

AI as a Service

The fast track to AI

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Shops	
Packet of bacon	2.00
Packet of sausages	3.50
1 Black pudding	1.50
Eggs	2.00
Orange Juice 1 Carton	2.45
Coffee 1 packet	4.50
Total	15.95



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DIY		
Sausages, Bacon	Purchase Animal	300.00
	Equipment	830.00
Black Pudding	Oat seeds	0.60
	Fertilizer	20.00
	Scythe	100.00
	Oatmeal grinder	65.00
Eggs	Purchase Hen	10.00
	Henhouse	129.00
	Hen feed	10.00
Orange Juice	Juicer	50.00
	Return flight to Valencia	612.00
Coffee	Coffee Grinder	40.00
	Return flight to Bogota	1,400.00
Total		3,566.60



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COMMODITISATION!



2005

Client

Application

Application
Server

Runtime

OS

Hardware

2010

Client

Application

Application
Server

Runtime

OS

Virtual Servers

2015

Client

Microservices

Runtime

Containers

Cloud Managed

Cloud Managed

2020

Client

Code (Function)

Cloud Managed

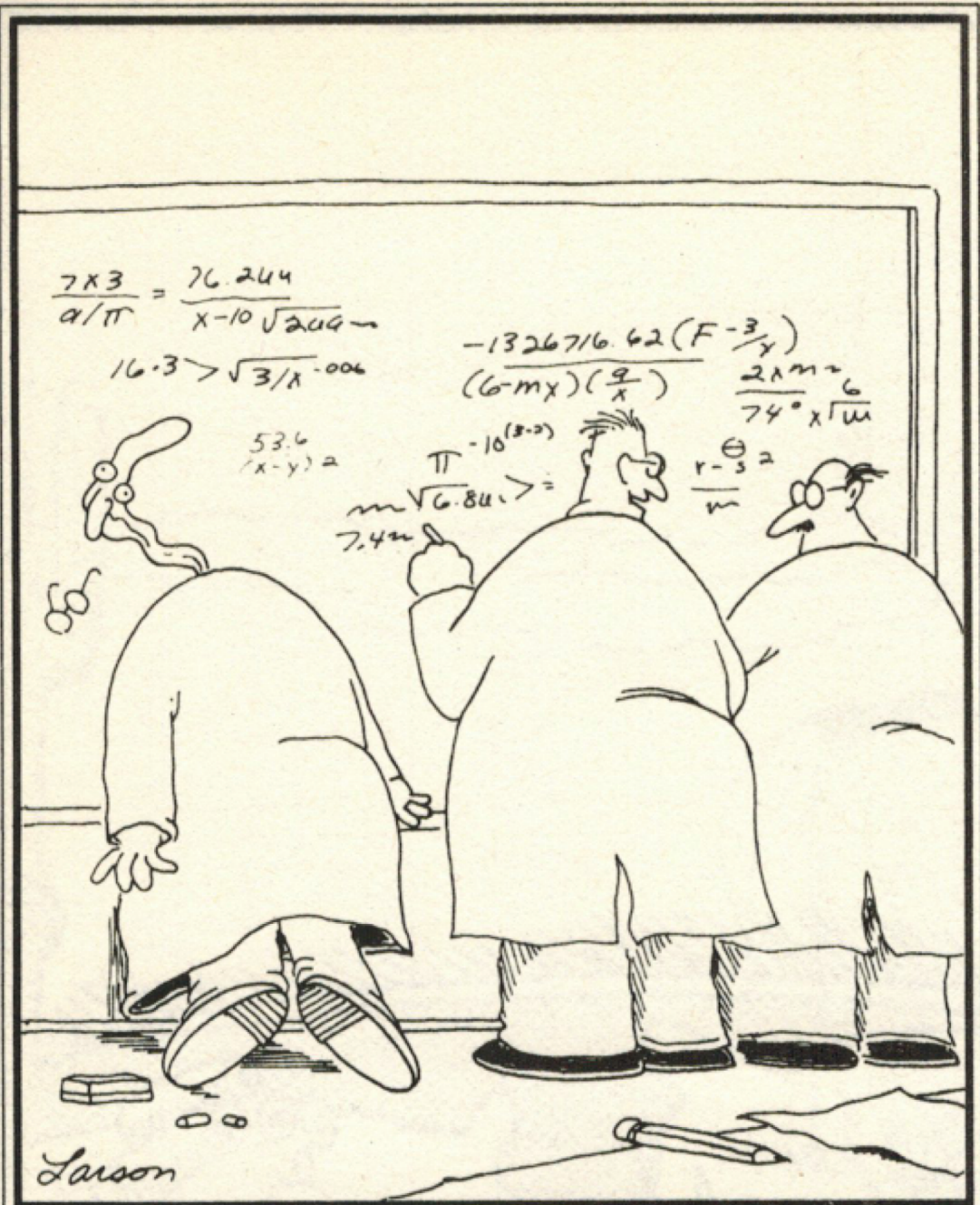
Cloud Managed

Cloud Managed

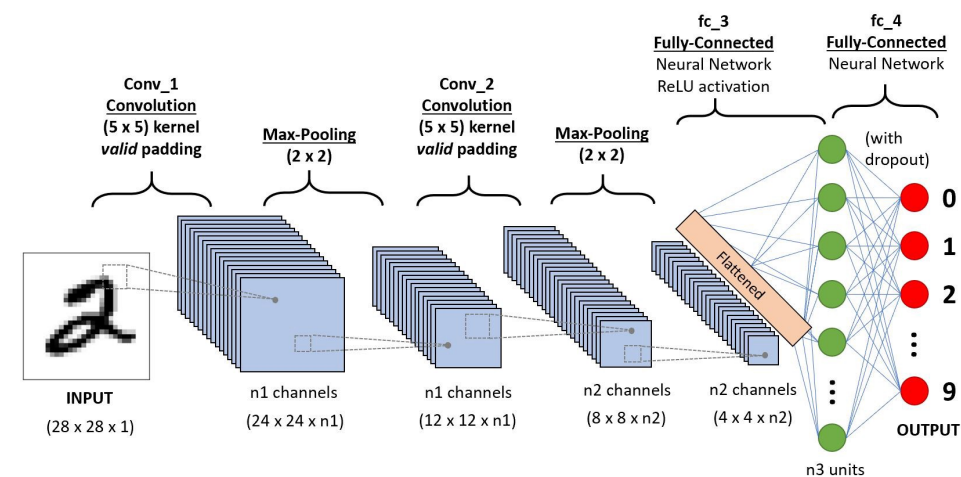
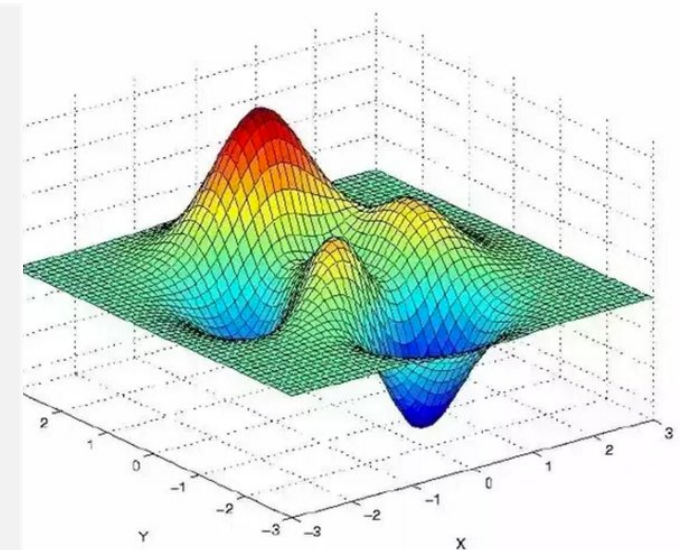
Cloud Managed

COMMODITISATION!





