Getting started with a POC

IMPLEMENTING AI SOLUTIONS IN BUSINESS

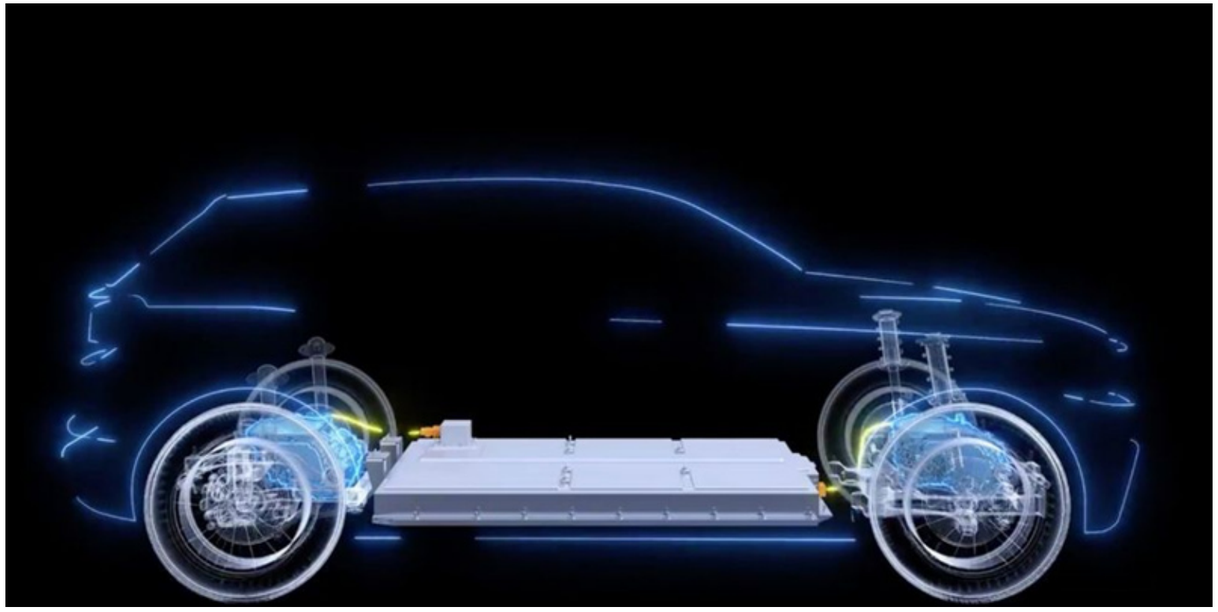


Jacob H. Marquez
Data Scientist

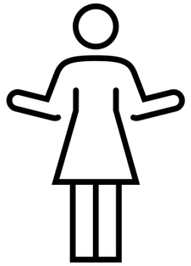
datacamp

What is a proof of concept?

Definition: *small realization of an idea to demonstrate its feasibility and potential*

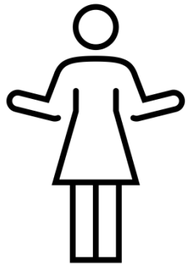


Phases of a POC

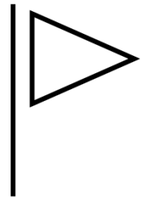


Identify
+
Confirm

Phases of a POC

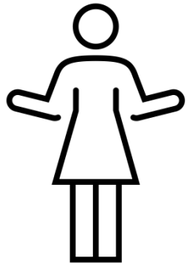


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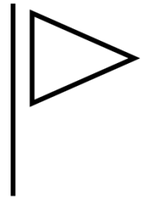


