

# Building a scalable language translation solution using AWS AI services

A human-in-the-loop language translation solution

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# The Trend



Language services and  
technology will grow from \$47B in  
2018 to \$65B by 2025

[Source: Consumer Service Advisory \(CSA\)](#)

# Globalization continues to drive the need for translation

**80%** Prefer a personalized experience

**51%** Prefer content in their own language

**55%** Can't read—won't buy

Source: CSA Analytics 4



# The Trends

- Demand for language conversion services is growing rapidly
- Difficult to find willing, skilled and domain aware human translators at scale
- Machine Translation - Post editing (MT-PE) continues to grow
- Current translation methods are often labor intensive, time consuming, and cost prohibitive

Source - <https://www.tomedes.com/translator-hub/translation-industry-trends-2020>  
and <https://ultimatelanguages.com/2019/12/03/translation-trends-2020/>

# The Opportunity



# The Opportunity

- Market dominated by Language Service Providers (LSPs)
- Current AI solutions are fragmented, expensive and vendors locking-in “translation memory”
- Privacy, time to process, and compliance are concerns for regulated industries ( life sciences, legal, financial etc.)
- Domain adaptive translation services is proving to be a much more cost-effective and efficient solution

Source - <https://www.tomedes.com/translator-hub/translation-industry-trends-2020> and <https://ultimatelanguages.com/2019/12/03/translation-trends-2020/>





# The Solution

Human in the loop – Machine Translation



# Human in the loop – Machine Translation

- Amazon Translate
- Amazon Augmented AI (A2I)
- AWS Lambda
- Amazon S3

# Amazon Translate

Customizable neural machine translation



# Amazon Translate

## Neural machine translation service



Highly accurate,  
fluent, and  
contextual



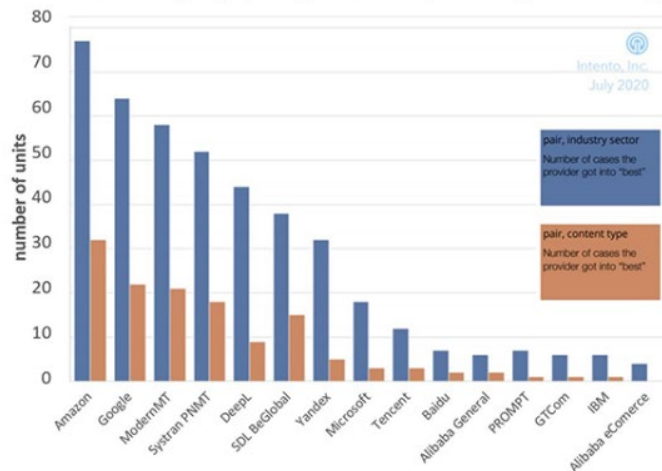
Dynamically  
customizable for  
your domain



Secure and easy to  
integrate into your  
applications

## Top Performing MT Providers (Chart 3.4)

across 14 language pairs, 16 industry sectors, 8 content types



Intento ranks Amazon Translate  
#1 Performing Machine Translation Provider in 2020

<https://aws.amazon.com/blogs/machine-learning/amazon-translate-ranked-as-1-machine-translation-provider-by-intento/>

# Amazon Translate key features



## Broad language coverage

4970 X<>Y translation combinations  
Language identification



## Low latency

< 150ms/sentence on average  
< 80ms/conversational/short form



## Data security

Data ownership  
Encryption  
Access Management



## Broad regional coverage

Available in the following 17 regions



## Customizable translation

Customize translation output with Custom Terminologies and Active Custom Translation



## Sync and batch translation

Translates either small strings or large set of documents with one API call



## Broad domain coverage

Trained on 11 domains

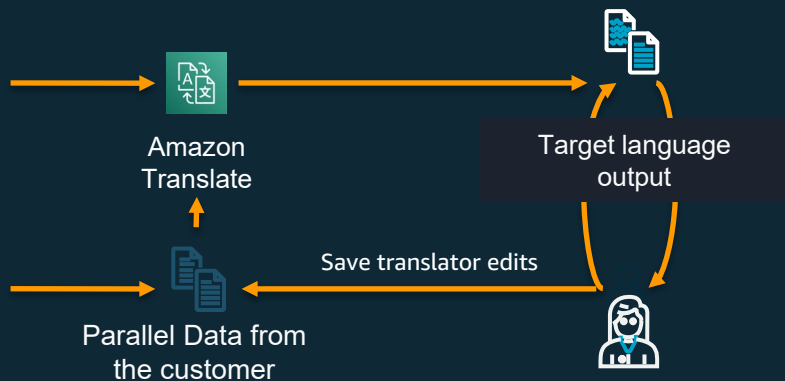


## Pay per use

Simple API calls and you pay for what you use

# Customize your translation output

## Active custom translation



Using **Active Custom Translation (ACT)**, Amazon Translate gives you greater control over the word choice, style and tone of your machine translation output

¿Cómo estás?



How are you?

How do you do?