"Ha! Webster's blown his cerebral cortex."



DIY?



AI as a Service

Peter Elger
Eoin Shanaghy

MEAP

MANNING



aiasaservicebook.com

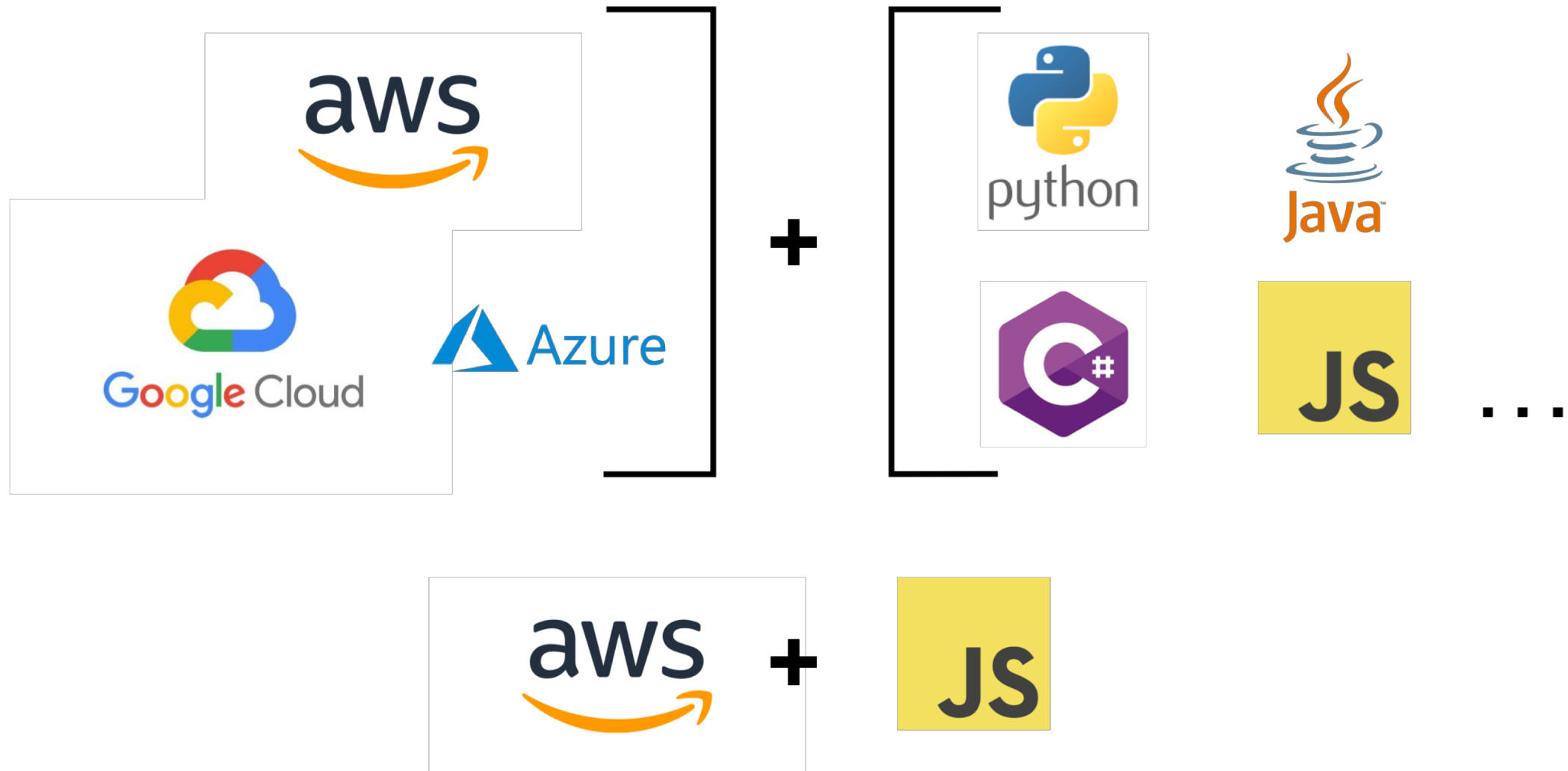
40% discount code:

ctwqcon20

AI/ML is commoditizing



It's just code! Only an API call away...



Forces



Compute Power



Availability of data



Improved models



Release cycles



Iteration times



Unit of deployment

+ Cloud Economics



AI as a service



Serverless



Consequences

- Serverless computing will increasingly become a standard approach for enterprise development. This represents a move to fully 'utility' computing and increasing commoditization.
- Increasing commoditization of AI/ML will result in a growth in the range and capability of off the shelf AI components.
- Increasingly enterprise systems will incorporate 'AI' capabilities built by adapting and combining off the shelf AI/ML services.



Cloud services as of December 2019 (+2018)

Service Type	AWS	Google	Azure
Compute	14	12 (+2)	19 (+2)
Data and Storage	20 (+7)	12	28 (+16)
Network	12 (+6)	10 (+2)	15 (+2)
Developer	12 (+3)	16 (+3)	10 (+1)
AI and Machine Learning	19 (+8)	19 (+4)	39 (+5)
Other (e.g. IoT)	98 (+42)	94 (+61)	135 (+111)
Totals	175 (+66)	163 (+74)	246 (+136)

