).
12. Circular by State Bank of Pakistan. [Policy for Financial Inclusion of Persons with Disabilities](#). June 21, 2021.
13. United Nations. [Convention on the Rights of Persons with Disabilities \(CRPD\)](#).
14. United Nations. [Transforming our world: the 2030 Agenda for Sustainable Development](#).

Emerging solutions address diverse disabilities in the 'new normal'

15. Be My Eyes press statement. [Banking breakthrough helps connect blind and visually impaired customers with their finances](#). May 2019.
16. Clarke, Kelly. The National. [Expo 2020-backed app connects visually impaired with sighted volunteers via video call](#). June 27, 2021.
17. Kenya Bankers Association press statement. [Banking Sign Language App Partnership to Deepen Deaf Community Inclusion](#). October 18, 2021.
18. Kramer Wealth Managers website. [ASL Library](#).
19. Purple press statement. [Introducing Purple from youBelong](#). December 23, 2020.

Accessibility is at the forefront of human development

20. W3C. Web Accessibility Initiative. [Web Content Accessibility Guidelines overview](#).
21. White Paper Media telephonic interview with Umar Hashmi, Vice President, Global Product & Engineering - Mobile Operator Solutions, Mastercard, on December 6, 2021, and December 19, 2021.

Authorship

This white paper is written in partnership with Mastercard's Product and Engineering team and White Paper Media Consulting.

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