aws

Modernize your document workflows

Intelligent Document Processing Workshop
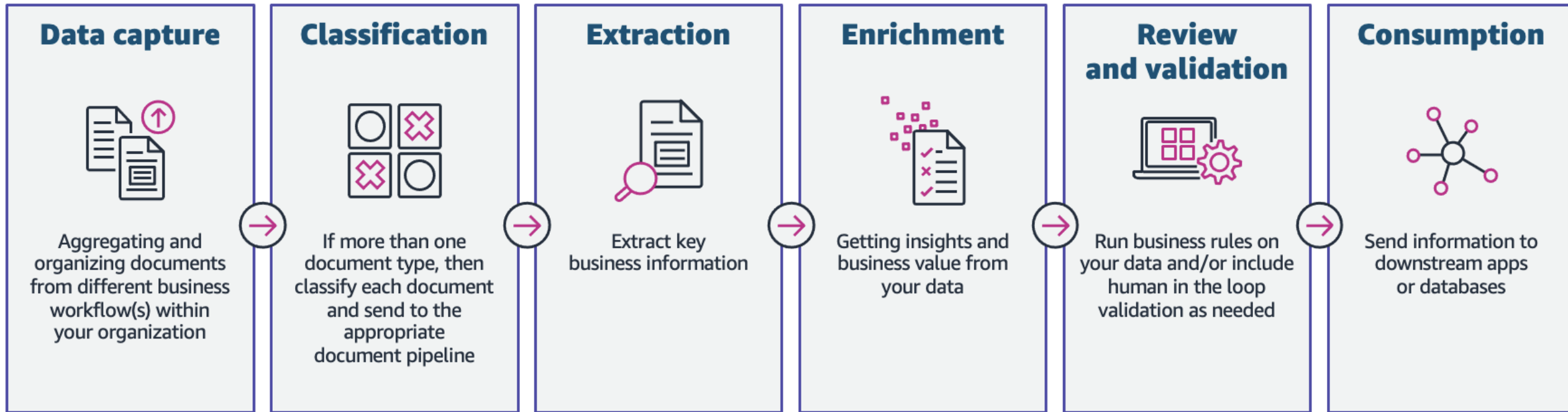
Agenda

- Introduction – IDP immersion day
  - 11.00 – 11.15 CEST(DE) /10.00 – 10.15 GMT(UK)
- Introduction – Intelligent Document Processing
  - 11.15 – 12.00 CEST(DE) /10.15 – 11.00 GMT(UK)
- Module 1 – Document Classification
  - Intro, 12.00 – 12.45 CEST(DE) /11.00 – 11.45 GMT(UK)
  - Lab Part 1, 12.45 – 13.15 CEST(DE) /11.45 – 12.15 GMT(UK)
- Lunch Break
  - 13.15 – 14.00 CEST(DE) /12.15 – 13.00 GMT(UK)
- Module 1 - – Document Classification
  - Lab Part 2, 14.00 – 14.15 CEST(DE) /13.00 – 13.15 GMT(UK)

- Module 2 - Extraction and Enrichment
  - Extraction, Intro, Lab - 14.15 – 14.45 CEST(DE) /13.15 – 13.45 GMT(UK)
  - Enrichment, Intro, Lab - 14.45 – 15.30 CEST(DE) /13.45 – 14.30 GMT(UK)
- Break
  - 15:30 – 15:45 CEST(DE) /14.30 – 14.45 GMT(UK)
- Module 3 - Generative AI + IDP
  - Intro, 15:45 - 16:00 CEST(DE) / 14:45 - 15:00 GMT(UK)
  - Lab, 16:00 - 16:45 CEST(DE) / 15:00 – 15.45 GMT(UK)
- Conclusion
  - 16:45 – 17.00 CEST(DE) /15.45 – 16.00 GMT(UK)

Data capture

Aggregating and organizing documents from different business workflow(s) within your organization

→

Classification

If more than one document type, then classify each document and send to the appropriate document pipeline

→

Extraction

Extract key business information

→

Enrichment

Getting insights and business value from your data

→

Review and validation

Run business rules on your data and/or include human in the loop validation as needed