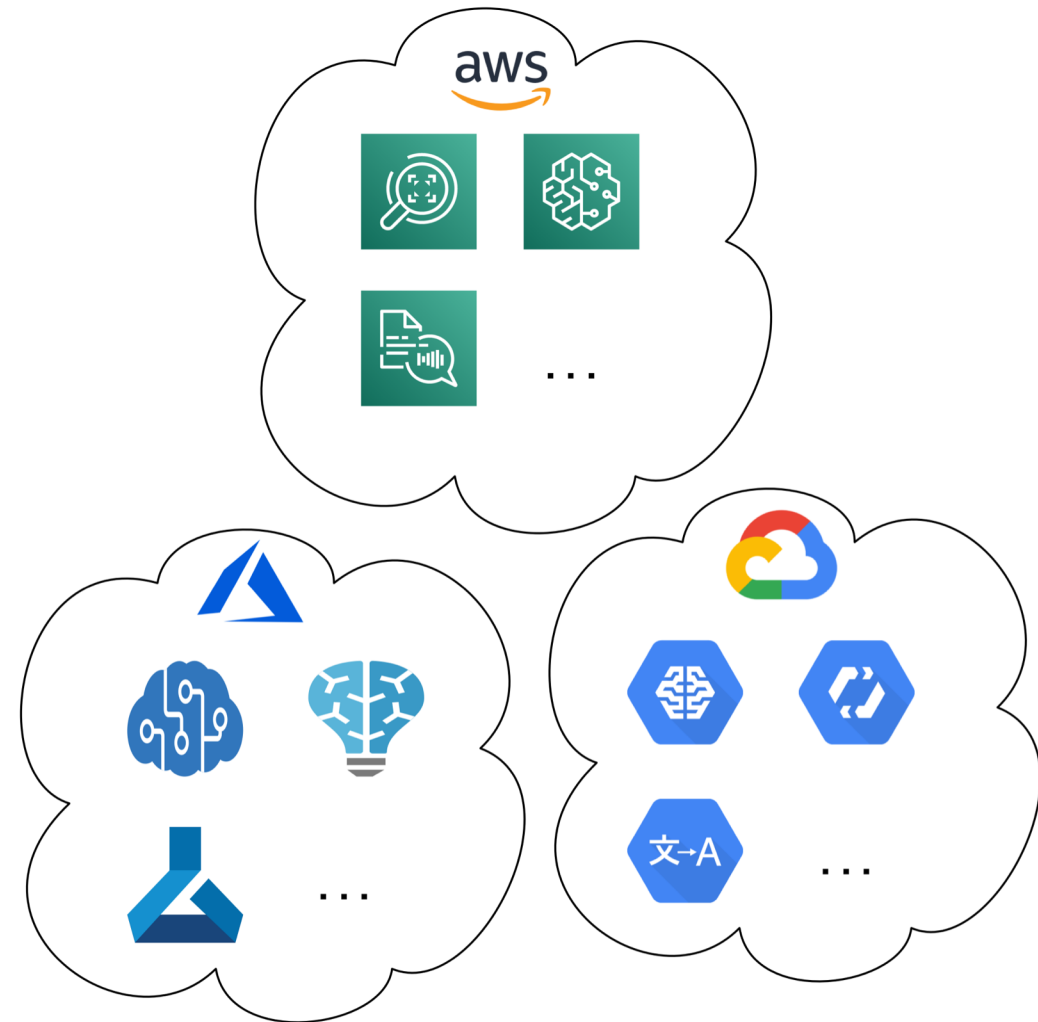


AI/ML Services

Service Type	AWS	Google	Azure
Image + Video	Rekognition	Vision, Video Intelligence	Face Detect, Video Indexer
Recommendations	Personalize	Recommendations AI	Personalizer
Voice	Lex, Polly, Transcribe	Cloud Speech to text, text to speech	speech to text, text to speech, speech translation, speaker recognition
Chatbot	Lex	Dialogflow	QnA Maker, Azure bot service
Prediction	Forecast, FraudDetector	Cloud inference API	Azure ML
Language	Comprehend, Textract, Transcribe	Cloud Natural Language, Cloud Translation	Form recognizer, translator, reader, text analytics
Training/Custom	SageMaker, Inferentia, Elastic Inference	AI Hub, Cloud AI, Auto ML	Azure ML service
Search	Kendra	Cloud search services	Cognitive search
Developer	CodeGuru, SageMaker Studio	TensorFlow, CoLab	ML Studio



When to use?



Research

Custom, problem not well understood.

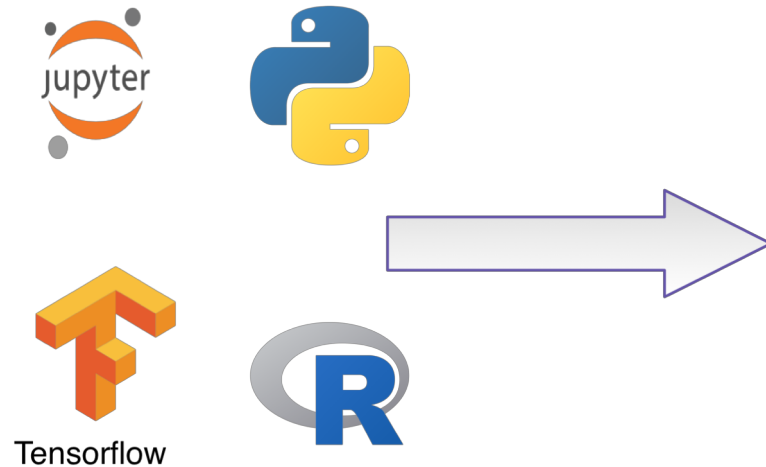
<- Adapt ->

Commodity

Problem is well understood. Operationalize,
Consume/Combine



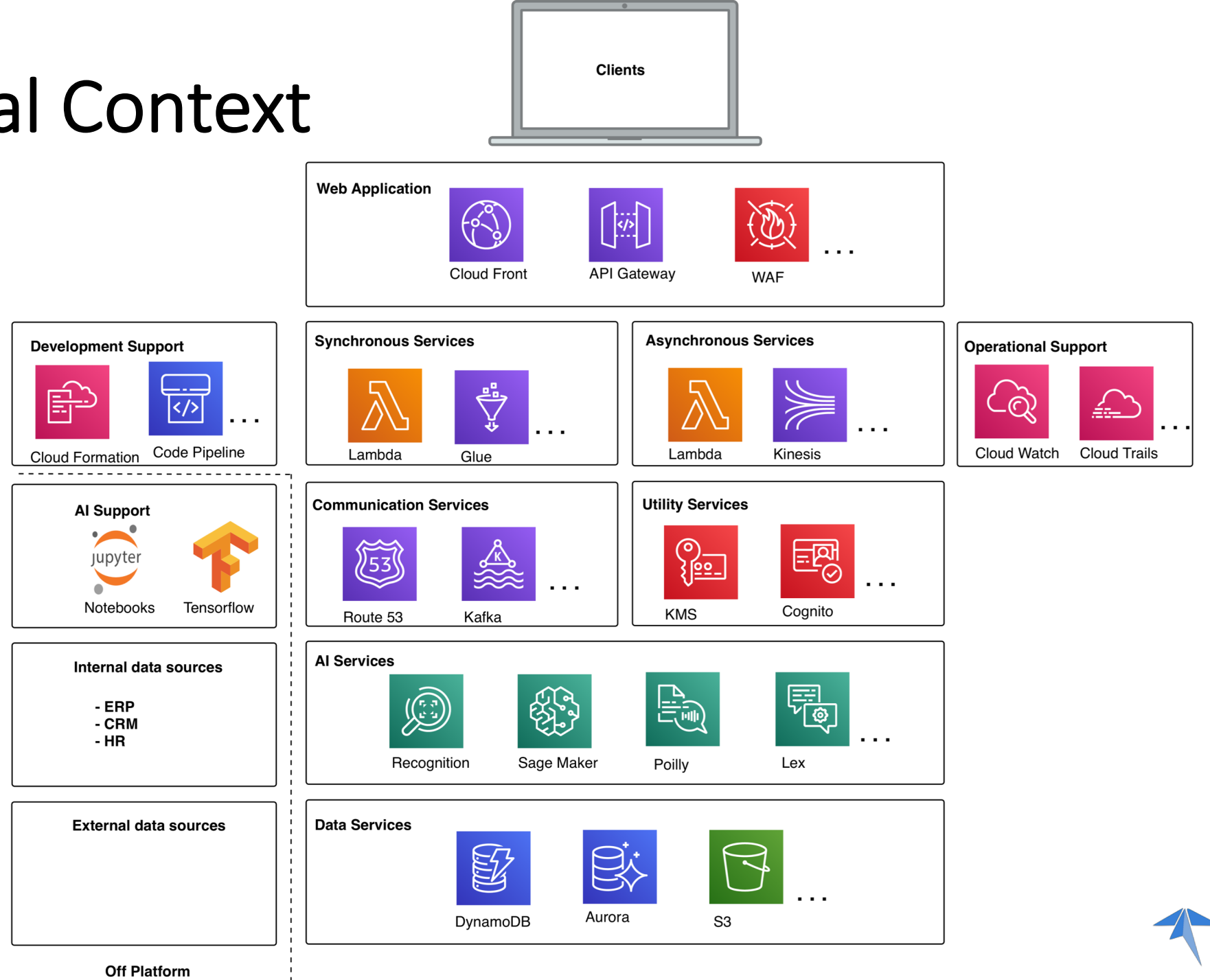
So you built a model...



