



LIBRARY OF CONGRESS
DESIGNING STORAGE ARCHITECTURES

Machine Learning for Digital Collections & Preservation

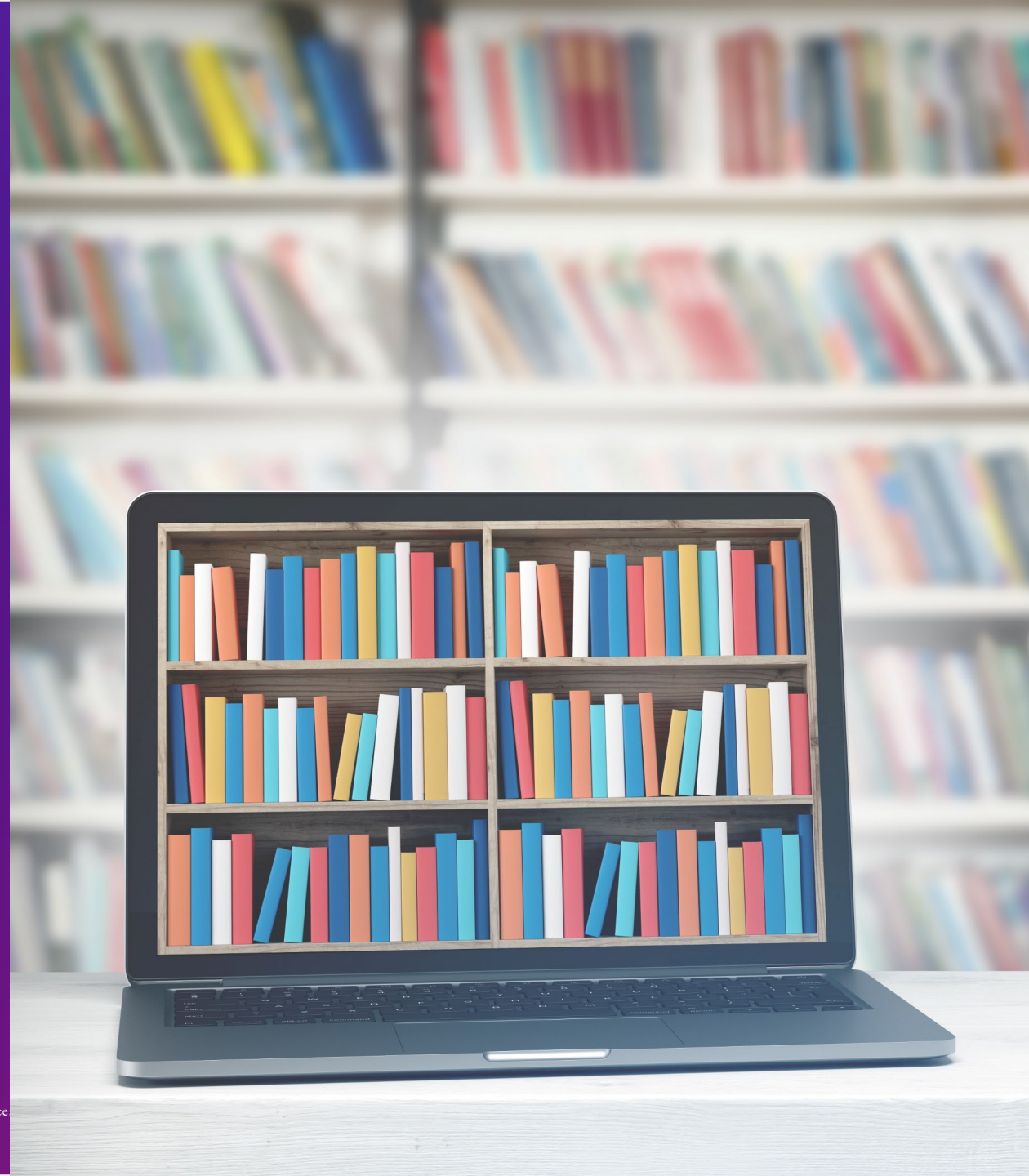
Greg Ritter (he/him)

Lead for Teaching, Learning, & Libraries
AWS Higher Education

CHALLENGE

Digital collections are growing by leaps and bounds.

