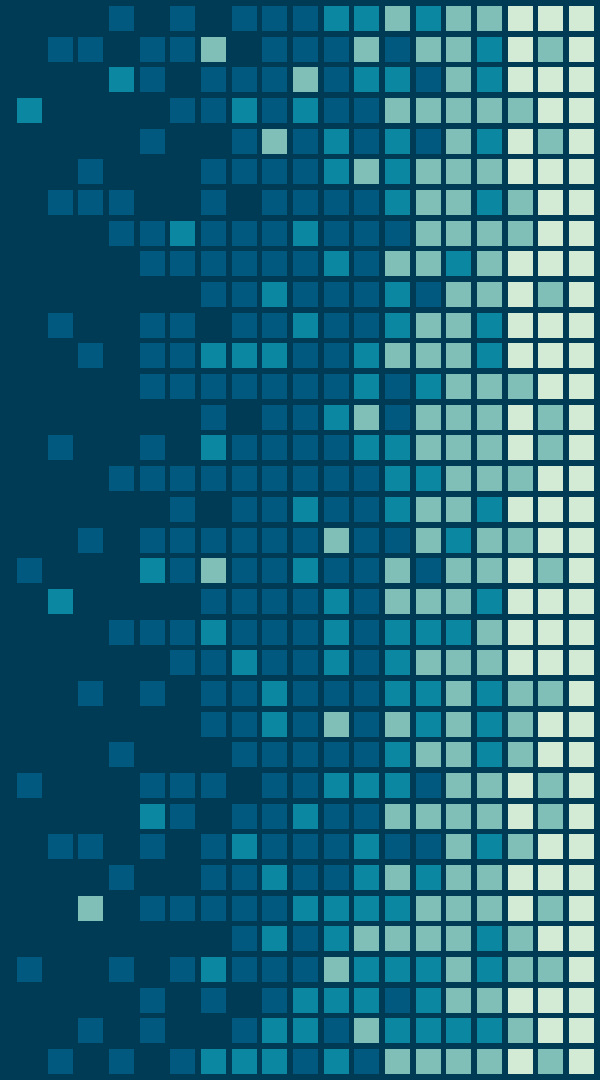# DevOps and Big Data

Software Engineering   Fall 2018
Department of Computer Science
Georgia State University
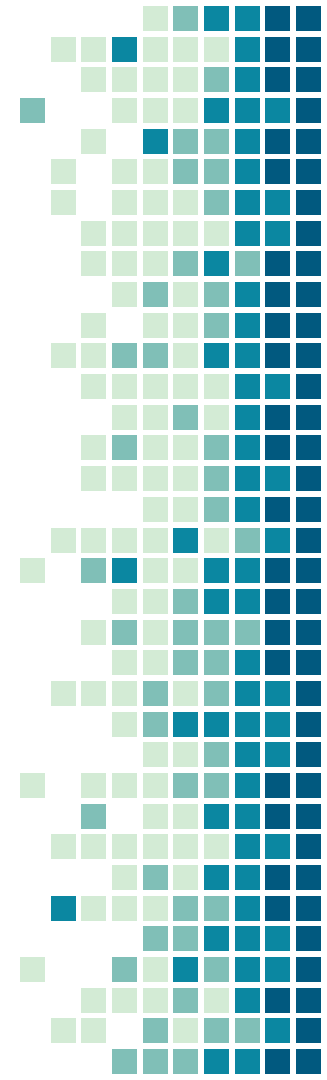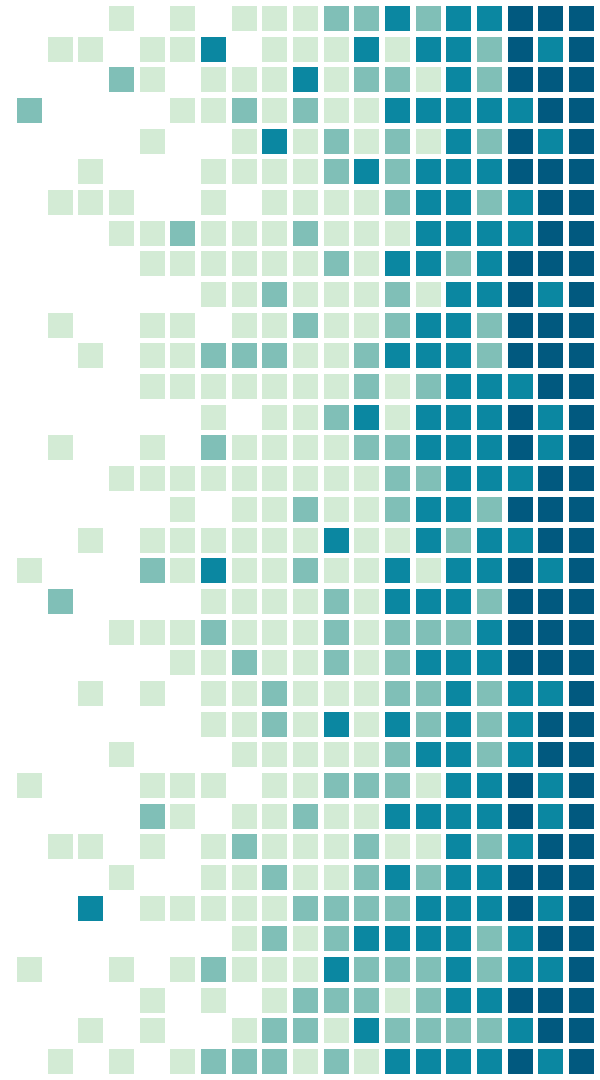William Gregory Johnson, PhD Candidate in CS

