AWS
TRANSFORMATION DAY
BENELUX

An introduction to Amazon AI

Julien Simon, Principal Technical Evangelist, AWS @julsimon
Wojciech Soltysiak, CTO, CHAMP Cargosystems

23/05/2017

amazon web services

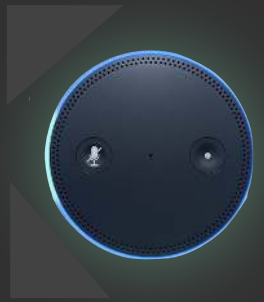
Artificial Intelligence At Amazon

Thousands Of Employees Across The Company Focused on AI

Discovery & Search

Fulfilment & Logistics

Enhance Existing Products



Define New Categories Of Products

Bring Machine Learning To All

amazon
KIVA

NATURE VALLEY
CRUNCHY
Nature Valley Oats 'n Honey...

JUST ASK

amazon
Prime Air
amazon

Beautiful things, updated daily

amazon go
NO LINES. NO CHECKOUT.
(NO, SERIOUSLY.)

Our Mission

Leverage Supply Chain Data across all stakeholders, improving Visibility, improving Cost to Serve, support Network Design and help to drive Organizational Efficiency.

DISCOVER

Get insights from real-time static data.

DIGITIZE

Enrich static data with digital sources, smart machines, sensors, blockchain

PREDICT

Use cognitive services to detect possible future events or triggers.

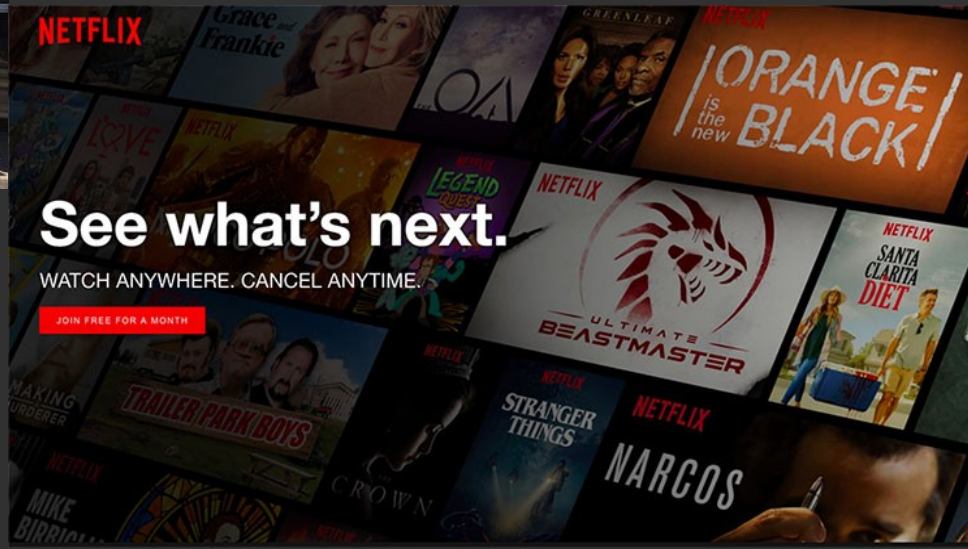
Not so long ago…

- 60.000 people, 1800 stores
- US, UK, Japan, Canada, Brazil, Australia…
- Dominant market position in 80', 90'…

WENT BANKRUPT IN 2010

- Rocky start in 1997
- Market capitalization 60B USD
- Technology pioneer

ALREADY BIGGER THAN DVR



"Each time history repeats itself, the price goes up"

Since 2000, 46% of the companies in the Fortune 500 have dropped off the list and since 1955 88% of companies are gone.