Goals
+
Characterize

Phases of a POC



Identify
+
Confirm

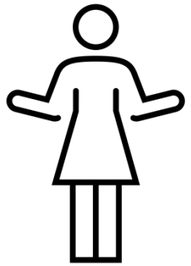


Goals
+
Characterize

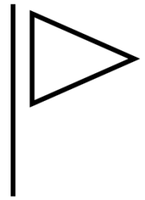


Profile
the
Data

Phases of a POC



Identify
+
Confirm



Goals
+
Characterize

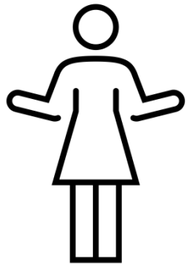


Profile
the
Data

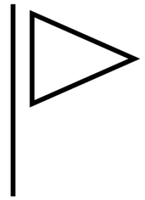


Architect
+
Design

Phases of a POC



Identify
+
Confirm



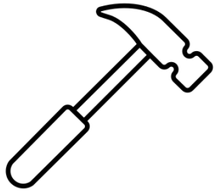
Goals
+
Characterize



Profile
the
Data

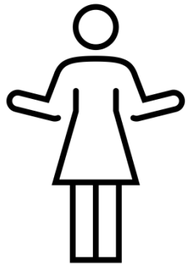


Architect
+
Design

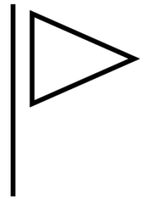


Develop
+
Test

Phases of a POC



Identify
+
Confirm



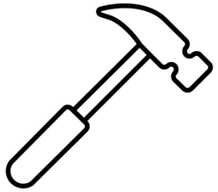
Goals
+
Characterize



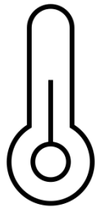
Profile
the
Data



Architect
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Design

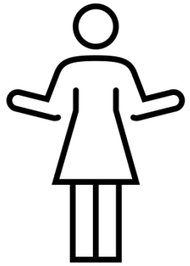


Develop
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Test

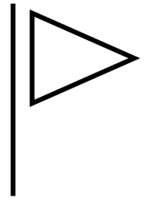


Deploy
+
Evaluate

Phases of a POC



Identify
+
Confirm



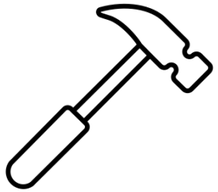
Goals
+
Characterize



Profile
the
Data



Architect
+
Design



Develop
+
Test

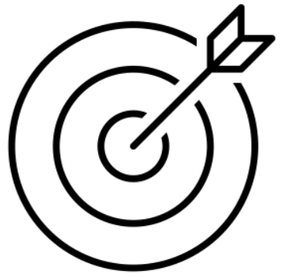


Deploy
+
Evaluate

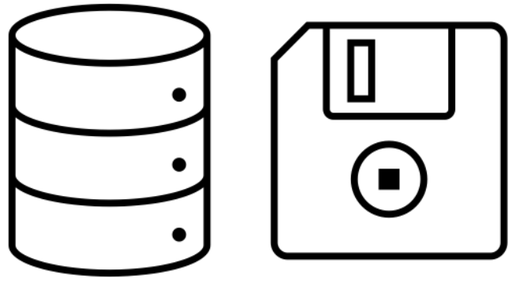


Scale
+
Govern

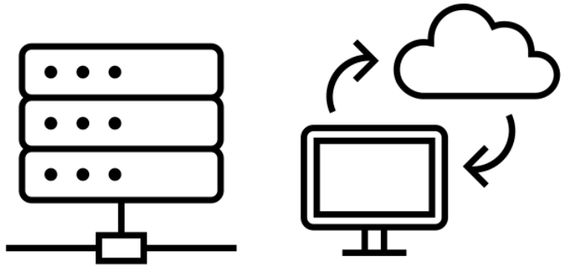
A successful POC



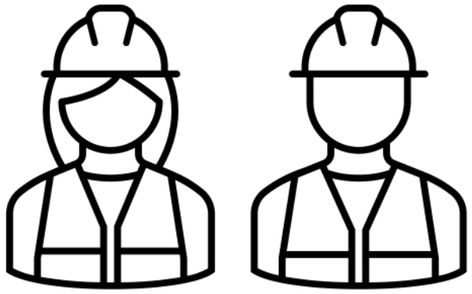
Clear goals & exit criteria



Available & representative data

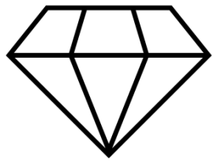


Efficient infrastructure



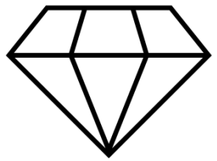
Skilled developers

Defining clear goals

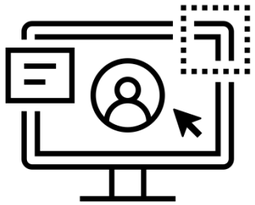


Value
Proposition

Defining clear goals

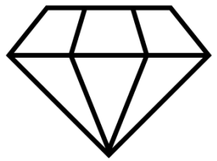


Value Proposition

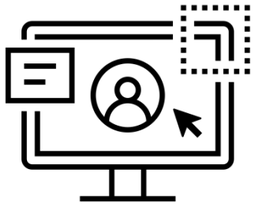


Know the end-user

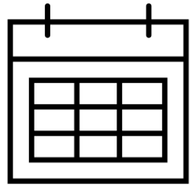
Defining clear goals



Value Proposition

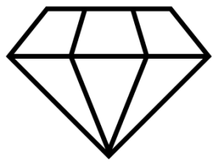


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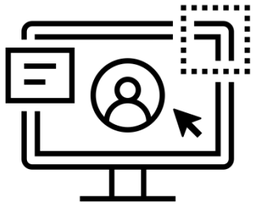