DevOps

- What is DevOps?
- Why 'do' DevOps?
- Agile + DevOps = ?
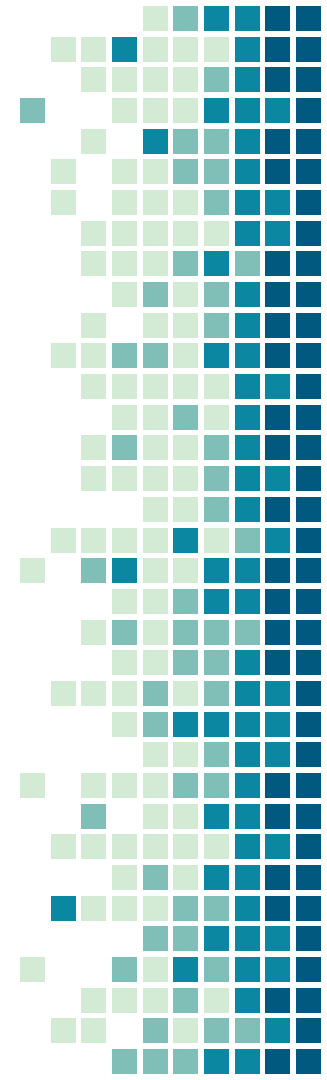- When to use DevOps?

