

# AI/ML on Cloud

## Session @ NSUT



# AGENDA



- **About Me**
- **AI/ML Basics**
- **Cloud Computing Basics**
- **AI/ML on Cloud**
- **Major Players**



- **General AI/ML Offerings**
- **Specific AI/ML Offerings**
- **Hardware for AI/ML Workload**
- **Open-source Standards in AI/ML**
- **Conclusion**



# About Me



## Build Your Own Roadmap

 ankitrathi.com



### Ankit Rathie

Lead Architect - Data & AI | Author | Speaker | All views are my own


Gautam Buddha Nagar, Uttar Pradesh, India · 500+ connections

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## Articles & activity

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### Artificial Intelligence: From Novice to Professional

 Ankit Rathie  
Published on LinkedIn

What aspects of Artificial Intelligence do you need to grasp beyond Algorithms? Why this post? There is a general notion that Artificial Intelligence is all about algorithms. If you look around most of the courses, books, blogs etc, you will find that most of them cover how you can apply certain al ...see more

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I am excited to share that I have started working on my upcoming...

Ankit shared this  
79 Reactions · 3 Comments



Time is the essence during the kind of virus outbreak that the world is...

Ankit shared this  
14 Reactions · 1 Comment



Very true...👍  
Ankit commented

[See all activity](#)

## Experience



### Lead Architect

SITA  
Dec 2017 – Present · 1 yr 9 mos



### Principal Consultant

Genpact Headstrong Capital Markets  
Jun 2016 – Dec 2017 · 1 yr 7 mos  
Noida Area, India



### Tech Lead

Royal Bank of Scotland  
Nov 2010 – Jun 2016 · 5 yrs 8 mos  
New Delhi Area, India



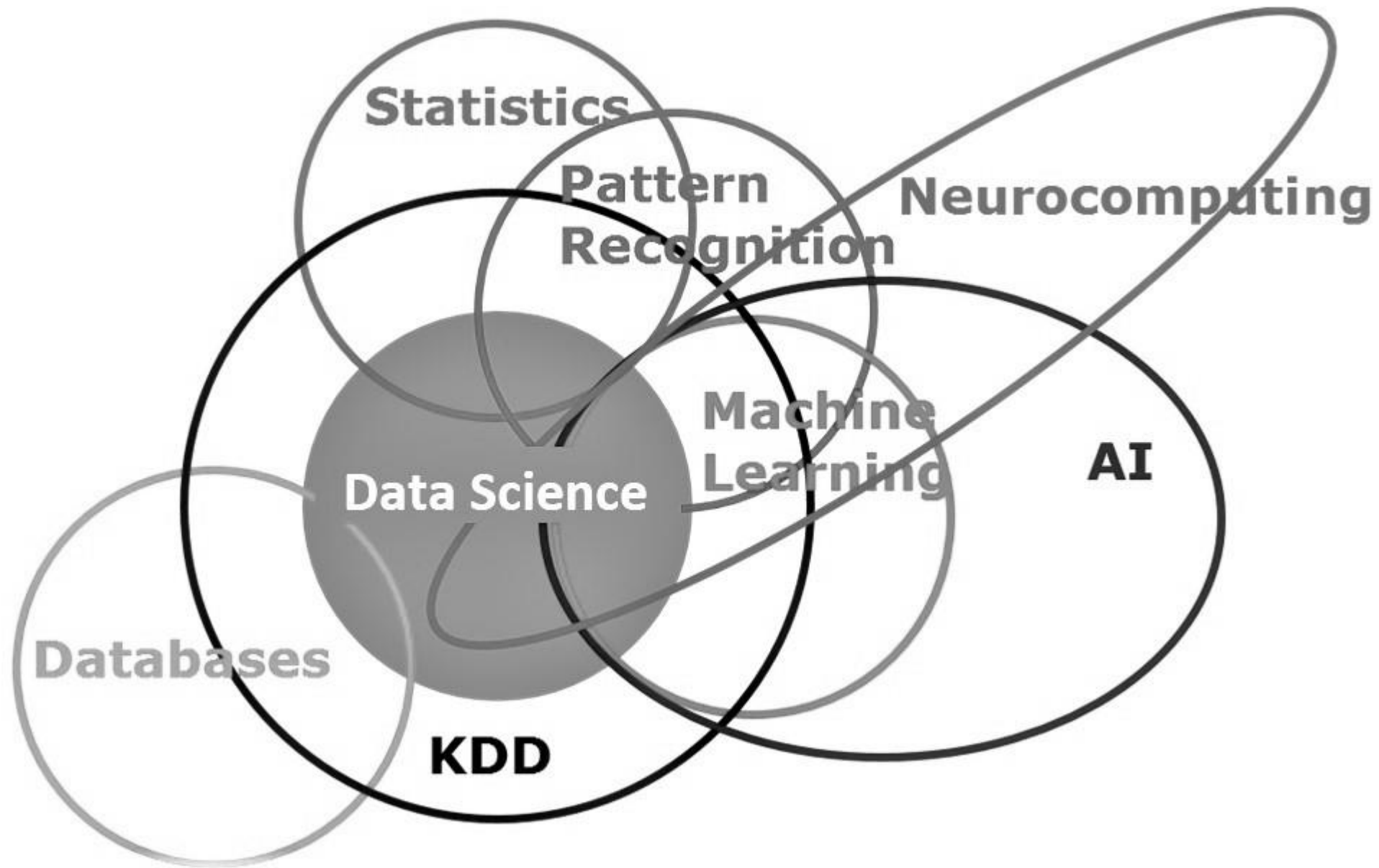
- **14+ years in Data & Analytics**
- **Currently working in SITA**
- **Worked on DBs/ETL/DWH/BI**
- **Transitioned into AI/ML in 2013**
- **Infusing intelligence in products**
- **Blogger, Author & Speaker**