Disruption removing, and creating companies

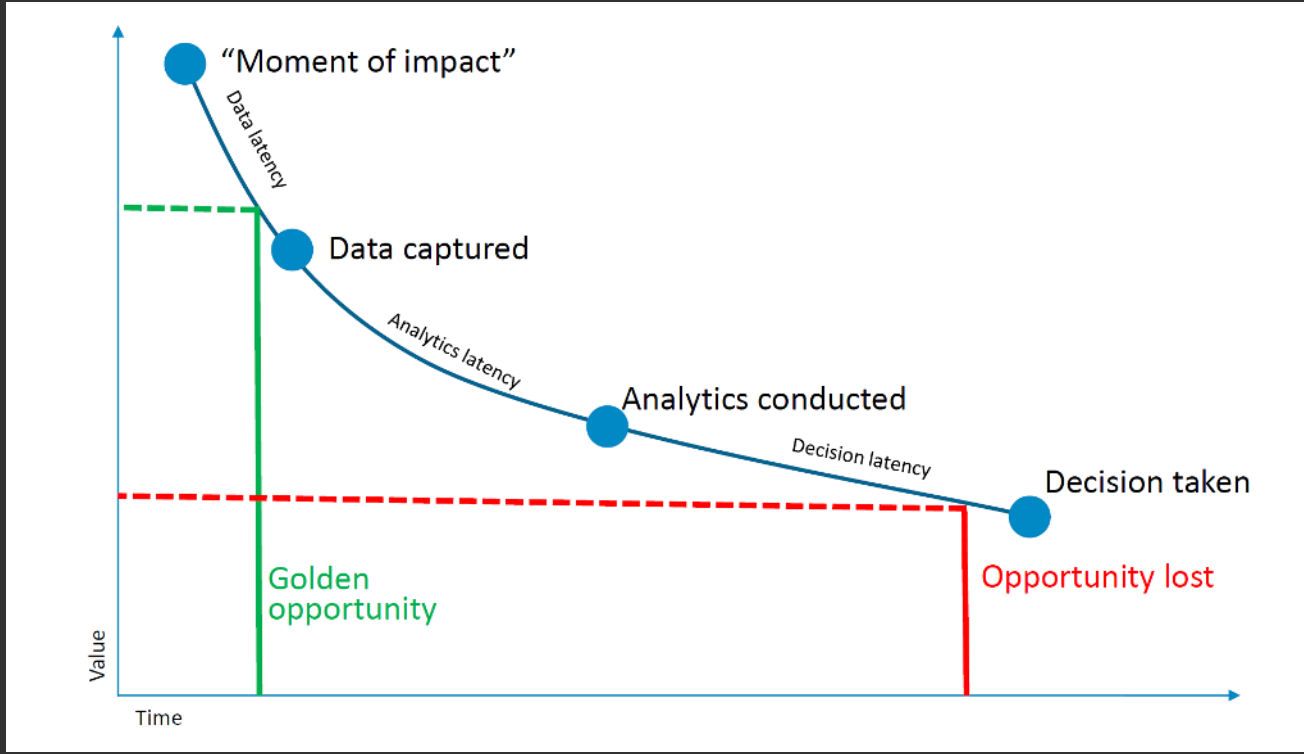
* Gartner

Change is Continuous, but Not Consistent

Incremental

Transformational

Paradigm shift: Faster = Digital



* Gartner

Technology Democratization

Upcoming work change in logistics…

Smart Machines –
From Tool to Team Member

Smart Machines –
Future Paradigm Shift

80.000

Books about managing people

10

Books about managing robots

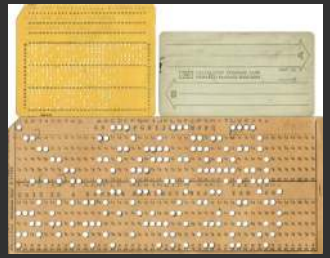
*Source: Gartner/Amazon

Humans and Smart Machines are starting to coexist

Source: Mercedes-Benz:
www.mercedes-benz.com/en/mercedes-benz/innovation/the-long-haul-truck-of-the-future

All next generation planes coming after 2020 are prepared to be UAV!

Our interactions are evolving…



60

30

10

?