Library budgets and staff are *not* growing at the same pace ... and sometimes shrinking!

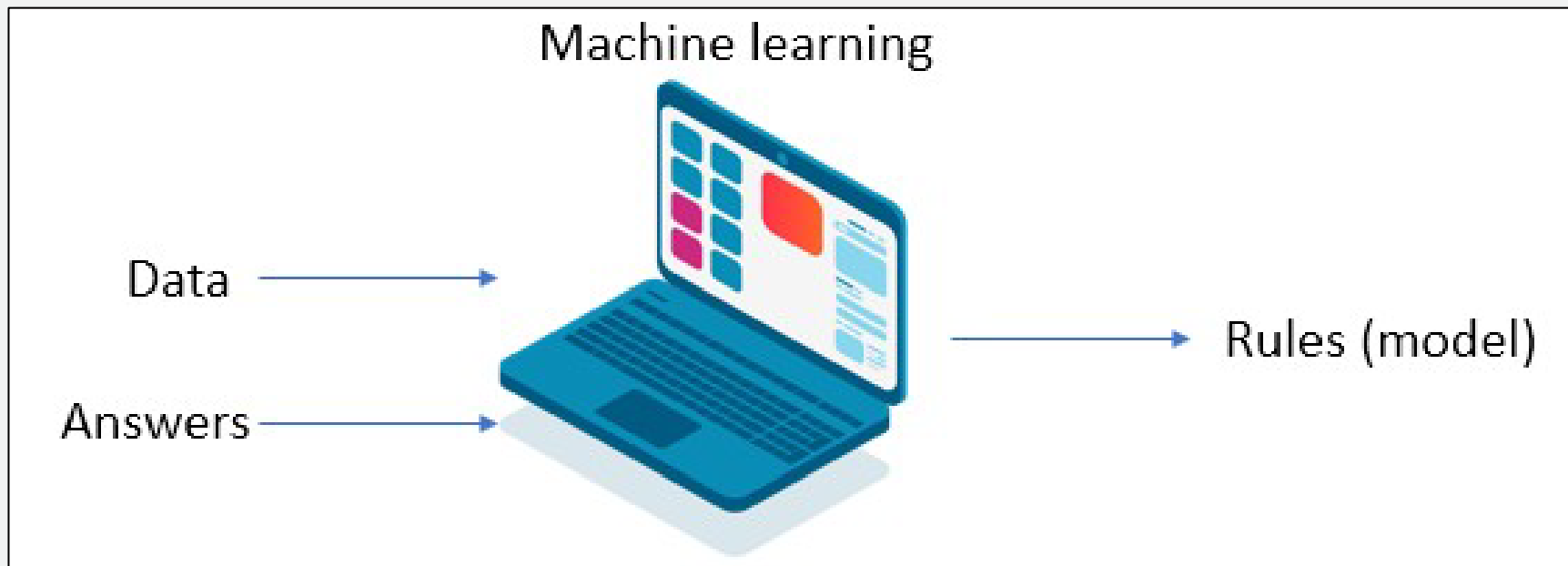


University of Oxford GLAM