→

Consumption

Send information to downstream apps or databases

Intelligent document processing with AWS AI services

Document Extraction

Go beyond OCR with accurate, versatile information extraction

INPUT ⟶ **OUTPUT**

Raw Text

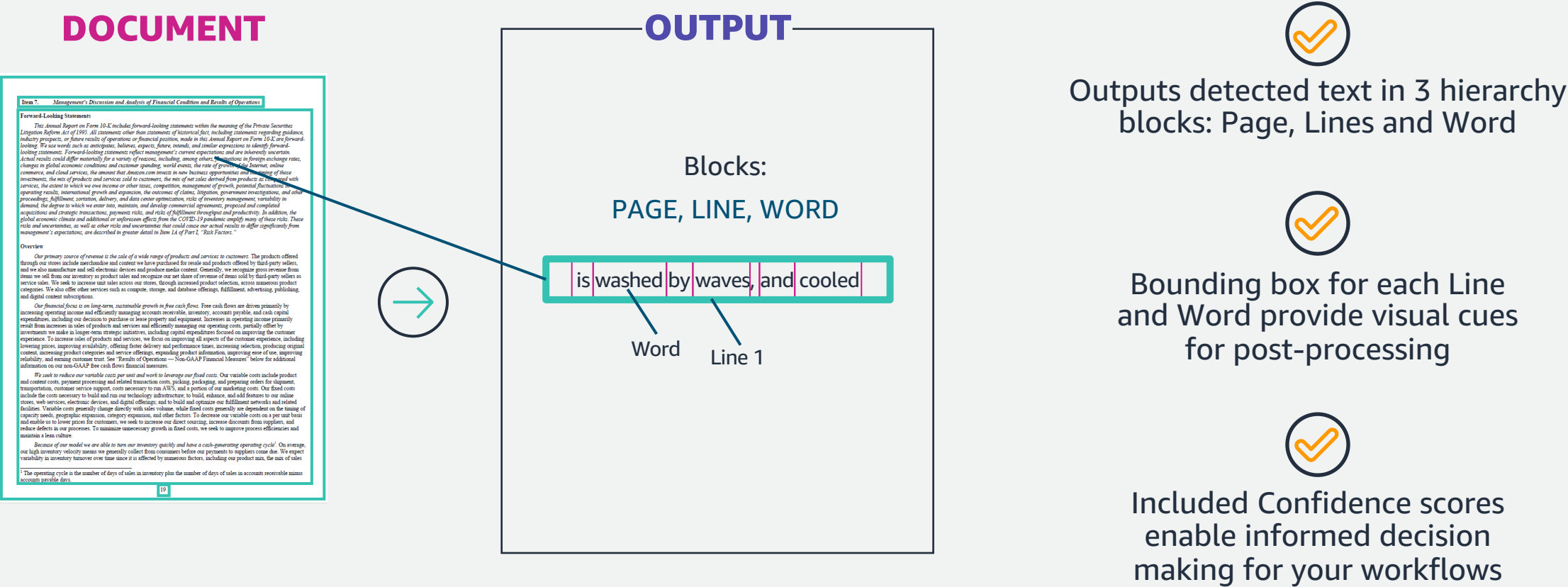|		
Employment Application	Application Information	Full Name: Jane Doe
Phone Number: 555-0100	Home Address: 123 Any street, Any Town. USA	

Forms

Job fair	Website
SELECTED	NOT_SELECTED

Table Recognition

7/1/2011	8/10/2013	Example Corp.	Baker	better opp.

Industry leading OCR accuracy for text extraction

DOCUMENT

OUTPUT

Blocks:

PAGE, LINE, WORD

is washed by waves, and cooled

Word Line 1

Outputs detected text in 3 hierarchy blocks: Page, Lines and Word

Bounding box for each Line and Word provide visual cues for post-processing

Included Confidence scores enable informed decision making for your workflows

Semi-structured extraction

Extract form data from documents as key-value pairs to preserve document structure

DOCUMENT

OUTPUT

Blocks:

PAGE, KEY_VALUE_SET

Example Output:

First: John

Middle: X

Last: Doe

MM: 01
DD: 01
YYYY: 1971

Male: True
Female: False

Outputs form field name (Key) and field value name (Value) with relationship data intact