Timeline

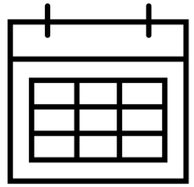
Defining clear goals



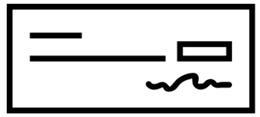
Value Proposition



Know the end-user

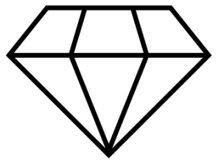


Timeline

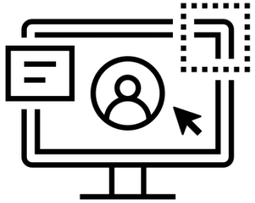


Funding

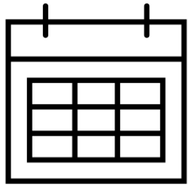
Defining clear goals



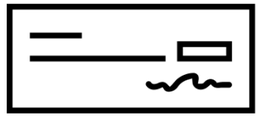
Value Proposition



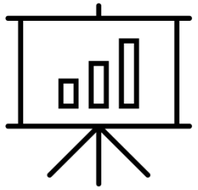
Know the end-user



Timeline



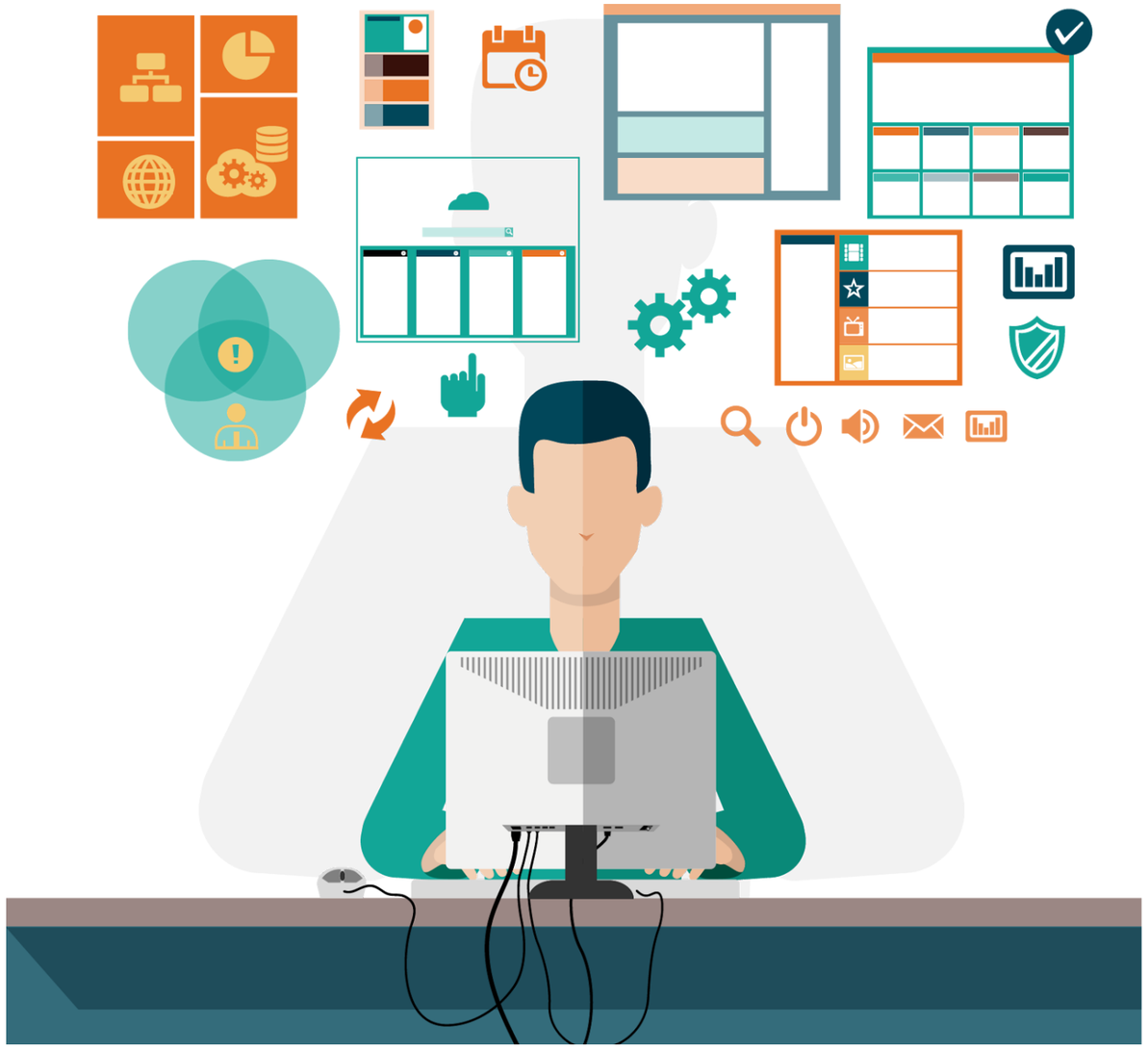
Funding



Business Metrics

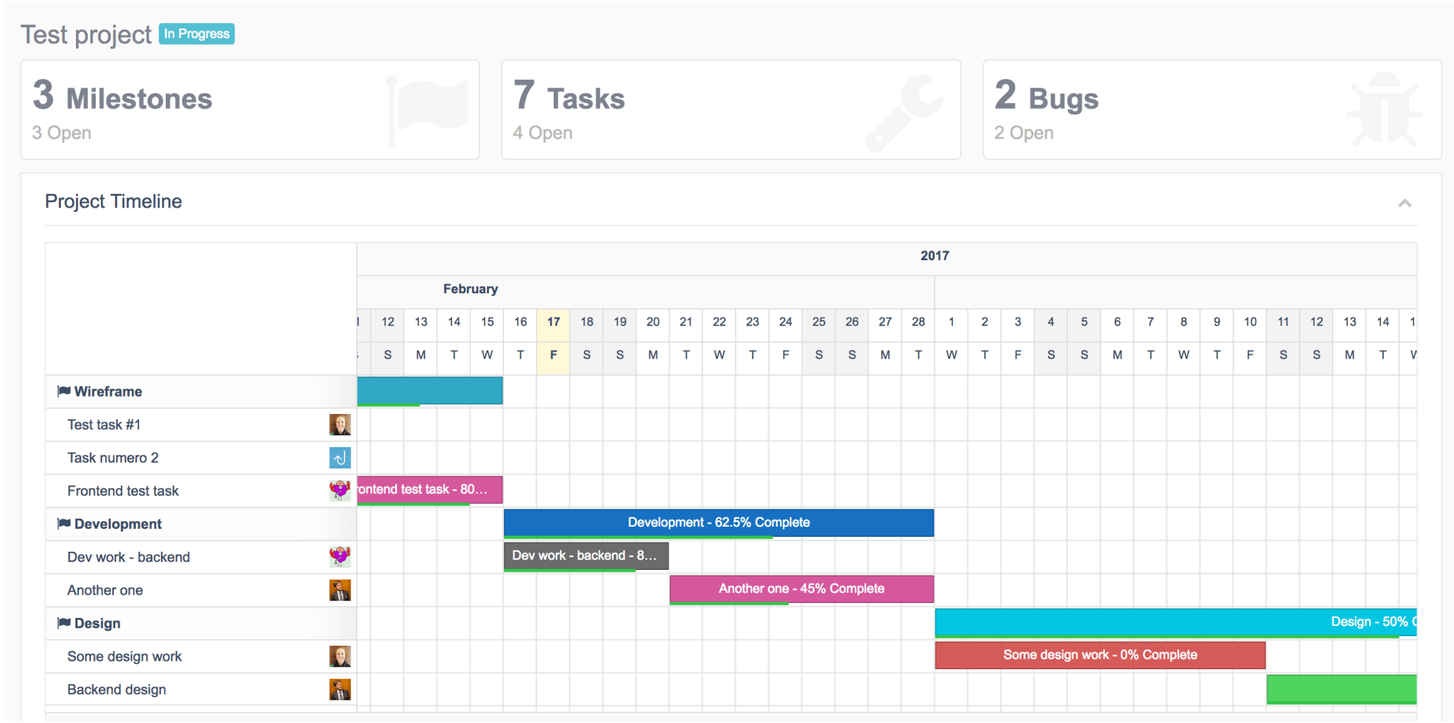
Understanding the end-user

- Who will be using this solution?
- How many people will be using the POC? The full solution?
- How will they be using it?
- What decisions will be made based on the solution?
- How interpretable does it have to be?