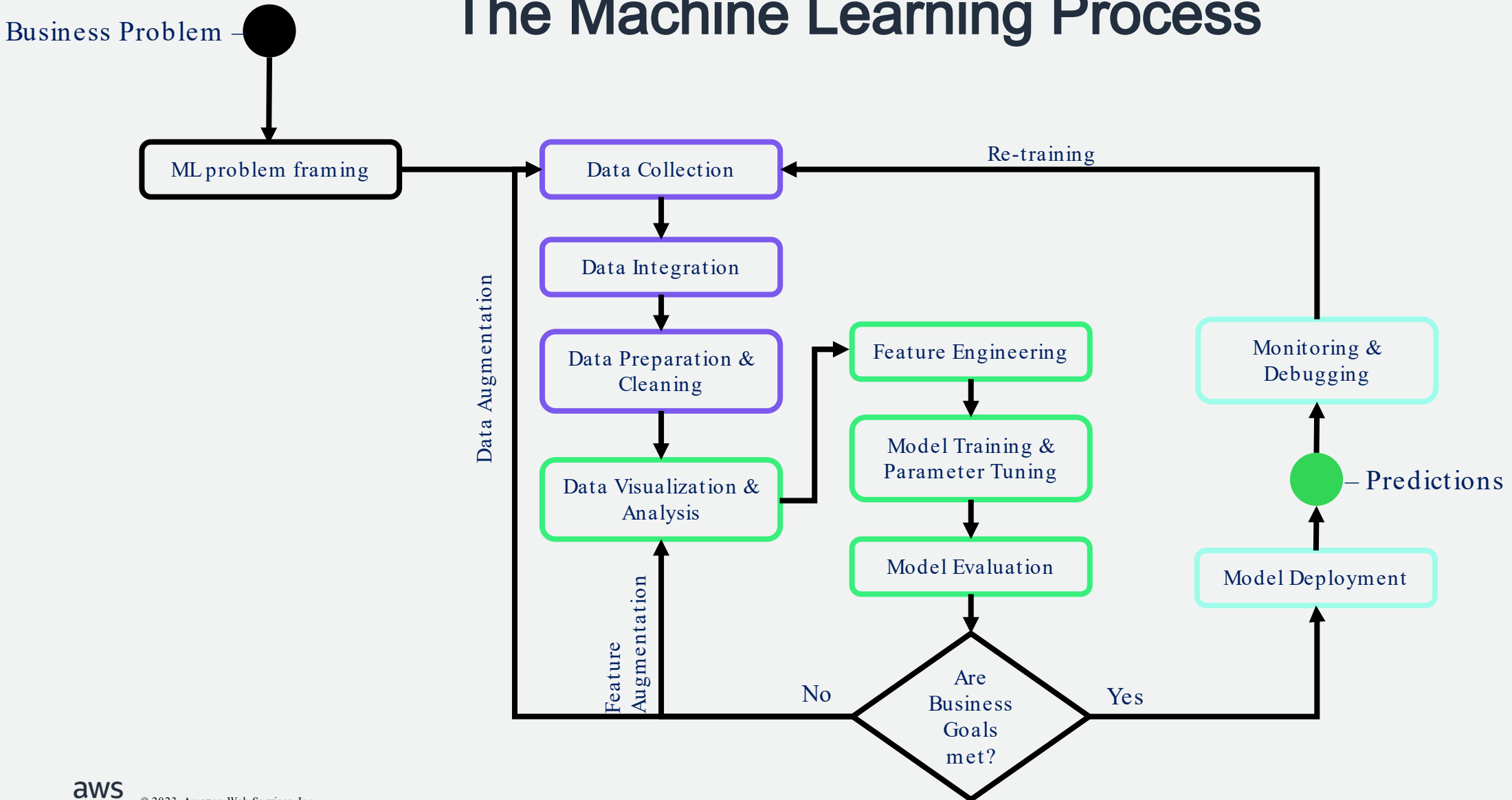


Machine Learning in particular

- Training a computer to recognize **patterns** in historical data that can be used to make **predictions** using new data

