A photograph of two women sitting at a desk, looking at a laptop screen. The woman on the left has short reddish-brown hair and is wearing a brown sweater. The woman on the right has dark curly hair and is wearing a black top. They appear to be in a collaborative work environment. The image is overlaid with a semi-transparent blue filter.

LIFTING THE LANGUAGE BARRIER

COULD REAL-TIME
TRANSLATION
TECHNOLOGY
BE A LINGUISTIC
EQUALIZER?

Spotlight
Series

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 **FI INSTITUTE**

Future Investment Initiative Institute

Impact
on Humanity

LIFTING THE LANGUAGE BARRIER

COULD REAL-TIME TRANSLATION TECHNOLOGY BE A LINGUISTIC EQUALIZER?

THE ISSUE AT STAKE

WE ARE ALL CONNECTED.

At least, technologically speaking. So rapid is online word-of-mouth that breaking news stories nearly always hit Twitter before national media sites. Viral TikToks travel tens of thousands of miles in seconds. And all it takes is a smartphone to speak with or see anyone, almost anywhere in the world.

But for all this digital connection, there's little doubt the world remains divided along cultural lines. Whether because of different values, traditions, lifestyles, or politics, there remain fundamental divisions that have resisted the pressures of globalization. This is important when it comes to preserving local identities. But it can also impede understanding, empathy, and true connection among many of the 7.7 billion people living on this planet.

Currently, the approximately 7,100 different languages spoken around the world only fuel that divide. They erect barriers to conversation, collaboration, and, arguably, compassion.

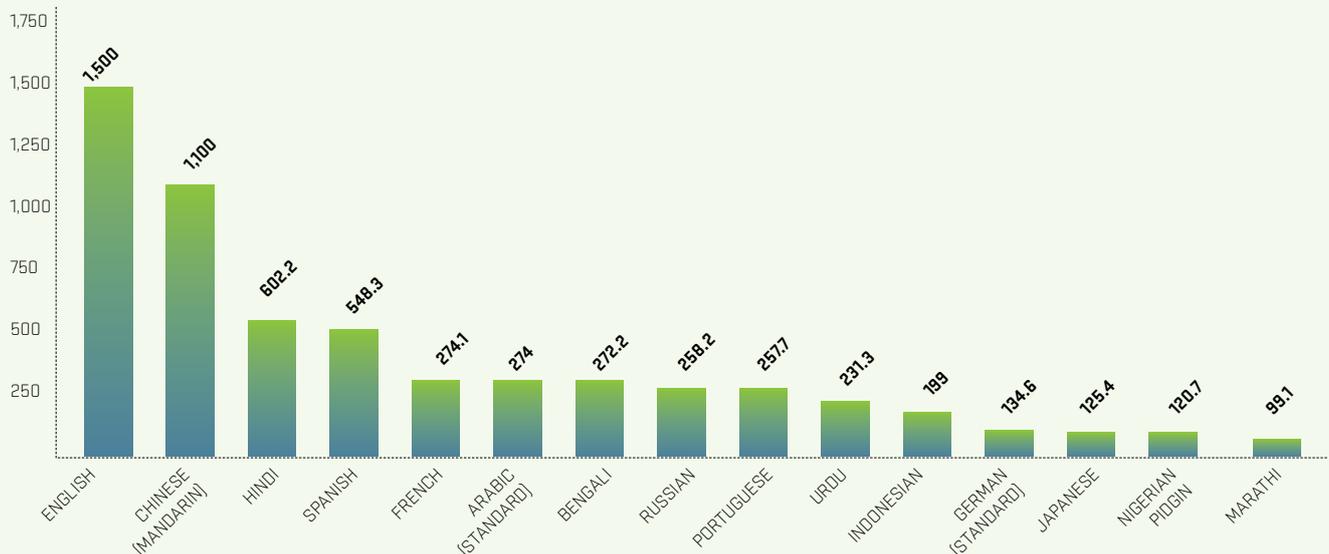
From bars to boardrooms, English has now become the world's second language, an indispensable tool for global communication. But as anyone who has tried to speak using a second language will know that this can often have its limitations.