See documentation page:

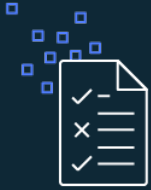
<https://docs.aws.amazon.com/translate/latest/dg/customizing-translations-parallel-data.html>

# Amazon Augmented AI

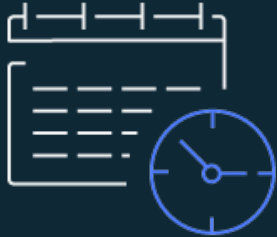
Easily implement human review of machine learning predictions



# Amazon Augmented AI (A2I) Human in the loops service



**Easily implement  
human review  
workflows**



**Reduce time to market  
with pre-built workflows  
and UIs**



**Multiple workforce  
options**



**Integrate with  
your custom ML  
models**



**Increased worker  
efficiency**



# Human review workforce options



## Amazon Mechanical Turk

An on-demand 24/7 workforce of over 500,000 independent contractors worldwide, powered by Amazon Mechanical Turk



## Private

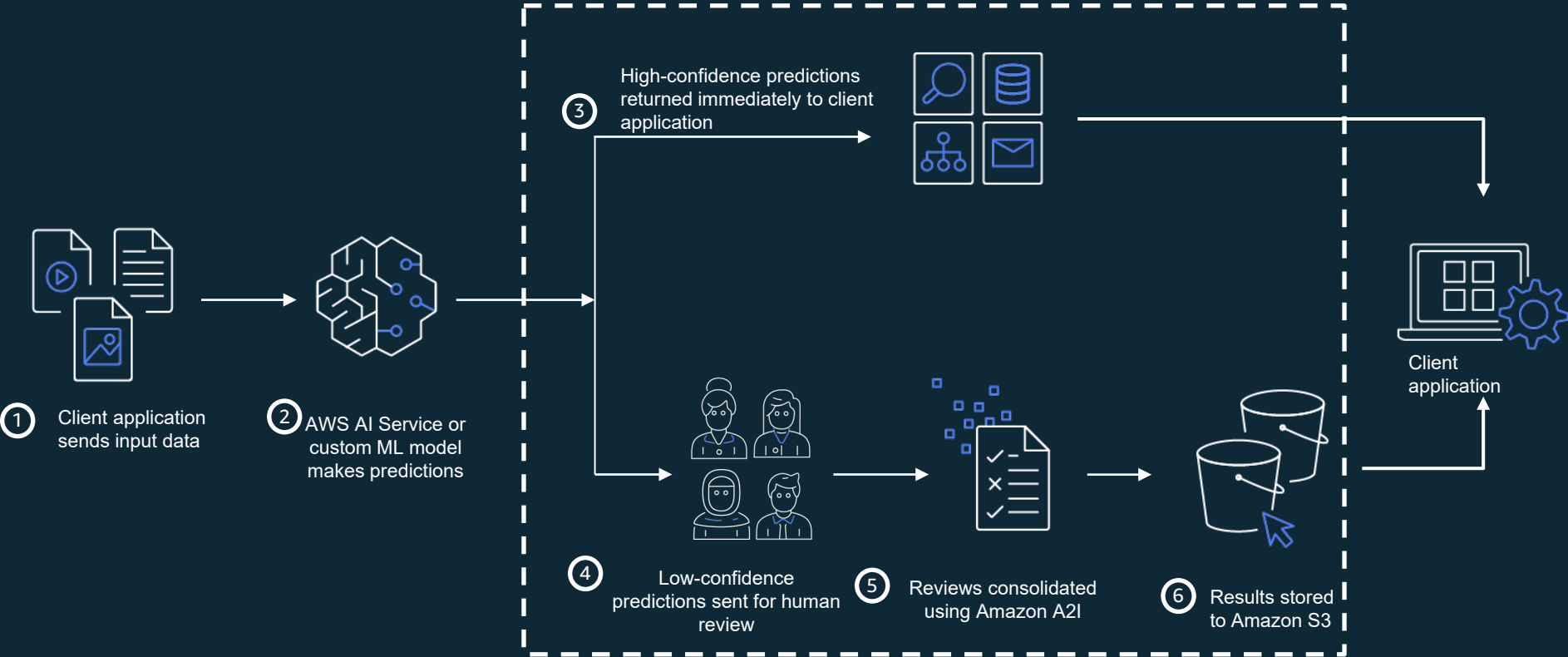
A team of workers that you have sourced yourself (your own employees or contractors)



