

# Machine Learning Section

# Amazon Rekognition



- Find **objects, people, text, scenes** in **images and videos** using ML
- **Facial analysis** and **facial search** to do user verification, people counting
- Create a database of “familiar faces” or compare against celebrities
- Use cases:
  - Labeling
  - Content Moderation
  - Text Detection
  - Face Detection and Analysis (gender, age range, emotions...)
  - Face Search and Verification
  - Celebrity Recognition
  - Pathing (ex: for sports game analysis)

<https://aws.amazon.com/rekognition/>

# Amazon Transcribe



- Automatically **convert speech to text**
- Uses a **deep learning process** called **automatic speech recognition (ASR)** to convert speech to text quickly and accurately
- **Automatically remove Personally Identifiable Information (PII)** using Redaction
- **Supports Automatic Language Identification** for multi-lingual audio
- Use cases:
  - transcribe customer service calls
  - automate closed captioning and subtitling
  - generate metadata for media assets to create a fully searchable archive



*"Hello my name is Stéphane.  
I hope you're enjoying the course!"*

# Amazon Polly

- Turn text into lifelike speech using deep learning
- Allowing you to create applications that talk



*Hi! My name is Stéphane  
and this is a demo of Amazon Polly*



# Amazon Translate



- Natural and accurate **language translation**
- Amazon Translate allows you to **localize content** - such as websites and applications - for **international users**, and to easily translate large volumes of text efficiently.

Source language

Auto (auto) ▼

Hi my name is Stéphane



Target language

French (fr) ▼

Bonjour, je m'appelle Stéphane.

Portuguese (pt) ▼

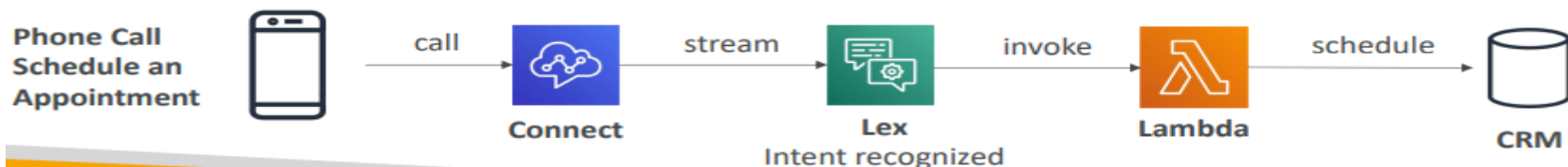
Oi, meu nome é Stéphane.

Hindi (hi) ▼

हाय मेरा नाम स्टीफन है

# Amazon Lex & Connect

- **Amazon Lex:** (same technology that powers Alexa)
  - Automatic Speech Recognition (ASR) to convert speech to text
  - Natural Language Understanding to recognize the intent of text, callers
  - Helps build chatbots, call center bots
- **Amazon Connect:**
  - Receive calls, create contact flows, cloud-based **virtual contact center**
  - Can integrate with other CRM systems or AWS
  - No upfront payments, 80% cheaper than traditional contact center solutions