# What is AI/ML?

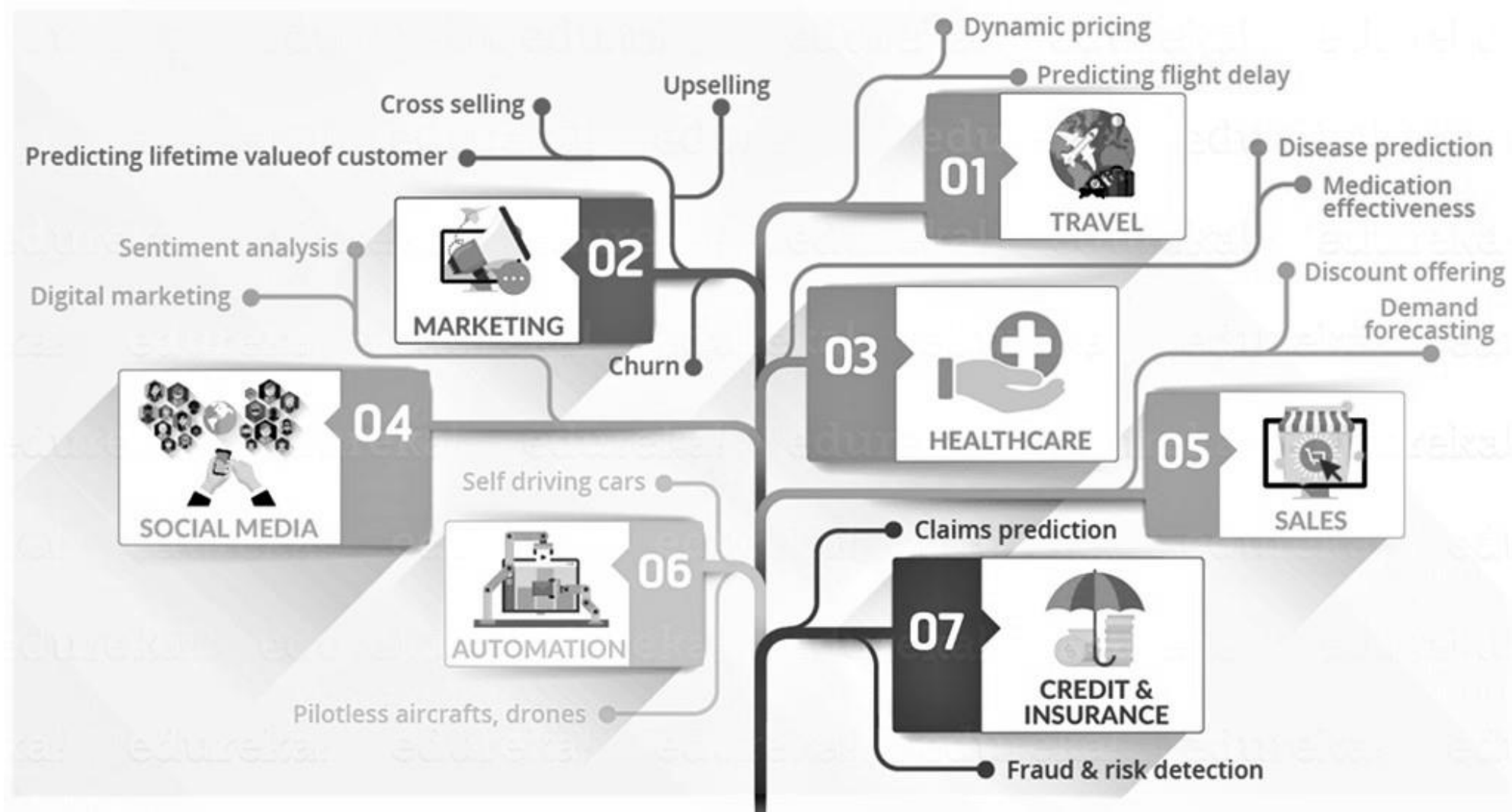






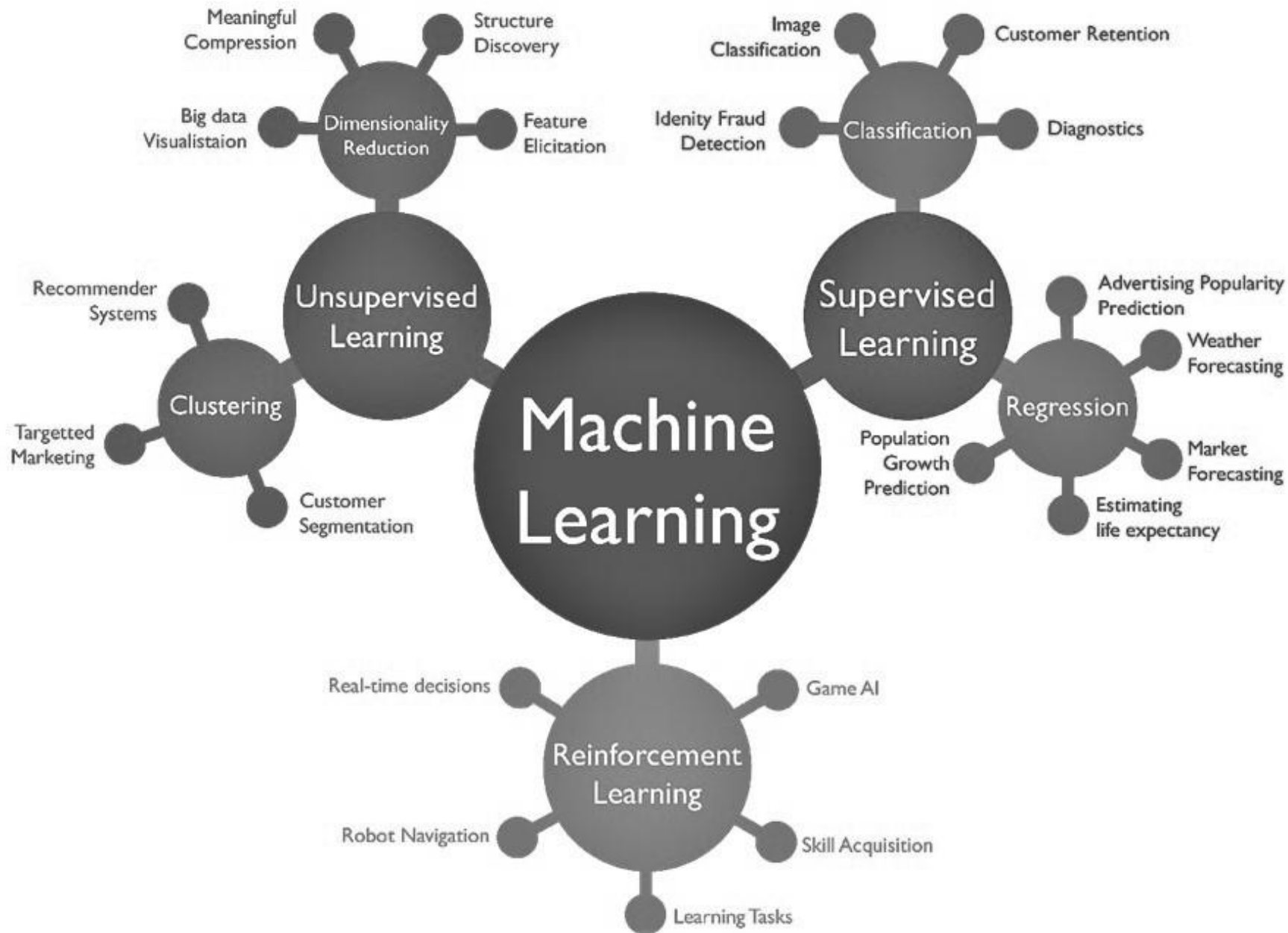
# Why AI/ML?





# Types of AI/ML





# From AI to Deep Learning



# ARTIFICIAL INTELLIGENCE

Early artificial intelligence stirs excitement.



# MACHINE LEARNING

Machine learning begins to flourish.



# DEEP LEARNING

Deep learning breakthroughs drive AI boom.