## Vendors

AWS Marketplace vendors that specialize in human review tasks

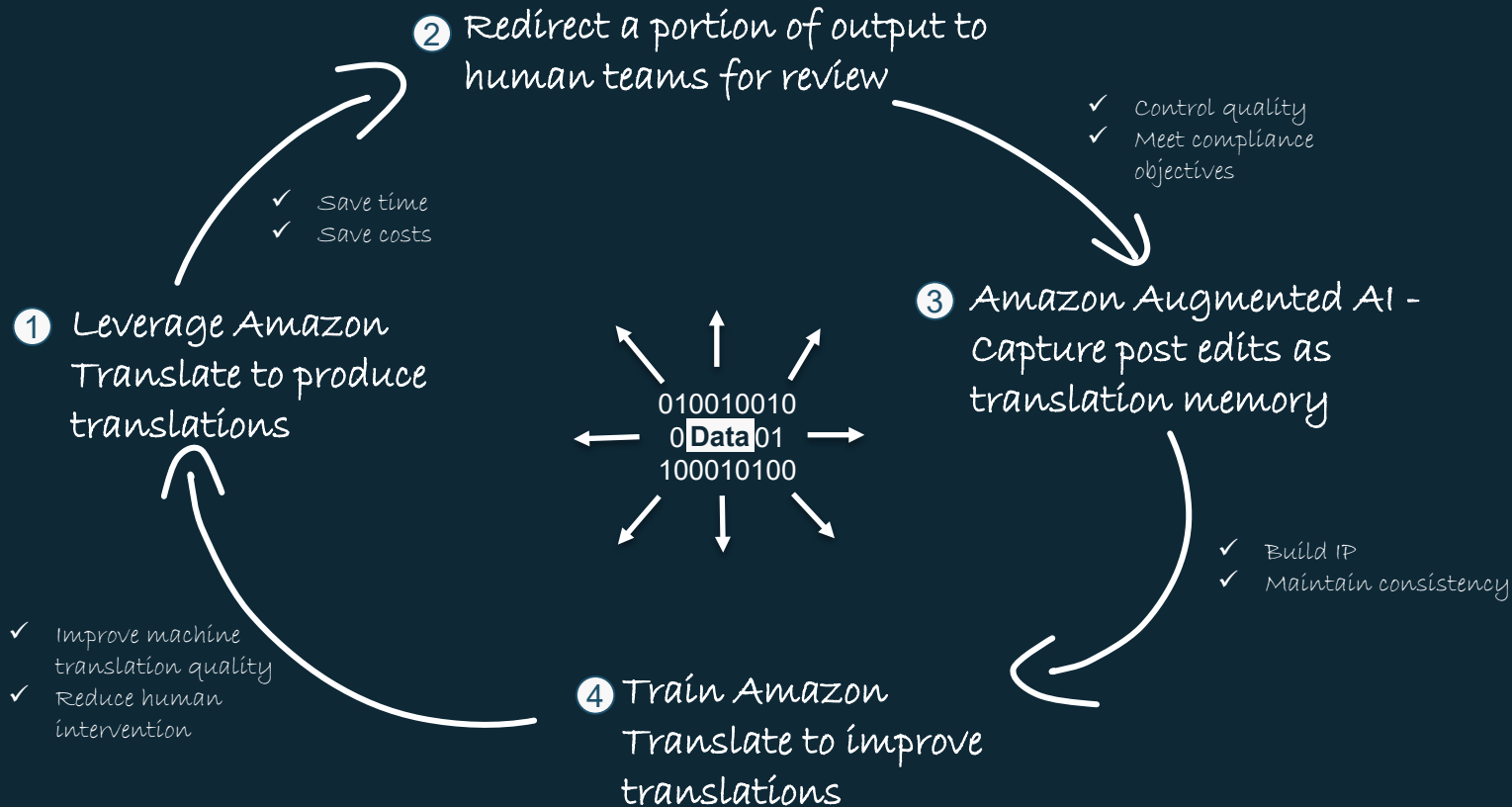
# How Amazon A2I works



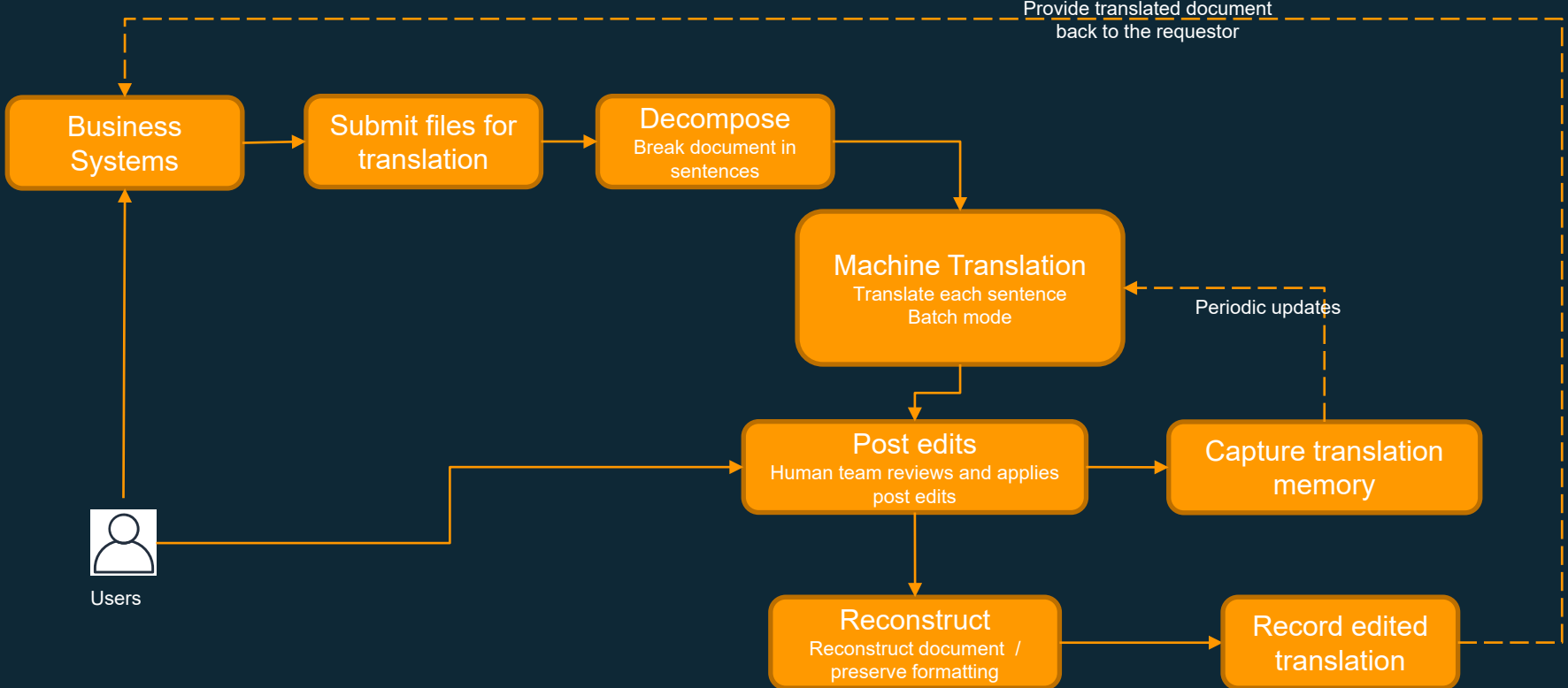
# Building the solution



# The Flywheel



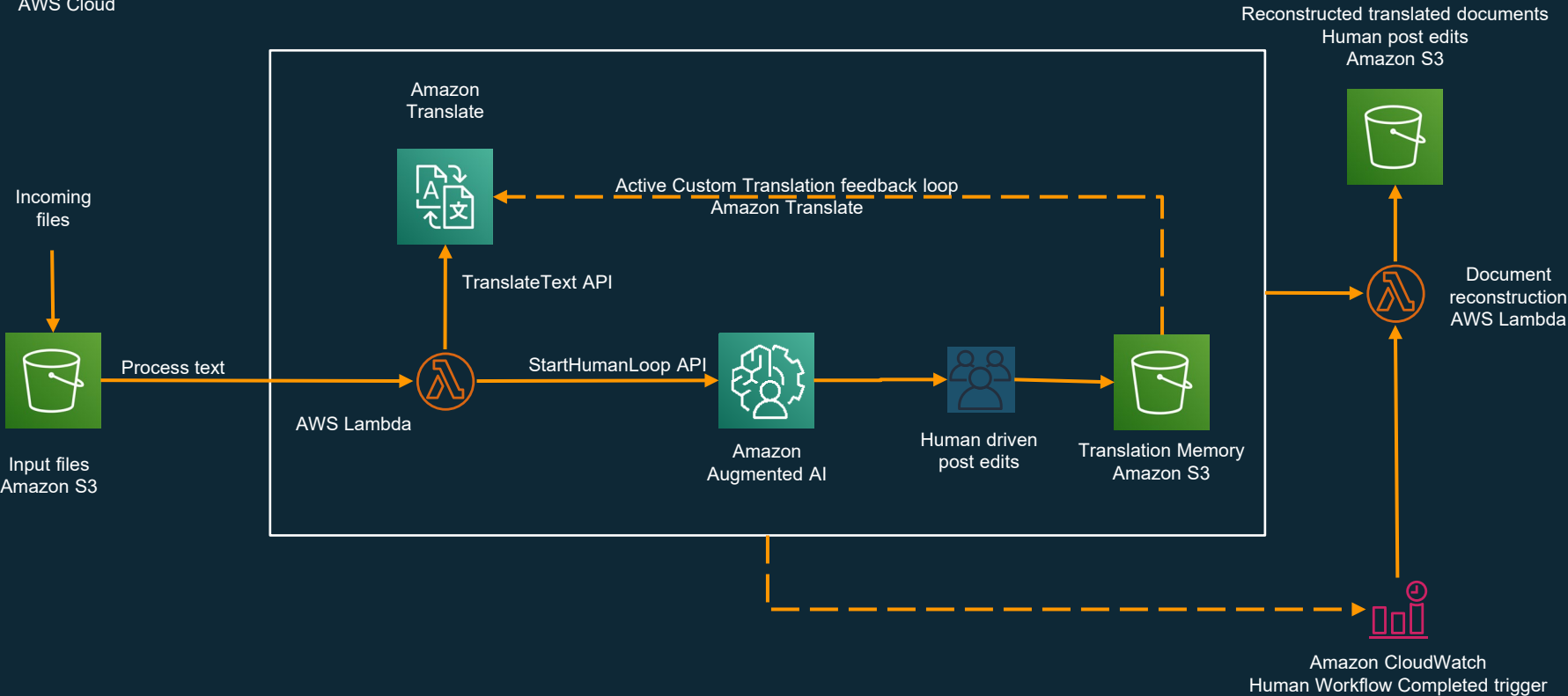
# Human in the loop – Process Flow



# Human in the loop – Solution Architecture



AWS Cloud



# Solution Features



- Serverless, pay as you go solution.
- Leverages **Amazon Translate (4970 language pairs)** to provide high-quality translation.
- **Event driven / batch driven** – can be easily plugged on existing systems
- **Support for docx, pptx, xlsx, HTML and plain text documents** with format preservation
- **Leverages Amazon Augmented AI** to securely drive human reviews and **capture translation memory** using post edits.
- Auto updates Amazon Translate on **captured translation memory** to continuously **evolve the translation model**.

As low as

19¢

per page

(Assuming 3000 characters per document, includes 1TB of S3 storage and AWS Lambda costs)



# Use Cases



# Deliver a versatile language experience

## Common use cases



Localization



Communication



Text analytics