- Why would this AI solution bring more value to them?



Understanding timelines

- Is there a pending deadline which requires an outcome from this POC?
- If so, how much time is available?
- What would be the important milestones?



Understanding costs and funding

- Will you be buying vs. building some or all of the components?
- Will it be cloud-based or on-premises?
- Is appropriate funding available?
- Who is funding the POC?



Let's practice!

IMPLEMENTING AI SOLUTIONS IN BUSINESS

Data

IMPLEMENTING AI SOLUTIONS IN BUSINESS



Jacob H. Marquez
Data Scientist

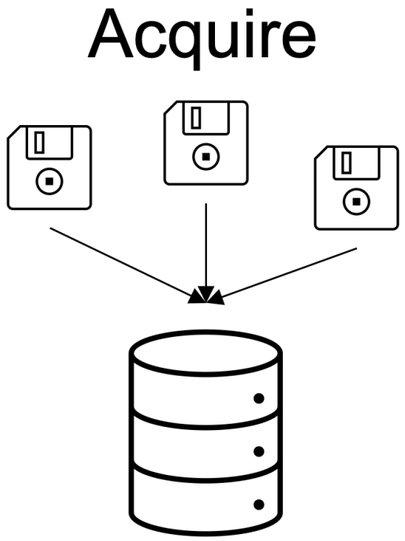
datacamp

Importance of data

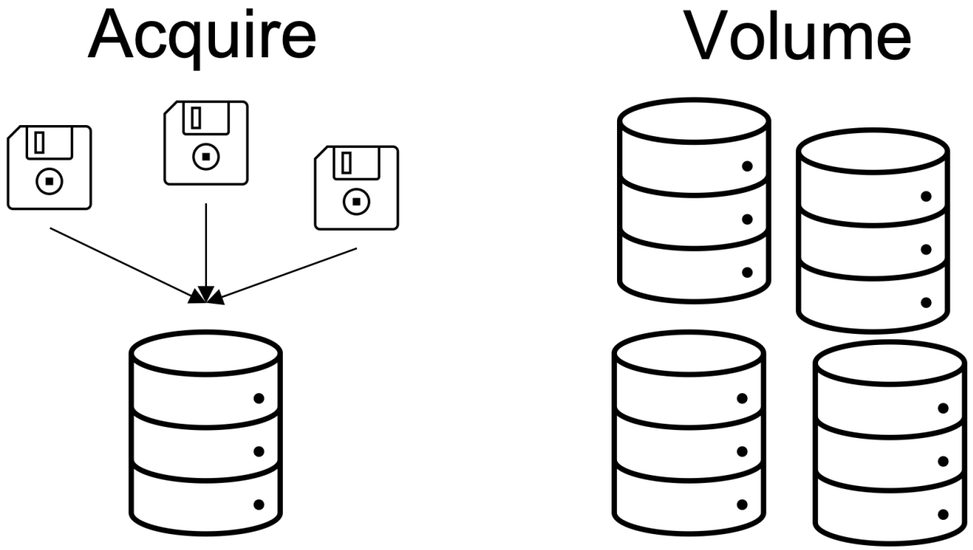
- No data, no patterns to learn
- Wrong data, wrong patterns
- AI is as good as the data



