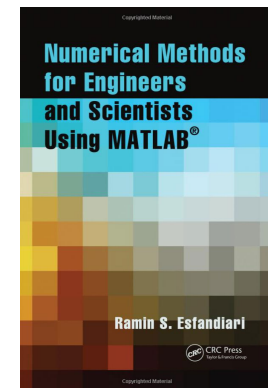
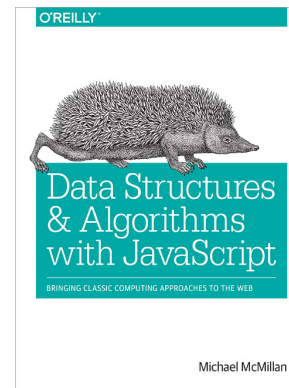
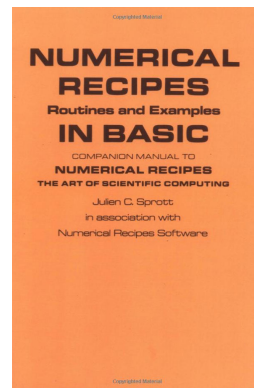
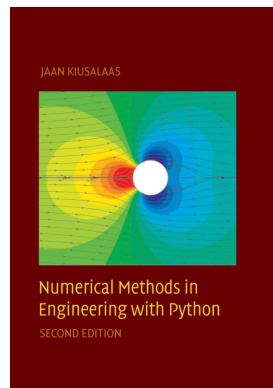
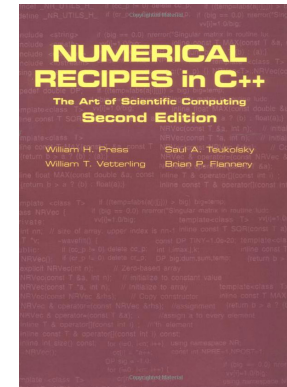
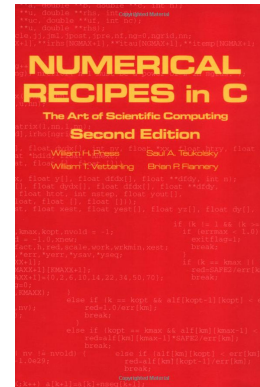
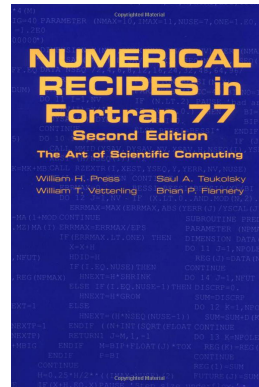
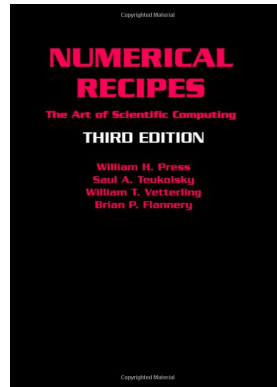


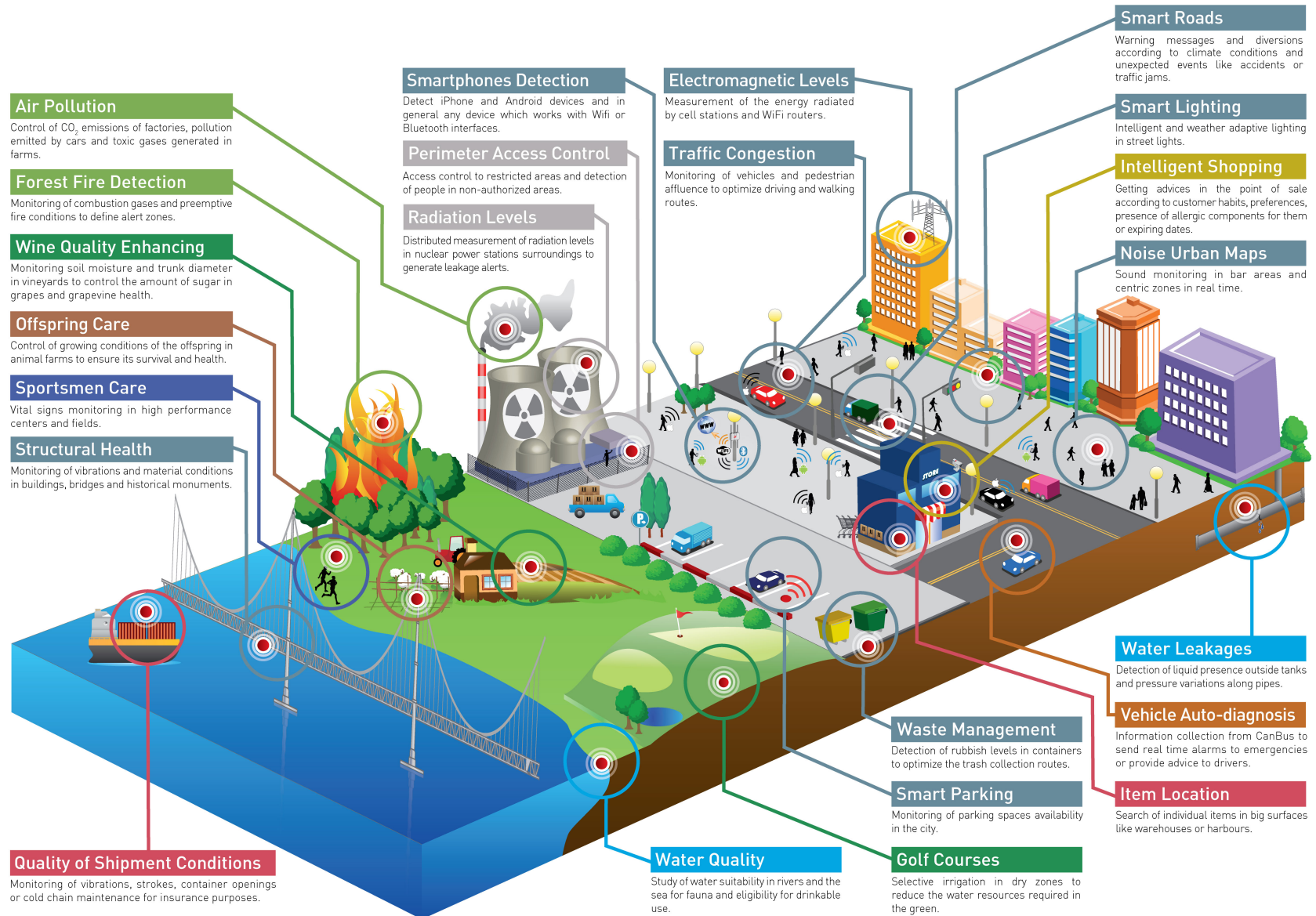
A white Volkswagen Westfalia van is driving away from the viewer on a dirt road, kicking up a cloud of dust. The scene is set during a golden sunset or sunrise, with the sun low on the horizon and its light reflecting off the dust. In the background, there are rolling hills or mountains under a hazy sky. The van has "WESTFALIA" written on its roof and a license plate that reads "2E-V677".