- Host
 - Data In, results out
 - User Interface
 - Scale
 - Security
 - Deploy updates (CI/CD)
 - Monitor
 - Optimize performance
-
- ML is a small part of delivery



Architectural Context



Cat Detector System in a day ?



~~DOG~~ LICENCE (£0.37½)
(NOT TRANSFERABLE) WJ 895224

Cat

Full Christian Names C M
and Surname _____
(IN BLOCK LETTERS)
Full Postal Address _____

Issued to keep **ONE DOG** in Great Britain, from the date hereof until and
at day of* JAN 88 next following; the sum of
£ N and a HALF PENCE having been paid for this
hours 43 minutes 2 m. o'clock at the place and
on the date indicated in the Issuing office stamp.
by L. Hatchett

NOTICE.—Any permanent change of address should be notified to the appropriate District or Island Council.

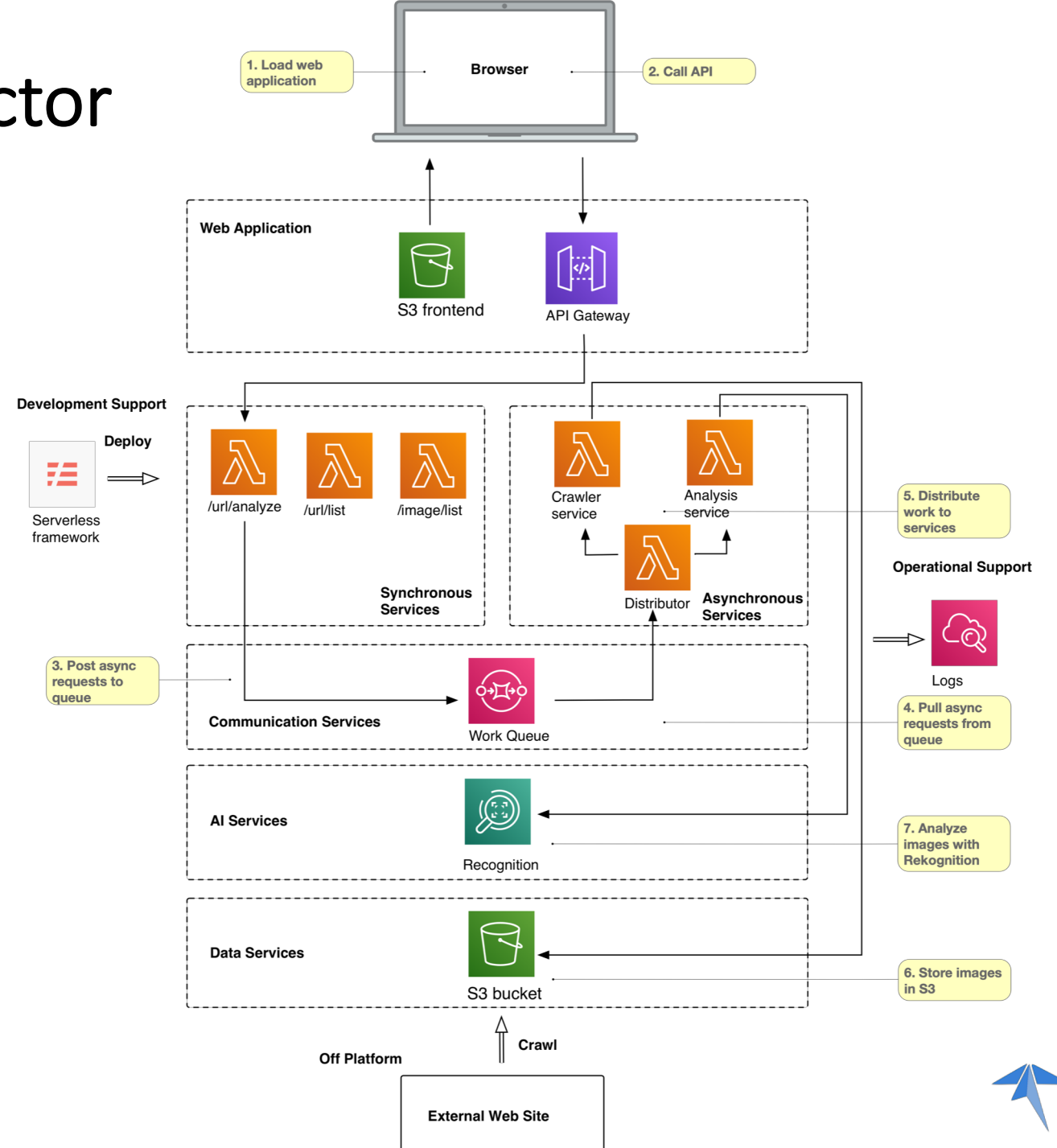
Penalty for refusing to show this Licence to any duly authorised Officer, or Police Constable, or for keeping a dog above 6 months old without Licence, £10