The four areas for data

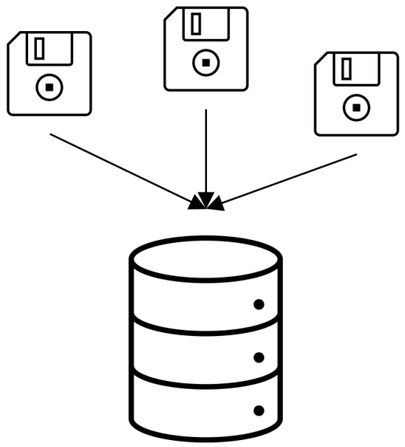


The four areas for data

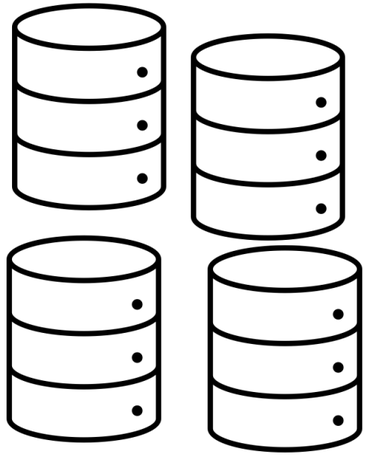


The four areas for data

Acquire



Volume



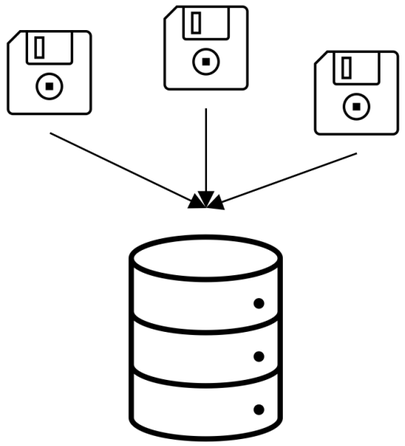
Quality



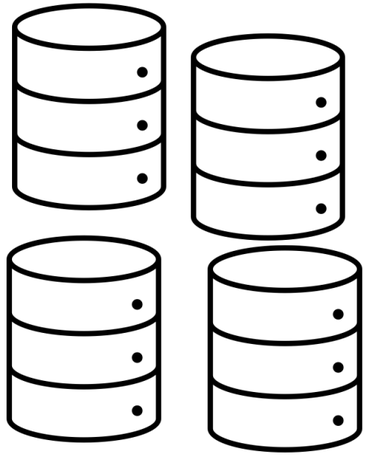


The four areas for data

Acquire



Volume



Quality



Security



Acquisition

Types of data

- Customer demographics
- Sales information
- Product inventory
- Marketing campaign performance

Supply Chain

- Procurement
- Transportation
- Inventory levels

AI for images classification

- Mechanical failures
- 1,000's of labeled images

Acquisition

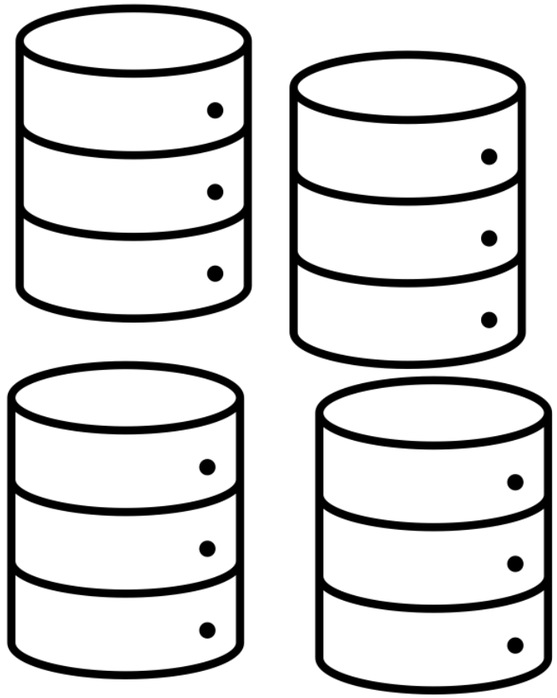
First-party

- Creative on data capture or existing sources
- Speak to other groups
- Take time to acquire

Third-party

- Data source specialists
- Partner with other businesses

Volume

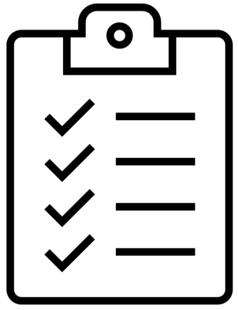


- More complex = more data
- Machine Learning scientist will determine requirements

Quality



Quality

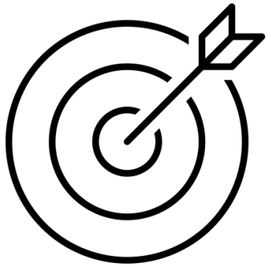


Completeness

Quality



Completeness

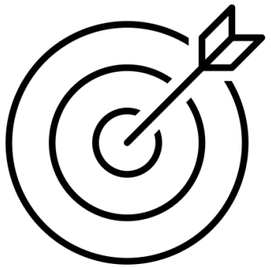


Accuracy

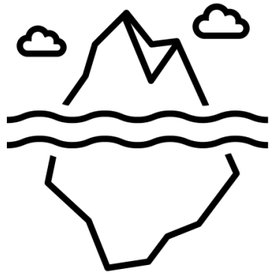
Quality



Completeness



Accuracy

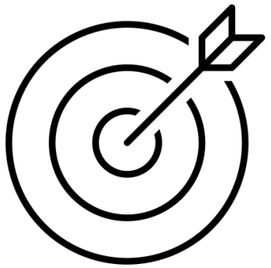


Relevance

Quality



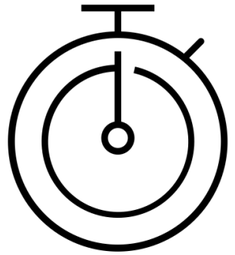
Completeness



Accuracy



Relevance



Timeliness

Quality - data bias

Definition: *systemic errors or prejudices in the data that can lead to inaccurate or unfair outcomes*

- Tools and methods to recognize and evaluate
- Prevent skewed outcomes and biased decision making
- Build AI responsibly

Security

Helps to:

- Maintain trust
- Comply with regulations
- Safeguard business interests

Measures:

- Removing personal identifiers
- Retention policies
- Encryption
- Access control

Let's practice!

IMPLEMENTING AI SOLUTIONS IN BUSINESS

Infrastructure

IMPLEMENTING AI SOLUTIONS IN BUSINESS



Jacob H. Marquez
Data Scientist

datacamp

To build or to buy?