Architecting & Engineering Software Systems

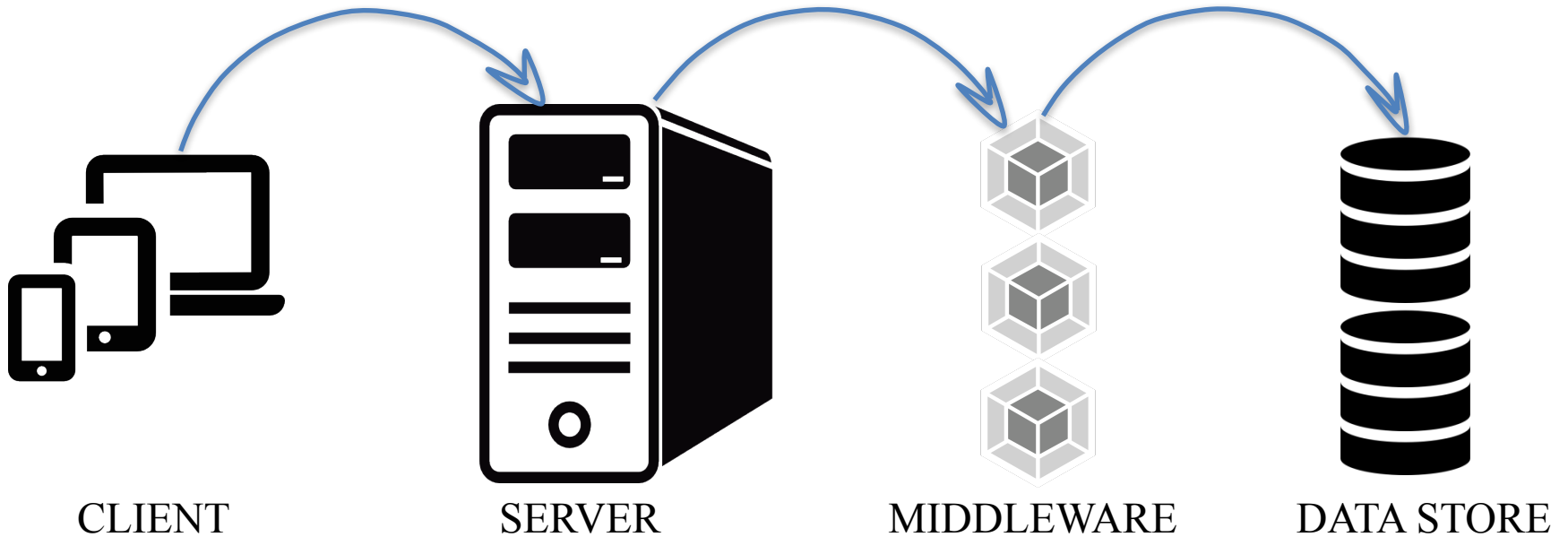
The Historical Approach



The Challenge: Complex Software Systems



N Tiers Systems



System Building Blocks

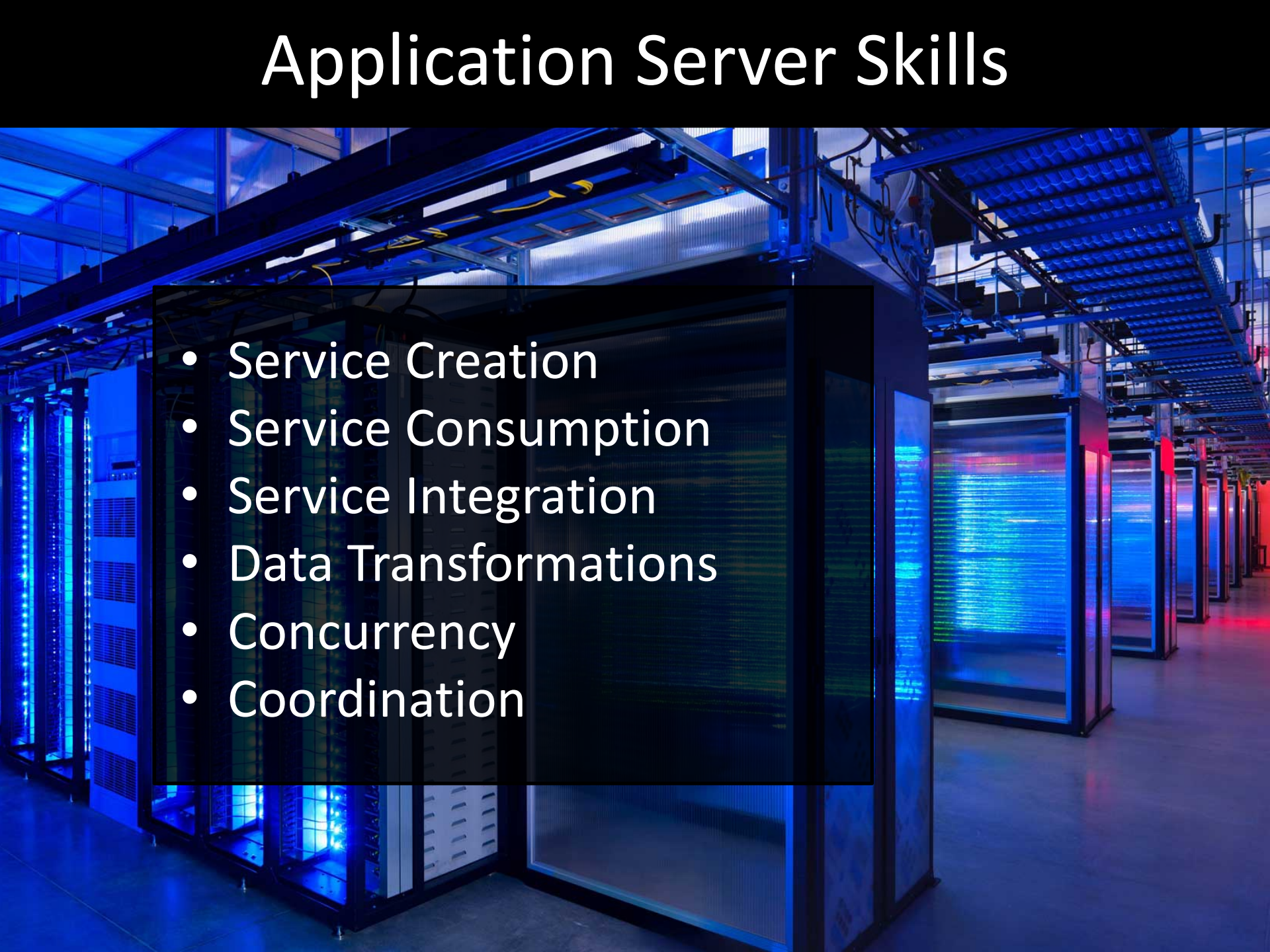


A hand with the index finger pointing upwards towards a bright, circular light source. The background is dark, and the light source is a large, glowing circle. The hand is positioned in the lower right quadrant of the frame.

Application Servers:

- Small
- Easy to use
- Low Cost
- Ubiquitous
- Loosely Joined

Application Server Skills

- 
- A photograph of a server room with blue lighting. Rows of server racks are visible, with some racks having glass doors that show internal components. The room has a high ceiling with exposed pipes and cables. The overall atmosphere is technical and modern.
- Service Creation
 - Service Consumption
 - Service Integration
 - Data Transformations
 - Concurrency
 - Coordination

Package Management

- Registry
- Creation
- Distribution
- Scalability

Parallel Happens – Async Programs

- Non-Blocking
- Event-loop
- Callbacks
- Promises



State Management

- 
- The background image is a high-angle, wide shot of a large, multi-level library. The library features numerous wooden study desks arranged in rows across different levels, connected by wooden walkways. Each desk is equipped with a green lamp. Many people are seated at the desks, working on laptops or reading. Bookshelves filled with books line the walls of the upper levels. The overall atmosphere is one of a quiet, busy academic environment.
- Record and Replay
 - Predictable Containers
 - Logging
 - Time Travel

Event Streams

- Event Management
- Event bubbling
- Event Driven Programming
- Reactive Patterns