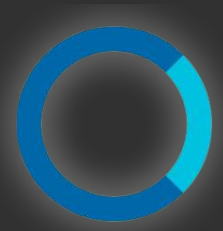
Conversational Access

Natural

On-Demand

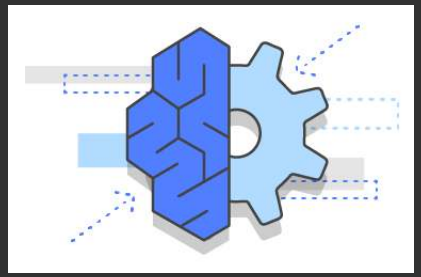
Accessible

Efficient



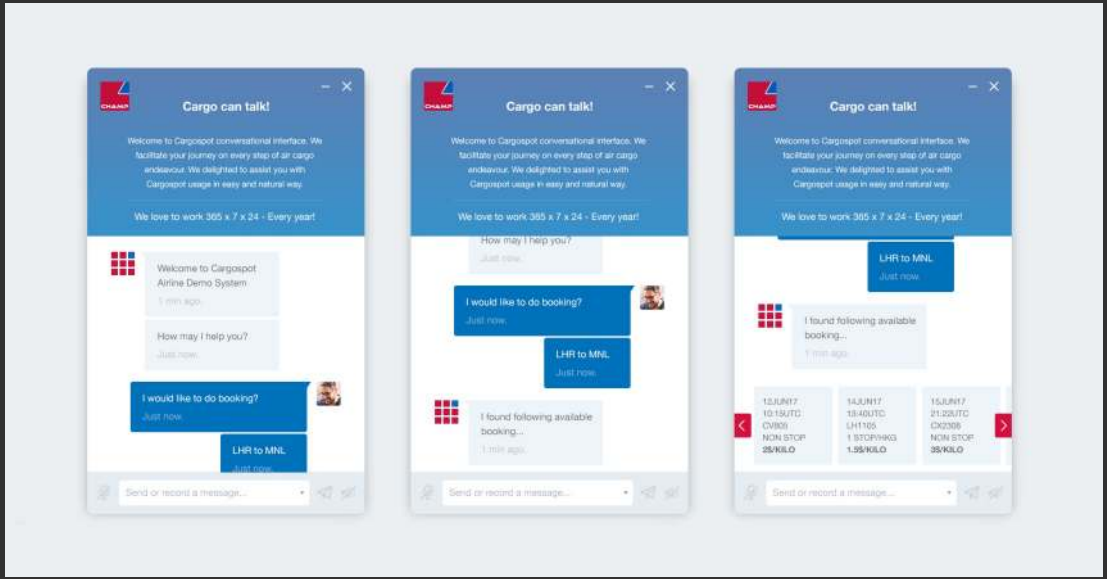
Alexa
Skills Kit

Alexa
Voice Service



AWS
Artificial Intelligence

CHAMP Voice Chatbot for Cargo application



AWS Services used

- Amazon Lex
- Amazon Polly
- AWS Lambda
- Amazon API Gateway

AWS services planned

- Amazon Machine Learning
- Amazon Cognito

Meet Alexa:

Air Cargo World

TAKE A
LOAD OFF,
LEAVE THE LOGISTICS TO US.

WCS 2017: Get ready for air cargo disruption on the Horizon

MARCH 13, 2017
BY RANDY WOOD

ABU DHABI, UAE — For most of the last 50 years, the symbol of a successful "future" has been the long-promised, never-realized flying car. While most of us have long ago given up dreams of seeing these hybrids to the air in real life, that is exactly the catalyst that has driven entrepreneur Svilen Rangelov and his aeronautical brother, Konstantin, to develop the prototype of an unmanned drone that will soon be able to

Will the air cargo industry hire Alexa?

MARCH 17, 2017
BY CHARLES KAUFFMAN

With the release of a new "Cargo Trace skill" that can be taught to Amazon's interactive app, Alexa, Luxembourg-based CHAMP Cargosystems is adding voice-controlled track-and-trace capabilities to its *Traxon* air cargo shipment tracking platform.

Stakeholders in the air cargo supply chain will be able to track the status of air cargo shipments moving on dozens of airlines simply by dictating the eleven-digit waybill numbers to an Alexa-equipped device.

CHAMP Cargosystems is teaching Amazon's Alexa a few lessons about air cargo.

CHAMP Cargosystems CEO, Arnaud Lambert said of the Alexa skill on social media, "Why do we restrict ourselves to keys, mouse and finger swipes? Lets's approach air cargo efficiency from a different angle: voice." He added, "This is only the start of the new User Experience program."