*Insert month preceding the month of issue of the Licence. SEE NOTES OVERLEAF

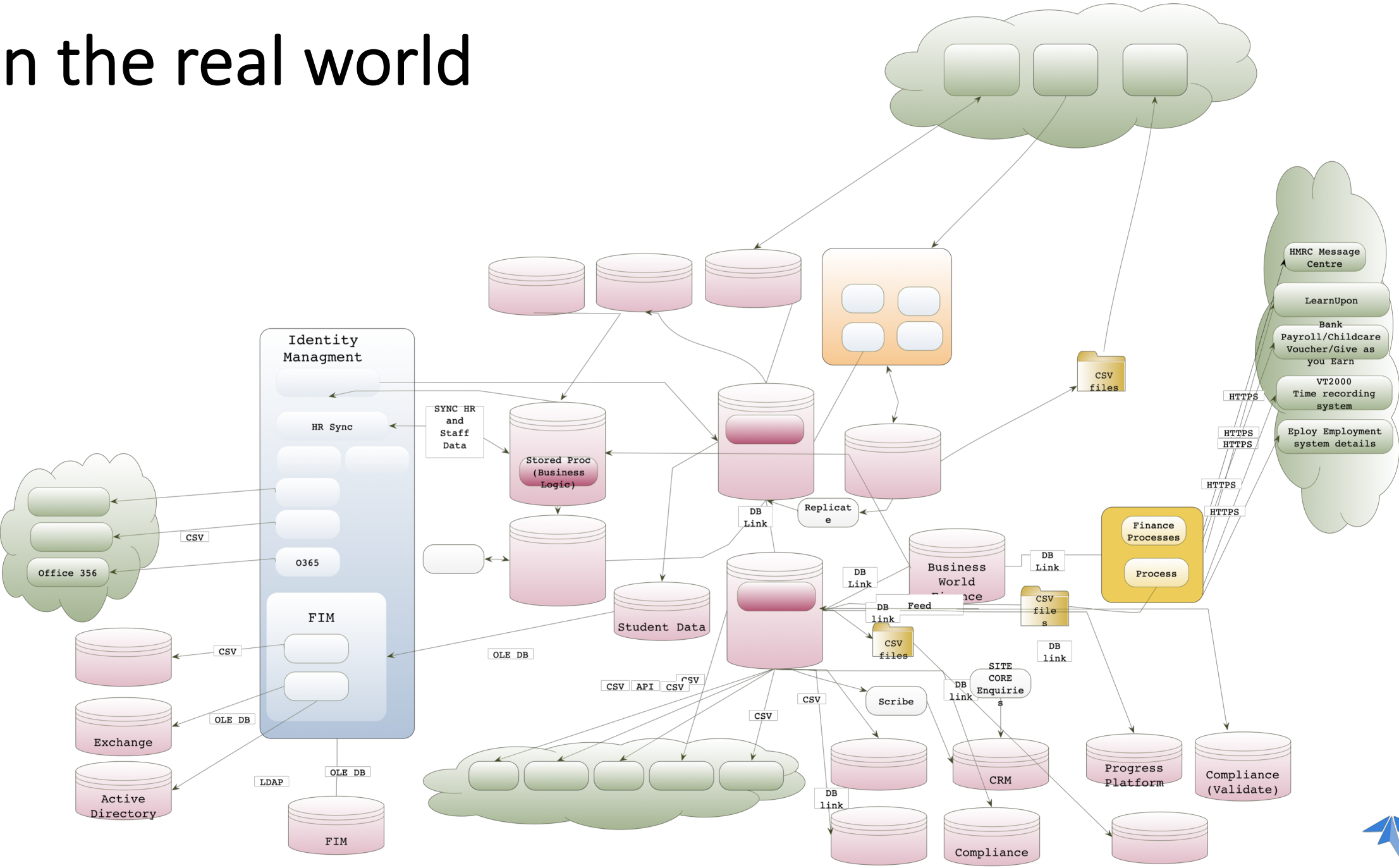
The 'hello world' of AI



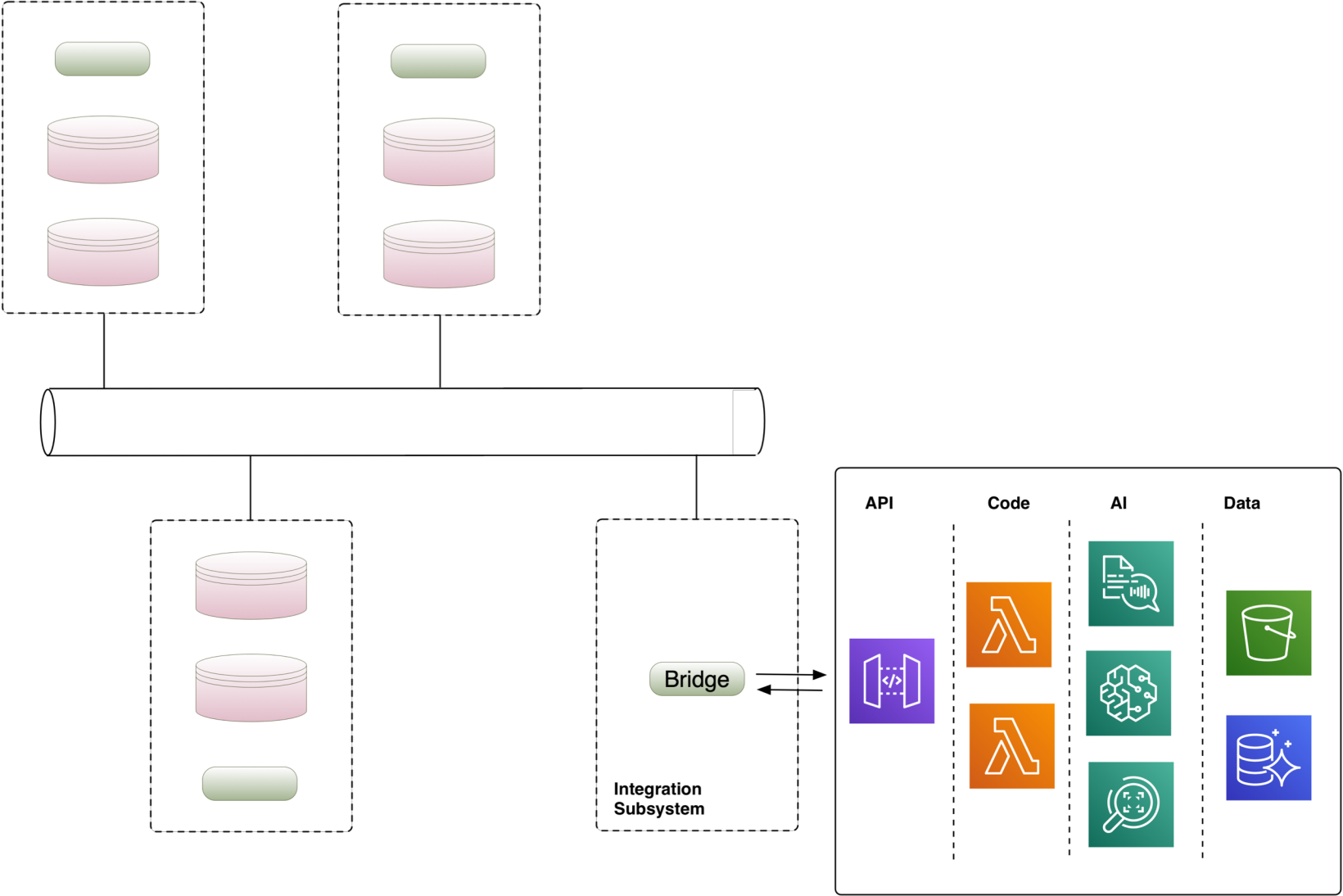
Book Example - Cat Detector



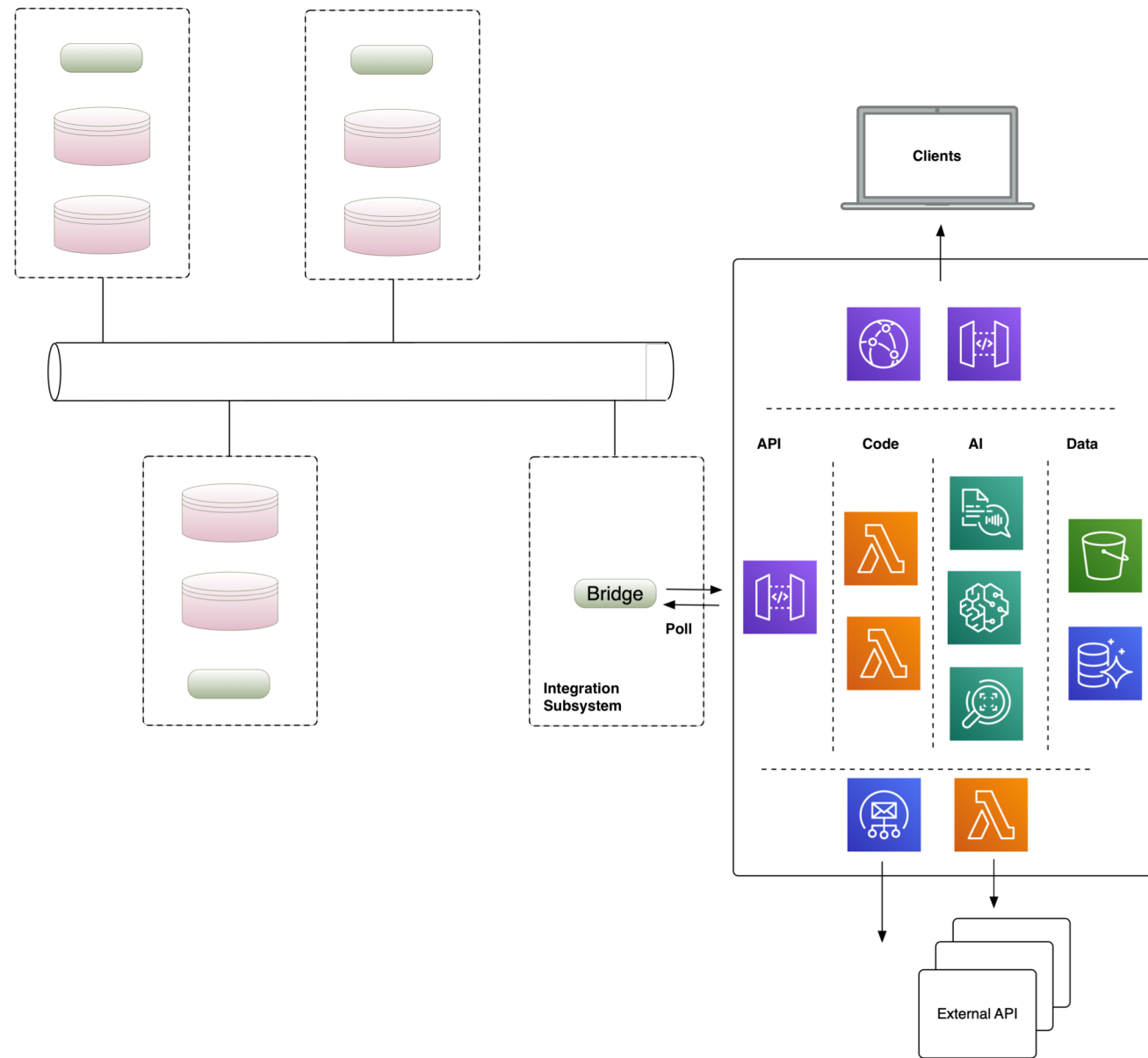
But in the real world



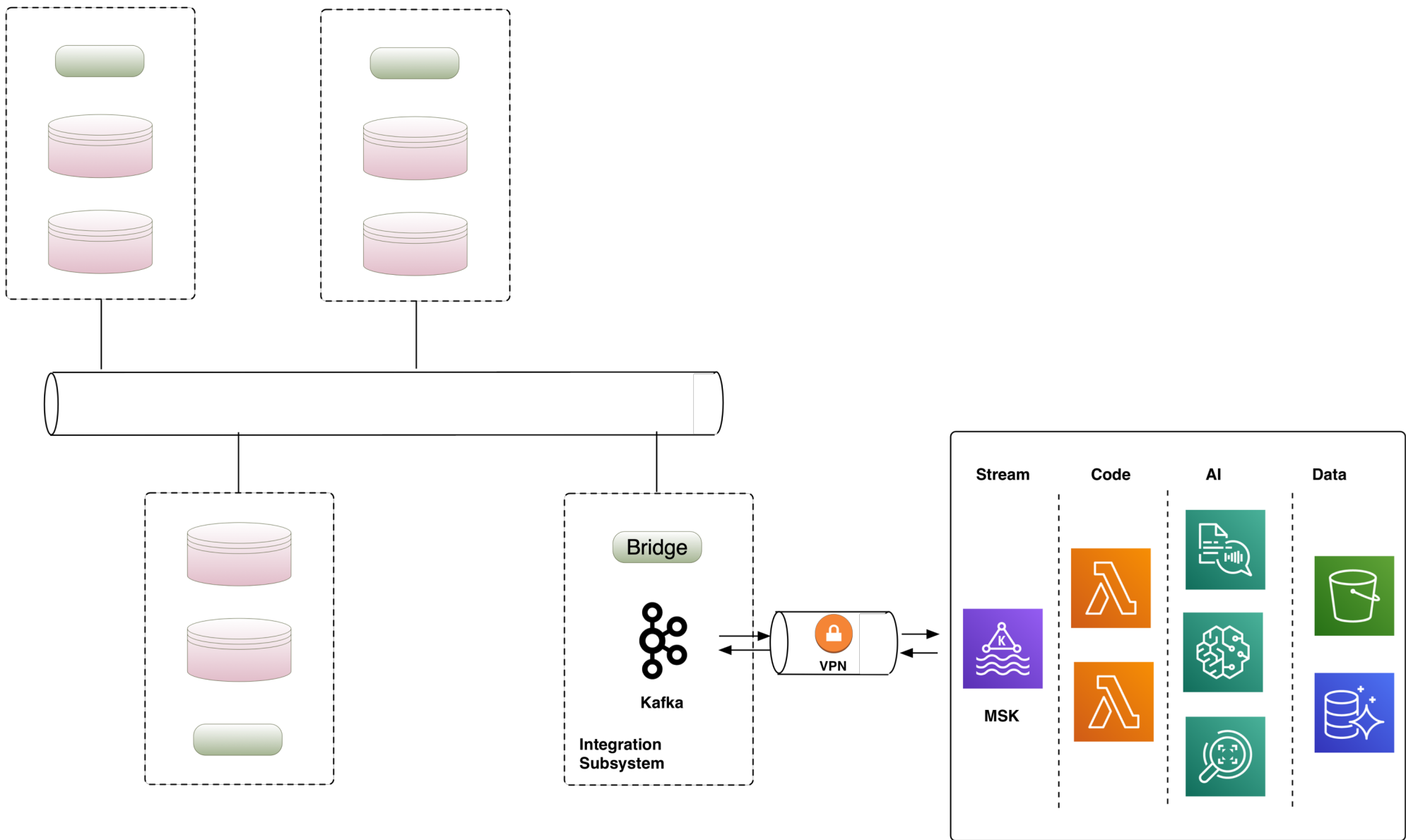
Synchronous API



Asynchronous API

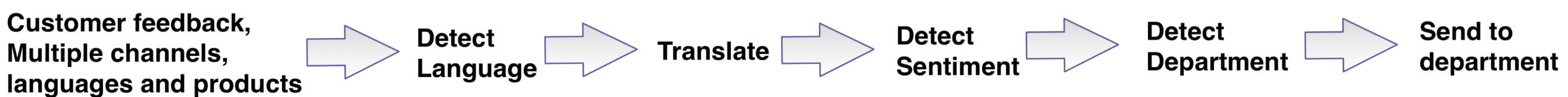


Streaming

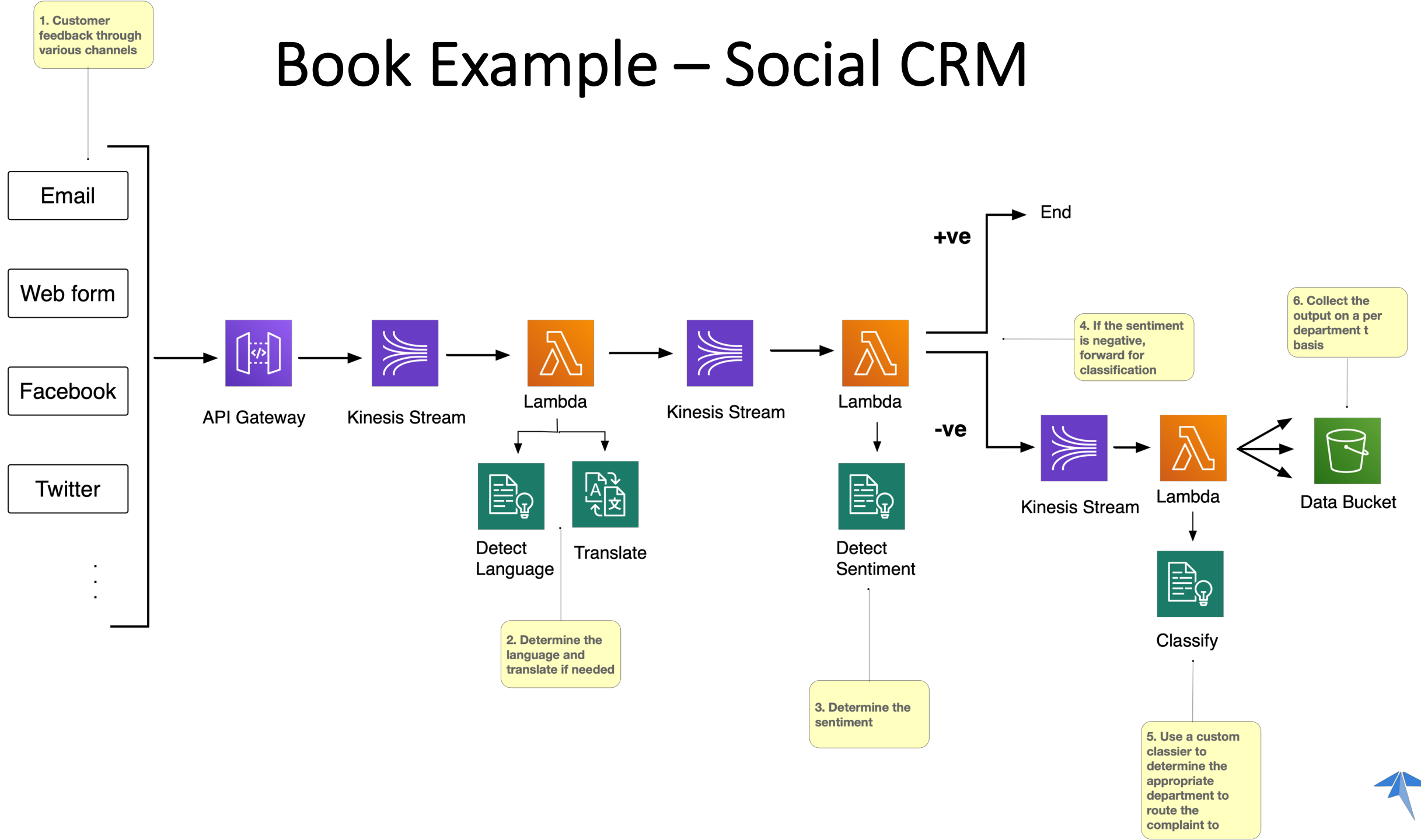


Book Example – Social CRM

- Social CRM / Product feedback
- Triage and categorize customer interactions
- Complicated, but can be constructed using commodity services