Coordination

- Orchestration
- Integration
- Error Handling



REST

- Microservices
- Route Mgmt.
- Token Mgmt.
- API Design



Containers

- Container Mgmt.
- Docker
- Mesos
- Kubernetes

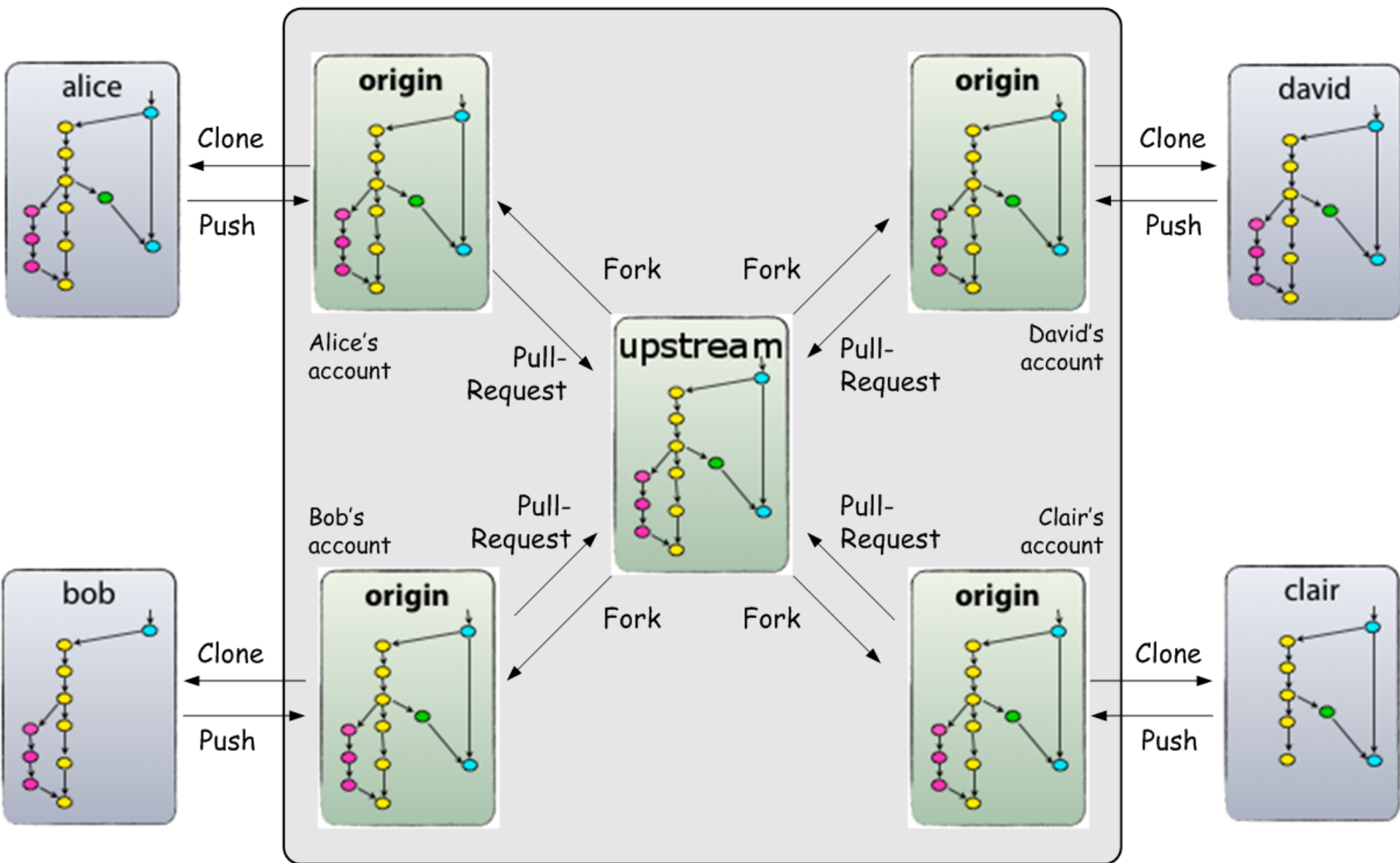


Collaboration

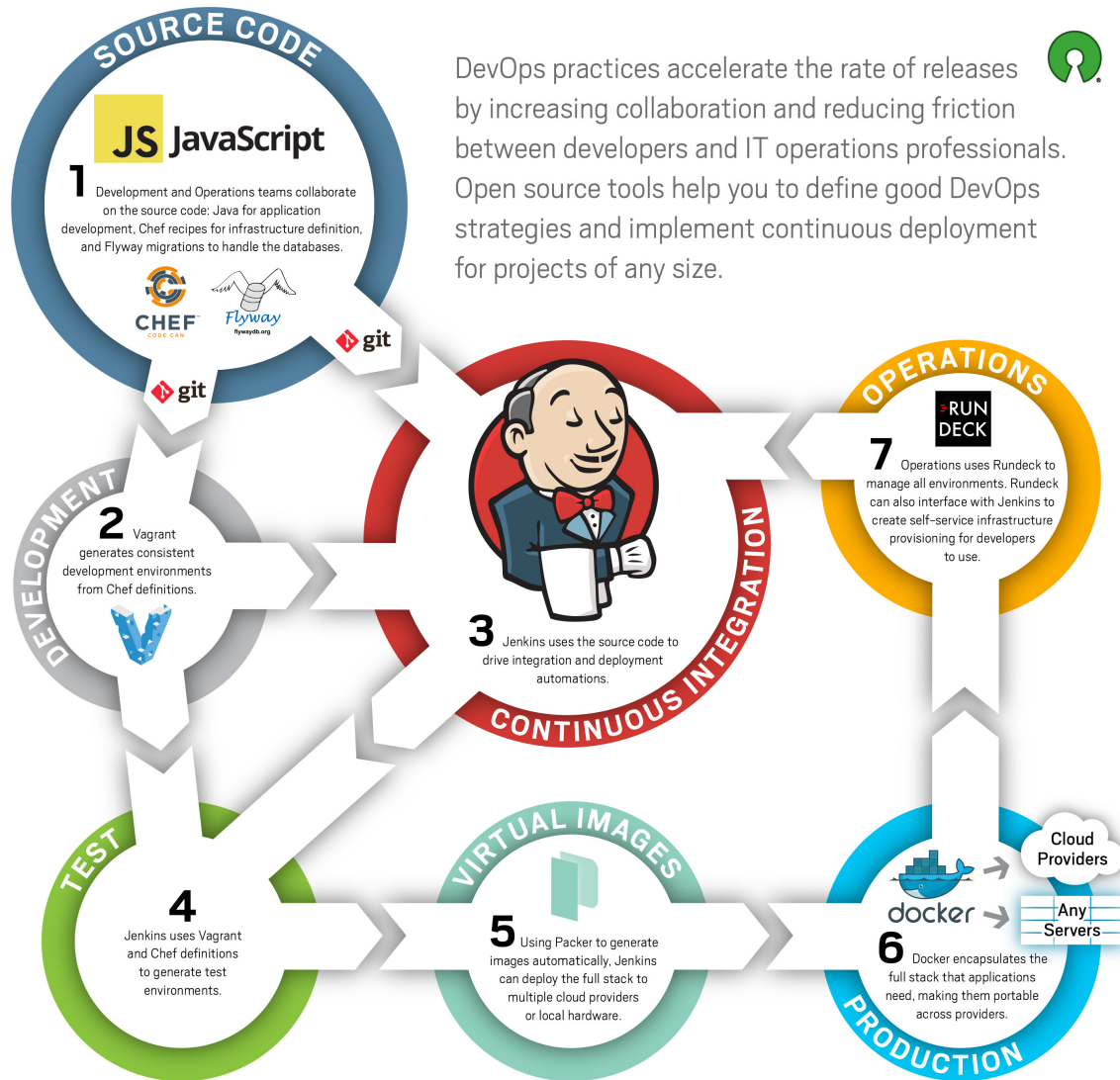
- Issues
- Tracking
- History
- Notifications
- Visualization
- Patterns