WCS 2017: Disruption finally hits air cargo as carriers pivot

MARCH 15, 2017
BY LEWIS KING

ABU DHABI — There has been talk in recent years about the wave of digital disruption coming to air cargo.

hat wave appears to have arrived.

nce-KLM Martinair Cargo, as an example, is on its way to true digital transformation, said Laurent angin, the carrier's Vice President Marketing, Digital & Communication. Petitmangin said Air France-KLM has undertaken a project to improve its data quality – an important step toward incorporating more data ics into its operations.

ecided to lead the change," Petitmangin told the packed Digital Transformation track at IATA's WCS 2017 in order to be "closer to the customers."

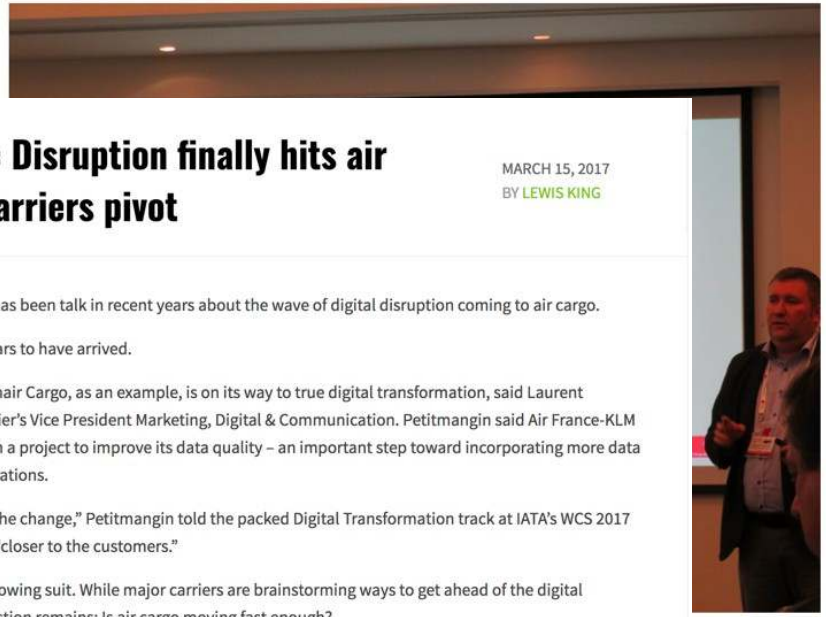
carriers are following suit. While major carriers are brainstorming ways to get ahead of the digital tion, a key question remains: Is air cargo moving fast enough?

ing to WCS panelists, stakeholders need to pick up the pace.

tion is coming," said Celine Hourcade, head of cargo transformation at IATA.

WCS17: Innovation, building windmills in Abu Dhabi

14 / 03 / 2017



mbraces

That was the clear message from the horizon innovation forum held in Abu Dhabi on the eve of the opening of today's IATA World Cargo Symposium 2017 at the ADNEC exhibition and conference centre.