- Asynchronous integration



Book Example – Social CRM



Example Project – KYC

The image shows a utility bill with several fields highlighted by red bounding boxes, indicating areas of interest for OCR extraction:

- Top right:** Billing period (04 Aug 2017 to 03 Oct 2017), Meter class (10 Oct 2017), and Account number.
- Meter information:** Meter No., Meter readings (Present, Minus, Previous), Electricity used, Meter reading types (Actual, Customer, Estimated), and MPRN.
- Amounts:** Previous Balance (114.98), Standing Charge (80 days, 45.27 cent/day, 27.16), 24 hour Units (537, 80.87), PSO Levy (2, 15.06 cent/kWh, 11.80), Total excluding VAT (119.83), VAT @ 13.5% (16.18), and Total Including VAT (136.01).
- Text blocks:** A large block for the Direct Debit notice and a smaller block for the rewards club sign-up.

- 2017 OSS OCR library + Custom analytics
 - Name, address, MPRN...

- 2019:



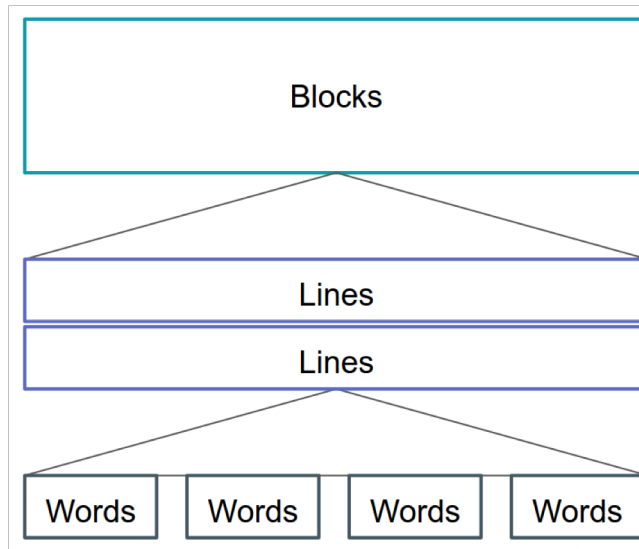
AWS Textract



Azure Form Recognizer



Google cloud vision OCR



Example project

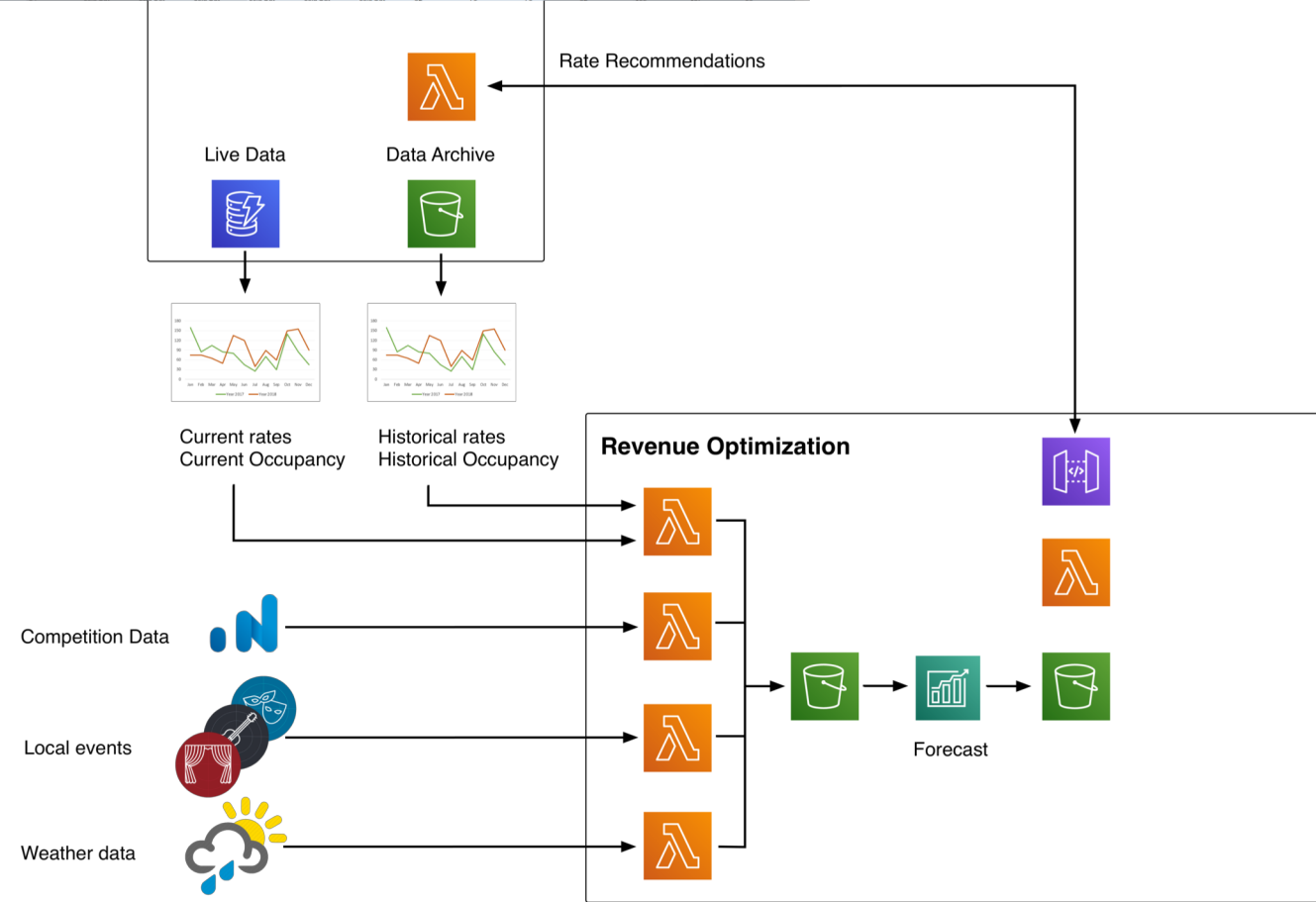
– Rate Optimization

- Optimize hotel room rates
 - Historical rates
 - Historical occupancy
 - Live Rates
 - Live Occupancy
 - Competition data
 - Local Events
 - Weather data
- Forecast the optimal room rate