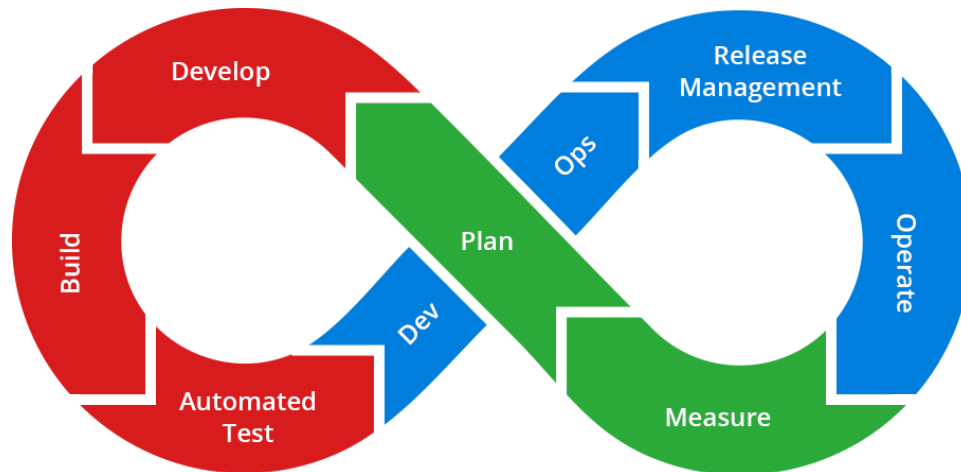
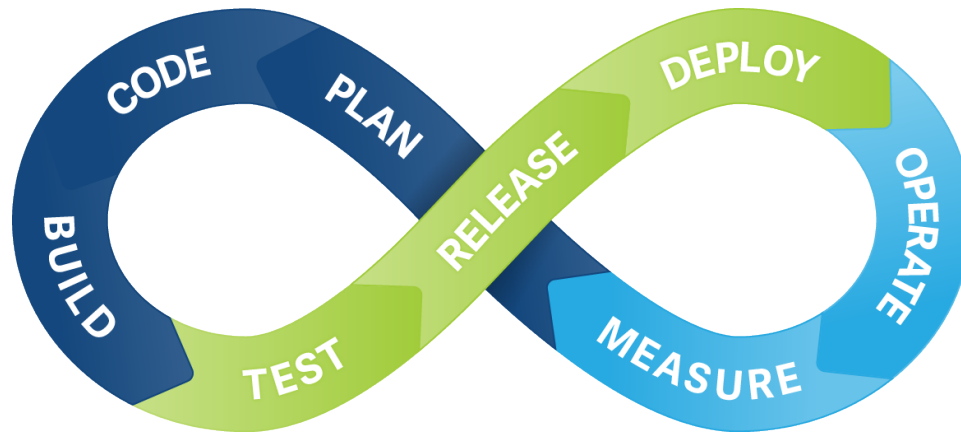
Collaboration