Build custom

- More control of the entire system
- Hyper specific to your business
- Requires more strategy around design, staff, maintenance, and cost
- Longer timeline and higher costs
- Not guaranteed to be the best performing

Buy existing

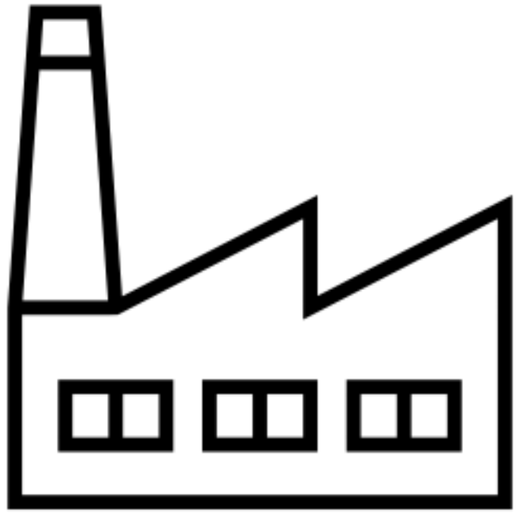
- Usable out of the box
- Less specialized skills required for development
- Customize with your data
- Spend more time on the integration strategy

Choosing an environment

Cloud



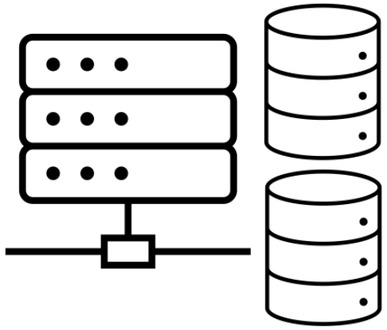
On-premise



Technical requirements

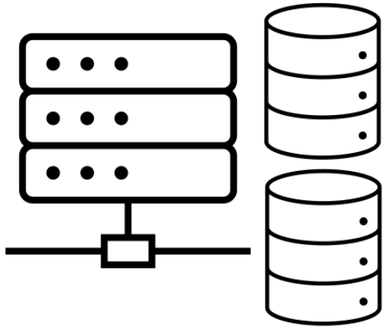
- AI solutions may need different hardware
- Needs to handle
  - Higher volumes of data
  - More complexity
  - Typical software processes