What if the latest technological advances could help overcome these barriers and bridge the huge linguistic divisions that remain? Imagine being able to communicate easily with speakers of Arabic or Russian without having any knowledge of either language.

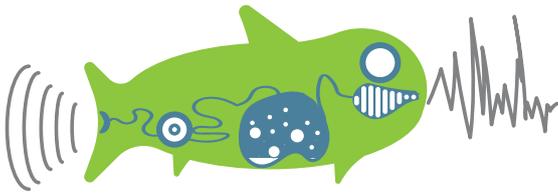
Of course, in a way, this is already possible. Translation is a proven method of building →

THE MOST-SPOKEN LANGUAGES WORLDWIDE

Millions of speakers in 2022



SOURCE: STATISTA (1)



The Babel Fish, from “The Hitchhiker’s Guide to the Galaxy,” could instantly translate any language for a person with one in their ear.

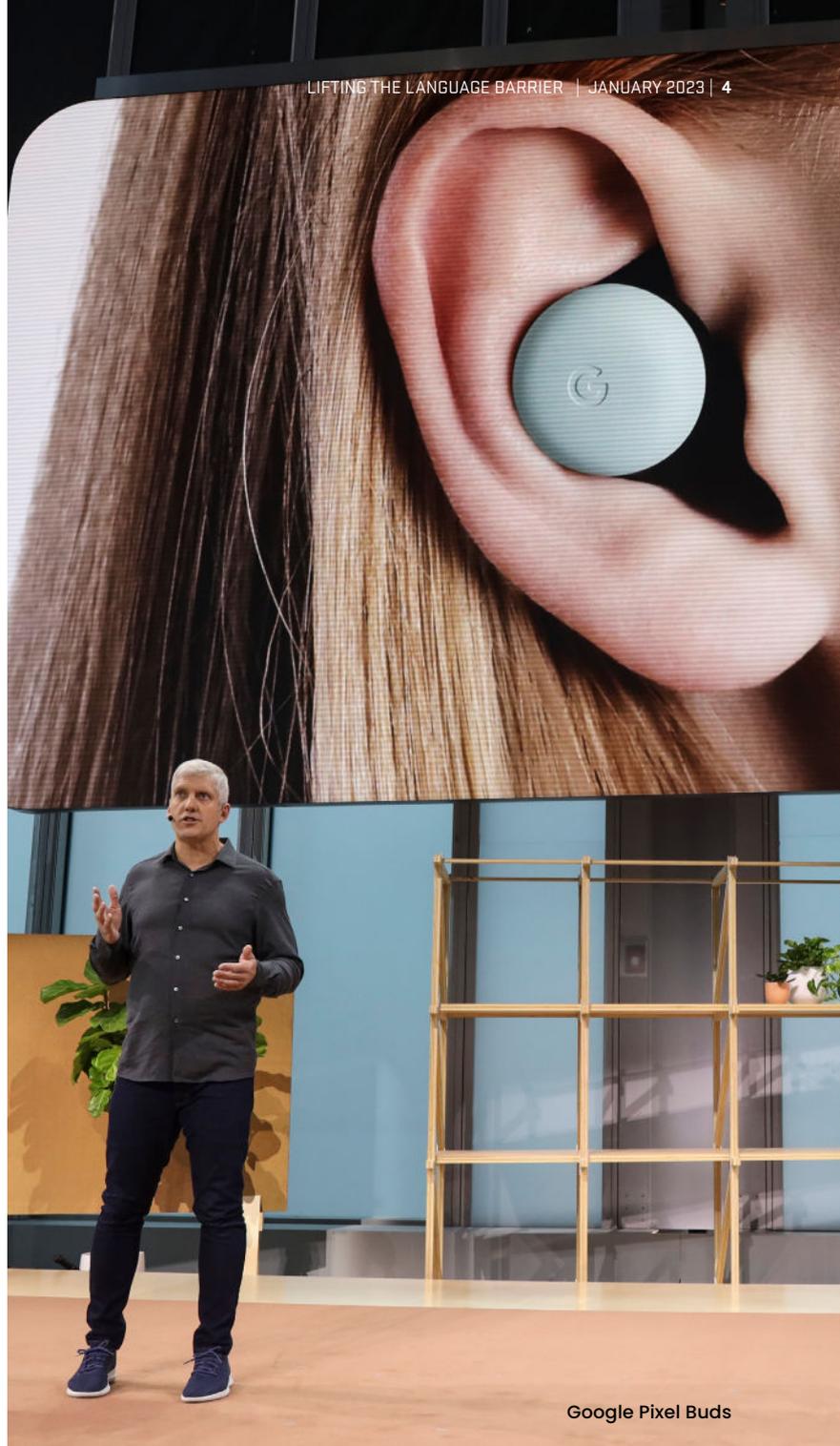
→ recently, it deployed technology known as zero-shot machine translation. This new development equips the tool with the ability to “learn” new languages with little to no source text, and allowed Google to add a raft of indigenous languages to the platform in May.³ Users can simply speak a phrase into the free app to receive an instant and largely accurate translation that can be used to strike up conversations with strangers abroad or navigate tricky situations. By March 2021, the app had been installed a billion times.⁴

