

The Truths About Identity and Inclusion

How businesses are Prioritising inclusion and building identity systems that work for everyone

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Introduction

From banking to employment to insurance, identity verification technology is the modern world's gatekeeper. Systems underpinned by artificial intelligence and machine learning, now control access to a diverse range of services, offering the potential to reduce onboarding friction and enhance the customer journey.

However, certain aspects of digital identity systems, if poorly designed, can mean that not every customer has a fair and equitable experience. Ensuring that biometric and document verification technologies work effectively for users regardless of race, ethnicity, sex, gender identity, age, national origin or disability, is essential for modern businesses.

This report demonstrates that with well-developed underlying technology and a carefully considered design process, it is possible for businesses to utilize identity systems that strive to achieve “zero bias AI” and which leave no one behind.

Overcoming System Bias

Inclusive digital identity systems have the power to support underserved groups in society. By removing barriers that lead to exclusion, digital ID systems can ensure that as many people as possible have access to life-enhancing products and services.

To achieve this, any potentially discriminatory system biases have to be accounted for. If an identity verification (IDV) solution only works on the latest smartphone model, with a superior camera spec, or with a high speed internet connection, then any users who do not meet these requirements will be forced to rely on manual methods of verification or be excluded from accessing a service altogether.

Mobile OS Bias

The Data: Android and iOS are installed on 99% of the world's mobile phones.¹ However, with 8 billion phones worldwide, that leaves 80 million using other operating systems. iOS in particular correlates with income level. The average annual salary for iPhone users is as much as 36% higher than that of Android users.²

The Challenge: Mobile phone onboarding technology that only works on iOS or Android smartphones excludes the 80 million other phones in use today. This is more than the population of France or the United Kingdom. Technology designed for iOS excludes non iPhone users, a larger percentage of whom are low-income.



The Solution: Identity verification systems that are built on software-based, OS-agnostic and hardware-independent image capture and processing.

1. www.statista.com/statistics/272307/market-share-forecast-for-smartphone-operating-systems

2. www.nypost.com/2018/10/25/iphone-and-android-users-are-completely-different-people

Once past the hurdle of accessing an IDV solution on their device, some users may find a platform has not been designed with their needs in mind. People with disabilities, for example, may experience challenges using biometric technology which is at the core of many modern verification solutions.

Take the example of a person with a voice stammer who is asked to prove their identity by using a voice recognition tool. If other verification options are not easily available, they will need to spend more time and energy proving who they are or may even be forced to abandon the process entirely.

According to research published by non-profit organisation Mitre³, visually impaired users may face issues when using biometric tools that only work when a mobile phone is placed at a specific angle. Similar challenges can be experienced by people with visible facial differences or who have lost or had a severe injury to fingers or hands.

Identity technology has improved significantly over the last few years, but biases can remain if not actively addressed. Businesses looking to implement an identity solution need to know that the provider they are selecting has prioritized inclusivity throughout the system development process.

Overcoming **Data** Bias

The United Nations reports that in 2019, there were 272 million international migrants, 74% of whom were adults of working age.

Europe hosted the largest number of international migrants (82.3 million), of whom 51.4% were female.⁴ Migrant communities are often drastically underserved by traditional financial institutions.

To address this gap, Bloom Money, a Fintech platform founded in 2021, dedicated itself to helping diaspora communities across Europe to seamlessly manage their finances. Its app gives users the tools to save with friends, family, colleagues, and communities to build communal wealth. This offering is based on 'tried and tested' methods of money management – whether called 'contributions', 'ajo', 'hagbad', or 'pardna' – used by communities around the world.



3. www.mitre.org/news-insights/publication/usability-biometric-authentication-methods-citizens-disabilities

4. www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/files/documents/2020/Feb/un_2019_factsheet4.pdf

“Training biases create potential unfair entry barriers, and in turn cause reduced accessibility for a vast demographic.”

When it came to an identity verification solution to onboard new users and prevent fraudulent activity, Bloom Money had to carefully consider the accessibility requirements of its unique customer-base. Immigrant communities need to be able to use identity documents from a wide range of countries and require technology free from ethnic biases.