Captures logical groupings, relationships, and glyphs

Output also includes confidence scores, and geometry info
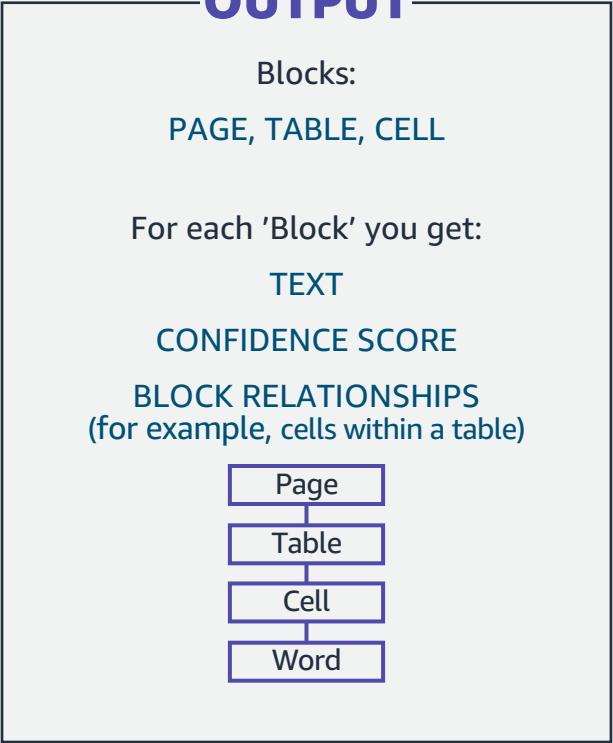
Structured extraction

Extract tables from documents while preserving data structure and relationships

DOCUMENT

Previous employment history				
Start date	End date	Employer name	Position held	Reason for leaving
1/15/2009	6/30/2013	Any company	Head Baker	Family relocated
8/15/2013	Present	Example corp.	Baker	N/A, current employer

→

OUTPUT

Blocks:

PAGE, TABLE, CELL

For each 'Block' you get:

TEXT

CONFIDENCE SCORE

BLOCK RELATIONSHIPS
(for example, cells within a table)

Page
Table
Cell
Word

✓ Outputs recognized tables with relationships data intact

✓ Intelligently groups cells within tables and words within each cell

✓ Output also includes confidence scores, geometry info, and row/column indexes

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Specialized Documents – Invoices and receipts

Specialized support to process invoices and receipts at scale

DOCUMENT

OUTPUT

Summary Fields:
Vendor Name: WHOLE FOODS MARKET
Subtotal (SUBTOTAL): $3.50
Net Sales (OTHER): $3.50
Tax/Fee (TAX): $0.39
Sold Items (OTHER): 1
Paid (OTHER):
Debit (OTHER): $3.89
Tax/Fee Total (TAX): $0.39
Total (TOTAL): $3.89

Line Items:
ITEM: Pizza Slice
PRICE: $3.50

Outputs headline amounts, line item details and inferred fields (like Vendor Name)