# Localization

Reach a wider audience with localized content



## Localize enterprise content

Translate your websites, applications, and content assets based on your reader's preferred language

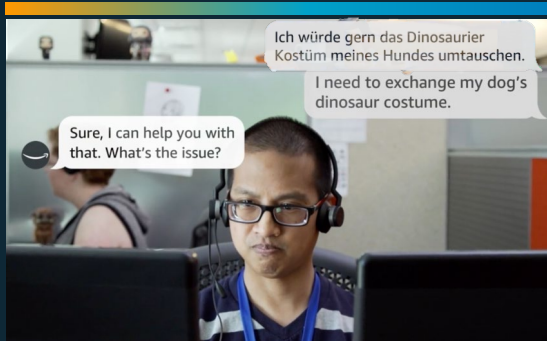


## Add subtitles in multiple languages

Improve the user experience by providing users with language options for subtitles

# Communication

Bridge the language gap with machine translation



## Improve customer service

Enable your call center agents to connect with users in any language



## Facilitate in-chat game

Increase gamer engagement and retention.



## Interact on social media

Allow your users to communicate freely across languages

# Text analytics

Analyze content efficiently across multiple language to discover insights at scale



## Evaluate voice of the customer

Enable post-call analytics across languages to comprehensively understand customer trends.



## Analyze media across languages

Review user generated content across languages to understand consumer sentiment and ensure community safety.



## Streamline eDiscovery

Process and analyze multilingual content into a standard language at scale.