Amazon AI: Three New Deep Learning Services

Lex

Conversational Engine

Polly

Life-like Speech

Rekognition

Image Analysis

Amazon Lex

Text and Speech Language Understanding

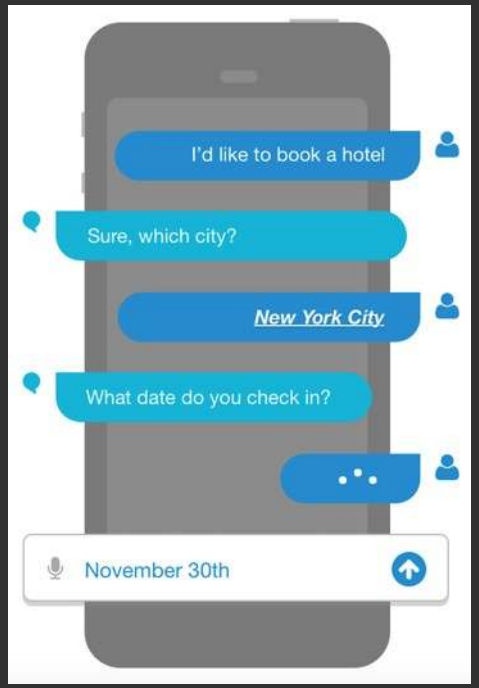
Speech Recognition

Natural Language Understanding

Powered by the same Deep Learning technology as Alexa

Lex Bot Structure

BookHotel

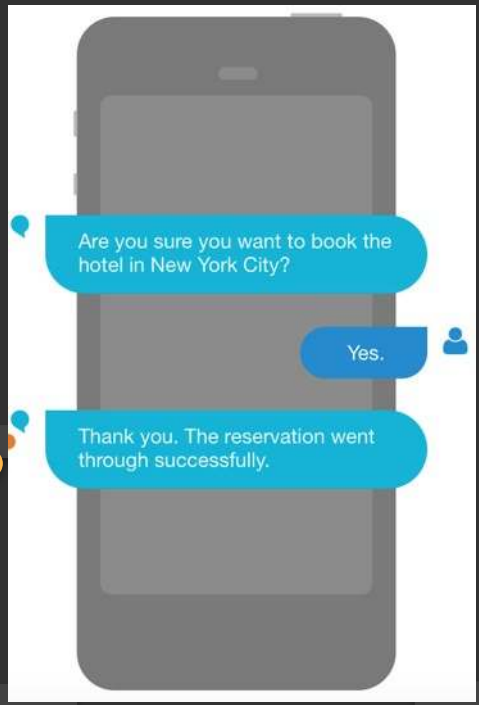


Intents
An Intent performs an action in response to natural language user input

Utterances
Spoken or typed phrases that invoke your intent

Slots
Slots are input data required to fulfill the intent

Fulfillment
Fulfillment mechanism for your intent



Utterances

I'd like to book a hotel

I want to make my hotel reservations

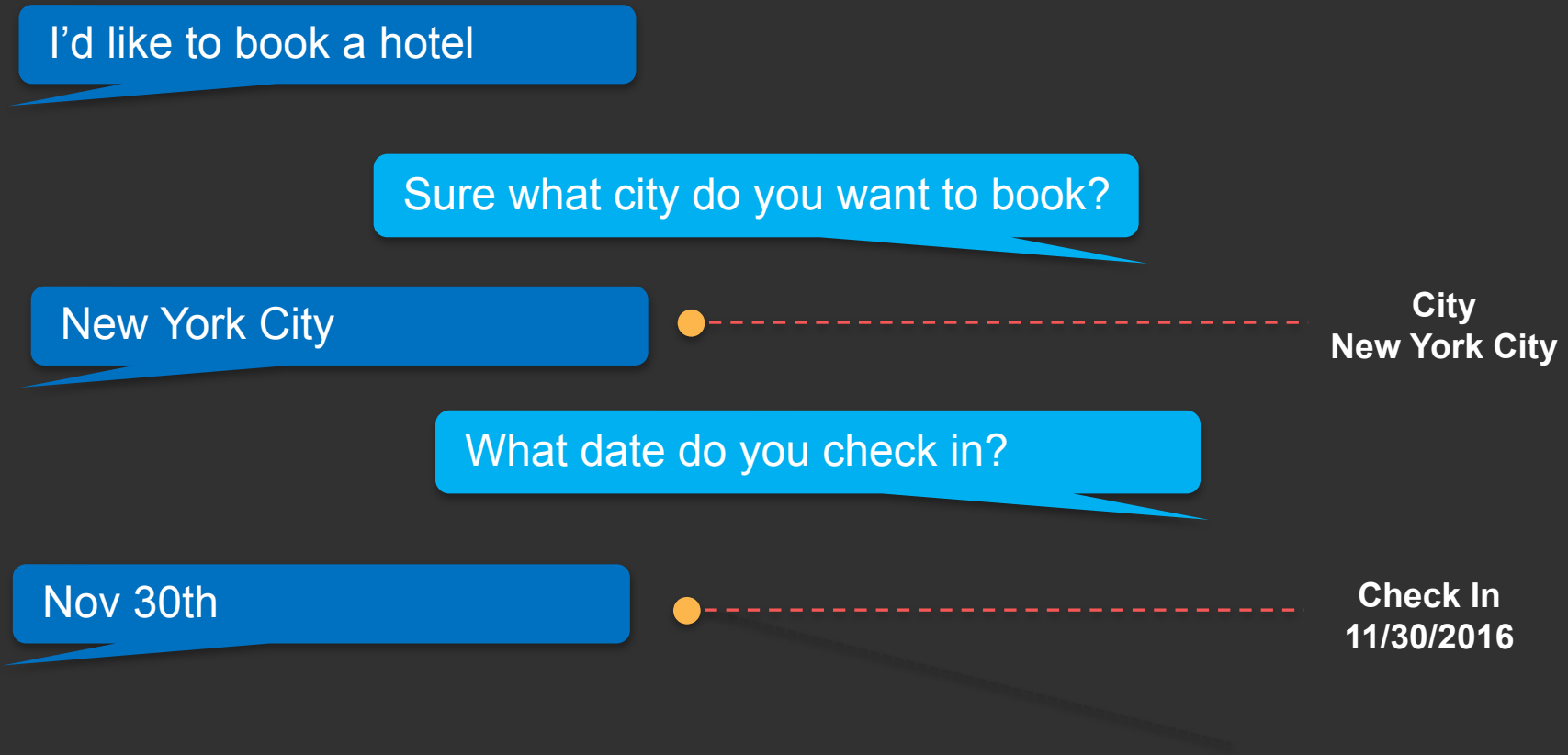
Can you help me book my hotel?