1950's

1960's

1970's

1980's

1990's

2000's

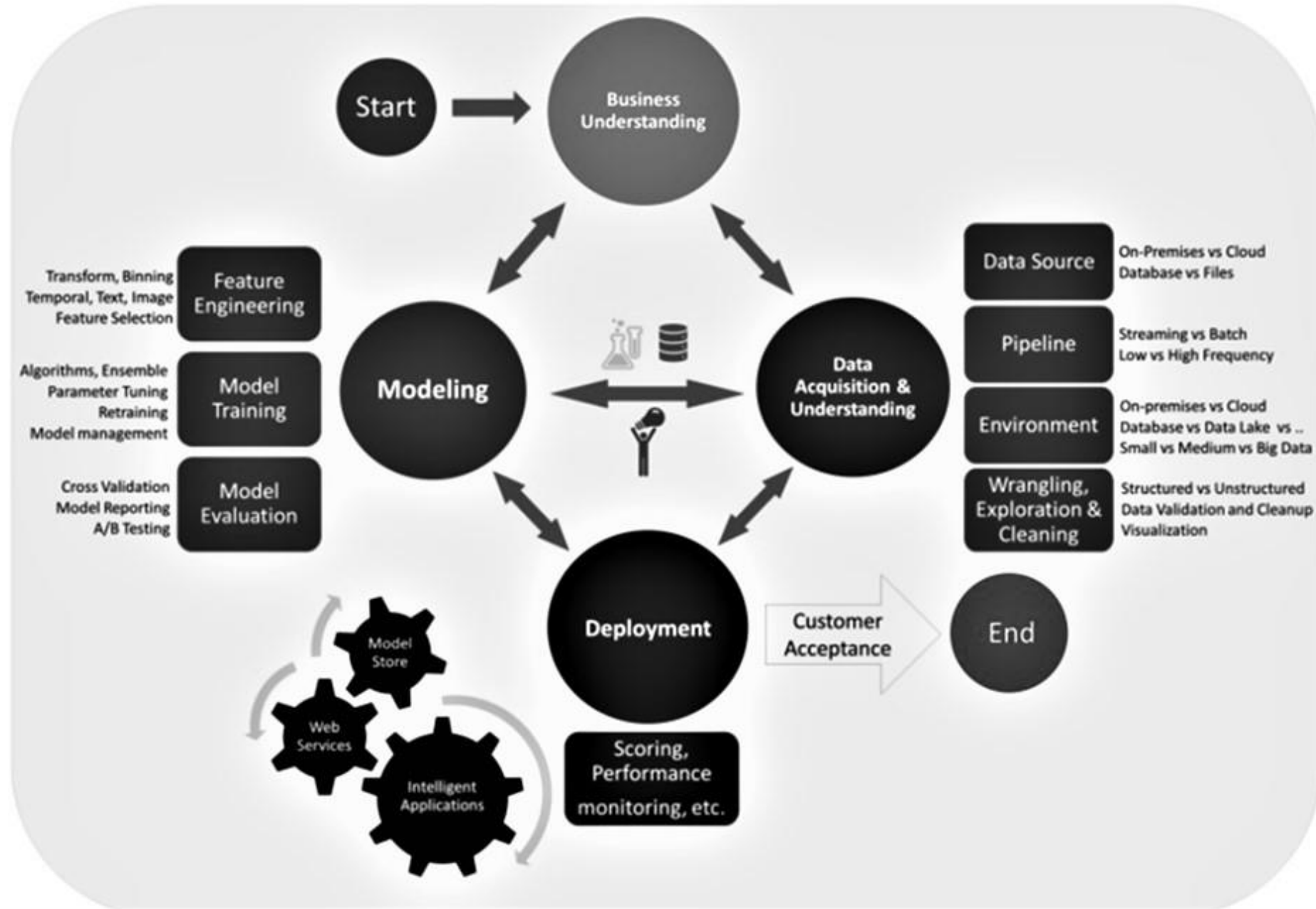
2010's



# Typical AI/ML Lifecycle