# Reducing call handling time by 20% with real-time translation



- Deliveroo is an online food delivery company in EMEA
- Wanted a 2-way live chat translator to enable customers, riders (delivery personnel), and food establishment owners to talk to each other across language barriers.
- Built a translation service with Amazon Connect and Amazon Translate to automatically convert messages between languages during live chat sessions.
- [www.amazon.com/livechattranslate](http://www.amazon.com/livechattranslate)

“Amazon Translate is fast, accurate, and customizable to ensure that food item names, restaurant names, addresses, and customer names are translated correctly to create trustful conversational connections in uncertain times. By using Amazon Translate, our customer service agents were able to **increase their first call resolution to 83%** and **reduce the average call handling time for their customers by 20%.**”

— Amy Norris  
Product Manger, Deliveroo Customer care

# Extracting global financial insights from multilingual sources



**CAUSALITY LINK**

- Causality Link provides AI-powered research solutions for the financial sector
- Uses Amazon Translate to process sources all over the world such as news, broker research, earnings call transcripts, and filings.
- Processes more over 500 million characters in 24 languages each month to fuel their NLP-powered tool that guides investment decisions with news and information consolidated from around the world.

“It would be extremely challenging for our small team to manage and maintain multiple ML models, supporting ontology and NLP modules targeting multiple different languages. Having a high quality, high-capacity translation solution (Amazon Translate) enables us to focus our work on the best possible interpretation of English while allowing our reach to expand significantly in terms of global understanding.”

— Eric Jensen  
CTO & Co-Founder of Causality Link

# Customer Example

# AWS Professional Services



# Life Sciences - Adverse Events Translation



Customer wanted to:

- Accelerate translation process
- Reduce potential errors in human heavy process
- Improve the domain specific machine model
- Decrease time spent in human review

# Life Science Co. – Automating initial translation and human verification workflows to accelerate document availability and regulatory reporting



## Challenges

- US based life sciences customers have **15 days to report an adverse event** from day of reporting. Adverse events come in multiple languages.
- Availability of translated documents is necessary to **perform time-sensitive reviews**
- Manual document translations are **time-consuming and costly** - \$10M+ annually to translate ~500k events per year (~3.3Bn characters per year).
- Results are **inconsistent**



## Solution

- Use Amazon Translate to **perform initial translations**
- **Route translated output to a skilled reviewer** for verification/editing using Amazon Augmented AI
- **Capture and apply feedback from human reviews** to continuously improve quality & accuracy of initial translations over time (ACT)
- Develop a **rich user experience to manage and perform document translations** efficiently
- Provide built-in support for highly **regulated workloads**



## Results

- Centralized document translation solution **reduced delays** with visibility across workloads and work teams
- Automated translations and workflows to **reduce human dependencies/errors**
- **Streamlined user interface** to review/edit translated documents - maintain **audit history** for regulated workload
- Retain edits to **improve translations/evolve domain-specific model**
- **Accelerate document availability** (weeks to days)

-- Name of Speaker, Title

# Complex PDF Forms

Case ID: [REDACTED] (German to English) "test.pdf" uploaded by undefined undefined on May 27, 2021 14:27.

< 1 / 3 > 🔍 100% 🔍

## Source Document

| PATIENTENKARTEN  |  |   |                                     |  |  |                          |
|--|--|---|-------------------------------------|--|--|--------------------------|
| Patienten-Initialen<br>(Vorname Nachname)  | geburtsdatum geburtsort<br>(TT.MM.JJJJ) (oder /) | Größe [cm]  | Gewicht [kg]                        | Geschlecht   | Schwangerschaft  |                          |
| [REDACTED]   | [REDACTED]                                       |   |                                     | <input type="checkbox"/> m <input checked="" type="checkbox"/> w | <input checked="" type="checkbox"/> Nein <input type="checkbox"/> Ja |                          |
| Patientennummer  | Referenznummer                                   | Andere Referenznummer   | Projektnummer                       | Studiennummer/name   | Schwangerschaftswoche  |                          |
| [REDACTED]   | [REDACTED]                                       | [REDACTED]  | [REDACTED]                          | [REDACTED]   | [REDACTED]   |                          |
| Follow up AE 20_1711   |  | [REDACTED]  | [REDACTED]                          | [REDACTED]   | Geburtsdatum:  |                          |
| Produktname, -stärke   |  |   |                                     |  |  |                          |
| [REDACTED]   |  | Darreichungsform <b>Pumpe</b>   |                                     |  |  |                          |
| Indikation(en)/<br>Grundkrankungen   |  | Dosierung/ Applikationsfrequenz   |                                     |  |  |                          |
| Parkinson  |  | MD 8.0mg / KRIT 4.2mg/h / KRIN 4.2mg/h / ED 2.5ml   |                                     |  |  |                          |
| Beginn der Therapie<br>(TT.MM.JJJJ)  |  | Therapeutikum/<br>Änderung der Therapie aufgrund des UE   |                                     |  |  |                          |
| April 2011   |  | <input checked="" type="checkbox"/> Unverändert <input type="checkbox"/> Geändert <input type="checkbox"/> Pausiert <input type="checkbox"/> Abge |                                     |  |  |                          |
| Ende der Therapie<br>(TT.MM.JJJJ)  |  | Neue Dosierung/Applikationsfrequenz<br>(falls zutreffend) seit (TT.MM.JJJJ)   |                                     |  |  |                          |
| Chargennummer (z.B. Datenabab)   |  | <input type="checkbox"/> <b>NEU! GEWISSENHAF NICHT GEWISSEN WAS</b>   |                                     |  |  |                          |
| 20F10GZ7B  |  | <input type="checkbox"/> <b>NEU! GEWISSENHAF NICHT GEWISSEN WAS</b>   |                                     |  |  |                          |
|  |  | <input type="checkbox"/> <b>NEU! GEWISSENHAF NICHT GEWISSEN WAS</b>   |                                     |  |  |                          |
| Unerwünschtes Ereignis (AE)  |  |   |                                     |  |  |                          |
| NO   | Unerwünschtes Ereignis (AE)                      | Beginn<br>(TT.MM.JJJJ)  | WENN 17_1030/1711<br>bzw. andauernd | Ausgang  | Ereigniskriterium  | Zusammenhang<br>ABV/IE-# |
| 1  | Reizmittel (Nervengabe) verursacht keine Wirkung | unbekannt   |                                     | Nicht wiederholt   | Nichts zutreffend  | Nicht beric              |
| 2  | weiterhin schlecht beweglich                     | Juni 2020   |                                     | Nicht wiederholt   | Nichts zutreffend  | Nicht beric              |
| 3  |  |   |                                     |  |  |                          |
| 4  |  |   |                                     |  |  |                          |
| 5  |  |   |                                     |  |  |                          |
| FST: <b>Hospitalisierung:</b>  |  | Aufnahmedatum   |                                     | Entlassungsdatum   |  |                          |
| Fall: <b>Todesdatum</b>  |  | Autopsie: <input type="checkbox"/> Ja <input type="checkbox"/> Nein <input type="checkbox"/> unbekannt  |                                     | Todesursache:  |  |                          |
| Welche andere(n) Ursache(n) liegen nach Meinung des Reporters dem Ereignis zugrunde? (Alternative Ätiologie) |  |   |                                     |  |  |                          |