In recent years, a long list of tech developers has followed Google’s lead. “We’ve made a lot of progress,” says Barry Haddow, head of natural language processing and senior research fellow at the University of Edinburgh in Scotland. “In the early 2000s, MT might have been usable for related languages, such as French–English pairs, and restricted domains of text. Now we can translate a variety of text types and languages.”

Many of these developments in translation are now becoming commercially available, either as apps or as dedicated devices. Some companies have even developed their own version of the Babel Fish from Douglas Adams’ Hitchhiker’s Guide to the Galaxy science-fiction franchise – earphones that deliver almost instant audio translations into the wearer’s first language (see box, right).

Near real-time translation is also being added to the remote communication platforms on which we have become so reliant. In August, for example, Zoom added translated captions to its video conferencing platform, designed to translate a speaker’s language in real time. Available as part of its paid membership plan, the software spans 12 languages and allows each participant to select their chosen audio language, as well as having access to a real-time text transcript.⁵

The following month, Microsoft Teams followed suit, adding live translated captions to its list of functions, aiming to help remote workers connect with their non-native-speaking colleagues in meetings. It →



Google Pixel Buds

Audio translation direct to your ear

There is a burgeoning category of next-gen headphones that deliver the latest in MT technology straight to consumer ears – for a price. First to the party, with the first iteration of its headphones launched in 2017, was Mymanu. The company claims its Mymanu CLIK in-ear headphones are “the world’s first language recognition and live translation in-ear earphones,” delivering real-time translation in 37 languages by integrating with voice-to-voice translation app My Juno. In the years since, many other tech developers have also jumped on the bandwagon, with the release of similar devices from TimeKettle, Waverly, and Google, which launched Pixel Buds, powered by its Google Translate app, in 2019.

→ represented a huge leap forward from the vetted human translators that Microsoft had previously relied on to provide such a service.⁶

NO LANGUAGE LEFT BEHIND

Other developers have broader ambitions. There are now many AI and tech firms focused on developing open-source translation tools that may be integrated across a variety of platforms.