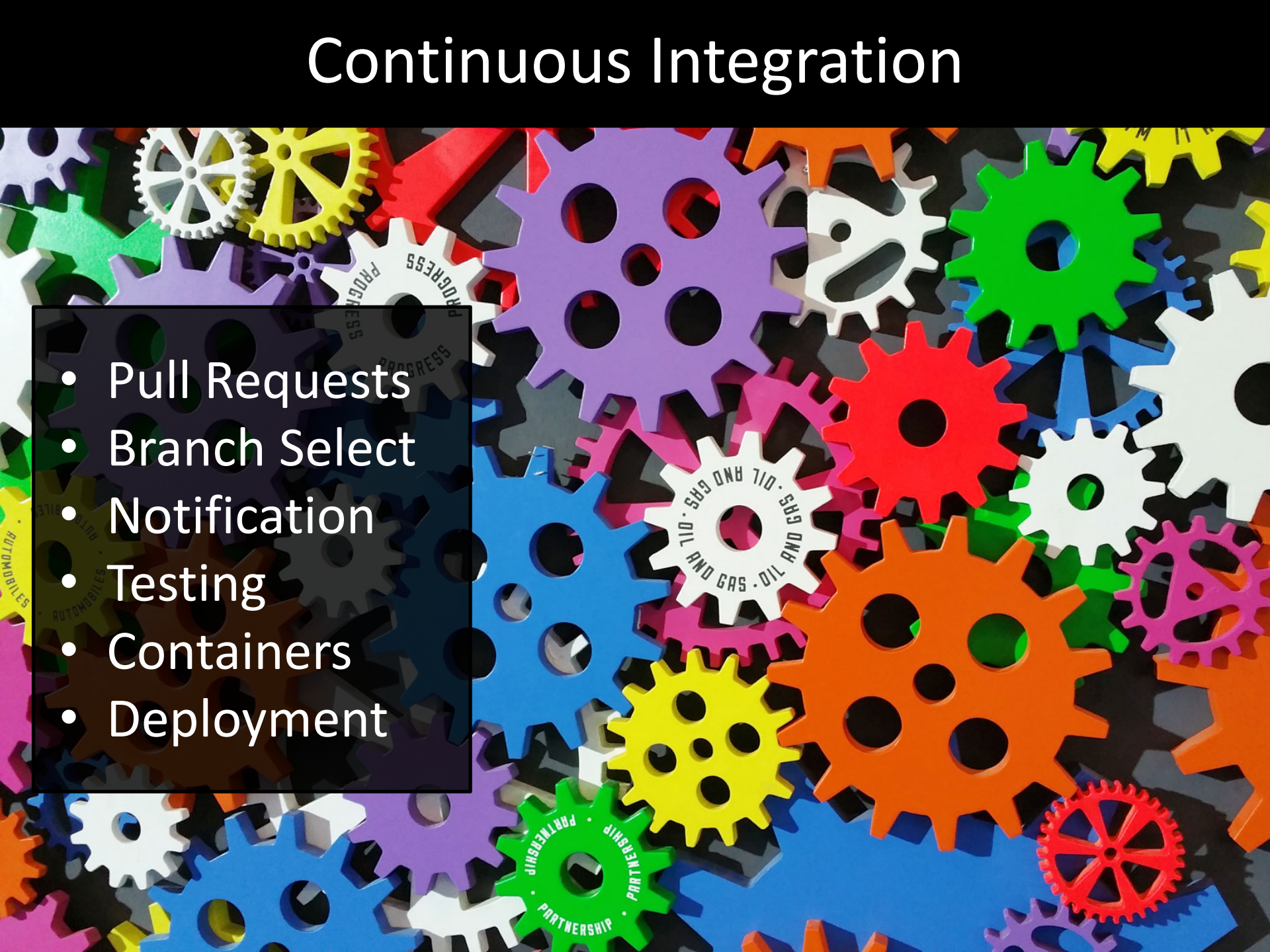
Continuous Integration



Continuous Integration



Continuous Integration

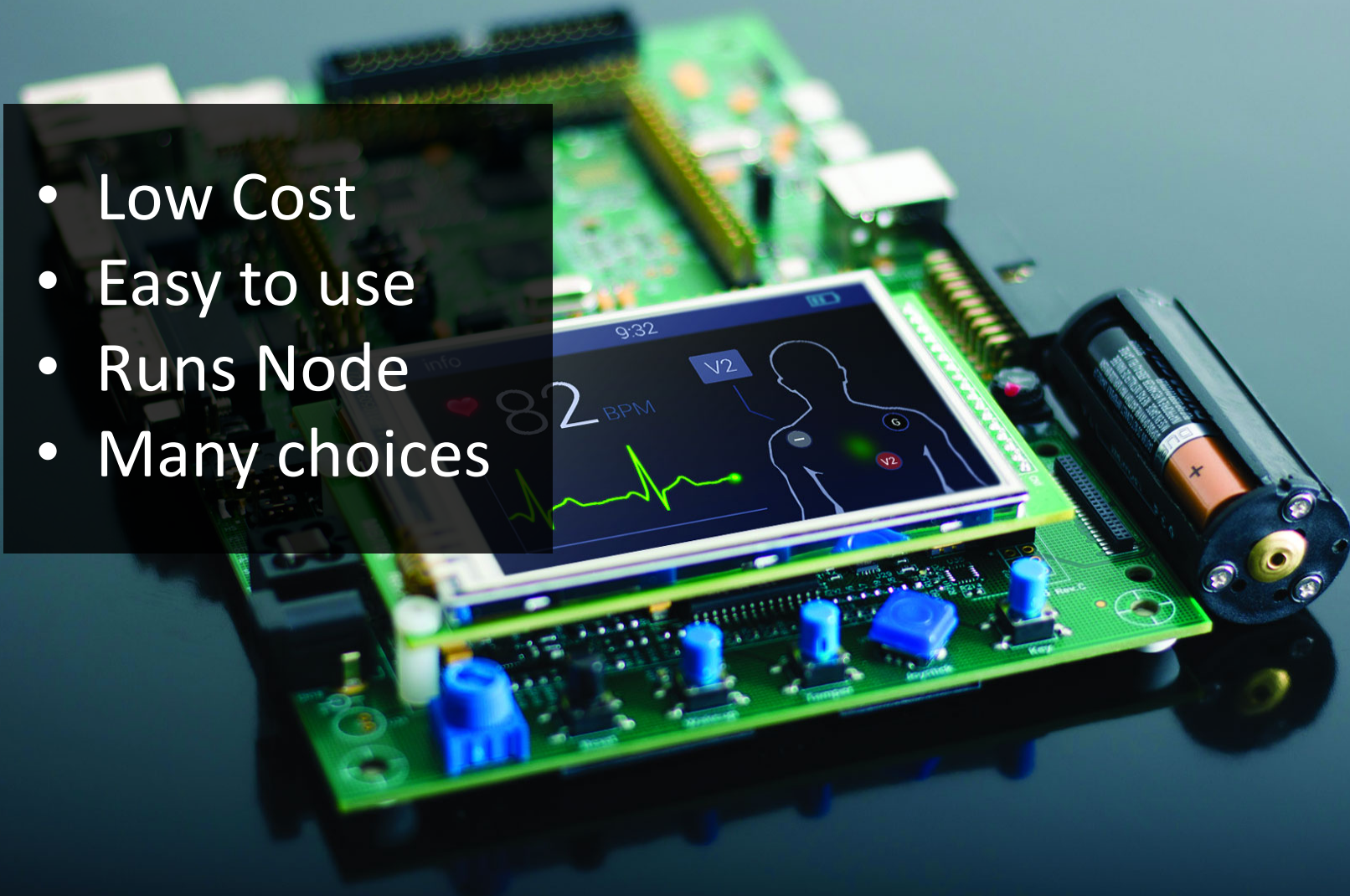
- 
- Pull Requests
 - Branch Select
 - Notification
 - Testing
 - Containers
 - Deployment