Supports any style of invoice or receipt

No templates or configuration required

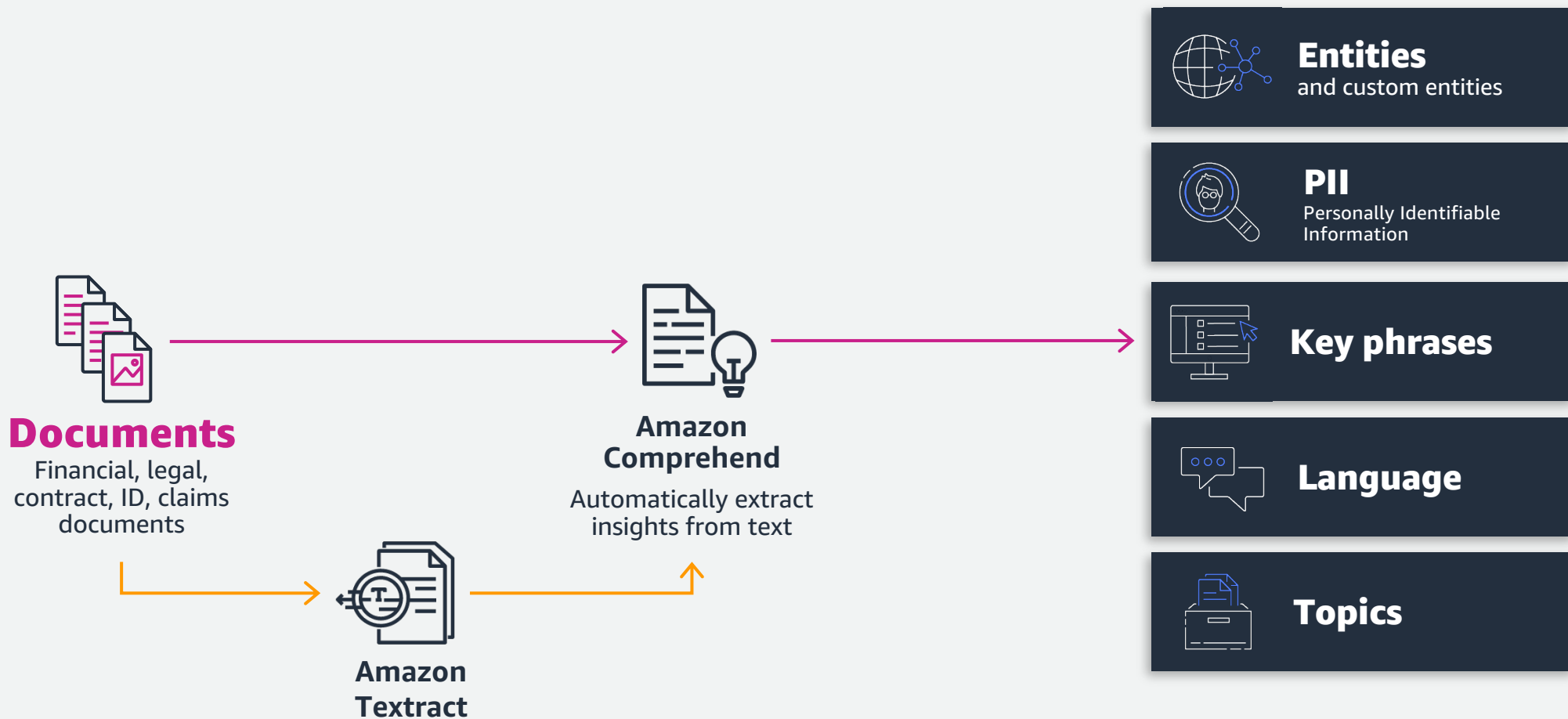# Specialized Documents – Identity documents

Specialized support for identity documents

DOCUMENT

OUTPUT

First Name: JORGE
Last Name: SOUZA
Middle Name:
Address Line1: 100 MAIN STREET
Address Line 2:
City: ANYTOWN
State: MA
Document Number: 820BAC729CBAC
Expiration Date: 01/20/2020
Date of Birth: 03/18/1978
ID Type: Driver License
Date of Issue: 03/18/1978
Issued By: MASSACHUSETTS
Class: D
Restrictions: NONE
Endorsements: NONE

95%+ accuracy for US driver licenses and passports

No Templates or Configuration required

Outputs normalized field names and supports implied elements

Document Extraction Lab

Enrichment

IDP enrichment with Amazon Comprehend
Discover insights and relationships in text

Entities and custom entities

PII Personally Identifiable Information

Key phrases

Language

Topics

Documents Financial, legal, contract, ID, claims documents

Amazon Comprehend Automatically extract insights from text

Amazon Textract

IDP enrichment with Amazon Comprehend

Redaction of sensitive data

DOCUMENT TEXT

Hi, my name is John Doe. For verification, the last 4 digits of my social are 6789 and my DOB is 01/01.

Hi, my name is [NAME]. For verification, the last 4 digits of my social are [SSN] and my DOB is [DATE_TIME].

Recognize common entities

DOCUMENT TEXT

Budget Mutual insurance Company 9876 Infinity Ave

Springfield, MI 65541

Client Laura McDaniel and date of death is 6/15/20202

OUTPUT

Organization: Budget Mutual insurance Company

Location: 9876 Infinity Ave Springfield, MI 65541

Date: 6/15/20202

Recognize entities specific to your business

DOCUMENT TEXT

Hi my name is John. I am filing a claim for a car accident, my insurance number is 456-YQT.