# Amazon Comprehend

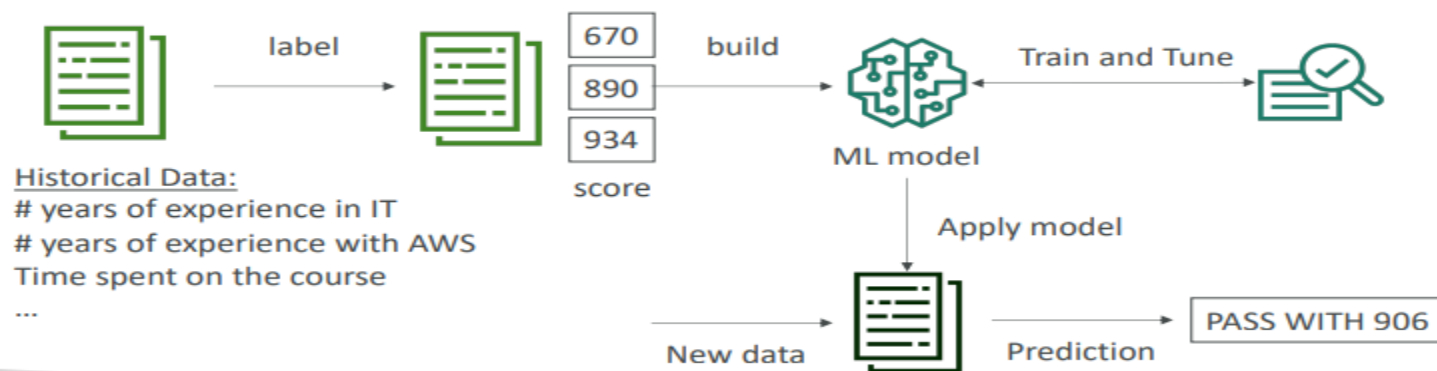


- For **Natural Language Processing – NLP**
- Fully managed and serverless service
- Uses machine learning to find insights and relationships in text
  - Language of the text
  - Extracts key phrases, places, people, brands, or events
  - Understands how positive or negative the text is
  - Analyzes text using tokenization and parts of speech
  - Automatically organizes a collection of text files by topic
- Sample use cases:
  - analyze customer interactions (emails) to find what leads to a positive or negative experience
  - Create and groups articles by topics that Comprehend will uncover

# Amazon SageMaker



- Fully managed service for developers / data scientists to build ML models
- Typically, difficult to do all the processes in one place + provision servers
- Machine learning process (simplified): predicting your exam score





# Amazon Forecast



- Fully managed service that uses ML to deliver highly accurate forecasts
- Example: predict the future sales of a raincoat
- 50% more accurate than looking at the data itself
- Reduce forecasting time from months to hours
- Use cases: Product Demand Planning, Financial Planning, Resource Planning, ...

## Historical Time-series Data:

Product features

Prices

Discounts

Website traffic

Store locations

...