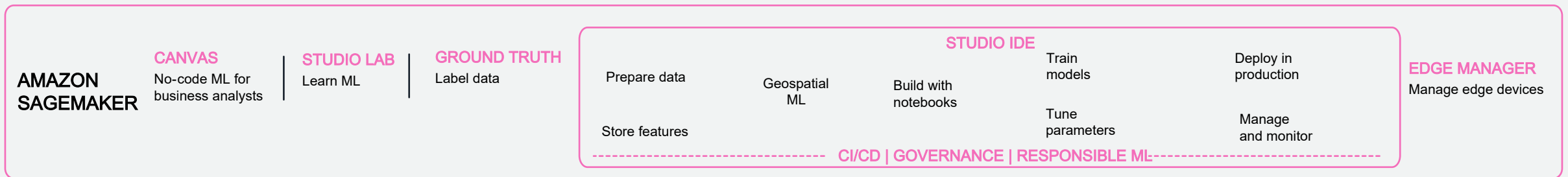
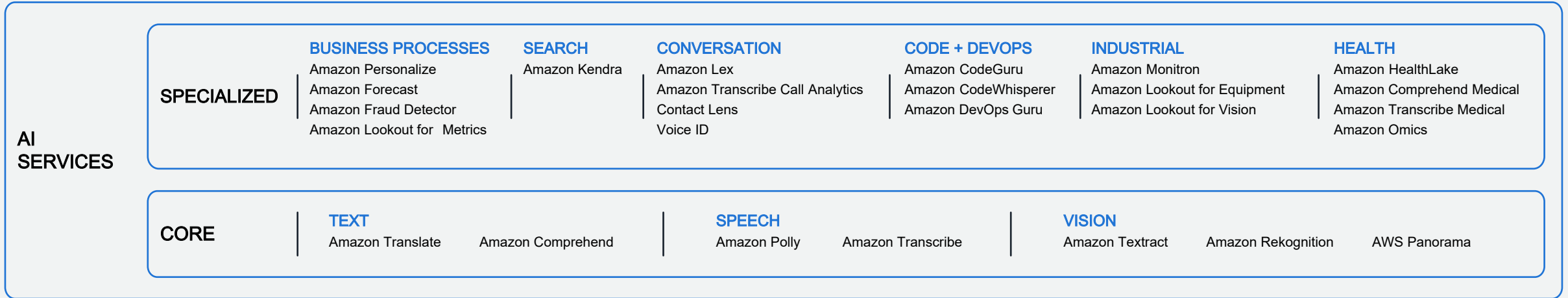


The Machine Learning Process

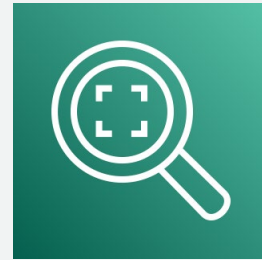


The AWS AI/ML stack

BROADEST AND MOST COMPLETE SET OF MACHINE LEARNING CAPABILITIES



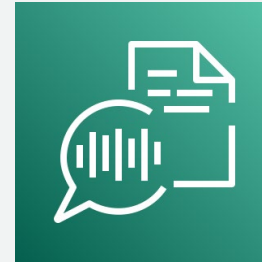
Metadata Extraction with Amazon Rekognition



Amazon Rekognition

- Object detection & labeling
- Custom object training with AutoML
- Text detection and extraction
- Face detection, analysis, and comparison
- Video segment detection
- Video event detection

Audio/Video Transcription with Amazon Transcribe



Amazon
Transcribe

- Automatic language identification
- Transcribe speech for audio or video
- Generate closed captions
- Speaker recognition
- Timestamp generation
- Custom vocabulary
- Mask sensitive information

OCR & Handwriting Recognition with Amazon Textract

An Inventory of the estate of James Demmaree, Dec., taken the 3rd August 1815.

We the undersigned, after being sworn as the law directs, have proceeded to appraise the estate of said Demmaree in the following manner

To wit - - - - -

To 1 Kettle, Oven, and hooks - - - - -	\$ 5, 25 cents
To 1 Small pot, and one broken Oven	1, 00 - - -
To 2 Hoes and 1 barshear plough - - -	2, 12 1/2
To 1 collar, pair of harness, tracys & 2 clevis's	1, 00 -
To 2 Smoothing Irons, and four plain - -	2, 00
To 2 Saws, and Cooper tools - - - - -	2, 00
To 1 Sugar tub and meal tub - - - - -	1, 25
To 1 Flax wheel, and Check reel - - - -	2, 00
To 11 Chairs and one Bell - - - - -	1, 00