OUTPUT

Summary fields:
Category of entity:
            Policy_ID
Entity: 456-YQT
Confidence: **0.95**

Automated Custom Entity Recognizer training

1

Prepare examples

Entity list/annotations

Entity value	Entity type
XT2457	PART
Renew subscription	ACTION
SD5578	PART
Cancel the order	ACTION

+

- Documents containing terms and phrases in text
- 100 examples per entity type recommended

2

Train Comprehend

- Automated or user-created annotations, automated algorithm selection, tuning and testing
- SDK or code-free Console UX

3

Analyze

Hello, my name is John Doe and thank you for calling AnyCompany. I understand you are calling about part number XT2457. We have that part on back order and we are expediting it for you.
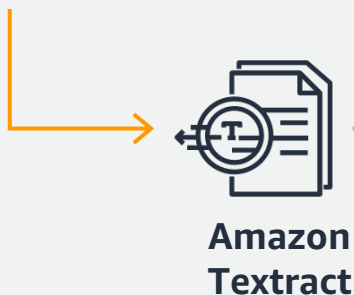
Thank you, but I was expediting it last week. At this point I think we should go ahead and cancel the order entirely.

We are sorry to hear that sir, would you be willing to complete the order if we offered a 10% discount?

Yes, thank you.

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IDP enrichment
Extract medical insights from text with Amazon Comprehend Medical

Documents
Physician notes, medical charts, lab reports, transcripts, and more

Amazon Textract

Amazon Comprehend Medical
Automatically extract insights from text

Named entities and relation extraction

PHI detection
Protected Health Information

ICD-10-CM linking

RxNorm linking

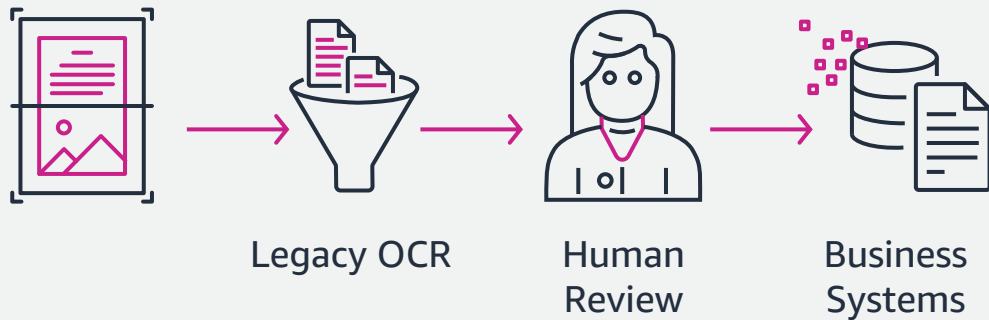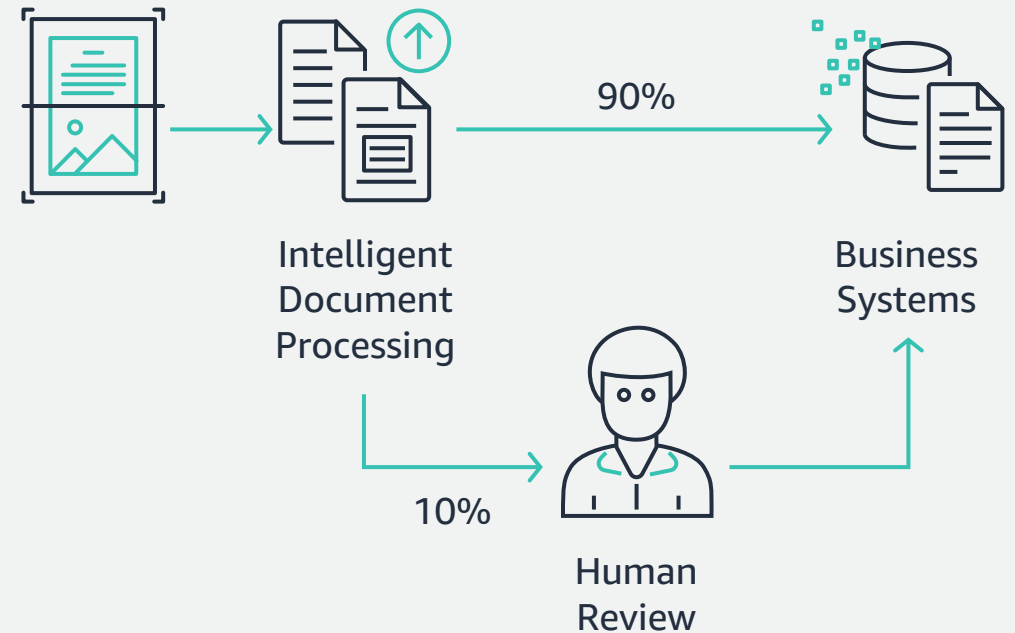# Enrichment Lab