Main Platform

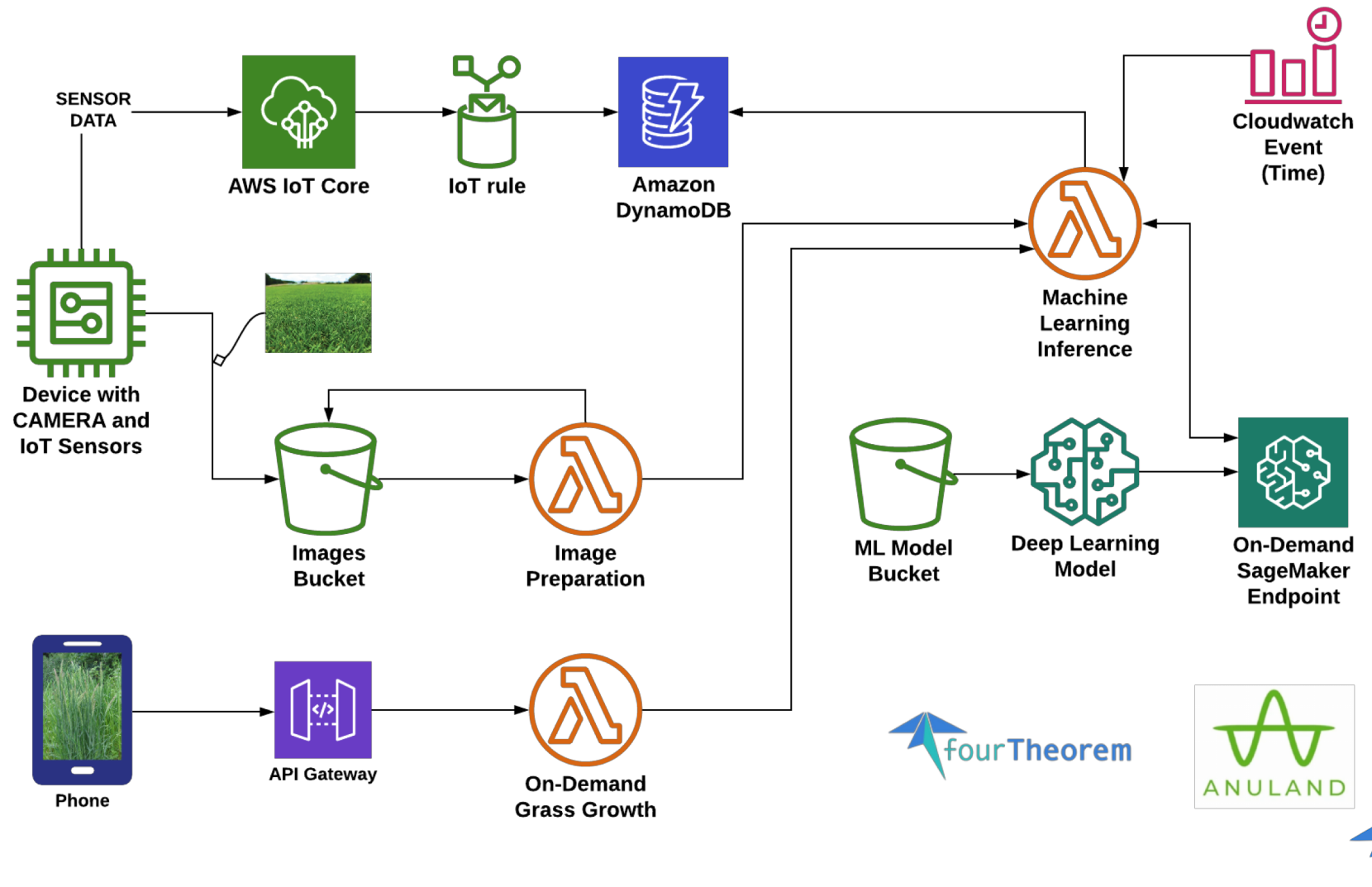
Revenue Yield Sheet 30 Sep 2019 – 13 Oct 2019 Publish Bulk update

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Date	30-Sep	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct
Calendar events														
Groups														
Inventory														
Sales														
Expected BR	69	65	72	72	99	109	69	65	65	65	65	135	119	57
BASE RATE	69	65	72	72	99	109	69	65	65	65	65	135	119	57
Left to Sell	35	43	35	47	51	29	61	54	55	54	62	88	52	69
Occupancy	32%	39%	46%	34%	28%	59%	14%	24%	23%	24%	13%	4%	27%	3%
Derived rates														
Double	2	0	1	2	5	3	7	6	6	6	6	2	8	7
Twin	2	0	0	2	2	2	5	5	5	5	5	2	4	5
Single	1	0	0	2	0	0	7	4	4	4	4	0	0	7
Family	2	0	0	2	4	2	3	3	3	3	3	0	3	3
Superior Double	2	0	0	2	3	3	10	10	10	10	10	0	10	10
Superior Twin	2	0	0	2	5	3	5	5	5	5	5	0	5	5
Pickup	0	17	25	17	8	13	6	7	7	6	1	1	3	1
Pickup Date	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep	26-Sep
Last update left to sell	43	43	38	47	51	29	61	54	55	54	62	88	52	70
Market Demand	67%	69%	54%	67%	62%	71%	55%	60%	61%	59%	58%	51%	73%	65%
Arch House B&B	80	Sold Out	65	70	90	Sold Out	60	70	60	65	120	100	Sold Out	50
Athlone Services Motel	84	Sold Out	Sold Out	Sold Out	Sold Out	Sold Out	Sold Out	82	75	70	82	108	187	66



Example Project - Agritech

- Optimize fertilizer usage
- Sensor unit in the field (really!)
- R&D Prototype to fully operational solution
- Serverless data and ML pipeline with SageMaker
- 2 weeks to get into production from existing prototype
- Significant cost reduction
- Elastic scale



Summary

- Serverless computing increasingly become a standard enterprise development tool. Incorporating 'AI' components built by customizing, combining and consuming off the shelf AI/ML services.
- Developers will increasingly use these commoditized services without requiring an expert understanding of AI/ML.
- AI is not just about the model. It has to be operationalized. The fastest, most economic route is through serverless technologies
 - Accelerate development
 - Reduce time to production



AI as a Service

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Eoin Shanaghy

MEAP

MANNING



aiasaservicebook.com
40% discount code:

ctwqcon20

Thanks!



Questions ?