## Translated Document

| PATIENTENKARTEN  |  |   |                                     |  |  |                          |
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| Patienten-Initialen<br>(Vorname Nachname)  | geburtsdatum geburtsort<br>(TT.MM.JJJJ) (oder /) | Größe [cm]  | Gewicht [kg]                        | Geschlecht   | Schwangerschaft  |                          |
| [REDACTED]   | [REDACTED]                                       |   |                                     | <input type="checkbox"/> m <input checked="" type="checkbox"/> w | <input checked="" type="checkbox"/> Nein <input type="checkbox"/> Ja |                          |
| Patientennummer  | Referenznummer                                   | Andere Referenznummer   | Projektnummer                       | Studiennummer/name   | Schwangerschaftswoche  |                          |
| [REDACTED]   | [REDACTED]                                       | [REDACTED]  | [REDACTED]                          | [REDACTED]   | [REDACTED]   |                          |
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| Produktname, -stärke   |  |   |                                     |  |  |                          |
| [REDACTED]   |  | Darreichungsform <b>Pumpe</b>   |                                     |  |  |                          |
| Indikation(en)/<br>Grundkrankungen   |  | Dosierung/ Applikationsfrequenz   |                                     |  |  |                          |
| Parkinson  |  | MD 8.0mg / KRIT 4.2mg/h / KRIN 4.2mg/h / ED 2.5ml   |                                     |  |  |                          |
| Beginn der Therapie<br>(TT.MM.JJJJ)  |  | Therapeutikum/<br>Änderung der Therapie aufgrund des UE   |                                     |  |  |                          |
| April 2011   |  | <input checked="" type="checkbox"/> Unverändert <input type="checkbox"/> Geändert <input type="checkbox"/> Pausiert <input type="checkbox"/> Abge |                                     |  |  |                          |
| Ende der Therapie<br>(TT.MM.JJJJ)  |  | Neue Dosierung/Applikationsfrequenz<br>(falls zutreffend) seit (TT.MM.JJJJ)   |                                     |  |  |                          |
| Chargennummer (z.B. Datenabab)   |  | <input type="checkbox"/> <b>NEU! GEWISSENHAF NICHT GEWISSEN WAS</b>   |                                     |  |  |                          |
| 20F10GZ7B  |  | <input type="checkbox"/> <b>NEU! GEWISSENHAF NICHT GEWISSEN WAS</b>   |                                     |  |  |                          |
|  |  | <input type="checkbox"/> <b>NEU! GEWISSENHAF NICHT GEWISSEN WAS</b>   |                                     |  |  |                          |
| Unerwünschtes Ereignis (AE)  |  |   |                                     |  |  |                          |
| NO   | Unerwünschtes Ereignis (AE)                      | Beginn<br>(TT.MM.JJJJ)  | WENN 17_1030/1711<br>bzw. andauernd | Ausgang  | Ereigniskriterium  | Zusammenhang<br>ABV/IE-# |
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| 2  | weiterhin schlecht beweglich                     | Juni 2020   |                                     | Nicht wiederholt   | Nichts zutreffend  | Nicht beric              |
| 3  |  |   |                                     |  |  |                          |
| 4  |  |   |                                     |  |  |                          |
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| Welche andere(n) Ursache(n) liegen nach Meinung des Reporters dem Ereignis zugrunde? (Alternative Ätiologie) |  |   |                                     |  |  |                          |

## Translated Text

Edit the text blocks and submit to improve the translations on the final document.

### Request Reviewer

is

and

continues to be Changed

bad

movable.

The

Neurologist

has

the requested delegation agreement has not yet been faxed back.  
On 01.11.2020, the general practitioner comes to the patient for home visit. The patient is then treated with

General practitioner talk about the delegation agreement and ask her to sign it and fax it to the hotline. Once the delegation is available, the

Optimized promptly.

EN/ABV/3917/2749

Version: 2.0

Page 1 of 3

# Public Document

## Source Document

### Mercury (planète)

Mercury est la planète la plus proche du Soleil et la moins massive du Système solaire<sup>[1]</sup>. Son éloignement au Soleil est compris entre 0,31 et 0,47 unité astronomique (soit 46 et 70 millions de kilomètres), ce qui correspond à une excentricité orbitale de 0,2 — plus de deux fois supérieure à celle de la Terre, et de loin la plus élevée pour une planète du Système solaire. Elle est visible à l'œil nu depuis la Terre avec un diamètre apparent de 10 à 13 secondes d'arc, et une magnitude apparente de 0,3 à -2,9 : cette observation est toutefois rendue difficile par son éloignement toujours important à 20% qui la rend le plus souvent dans l'ombre du Soleil. En pratique, cette proximité avec le soleil implique qu'elle ne peut être vue que près de l'horizon occidental après le coucher du soleil ou près de l'horizon oriental avant le lever du soleil, en général au crépuscule. Mercury a la particularité d'être en résonance spin-orbite 3:2, sa période de révolution (-88 jours) valant exactement 1,5 fois sa période de rotation (-59 jours), et donc le tourner 1,5 tour autour du soleil (-176 jours). Ainsi, lorsque aux époques fixes, elle tourne sur son axe exactement trois fois toutes les deux révolutions autour du Soleil.