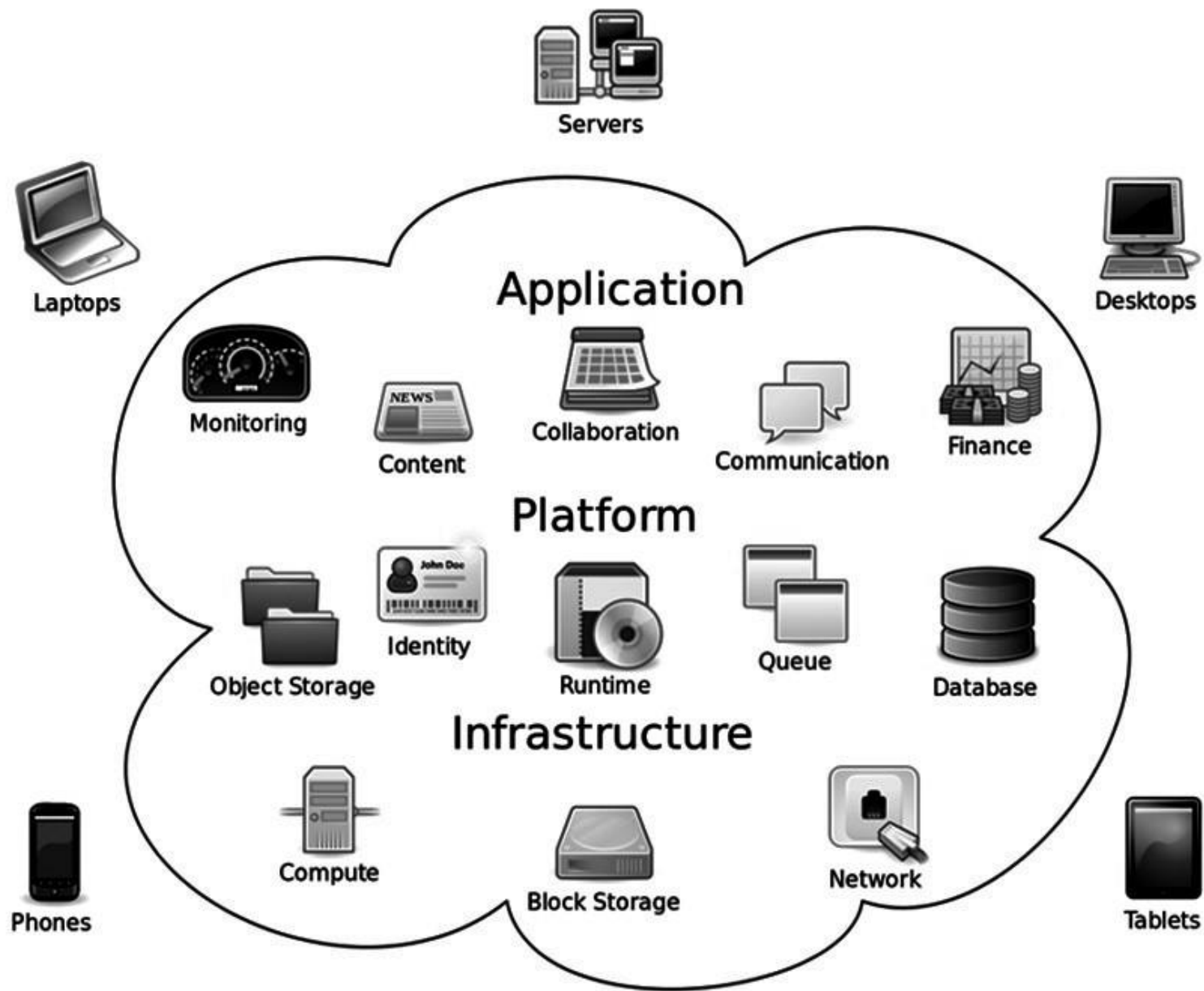






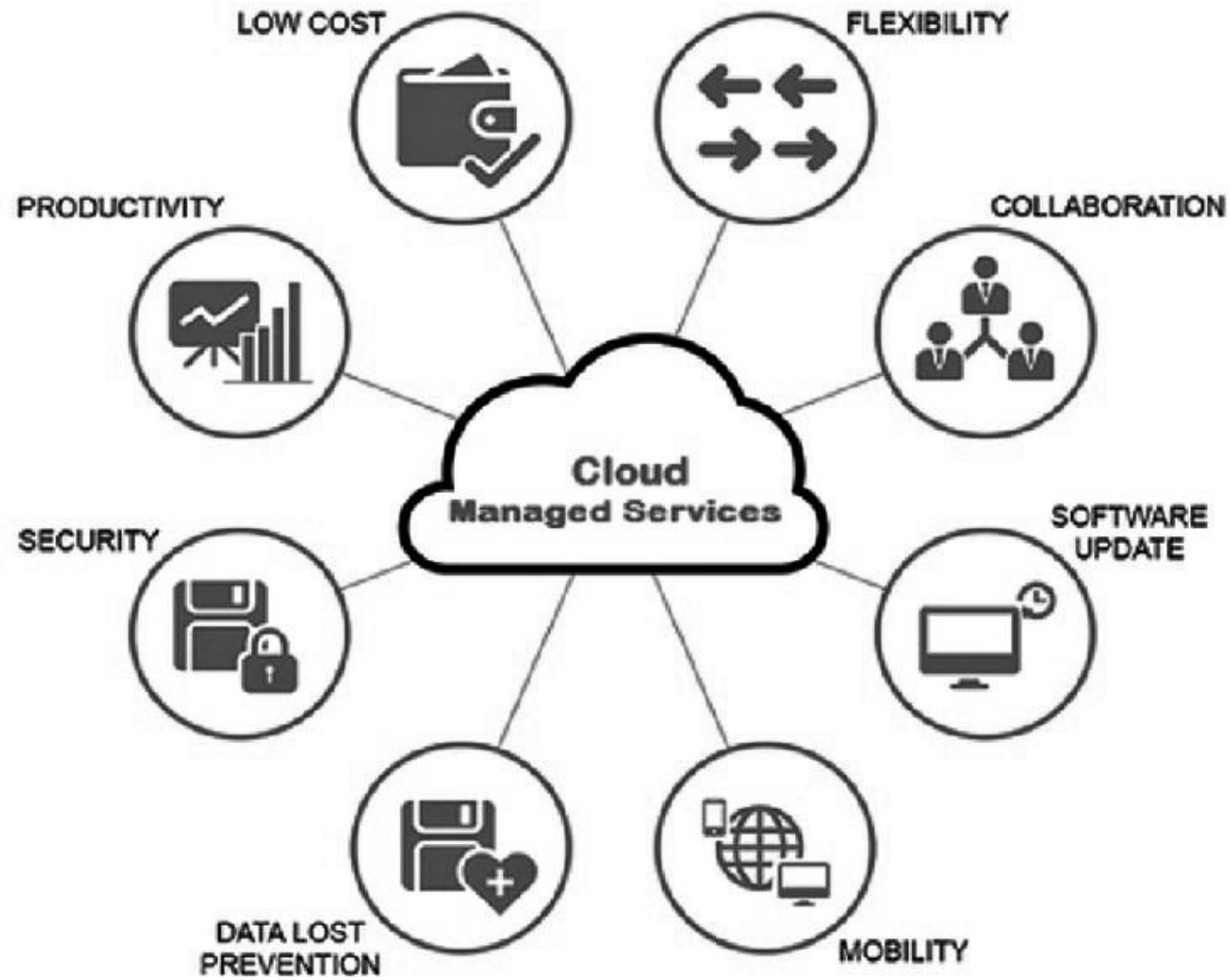
# What is Cloud Computing?