Technical requirements

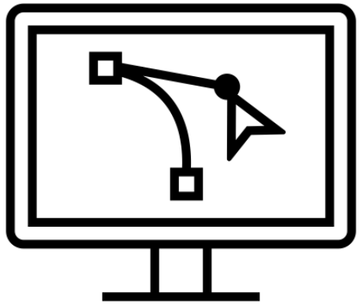


Data Infrastructure

Technical requirements

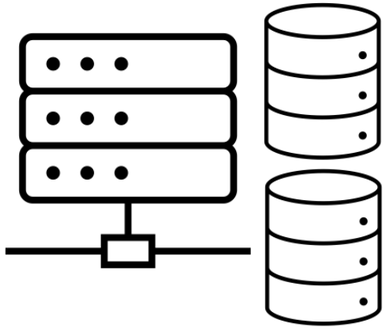


Data Infrastructure

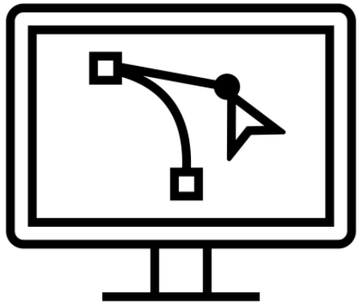


AI Dev Environment

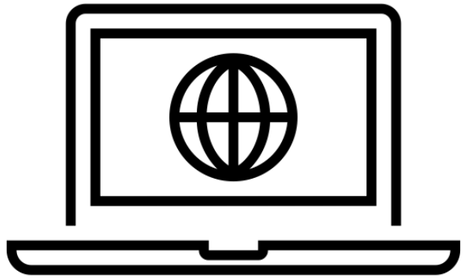
Technical requirements



Data Infrastructure

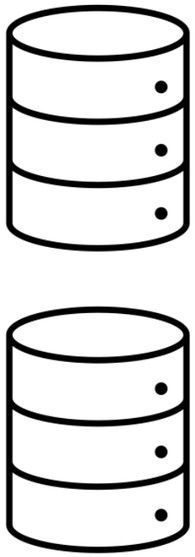


AI Dev Environment



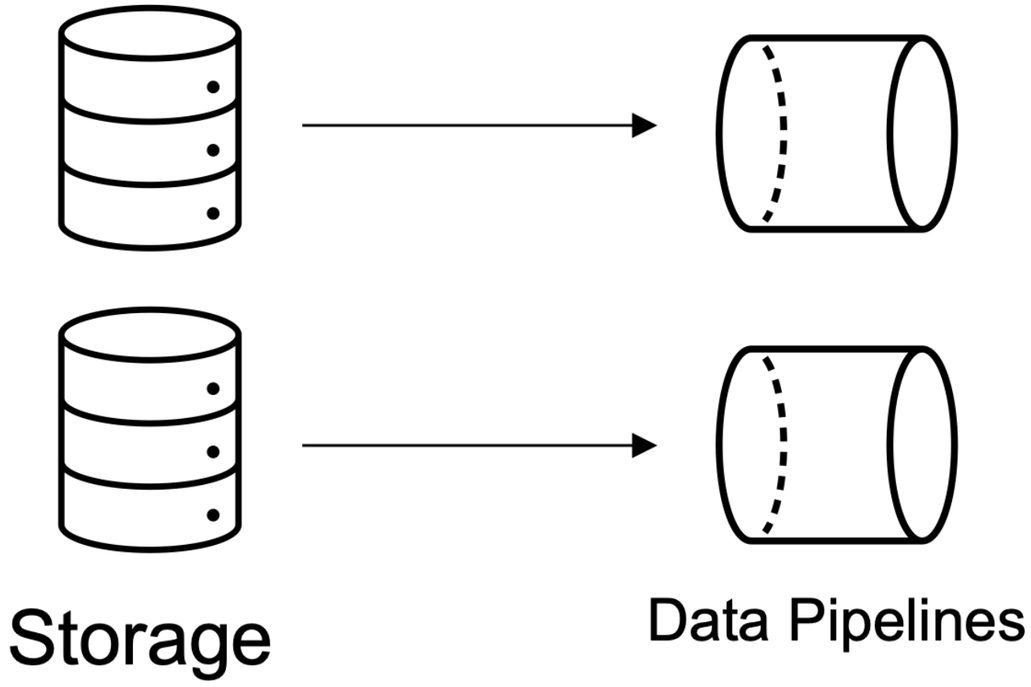
Deployment Infrastructure

Data infrastructure



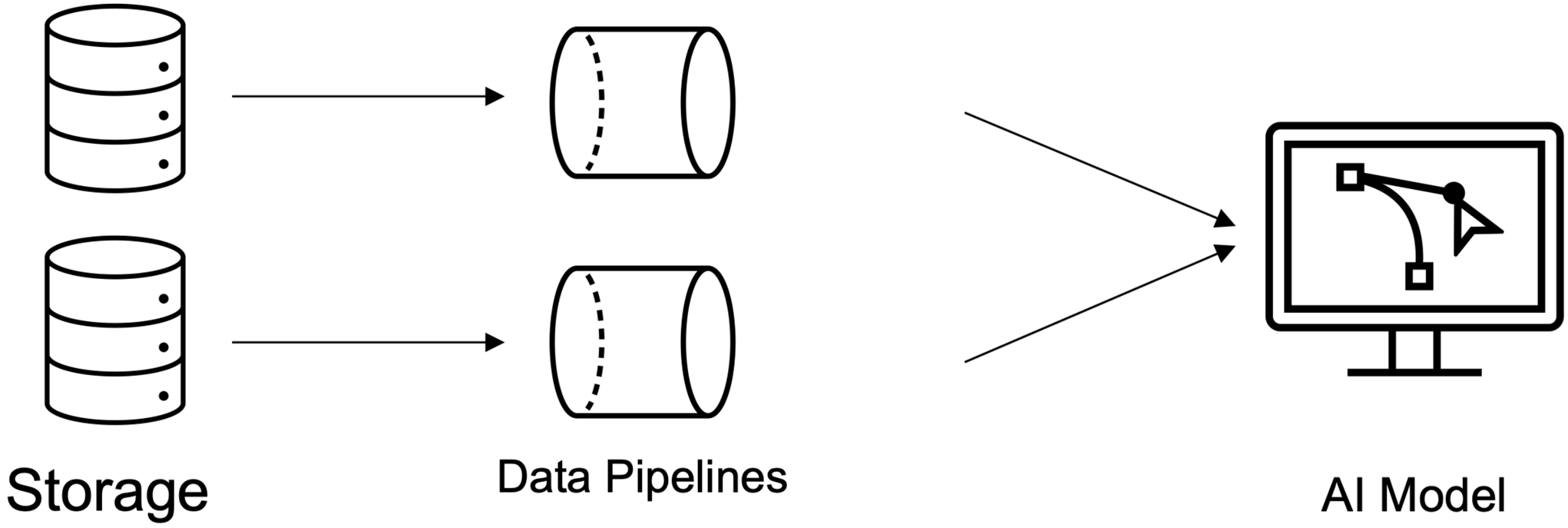
Storage

Data infrastructure

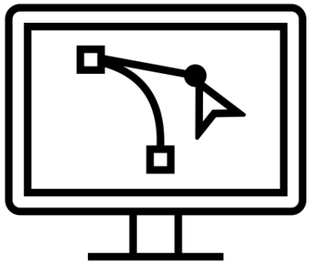


- Handle more volume
- Update to be faster

Data infrastructure

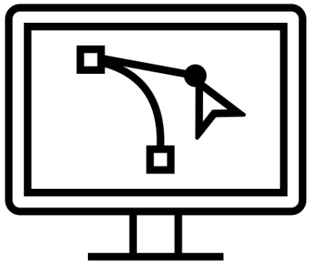


AI development environment

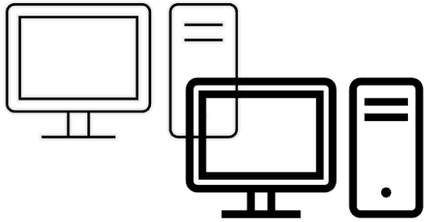


AI Dev
Environment

AI development environment

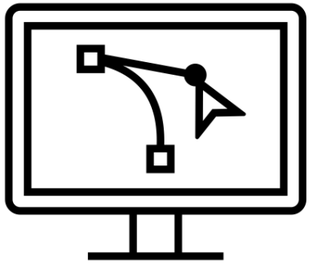


AI Dev Environment

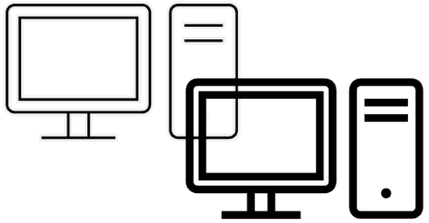


Compute

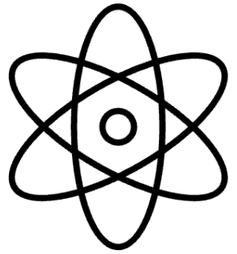
AI development environment



AI Dev Environment



Compute



Algorithm

Deployment Infrastructure

- Where the solution will be hosted, interacted with, monitored, secured, and more
- Eventually will include MLOps and DevOps

Questions to consider

- What is the end-user interface?
- Does it need to be built or will the AI solution be integrated into an existing system?
- Does the AI solution need to be real-time?
- Who should be able to access the AI solution?