Amazon
Textract

- Optical character recognition
- Handwriting recognition
- Table and form extraction
- Query based extraction
- Bounding boxes
- Adjustable confidence thresholds
- Built-in human review with Amazon A2I

Natural Language Processing

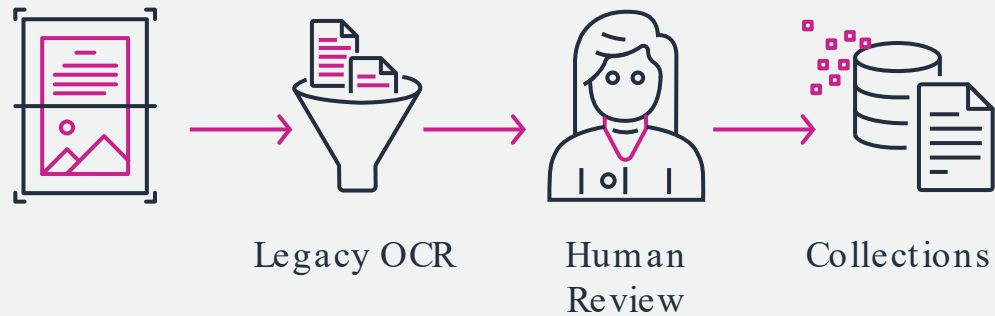


Amazon Comprehend

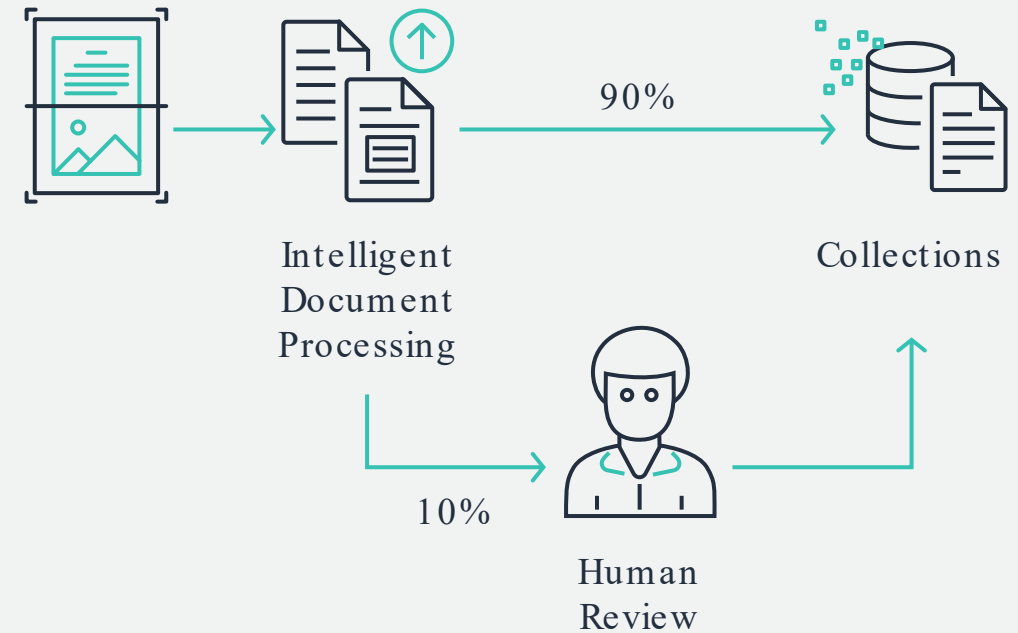
- Language detection
- Entity recognition (people, places, dates)
- Custom entity recognition
- Topic modeling
- Keyphrase extraction (summarization)
- Sentiment analysis
- PII identification and redaction

Human in the Loop with Amazon Augmented AI (A2I)