Take Meta. The Facebook owner's AI arm is currently working on its No Language Left Behind project and a Universal Speech Translator; both aim to significantly improve the accuracy and latency of MT in encompassing all global languages (it currently works for 200 of them). The company has also made much of its data and research open source to help other researchers advance their tools. According to its own benchmarking tool FLORES-101, the single AI model scores 44% higher than previous state-of-the-art tools.⁷

Similarly, the nonprofit OpenAI has released Whisper, an automatic speech recognition system that the organization claims will facilitate "robust" translation and transcription across multiple languages. The tool was trained on 680,000 hours of multilingual and multitask data from the web to enable improved accuracy despite strong accents or high levels of background noise, terminology, or jargon.⁸

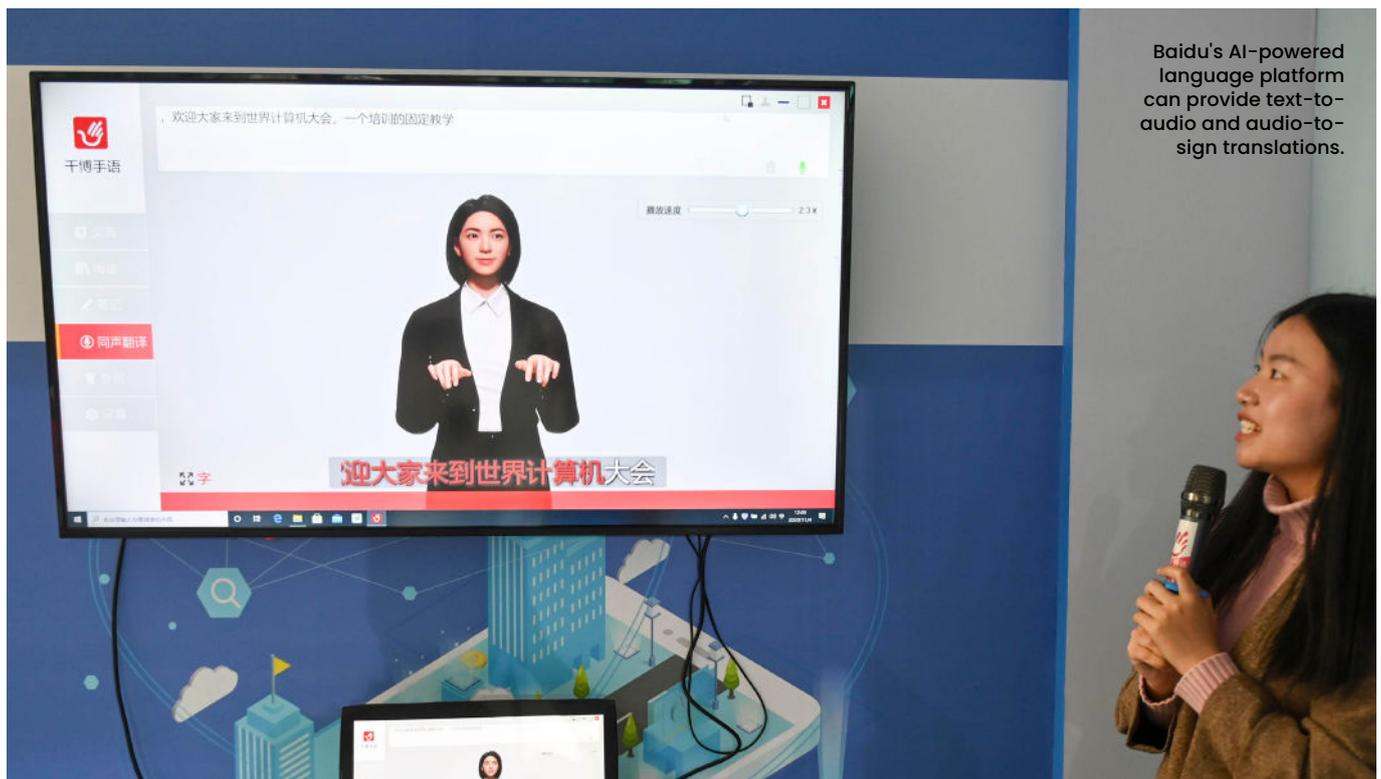
BREAKING DOWN BARRIERS

This rapid level of improvement in audio translation technology has significantly enhanced its potential applications in breaking down cultural barriers, believes tech industry analyst Jeff Kagan.