# Why Cloud Computing?





# Why NOT Cloud Computing?



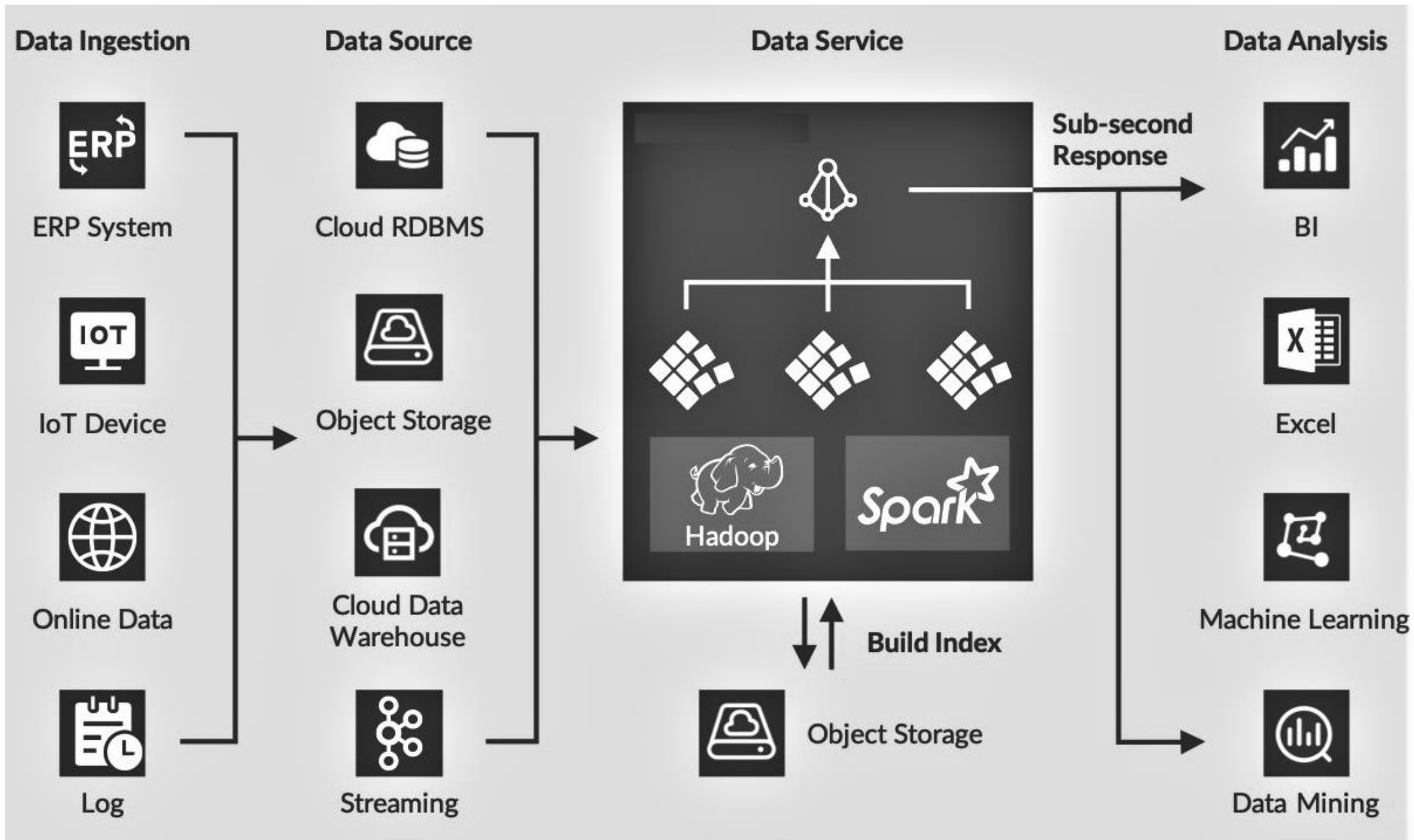
- **Downtime**
- **Security & Privacy**
- **Vulnerability to attack**
- **Limited control and flexibility**
- **Vendor lock-in**
- **Cost Concerns**