Let's practice!

IMPLEMENTING AI SOLUTIONS IN BUSINESS

Building the project team

IMPLEMENTING AI SOLUTIONS IN BUSINESS



Jacob H. Marquez
Data Scientist

datacamp

The project team

Dependent on

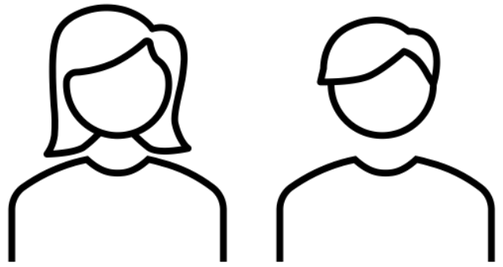
- Use case
- What you're building or buying
- Size of your company

Types of Roles

- Machine Learning
- Software Engineering
- Business

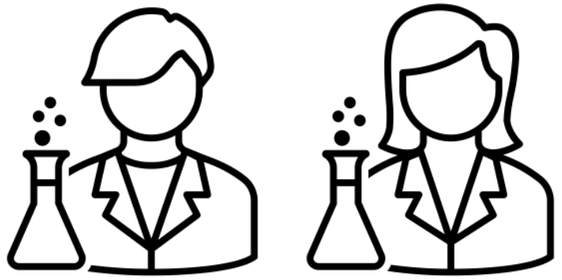
The machine learning roles

Data Analyst



- Exploring data
- Transform data for the AI
- Monitoring and evaluation

ML Scientist



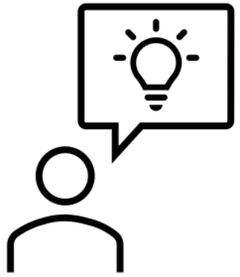
- Develop the AI
- Select algorithm
- Ensure learning of patterns
- SME consultant

The software engineering team

- Solution Architect
- Data Engineer
- Product Engineer
- UX Designer
- Operations

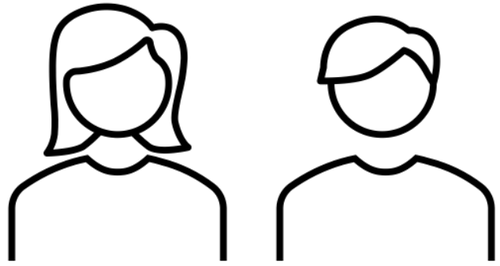
The software engineering team

Solution Architect



- Design the system architecture
- Cloud services, compute requirements
- Could be Technical PM

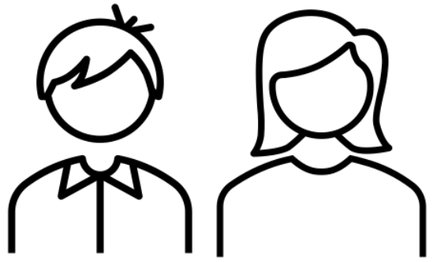
Data Engineers



- Build data pipelines
- Move, aggregate, transform, store
- Could be data analyst or ML scientist

The software engineering team

Product Engineers



- aka Software Engineers
- Build the product or feature
- Create back-end and front-end

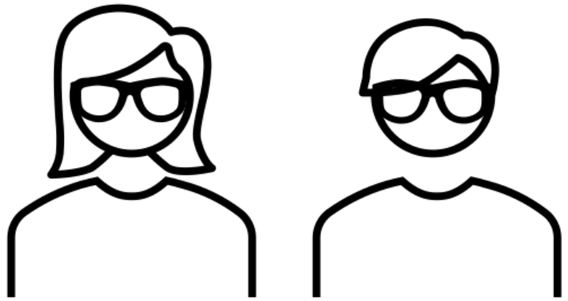
UX Designers



- Create the experience
- Intuitive user interface

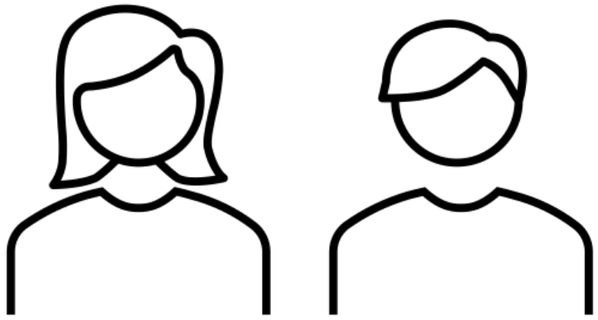
The software engineering team

MLOps Engineer



- Automate and productionalize the AI model
- Monitor and alert systems

DevOps Engineer



- Development lifecycle
- Enable continuous integration and delivery of the product

The business roles

Project Manager



- Clearly defined requirements
- Build the timeline
- Drive clarity

Business Expert



- Industry and end-user expertise
- SME from use case business area
- Consultant
- Use case identification
- Evaluate impact

Third-party support

- Hire an outside development partner
- Support change management, upskilling
- Expedite development with pre-built solutions

Let's practice!

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