"There are countless use cases this technology will impact," he says. There are the more obvious applications, such as helping "visitors to other countries or customers at restaurants communicate with anyone who does not share a common language." But also, a broader spectrum →

How could Machine Translation help in healthcare?

It isn't only work, study and travel that could benefit from advances in MT technology, with a number of research projects also drilling down into potential use cases in healthcare. These technologies could prove particularly useful in countries with a variety of local dialects and languages, where a physician may not share a language with a patient and a human translator is either unavailable or not appropriate for privacy reasons. In 2020, for example, speech and language translation app AwezaMed completed a three-year pilot program for its translation app spanning 11 official South African languages, as well as incorporating the specific medical terminology required for such a setting. As part of the three-year trial, five public hospitals and community health centers tested a version of the app that was focused on obstetrics.⁹



Baidu's AI-powered language platform can provide text-to-audio and audio-to-sign translations.

→ of situations in which audio translation could facilitate connection. These include settings where those with disabilities may traditionally be excluded, says Kagan. At the 2022 Winter Paralympic Games in Beijing, for example, an AI sign-language platform was deployed that delivers both text-to-audio and audio-to-sign translation. The same tech has also been trialed in hospitals, banks, airports, bus stations, and other public areas.

Meanwhile, the recent European Live Translator project (ELITR) was tasked with investigating how technology could break down language barriers at European conferences, as well as at smaller live discussions like workshops, and even informal online meetings.¹⁰

TECHNICAL CHALLENGES ...

But as highlighted by many of these projects, there are still numerous challenges in getting the technology to a stage where it can compete with the accuracy and nuance of human translation.

Barry Haddow, who was involved in the ELITR project, points out that there remain technical hurdles in avoiding a lag between a speaker and a live translation, for example. “If you’re delivering a presentation or showing slides you don’t want that delay,” he says.

There are linguistic obstacles as well, such as the fact that different grammatical rules may see words appearing in a different order in a sentence, depending on the language. That too creates a natural lag if MT is being used to deliver word-for-word translations. And finally, despite big improvements, the capacity of Automatic Speech Recognition (ASR) technologies is still such that poor acoustic quality or strong accents can interfere with accuracy.

... AND CULTURAL OBSTACLES

But it isn’t just technology that poses a challenge. There are also broader issues that the emerging sector will have to negotiate.

One ongoing dilemma is that MT may reflect the societal biases present in its source text – assuming that a “nurse” is female, for example, and a “doctor” is male. To combat this, in 2018 Google even began offering gender-specific translations for some languages.¹¹

Then there is the lingering question of whether an AI tool – no matter how sophisticated – can replicate the performance of a human translator. Can it appreciate the subtle context and nuance behind each word, deciding what is literal and what is not?