Dan James, CTO at Bloom Money, notes, “We were aware of the training biases commonly found in the heuristic AI models of many commercially available identity verification services. Such training flaws are often related to document types, name mismatches, facial features, and skin tone.”

Research has shown women and ethnic minorities are most at risk from failures to build inclusive digital identity solutions. An important contributor to this disparity is the data sets used to develop a solution. IDV systems trained on limited datasets present clear challenges for migrant communities.

Dan highlights that this was a key concern for Bloom Money in their search for a suitable IDV solution. “With community savings models being commonplace in the global south and diaspora communities, training biases create potential unfair entry barriers. In turn, this causes reduced accessibility for a vast demographic,” he explains.

Dataset Bias

The Data: In 2018, a study from MIT revealed that facial recognition error rates for white men were less than 1 in 100. For dark-skinned women, the error rates were 1 in 3. The solutions surveyed were found to have been developed using data sets containing 77% male images and 83% white images.⁵

The Challenge: The artificial intelligence powering modern IDV systems requires training with sample datasets. Large, unbiased datasets are expensive and difficult to procure. If biased data is used to train AI, it is likely the system will exhibit those same biases when making decisions.

The Solution: Biometric systems designed in line with the ISO standard, a training process utilizing ethically sourced



synthetic datasets and rigorous testing using a recognized authority like BixeLab.

Until recently, the diverse data sets needed to train computer models were difficult and expensive to obtain. This has become the AI industry's Achilles heel. With advancements in generative AI, also known as synthetic media, combined with ethically sourced synthetic datasets for training, developers are using computers to make better computers.

Ensuring datasets are truly representative will result in an effective experience for customers of all demographics. Bloom Money experienced this firsthand when adopting digital identity, "The AI systems we selected were miles ahead at the start of our integration," Dan notes, "but the provider also applied a steady stream of updates, resulting in faster and more effective matches.

"Even in more taxing scenarios, such as for customers that have changed facial hair, started wearing glasses since taking their document photo, or are verifying their identity in low-lighting conditions."

By using identity technology trained using unbiased synthetic media, Bloom Money was able to make its app inclusive to its diverse member community.



Overcoming **Manual Screening Bias**

In order to establish an inclusive digital identity system, accessibility must be considered throughout the entire development process - not addressed as an afterthought. A genuine effort to understand the challenges faced by end users is key to ensuring no customers are left behind.

From testing to product development - people who may traditionally not see their needs included in digital identity solutions, would benefit from being consulted. It's unlikely an identity system will achieve real inclusion without hearing directly from those users who have lived experience of facing barriers.

Reed Screening, the only 24/7, UK-based screening business, is on a mission to transform hiring by understanding the needs of employers and employees and representing those needs to drive industry change.

A central challenge faced by job candidates is the need to complete right to work checks. A reliance on human teams to conduct verification restricts the available service hours offered to candidates, while conducting checks in person can be time consuming and expensive. Manual screening bias disproportionately impacts low-income individuals and communities of colour.

Corrine Peart, Head of Strategic Sales & Client Relationships at Reed Screening explains, “Allowing candidates to complete identity checks remotely, at a time that suits them, will support those without the physical or financial means to travel and open up employment opportunities that wouldn’t have been available to them previously.”

Manual Screening Bias

The Data: Research has shown that limited voting hours disproportionately impact communities of color, low-income and working-class people, who may have less freedom to take time out of their working day to visit a polling station.⁶ Manual screening for right-to-work checks has a similar impact.

The Challenge: Offering account opening services during business operating hours, when human analysts are available, excludes low-income customers who cannot afford to take time out of work, or those who work night or weekend shifts.

The Solution: Automated identity verification systems that are available 24/7/365 and require no manual human intervention are far more inclusive to a wider customer base.



As tighter regulations increase the demand for right to work verifications, companies are struggling to find enough people to do ID checks. This is where automated systems come in. Humans can make mistakes, but machines don't get tired or lose their focus and can operate 24/7. Automated systems can make decisions in seconds, manual identity checks take days.

Reed Screening needed a digital identity solution that would make the hiring process faster, but also fairer and safer. Corrine explains that equitable access was a key requirement in their search for an IDV solution, “Excluding those without the right availability, documents, device, or bandwidth, would reinforce existing forms of discrimination against migrant or economically disadvantaged workers”, Corrine notes.