Review & Validation

Reduce the total cost / time for document processing

Common for people to review all documents prior to downstream usage

Legacy OCR

Human Review

Business Systems

Limit people review to the documents with confidence scores < target

Intelligent Document Processing

90%

Business Systems

10%

Human Review

Use human in the loop (A2I) when needed

Human Review

Business rules drive when to review

- Example: review if low field accuracy or if claim value is >[$25K]

- Flexible to use your staff or your designated 3rd party

- Can use multiple reviewers for most critical data points

- Admin panels allow business users to update rules

Flexibility to add Business Rules to Suite Your Needs

- add business rules via Lambda (with admin panel for business users with asterisk this is custom code)

- Example accuracy checkpoints with human loop

- Example not complete form with routing to separate process to deal with incomplete forms

- Example of simple logic is the cost over X then route this way…

Review & Validation Lab

Security and governance

IDP security, governance, and compliance posture

Security and governance

Data privacy and access management

Manage user, access permissions, and policies with IAM

Encrypt data end-to-end in transit, and at rest with AWS KMS

Network security and isolation

Isolate data to your private network and region using a Virtual Private Cloud and establish private connections with VPC Endpoints

Governance, audit, and log management

Enable governance, compliance, and operational and risk auditing with Amazon CloudTrail. Centralized logging with Amazon CloudWatch

Compliance

ISO ISO 9001/27001/27017/27018

HIPAA Health Insurance Portability and Accountability Act

FedRAMP Federal Risk and Authorization Management Program

AICPA SOC Service Organization Certificate
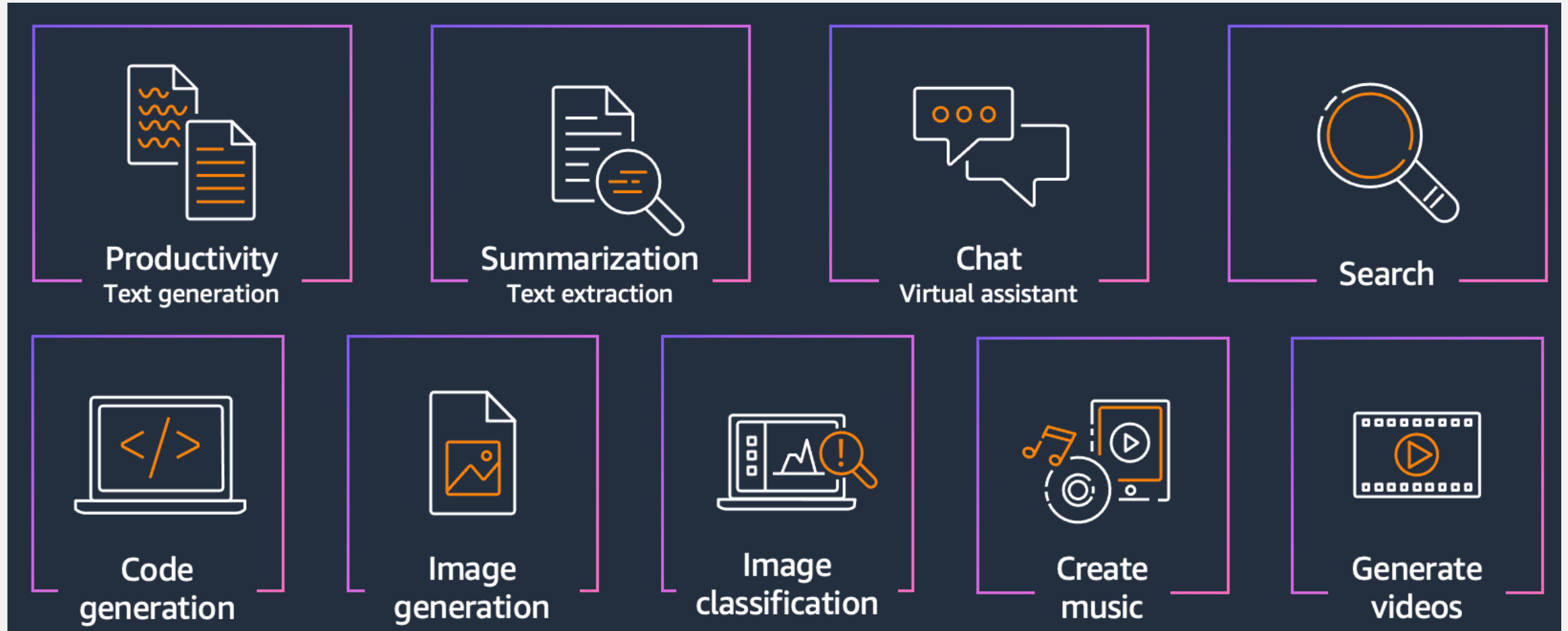
PCI DSS COMPLIANT Payment Card Industry Data Security Standard