Big Data

- Volume
- Variety
- Velocity
- Transformations

Commodity Hardware

- Low Cost
- Easy to use
- Runs Node
- Many choices



Security

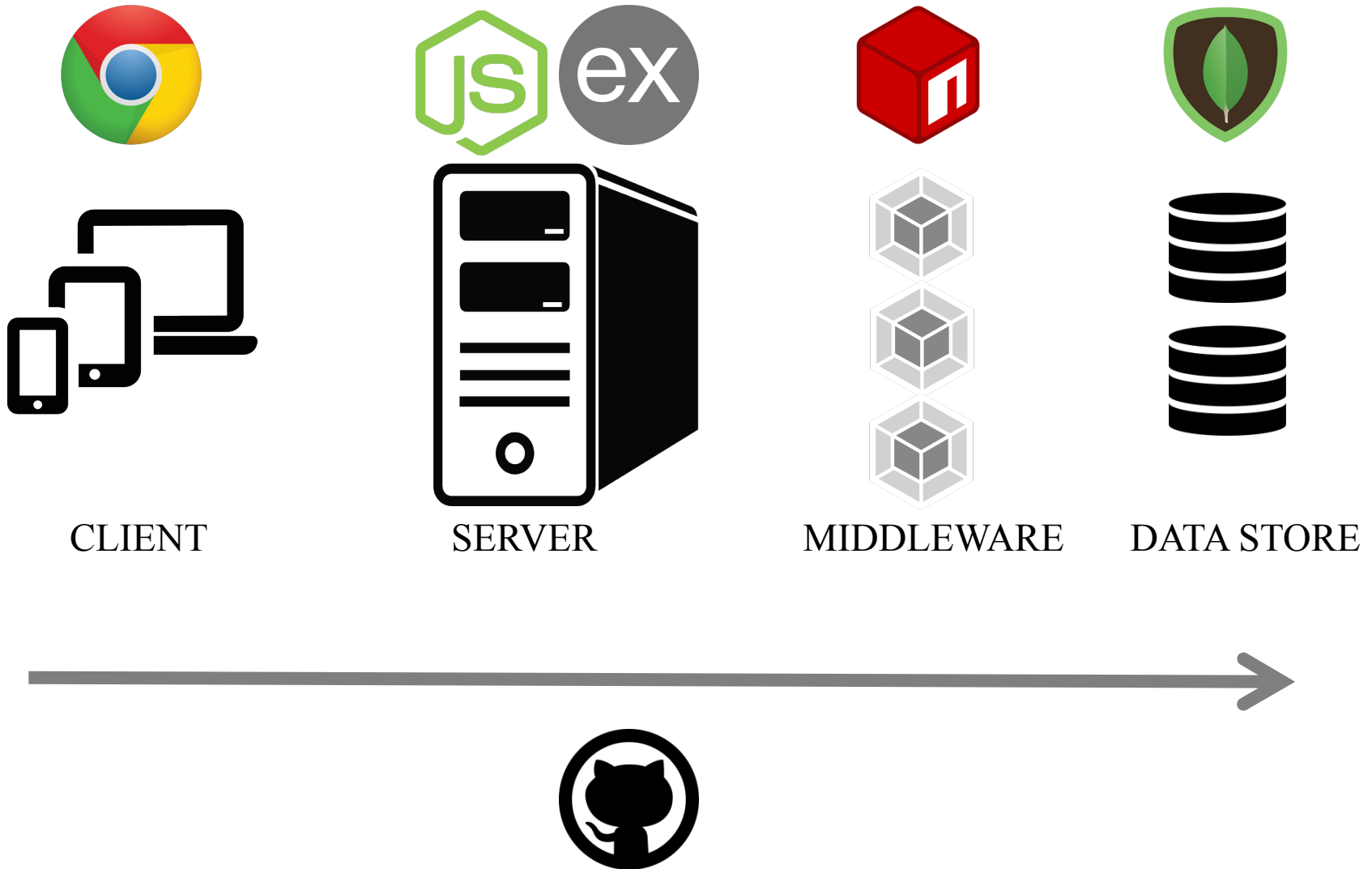
- Identify
- Protect
- Detect
- Respond
- Recover