upload



Amazon S3



Amazon Forecast

produce



Forecasting Model

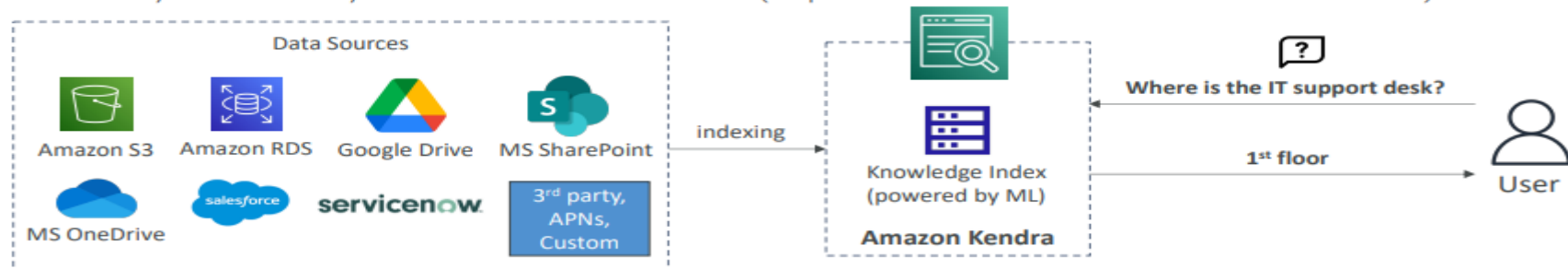


Future sales  
of raincoat:  
\$500,000

# Amazon Kendra



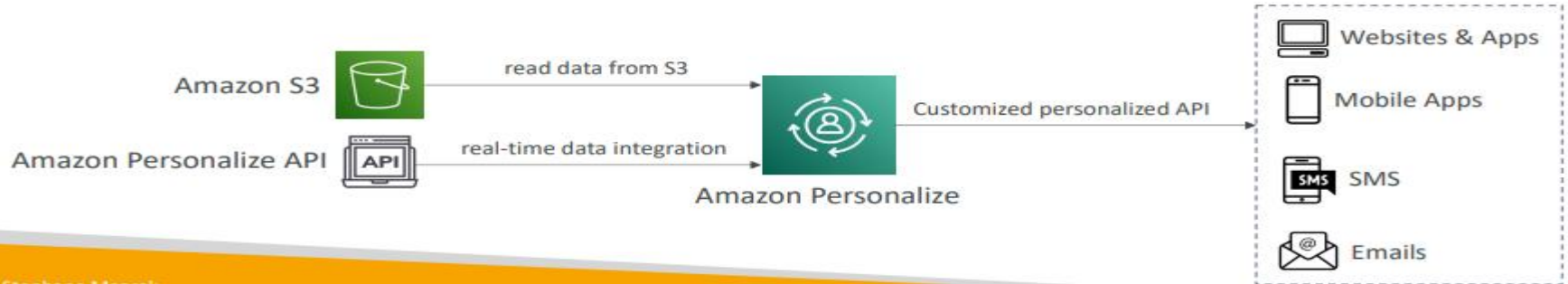
- Fully managed **document search service** powered by Machine Learning
- Extract answers from within a document (text, pdf, HTML, PowerPoint, MS Word, FAQs...)
- Natural language search capabilities
- Learn from user interactions/feedback to promote preferred results (**Incremental Learning**)
- Ability to manually fine-tune search results (importance of data, freshness, custom, ...)



# Amazon Personalize



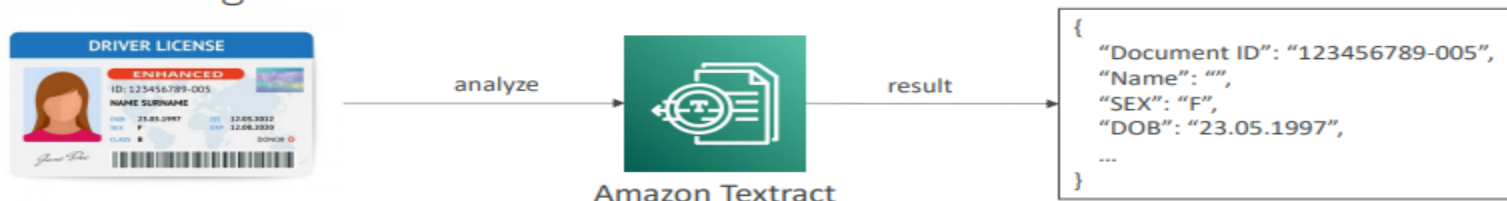
- Fully managed ML-service to build apps with real-time personalized recommendations
- Example: personalized product recommendations/re-ranking, customized direct marketing
  - Example: User bought gardening tools, provide recommendations on the next one to buy
- Same technology used by Amazon.com
- Integrates into existing websites, applications, SMS, email marketing systems, ...
- Implement in days, not months (you don't need to build, train, and deploy ML solutions)
- Use cases: retail stores, media and entertainment...



# Amazon Textract



- Automatically extracts text, handwriting, and data from any scanned documents using AI and ML



- Extract data from forms and tables
- Read and process any type of document (PDFs, images, ...)
- Use cases:
  - Financial Services (e.g., invoices, financial reports)
  - Healthcare (e.g., medical records, insurance claims)
  - Public Sector (e.g., tax forms, ID documents, passports)

# AWS Machine Learning - Summary

- **Rekognition:** face detection, labeling, celebrity recognition
- **Transcribe:** audio to text (ex: subtitles)
- **Polly:** text to audio
- **Translate:** translations
- **Lex:** build conversational bots – chatbots
- **Connect:** cloud contact center
- **Comprehend:** natural language processing
- **SageMaker:** machine learning for every developer and data scientist
- **Forecast:** build highly accurate forecasts
- **Kendra:** ML-powered search engine
- **Personalize:** real-time personalized recommendations
- **Textract:** detect text and data in documents