Generative AI + IDP

Generative AI is emerging across a range of domains ...

Types of foundation models

Input		FM		Output
	▶		▶	

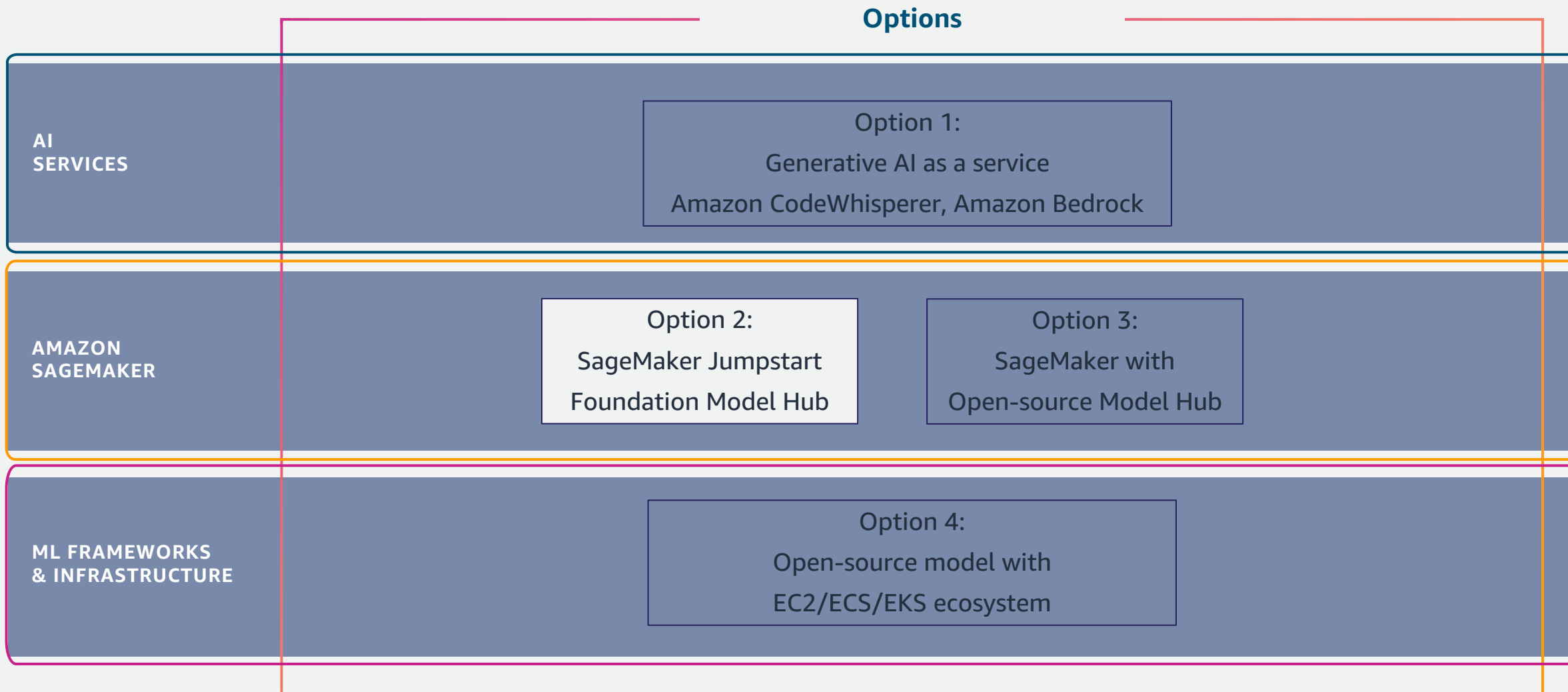| Input	FM	Output
"Summarize the articles on impact of walking on heart health"	**Text-to-text** Generate text from simple natural-language prompts for various applications	"Ten thousand steps per day is optimum for maintaining a healthy heart"
"hand soap"	**Text-to-embeddings** Generate numerical representation of text for applications like search and finding similarities between documents	Numerical representation of "Hand soap refills Hand soap dispenser Hand soap antibacterial"
"a photo of an astronaut riding a horse on mars"	**Multimodal** Generate and edit images from natural-language prompts	