Mercury vue par la sonde MESSENGER, le 14 janvier 2008.

| Caractéristiques orbitales   |   |
|------------------------------|---|
| Demi-grand axe               | 57 900 050 km (0,387 098 <sup>[1]</sup> au) |
| Aphélie                      | 69 816 900 km (0,466 701 au)                |
| Périhélie                    | 46 001 200 km (0,307 499 au)                |
| Circonférence orbitale       | 350 966 400 km (2,406 228 au)               |
| Excentricité                 | 0,2056 <sup>[2]</sup>                       |
| Période de révolution        | 87,969 <sup>[3]</sup> jours                 |
| Période synodique            | 115,88 d                                    |
| Vitesse orbitale moyenne     | 47,362 km/s                                 |
| Vitesse orbitale maximale    | 58,98 km/s                                  |
| Vitesse orbitale minimale    | 38,86 km/s                                  |
| Inclinaison sur l'écliptique | 7,00°                                       |
| Nœud ascendant               | 48,33°                                      |
| Argument du périhélie        | 29,12°                                      |
| Satellites connus            | 0   |

| Caractéristiques physiques |            |
|----------------------------|------------|
| Rayon équatorial           | 2 439,7 km |

Mercury est une planète tellurique, comme le sont également Vénus, la Terre et Mars. Elle est près de trois fois plus petite et presque vingt fois moins massive que la Terre mais presque aussi dense qu'elle. Sa densité remarquable — dépassée seulement par celle de la Terre, qui lui serait d'ailleurs inférieure sans l'effet de la compression gravitationnelle — est due à l'importance de son noyau métallique, qui représentent 85 % de son rayon, contre environ 35 % pour la Terre.

Comme Vénus, Mercury est quasiment sphérique — son aplatissement pourrait être considéré comme nul — en raison de sa rotation très lente. **Observatoire de ventrale atmosphère pour la protection des universités (OVSU)** qu'une exosphère exerçant une pression au sol de moins de 1 nPa ou 10<sup>-14</sup> atm), sa surface est très fortement craterisée et globalement similaire à la face cachée de la Lune, indiquant qu'elle est géologiquement inactive depuis des milliards d'années. Cette absence d'atmosphère contribue à la possibilité du Soleil engendrer des températures en surface allant de 90 K (-183 °C) au fond des cratères polaires (à où les rayons du Soleil ne parviennent jamais) jusqu'à 700 K (427 °C) au point subsolaire au périhélie. La planète est par ailleurs dépourvue de satellites naturels.

Seules deux sondes spatiales ont étudié Mercury : Mariner 10, qui survola à trois reprises la planète en 1974-1975, cartographia 45 % de sa surface et découvrit l'existence de son champ magnétique. La sonde MESSENGER, après trois survols en 2008-2009, se met en orbite autour de Mercury en mars 2011 et réalise une étude détaillée notamment de sa topographie, son histoire géologique, son champ magnétique et son exosphère. La sonde BepiColombo a pour objectif de se mettre en orbite autour de Mercury en décembre 2025. La planète Mercury doit son nom au messager des dieux dans la mythologie romaine, Mercury. La planète est nommée ainsi par les Romains à cause de la vitesse avec laquelle elle se déplace dans le ciel. Le symbole

## Translated Document

### Mercury (planet)

Mercury is the closest planet to the Sun and the least massive of Solar System its remoteness to the Sun is between 0.31 and 0.47 astronomical unit (46 and 70 million kilometers), which corresponds to an orbital eccentricity of 0.2 — more than double that of the Earth, and by far the highest for a planet of the System Solar. It is visible to the naked eye from the Earth with an apparent diameter of 10 to 13 arc seconds, and an apparent magnitude of 0.3 to -2.9: this observation is however made difficult by its ever-lower elongation to the Sun, which makes it only be seen just after the horizon west after sunset or near the eastern horizon before sunrise from the pole, usually at dawn. Mercury has the particularity of being in 3:2 spin-orbit resonance, its period of revolution (-88 days) being exactly 1.5 times its rotation period (-59 days), and therefore half of a solar day (-176 days). Thus, relative to fixed stars, it turns on its axis exactly three times every two revolutions around the Sun.



Mercury seen by MESSENGER probe, on 14 January 2008.

| Orbital characteristics       |   |
|-------------------------------|---|
| Semi-major axis               | 57 900 050 km (0,387 098 <sup>[1]</sup> au) |
| Aphelion                      | 69 816 900 km (0,466 701 au)                |
| Perihelion                    | 46 001 200 km (0,307 499 au)                |
| Orbital circumference         | 350 966 400 km (2,406 228 au)               |
| eccentricity                  | 0,2056 <sup>[2]</sup>                       |
| Period of Revolution          | 87,969 <sup>[3]</sup> days                  |
| Synodic Period                | 115,88 d                                    |
| Average orbital velocity      | 47,362 km/s                                 |
| Maximum orbital speed         | 58,98 km/s                                  |
| Minimum orbital speed         | 38,86 km/s                                  |
| Inclination over the ecliptic | 7,00°                                       |
| Ascending Node                | 48,33°                                      |
| Perihelion Argument           | 29,12°                                      |
| Known satellites              | 0   |

| Physical characteristics |            |
|--------------------------|------------|
| Equatorial ray           | 2 439,7 km |