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“Reed have outlined proposals for further changes to the digital right to work scheme that will make it even more inclusive and help maximise available talent to hirers, proposals that were accepted by the Minister of State.”

By carefully considering inclusivity in selecting an automated document verification and biometric matching solution, Reed was able to support faster and more efficient onboarding to transform the digital hiring process and enhance employee mobility.

Overcoming **Language** Bias

It's no secret that the onboarding process represents a major hurdle for businesses. Users are prepared to drop-out if this stage is too difficult or can't be completed. Removing the barriers preventing users from comprehending the actions they need to take and successfully advancing through each stage, will require catering to a range of accessibility needs.

The primary barrier to understanding is language. If a user cannot interact with an IDV system in their own language they could face difficulties onboarding and be prevented from accessing vital products and services.

Language Bias

The Data: There are 293 writing systems worldwide.⁷ The Latin Script is used to write English and at least 150 other languages, spoken by 70% of the world's population. This means more than 2 billion people use another writing system.

The Challenge: Employees responsible for identity verification cannot read or understand every writing system used in the identity documents their customers present. A digital verification solution which is limited to a small number of languages will also exclude large numbers of customers.

The Solution: IDV solutions which support more writing systems, more languages and more document types, will allow businesses to reach more customers.



Language bias impacts both written and spoken instructions. Where audio prompts are given to support a customer through the journey, these should be heard in the language and accent they understand. The ability for a solution to accept documents from any number of countries, using any number of writing systems is also key.

Closed captions are important for those with hearing impairments and audio description is required for users with blindness or low vision. Ensuring that instructions are delivered clearly and simply is vital to cater to all levels of understanding.



Admiral Money, a subsidiary of Admiral Group PLC, provides home improvement loans, debt consolidation and car financing products to customers in a simple and convenient way. Inclusivity and reaching traditionally underserved groups that speak, read and write multiple languages are key to the Admiral Money ethos.

Admiral Money partnered with IDVerse to streamline their customer onboarding journey and increase the accuracy and consistency of verification outcomes.

IDVerse has cataloged 110 languages and 32 unique typesets which cover languages spoken by more than 97% of the world's population. This includes over 16,000 document types used for identity verification.

Nicholas Jones, Head of Customer Fulfilment at Admiral Money, explains that this was a central element of the partnership. "Following our market review, IDVerse stood out in terms of their focus and commitment to producing an inclusive and accessible product which aligned with our values at Admiral Money."

Processing a wide variety of identity documents digitally allows Admiral Money's customers to pass onboarding checks without depending on human translators and avoid delays in waiting for vital funds. What is more, a reduction in false error rates due to incorrect language translations will go a long way to reducing customer abandonment.

Why should businesses be prioritising **inclusion**?

Morally, all people have the equal right to access products and services to which they're entitled. Prioritising inclusion benefits businesses, society and, perhaps most importantly, some of the most vulnerable groups who have been excluded from full participation in the digital world.

Governments around the world are increasingly introducing new legislation and standards that speak to the importance of inclusion. For example, the most recent UK Government Digital Identity and Attributes Trust Framework (DIATF) has a section on how to make sure projects and services are inclusive.

Rules in section 13.3 of the DIATF, require providers to submit an annual exclusion report to show that firms have tried to make inclusion a priority, with a range of examples given to illustrate potential inclusion issues. Falling foul of guidelines and laws around inclusion would be extremely damaging for companies and potentially lead to a loss of customers and declining trust.

“EA focus and commitment to producing an inclusive and accessible product aligned with our values.”



In the US, the White House Office of Science and Technology Policy has identified the ‘Algorithmic Discrimination Protections Principle’ to guide the designers, developers and deployers of automated systems to proactively protect individuals and communities from algorithmic discrimination.⁸ This means preventing disfavoring people based on race, skin colour, ethnicity, sex, religion, age, national origin, disability or any other classification protected by law.

“Model biases can cause unnecessarily high volumes of manual review work due to false positive flags.”