I want to book a hotel in New York City

Slots

Slot	Type	Values
destination	City	New York City, Seattle, London, …
Check In	Date	Valid dates
Check Out	Date	Valid dates

Slot Elicitation



Fulfillment

Intents and slots passed to AWS Lambda function for business logic implementation.

AWS Lambda Integration

User input parsed to derive intents and slot values. Output returned to client for further processing.

Return to Client

Amazon Polly

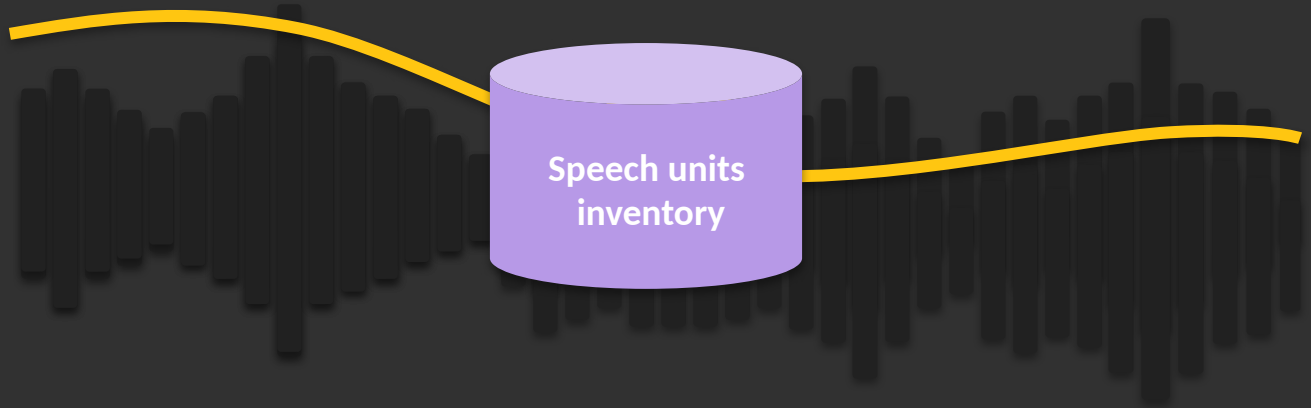
TEXT PROCESSING

Market | grew | by | > | 20%.

Market | grew | by | more than | twenty percent

ˈmɑɹ.kət | ˈgɹu | baɪ | ˈmoʊɹ ˈðæn | ˈtwɛn.ti pɚ. ˈsɛnt

UNIT SELECTION & CONCATENATION



Amazon Polly

- A service that converts text into lifelike speech
- Offers 47 lifelike voices across 24 languages
- Low latency responses enable developers to build real-time systems
- Developers can store, replay and distribute generated speech

Amazon Polly: Language Portfolio

EMEA:

- British English
- Danish
- Dutch
- French
- German
- Icelandic
- Italian
- Norwegian
- Polish
- Portuguese
- Romanian
- Russian
- Spanish
- Swedish
- Turkish
- Welsh
- Welsh English

Americas:

- Brazilian Portuguese
- Canadian French
- English (US)
- Spanish (US)

APAC:

- Australian English
- Indian English
- Japanese

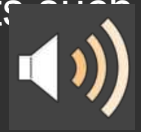
Amazon Polly: Quality

Natural sounding speech

A subjective measure of how close TTS output is to human speech.