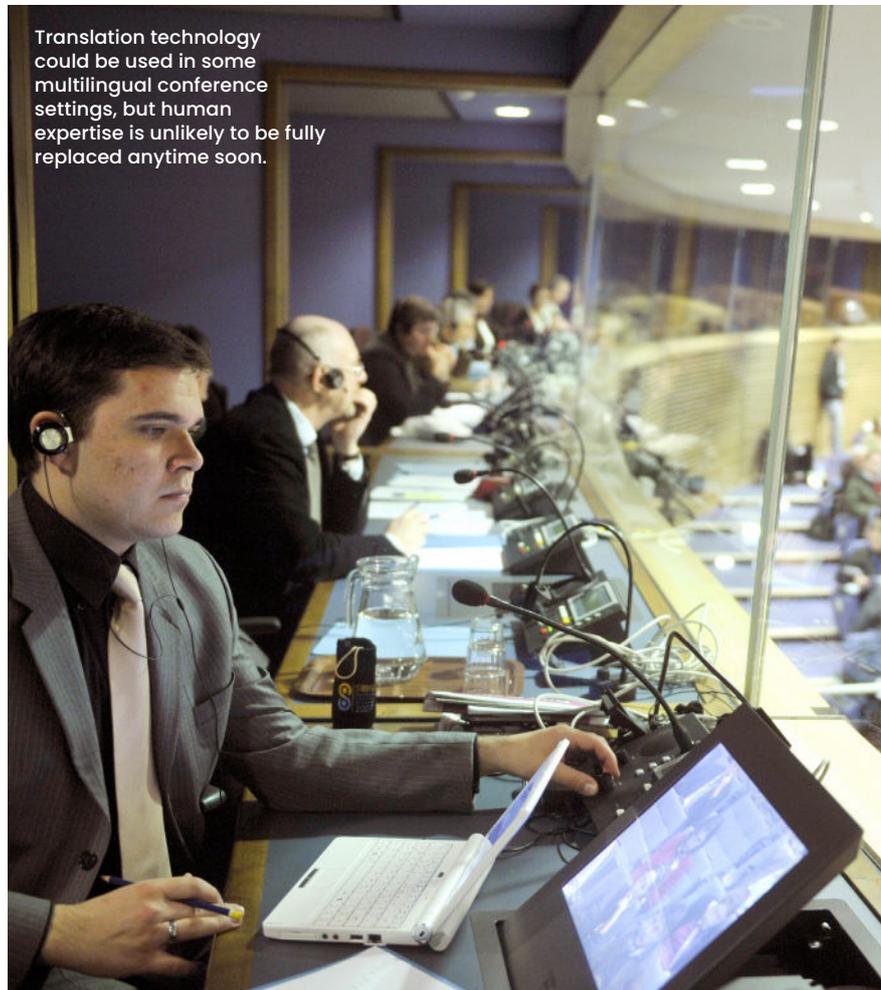
“What a human translator can do is judge all these different strategies and work out the best one in context,” points out Mansell.

In the long term, the broad adoption of sophisticated audio translation tools could even – inadvertently – erode the need to learn foreign languages in the first place. But Mansell isn’t convinced that’s the case. Instead, he believes, “the growth of communication tools and the increased use of a lingua franca [could] actually bring about a rise in the diversity of languages” as demand for translation and translated content grows.

And if that’s the case, is it going too far to claim it could help forge new connections around the world? If it’s genuinely accessible to all, then it’s possible, says Mansell. “However, if access is limited by more expensive technology, never mind subscription charges, then it becomes a problem.”

For Haddow, it’s about viewing the technology as a tool that complements current translation methods, rather than as a replacement. “I’m not going to pretend that technology will fix everything,” he says, “but there’s certainly a role for it.” ←

Translation technology could be used in some multilingual conference settings, but human expertise is unlikely to be fully replaced anytime soon.





WHAT CAN WE DO?

🔗 **Focus on culture:** Translators will need to bridge cultural gaps more than linguistic ones. Educational curricula should reflect this.

🔗 **Retain roots:** As translations improve, there will be fewer reasons for speakers to abandon their native tongue – no matter how rare or hard to understand it may be.

🔗 **Make technology accessible:** If audio translation tech is widely available, it could help forge new connections around the globe.

ABOUT FII INSTITUTE

→ **THE FUTURE INVESTMENT INITIATIVE (FII) INSTITUTE** is a new global nonprofit foundation with an investment arm and one agenda: Impact on Humanity.

Global, inclusive and committed to Environmental, Social and Governance (ESG) principles, we foster great minds from around the world and turn ideas into real-world solutions in five critical areas: Artificial Intelligence (AI) and Robotics, Education, Healthcare and Sustainability. We are in the right place at the right time: when decision-makers, investors and an engaged generation of youth come together in aspiration, energized and ready for change.

We harness that energy into three pillars: THINK, XCHANGE, ACT. Our THINK pillar

empowers the world's brightest minds to identify technological solutions to the most pressing issues facing humanity. Our XCHANGE pillar builds inclusive platforms for international dialogue, knowledge-sharing, and partnership. Our ACT pillar curates and invests directly in the technologies of the future to secure sustainable real-world solutions. Join us to own, co-create, and actualize a brighter, more sustainable future for humanity. ←



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