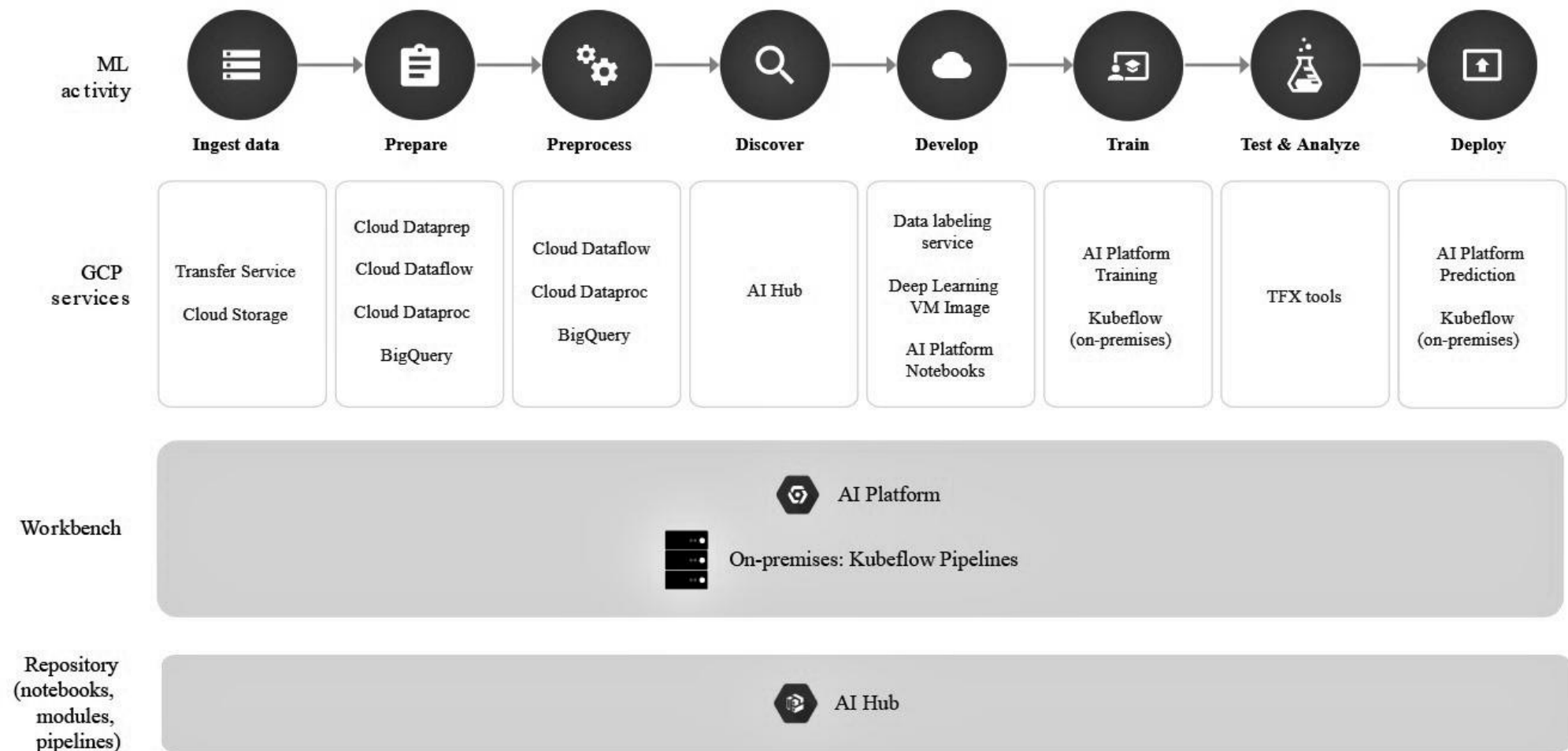


# AI/ML on Cloud









# Why AI/ML on Cloud?



- **Scale on the fly**
- **Reduce operational costs**
- **Faster deployment**
- **Expand geographically**
- **Easy collaboration**