On a financial level, businesses are striving to reach as many customers as possible and failing to treat inclusion as a priority will limit the potential user base. Given the high financial cost of turning to human intervention, investing funds during the development process to ensure all customers can access fully digital verification will save money down the line.

Dan explains this was a key consideration for Bloom Money, “From a business case perspective,” he notes, “model biases can cause unnecessarily high volumes of manual review work due to false positive flags against valid identity matches.”

When built correctly, digital identity solutions can lower onboarding costs, improve the customer experience, and increase financial inclusion. Businesses that fail to address the needs of marginalised communities, however, face potential reputational damage and the loss of consumers to rivals who are more connected with the needs of their customers.

“Almost 1 in 3 companies globally are failing to meet website accessibility standards.”

Statistics from the World Health Organization find that there are more than 1 billion people around the world living with some type of disability. Yet, research shows almost 1 in 3 companies (29%) are failing to meet website accessibility standards, potentially missing out on a \$13 trillion market by ignoring the needs of disabled customers.⁹ Everyone loses out when accessibility issues are not a priority for developers and companies alike.

As the value of diversity in all areas of society is clear, now is the time to refocus efforts on achieving inclusivity to prepare for a future where more people than ever before will utilise identity solutions for all parts of their life, from daily banking to paying bills and signing up for subscription services.

8. www.whitehouse.gov/ostp/ai-bill-of-rights/algorithmic-discrimination-protections-2

9. www.thevaluable500.com/press-release/bullet-larken-test

Conclusion: The quest for **Zero Bias AI™**

In the industry, we know that technology has a problem with implicit bias. A 2016 report by the Royal Academy of Engineering says that 92% of UK engineers are men and 94% are white.¹ Over the last few years, the general public has also grown increasingly aware that technology and automation aren't necessarily the solution to human biases.

In 2016, an AI chatbot called Tay - created by Microsoft - made global headlines because it quickly devolved into hate speech.² Tay was functioning as it was expected to, and yet, the result was dismaying - which is a good illustration of the old saying, GIGO - garbage in, garbage out. In other words, the output is only as good as the input - no matter how clever the technology.

The key is to make sure that you don't just make good tech, but that you embed accessibility and inclusivity into the process of designing and building it - and that you also feed your AI good input. The world doesn't need 'solutions' that exclude whole groups of people any more than it needs AI chatbots tweeting about 9/11.

'Accessibility' and 'inclusivity' are broad terms that describe a wide range of potential problems and solutions. Even when we limit the discussion to digital accessibility and inclusivity, we're still looking at cultural, geographical, financial, physical and cognitive ability, and other considerations.

For digital identity verification providers, all of these elements are equally important to consider. Even if a vendor has excellent technology, if any group of people is systematically excluded from using it, the value will always be limited.

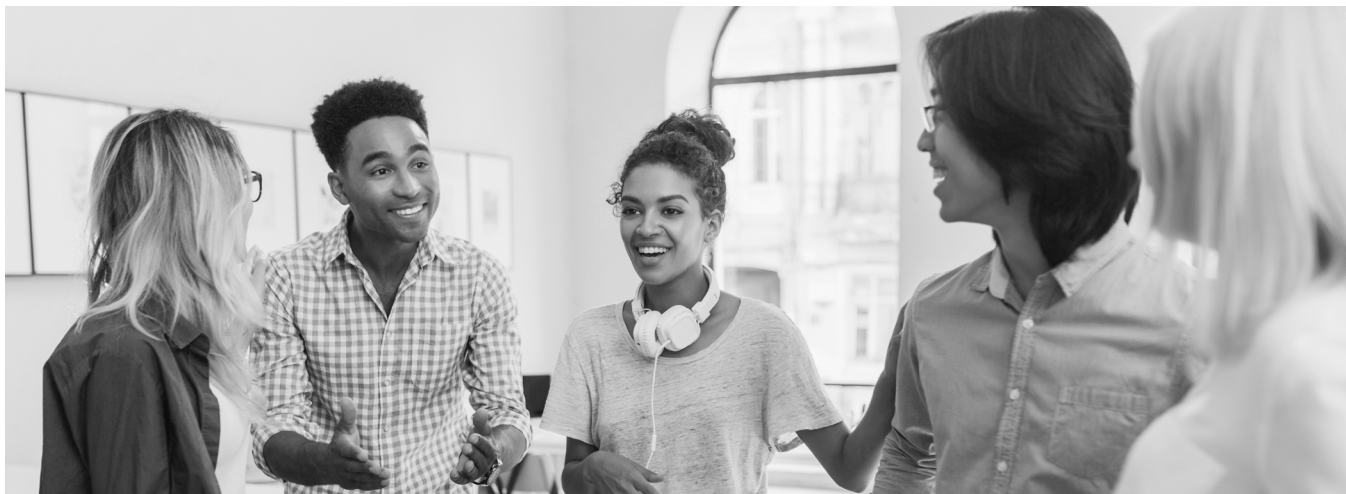
If any group of people is systematically excluded from using a technology, the value will be limited.