AWS supports Gen AI in all layers of stack

Options

AI SERVICES

Option 1:

Generative AI as a service

Amazon CodeWhisperer, Amazon Bedrock

AMAZON SAGEMAKER

Option 2:

SageMaker Jumpstart

Foundation Model Hub

Option 3:

SageMaker with

Open-source Model Hub

ML FRAMEWORKS & INFRASTRUCTURE

Option 4:

Open-source model with

EC2/ECS/EKS ecosystem

Foundation models with SageMaker JumpStart: How it works

Amazon SageMaker JumpStart

Access and try out public and proprietary FMs, and customize and integrate them into your generative AI applications

Browse

Browse public and proprietary FMs

Experiment

Experiment with FMs before choosing a model for deployment

Customize

Customize selected FM with your own dataset without training from scratch

Deploy

Deploy the model and run inference for your generative AI use case

Foundation models available on SageMaker JumpStart for self-managed access

Publicly available

stability.ai

Models

Text2Image

Upscaling

Tasks

Generate photo-realistic images from text input

Improve quality of generated images

Features

Fine-tuning on SD 2.1 model

alexa

Models

AlexaTM 20B

Tasks

Machine translation

Question answering

Summarization

Annotation

Data generation

🤗

Models

Flan T-5 models (8 variants)

DistilGPT2, GPT2

Bloom models (3 variants)

Tasks

Machine translation

Question answering

Summarization

Annotation

Data generation

Proprietary models

co:here

Models

Cohere generate-med

Tasks

Text generation

Information extraction

Question answering

Summarization

LightOn

Models

Lyra-Fr 10B

Tasks

Text generation

Keyword extraction

Information extraction

Question answering

Summarization

Sentiment analysis

Classification

AI21labs

Models

Jurassic-1 Grande 17B

Tasks

Text generation

Long-form generation

Summarization

Paraphrasing

Chat

Information extraction

Question answering

Classification

Survey; Resources

✓ **Intelligent Document Processing Page**

- Insurance
- Capital Market
- Healthcare
- Banking
- Manufacturing
- Oil & Gas
- Legal
- Accounts Payable

✓ Blog Posts

- Build an end-to-end intelligent document processing solution using AWS
- Automating customer onboarding with Lumiq's Drishti Document AI and Amazon Textract
- Broadridge Advances the Proxy Voting Data Process Using Artificial Intelligence on AWS

✓ Service links

- Amazon Textract
- Amazon Comprehend
- Amazon SageMaker

✓ Git source code link

- Document Understanding Solution
- Amazon Textract Samples
- Amazon Comprehend Samples
- Amazon SageMaker Samples

✓ Account team can provide

- Textract and Comprehend Security Papers (can be shared under NDA)
- Immersion day training
- Partner referrals

Thank you!