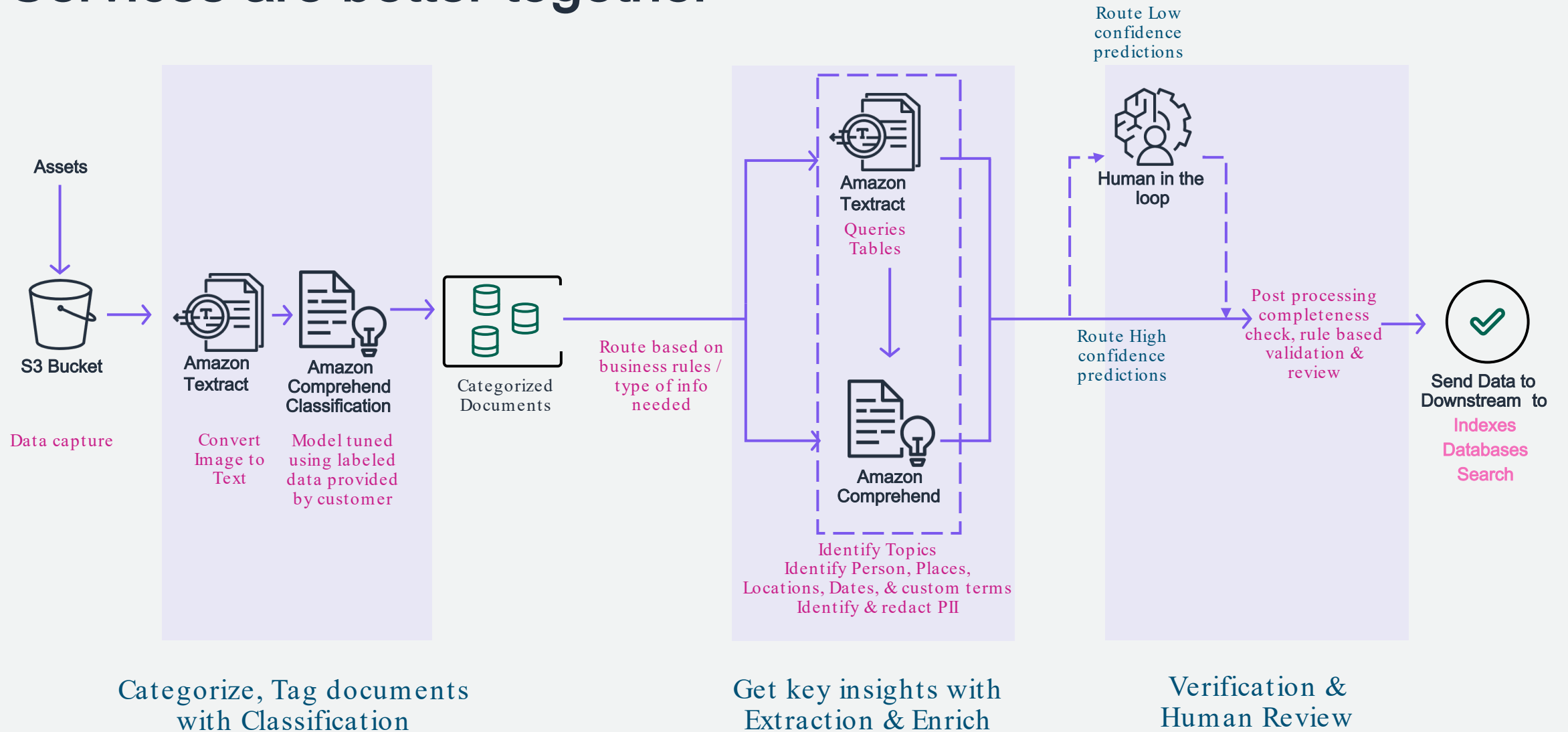
Common for people to review all documents prior to downstream usage



Limit people review to the documents with confidence scores < target



Services are better together



Custom Training with Amazon SageMaker



Pre-built notebooks for common problems



Built-in, high-performance algorithms

Build



One-click training



Hyperparameter optimization

Train



One-click deployment



Fully managed hosting with auto-scaling

Deploy



Thank you!

Greg Ritter
Lead for Teaching, Learning, & Libraries
AWS Higher Education

gritter@amazon.com