Accurate text processing

Ability of the system to interpret common text formats such as abbreviations, numerical sequences, homographs etc.



Today in Las Vegas, NV it's 54°F.

"We live for the music", live from the Madison Square Garden.

Highly intelligibile

A measure of how comprehensible speech is.

”Peter Piper picked a peck of pickled peppers.”

Amazon Polly features: SSML

Speech Synthesis Markup Language

is a W3C recommendation, an XML-based markup language for speech synthesis applications

```
<speak>
    My name is Kuklinski. It is spelled
    <prosody rate='x-slow'>
        <say-as interpret-as="characters">Kuklinski</say-as>
    </prosody>
</speak>
```

Amazon Polly features: Lexicons

Enables developers to customize the pronunciation of words or phrases

My daughter's name is Kaja.

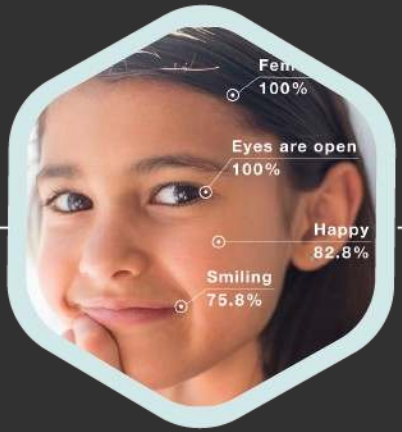
```
<lexeme>
    <grapheme>Kaja</grapheme>
    <grapheme>kaja</grapheme>
    <grapheme>KAJA</grapheme>
    <phoneme>"kaI.@</phoneme>
</lexeme>
```

Amazon Rekognition

Amazon Rekognition

Deep learning-based image recognition service
Search, verify, and organize millions of images

Object and Scene Detection



Facial Analysis

Face Comparison

Facial Recognition

Amazon Rekognition API

Object and Scene Detection

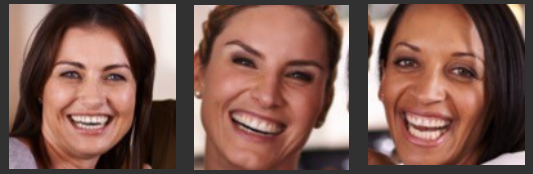
Detect objects, scenes, and concepts in images

DetectLabels

```
{
    "Confidence": 94.62968444824219,
    "Name": "adventure"
},
{
    "Confidence": 94.62968444824219,
    "Name": "boat"
},
{
    "Confidence": 94.62968444824219,
    "Name": "rafting"
},
. . .
```

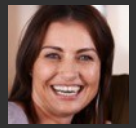
Amazon Rekognition API

DetectFaces



Facial Analysis

Detect face and key facial characteristics




```
[
    {
        "BoundingBox": {
            "Height": 0.3449999988079071,
            "Left": 0.09666666388511658,
            "Top": 0.27166667580604553,
            "Width": 0.23000000417232513
        },
        "Confidence": 100,
        "Emotions": [
            {"Confidence": 99.1335220336914,
                "Type": "HAPPY" },
            {"Confidence": 3.3275485038757324,
                "Type": "CALM"},
            {"Confidence": 0.31517744064331055,
                "Type": "SAD"}
        ],
        "Eyeglasses": {"Confidence": 99.8050537109375,
            "Value": false},
        "EyesOpen": {Confidence": 99.99979400634766,
            "Value": true},
        "Gender": {"Confidence": 100,
            "Value": "Female”}
```