That's why IDVerse has always put accessibility and inclusion at the forefront of everything we do, looking at both from all angles. One of the very first customers of IDVerse was a bank. When we met with their accessibility officer, we learned that he was blind.

At that moment, we felt the need to make our product accessible on a very personal level. We took this accessibility officer's feedback on board, and rewrote the code to make our process flow easier to navigate. From that day onwards, accessibility has been ingrained in everything we do, right from the start.

1. www.engc.org.uk/news/archive/engineering-news-archive/na2016/royal-academy-of-engineering-states-action-on-diversity-and-inclusion-is-imperative/

2. <https://www.theguardian.com/technology/2016/mar/24/tay-microsofts-ai-chatbot-gets-a-crash-course-in-racism-from-twitter>

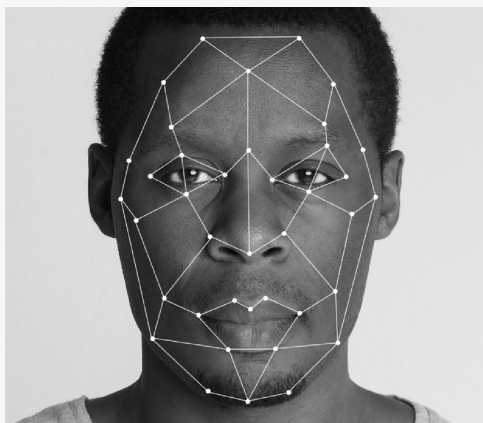


For example, beyond language and ability requirements, we look at things like device support - if we aren't as reliant on users having the newest iOS or Android devices, more people worldwide will be able to go through our flow.

That's the tech side - but remember, we also need to consider the data input. We know that data sets used to develop digital identity solutions, put women and ethnic minorities most at risk of exclusion.

We tackled this problem by ensuring that we use ethically-sourced data sets to train our engine. We do not use a single real face in the training process - purely synthetic ones - with an equal count of each face dataset. That means our synthetic models and the data that we source, are not sourced by governments, authorities or public bodies, which can become skewed.

The methods we use for liveness are not impacted by outliers or specific demographic groups - they revolve around unique physiology, and not the anatomy of the human body in general. However, we do test with various demographics of individuals and have no reported skew in output or regressive results.



A range of ethnic groups were represented in the testing, split as follows:

- European - 40.05%
- South and Central Asian - 28.06%
- North-East Asian - 9.11%
- South-East Asian - 6.00%
- North African and Middle Eastern - 2.40%
- African - 0.96%
- Central American - 0.48%
- Oceanian - 12.95%

Don't just take it from us. IDVerse is very proud that as of December 2022, we received our Level B Bias Evaluation from BixeLab - becoming the first company in the world to independently verify that we have 0% demographic bias in our liveness, in the first test attempt.. That means no error - 0% - tested against subjects from ages 18-70, including a transgender subject.

Our watchwords at IDVerse are anyone, anywhere, anytime - and that's who our solution is for. We are happy to put our tech through the most rigorous testing available to ensure that we don't slip up. And we're always gratified to hear from our existing customers that it's working for them as we hoped.

We will continue to listen and learn, and build on the success we've had in creating an inclusive IDV solution for all.



With thanks to



IDVerse

For a demo of our fully automated,
digital IDV solution, please get in touch

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