Like Venus, Mercury is almost spherical - its flattening which can be considered null - due to its very slow rotation. **Without a real atmosphere to protect it from meteorites (there is only a thin exosphere exerting a pressure on the ground of less than 1 nPa or 10<sup>-14</sup> atm), its surface is very heavily cratered and globally similar to the hidden face of the Moon, indicating that it is geologically inactive since billions of years. This lack of atmosphere combined with the proximity of the Sun generates surface temperatures ranging from 90 K (-183 °C) at the bottom of the craters (where the sun's rays never reach) to 700 K (427 °C) at the subsolar point at perihelion. The planet is also devoid of natural satellites.**

Only two space probes studied Mercury: Mariner 10, which flew over on three times the planet in 1974-1975, mapping 45% of its surface and discovered the existence of its magnetic field. The MESSENGER probe, after three overflights in 2008-2009, enters orbit around Mercury in March 2011 and carried out a detailed study of its topography, its geological history, its magnetic field and its exosphere. The probe BepiColombo aims to enter orbit around Mercury in December 2025. Mercury owes its name to the messenger of the gods in Roman mythology. Mercury. The planet is named so by the Romans because of the speed with which it moves through the sky. The symbol

## Translated Text

Edit the text blocks and submit to improve the translations on the final document.

### Request Reviewer

(u,385 earth)

horn-shaped circle (Unicode: ☿). This is a representation of the

Polar beam Changed

2,439.7 km

caduceus of the god Hermes, equivalent of Mercury in Greek mythology.

(0.384 Earth)

Mercury also gave its name to the third day of the week, Wednesday

Medium radius

2,439.7 km ←

("Mercuri dies"?)

volumetric

(0,383 Earth)

Flattening Changed

0

Submit



# Next Steps



# How we can help

## Solution architects



- Engage with a solution architect dedicated to your account
- Brainstorm use cases and get support for solution implementation
- <https://aws.amazon.com/contact-us/>

## AWS Professional Services Team



- Identify key areas where machine learning could help you with an AWS AI expert
- Let AWS experts build POCs and custom solutions for your use case

# Other resources

AWS Machine Learning Blog

## Designing human review workflows with Amazon Translate and Amazon Augmented AI

by Mayank Thakkar and Purnesh Tripathi | on 29 MAY 2020 | in Amazon Augmented AI, Amazon Translate, Artificial Intelligence | Permalink |

Comments | Share

The world is becoming smaller as many businesses and organizations expand globally. As businesses expand their reach to wider audiences across different linguistic groups, their need for interoperability with multiple languages increases exponentially. Most of the industry work is manual, slow, and expensive human effort, with many industry verticals struggling to find a scalable, reliable, and cost-effective solution. Amazon Translate is a neural machine translation service that delivers fast, high-quality, and affordable language translation. Amazon Translate provides high quality on-demand and batch translation capabilities across more than 2970 language pairs, while decreasing your translation costs.

Amazon Translate is constantly learning and evolving to provide exceptional output. In domain-sensitive applications such as legal, medical, construction, and engineering, you can always improve translation quality by using Amazon Translate custom terminology. This is a great approach for most use cases, but some outliers might require light post-editing by human teams. The post-editing process can help you better understand the needs of your customers by capturing the nuances of local language that can get lost in translation. Human translators armed with machine translation can help you localize more content, faster, more affordably and into more languages.

For such businesses and organizations that want to augment the output of Amazon Translate (and other Amazon AI services) with human intelligence, Amazon Augmented AI (Amazon A2I) provides a managed approach to do so. Amazon

<https://www.amazon.com/hitl-translation>

The screenshot shows a GitHub repository page for 'aws-samples / amazon-translate-augmented-ai'. The repository is on the 'master' branch. A commit by 'mbtaws' titled 'Fixed Typo' is highlighted, dated 'on May 28' with '7' comments. The commit history table lists several files and their commit types: 'code' (Fixed typo), 'images' (Initial Commit), '.gitignore' (Updated to MIT license), 'CODE\_OF\_CONDUCT.md' (Initial commit), 'CONTRIBUTING.md' (Initial commit), 'LICENSE' (Initial Commit), and 'README.md' (Fixed Typo). Below the commit history, the 'README.md' content is visible, featuring the title 'translate-a2i-human-workflow' and a description: 'An Amazon Translate and Amazon Augmented AI driven workflow to post edit machine translated documents.' The section 'Solution Architecture' is also visible.

<https://github.com/aws-samples/amazon-translate-augmented-ai>

# Questions & Answers







# Call Center: Enhance customer-agent communication with translation



## Challenges

- Self-service virtual agents: Limited language availability. Customers are forced to interact in secondary languages
- Real-time communication: Customers often have to wait for an agent that speaks their language
- Post call analytics: Previously unmined call center notes present an untapped opportunity to gain additional insights in customer interactions.
- Quality translations required for downstream workflows like entity extraction and sentiment analysis.



## Results

- Human in the loop solution can handle 137 language pairs.
- Costs less \$0.19 per page to process.
- Allows for human review of translated documents.
- Post edits captured and fed back into Amazon Translate to continuously improve domain specificity.

# Localization of video content: Increase customer reach



## Challenges

- Localizing video content in a timely manner at scale to meet production timelines is expensive and slow
- Customers often has specific terminology that is unique to their use case or business



## Results

- Human in the loop solution can handle 137 language pairs.
- Costs less \$0.19 per page to process.
- Allows for human review of translated documents.
- Post edits captured and fed back into Amazon Translate to continuously improve domain specificity.