Amazon Rekognition API

Face Comparison

Face-based user verification

CompareFaces

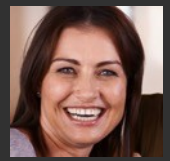

```
{
    "FaceMatches": [
        {"Face": {"BoundingBox": {
                    "Height": 0.2683333456516266,
                    "Left": 0.5099999904632568,
                    "Top": 0.1783333271741867,
                    "Width": 0.17888888716697693},
                "Confidence": 99.99845123291016},
            "Similarity": 96
        },
        {"Face": {"BoundingBox": {
                    "Height": 0.2383333295583725,
                    "Left": 0.6233333349227905,
                    "Top": 0.3016666769981384,
                    "Width": 0.15888889133930206},
                "Confidence": 99.71249389648438},
            "Similarity": 0
        }
    ],
    "SourceImageFace": {"BoundingBox": {
            "Height": 0.23983436822891235,
            "Left": 0.28333333134651184,
            "Top": 0.351423978805542,
            "Width": 0.1599999964237213},
        "Confidence": 99.99344635009766}
}
```

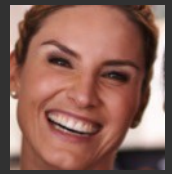
Amazon Rekognition API

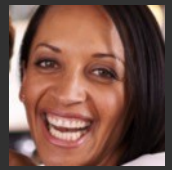
IndexFace

{
f7a3a278-2a59-5102-a549-a12ab1a8cae8,
02e56305-1579-5b39-ba57-9afb0fd8782d,
4c55926e-69b3-5c80-8c9b-78ea01d30690
}

Face







transformed

Face ID & vector<float>

f7a3a278-2a59-5102-a549-a12ab1a8cae8
&
v1

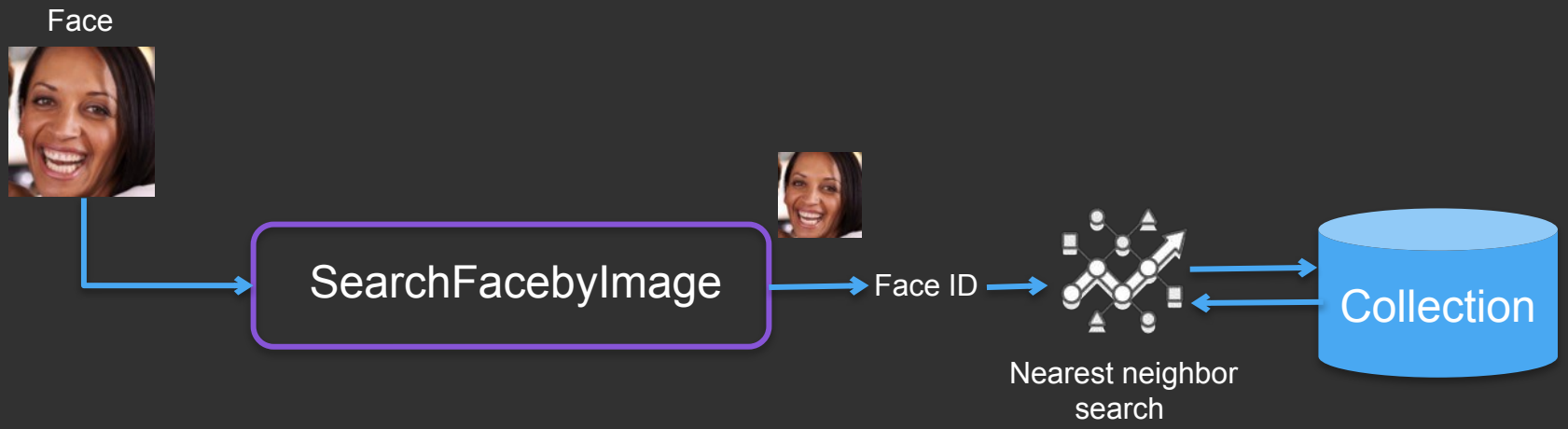
02e56305-1579-5b39-ba57-9afb0fd8782d
&
v2

4c55926e-69b3-5c80-8c9b-78ea01d30690
&
v3

stored

Collection

Amazon Rekognition API



{
f7a3a278-2a59-5102-a549-a12ab1a8cae8,
02e56305-1579-5b39-ba57-9afb0fd8782d,
4c55926e-69b3-5c80-8c9b-78ea01d30690
}

AWS
TRANSFORMATION DAY
BENELUX

Thank you!

Julien Simon, Principal Technical Evangelist, AWS @julsimon
Wojciech Soltysiak, CTO, CHAMP Cargosystems

amazon web services