- **Easier upgrades**
- **Pay-per-use model**
- **Easy experimentation**
- **Less expertise required**
- **Low entry barrier**



# Major Players





Google Cloud Platform



# General AI/ML Offerings








	Amazon	Microsoft	Google
Automated and semi-automated ML services			
	Amazon ML	Microsoft Azure ML Studio	Cloud AutoML
Classification	✓	✓	✓
Regression	✓	✓	✓
Clustering	✓	✓	✗
Anomaly detection	✗	✓	✗
Recommendation	✗	✓	✓
Ranking	✗	✓	✗
Platforms for custom modeling			
	Amazon SageMaker	Azure ML Services	Google ML Engine
Built-in algorithms	✓	✗	✓
Supported frameworks	TensorFlow, MXNet, Keras, Gluon, Pytorch, Caffe2, Chainer, Torch	TensorFlow, scikit-learn, Microsoft Cognitive Toolkit, Spark ML	TensorFlow, scikit-learn, XGBoost, Keras



# Featured AI/ML Offerings



	 Google Cloud Platform		
<b>Image Recognition</b>	Vision API AutoML Vision	Rekognition Image	Computer Vision API Custom Vision Service
<b>Video Analysis</b>	Video Intelligence API	Rekognition Video	Computer Vision API
<b>Speech to Text</b>	Speech API	Transcribe	Bing Speech API Speaker Recognition API
<b>Text to Speech</b>	Text-to-Speech API	Polly	Bing Speech API
<b>Translation</b>	Translation API	Translate	Translator Text API
<b>Chatbot</b>	Dialogflow	Lex	Azure Bot Service



# Hardware for AI/ML Workload



- **Very Expensive processing power**
- **GPUs for reduced processing time**
- **Providers support both (GPUs & CPUs)**
- **TPUs\* optimized for AI/ML jobs**
- **Edge computing & AI accelerators**

\* By Google



# Open-source Standards in *AI/ML*



- **Tensorflow** by Google (supported by Amazon and Microsoft)
- **Apache MXNet** (supported by Amazon)
- **CNTK** aka Cognitive Toolkit (supported by Microsoft)
- **Gluon** supports MXNet & CNTK (supported by Amazon and Microsoft)
- **ONNX** (the Open Neural Network Exchange) from Facebook and Microsoft (supported by Amazon and Microsoft)



# Conclusion





- **Avoid vendor lock-in**
- **General purpose -> Open-source**
- **Select with broad support**
- **GCP > AWS > Azure (as of now)**
- **Scenario evolving rapidly...**



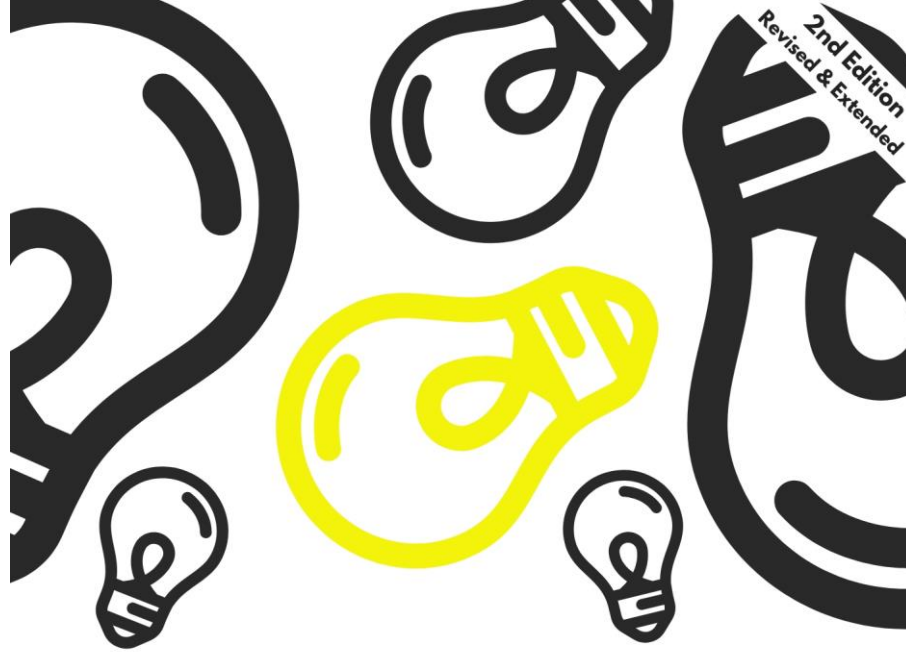


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# Artificial Intelligence

## Self-Starter Handbook

BUILD YOUR OWN ROADMAP

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Ankit Rathi



**2<sup>nd</sup> Edition**  
Revised & Extended  
**Coming Soon...**



# Questions...?



# Thank You



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