Technology



Open Source, Scalable, Large Adoption



Some of the numbers



349,392

total packages



415,540,329

downloads in the last day



1,662,161,317

downloads in the last week



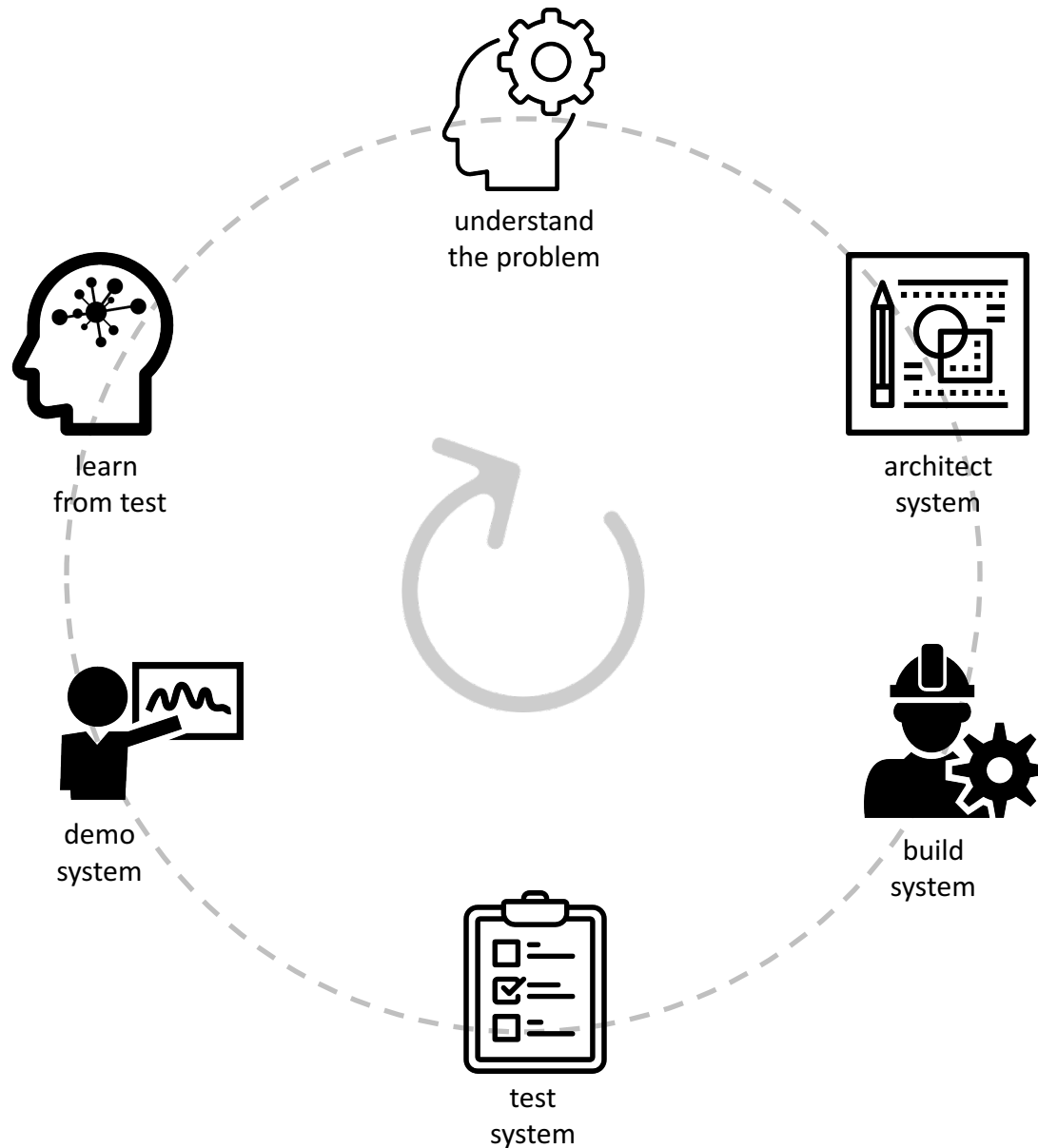
6,140,641,245

downloads in the last
month

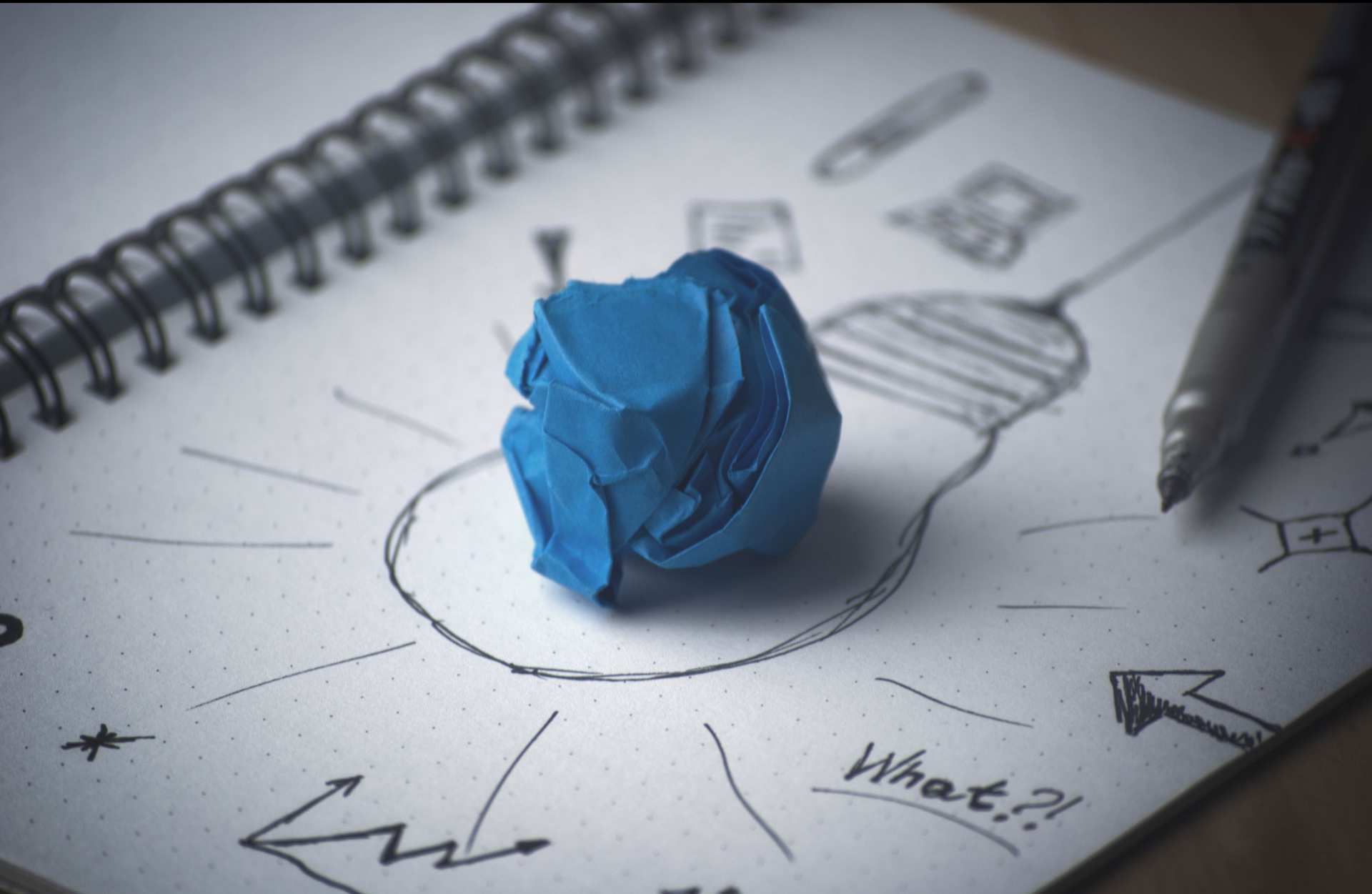
Construction Cycle



Complex Software System Cycle



Step 1: Understand the problem deeply



Step 2: Architect System



Step 3: Build System

WEEK 3: Design

4) WEEK 4: Design

WEEK 5: Design

3) WEEK 6: Dev

WEEK 7: DEV

Hosting & Staging Setup

Finalize
API
Concls

Infrastructure Recs:
- Laravel + Backbone

Initialize
Database

Normalized Database

Create
Fixtures
for
testing

← Create Fixtures for testing

Admin
Dashboard
BIE Frame
work

Database
API
<(Continuous)>

← Engineering

B/E Sorting
(for All
Dashboard
Views)
w/ pagination

B/E Filter
(ten for
all viruses)

B/E
Crud for
all DB
Tables

Exporting

ADMIN

API

Cron

Automated
(send)
email
BLE

Admin
Lapin /
Beck Prow

Individual Survey View

Individual
Power
Law

100

Admin
Deliberated
Overruled
Veto & Actions

Adress
Telefon
Postfach
Name + Adresse

(A) $\frac{1}{2}$ (B) $\frac{1}{3}$
 (C) $\frac{1}{4}$ (D) $\frac{1}{5}$
 (E) $\frac{1}{6}$

10. 10.10.2018

Person
+ Add (Date)

Schedule
+ Add To
Notes

• Wiederholung

128

11

Physical Science

John - Sue
Suey
Suey

100

Step 4: Test the System



Step 5: Demo System



Step 6: Learn



Step 7: Iterate