Big Data

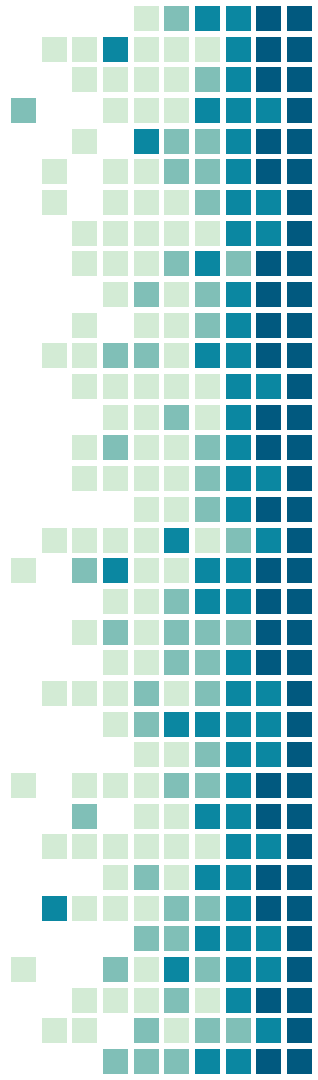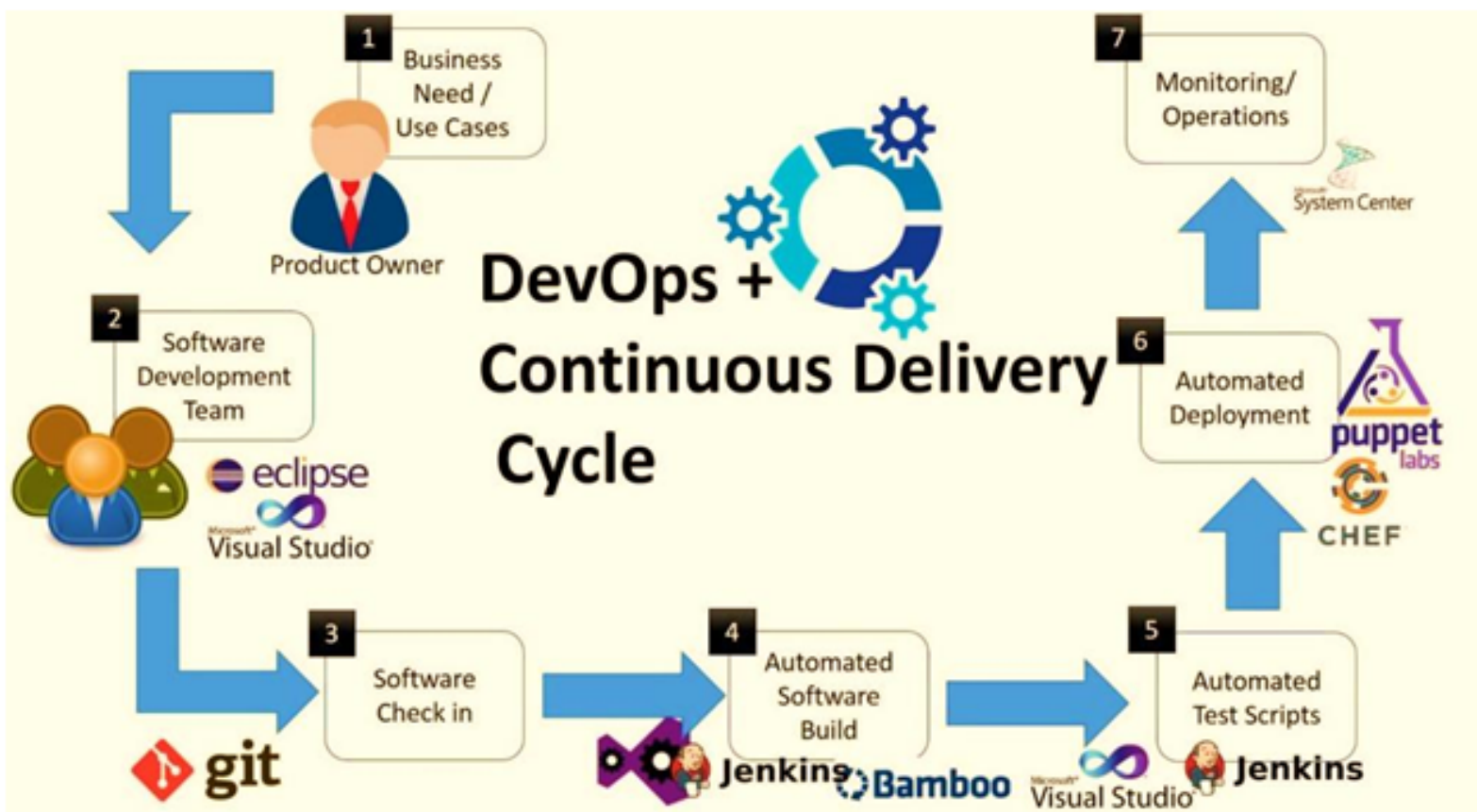- Specifics, Sources, and Sizes
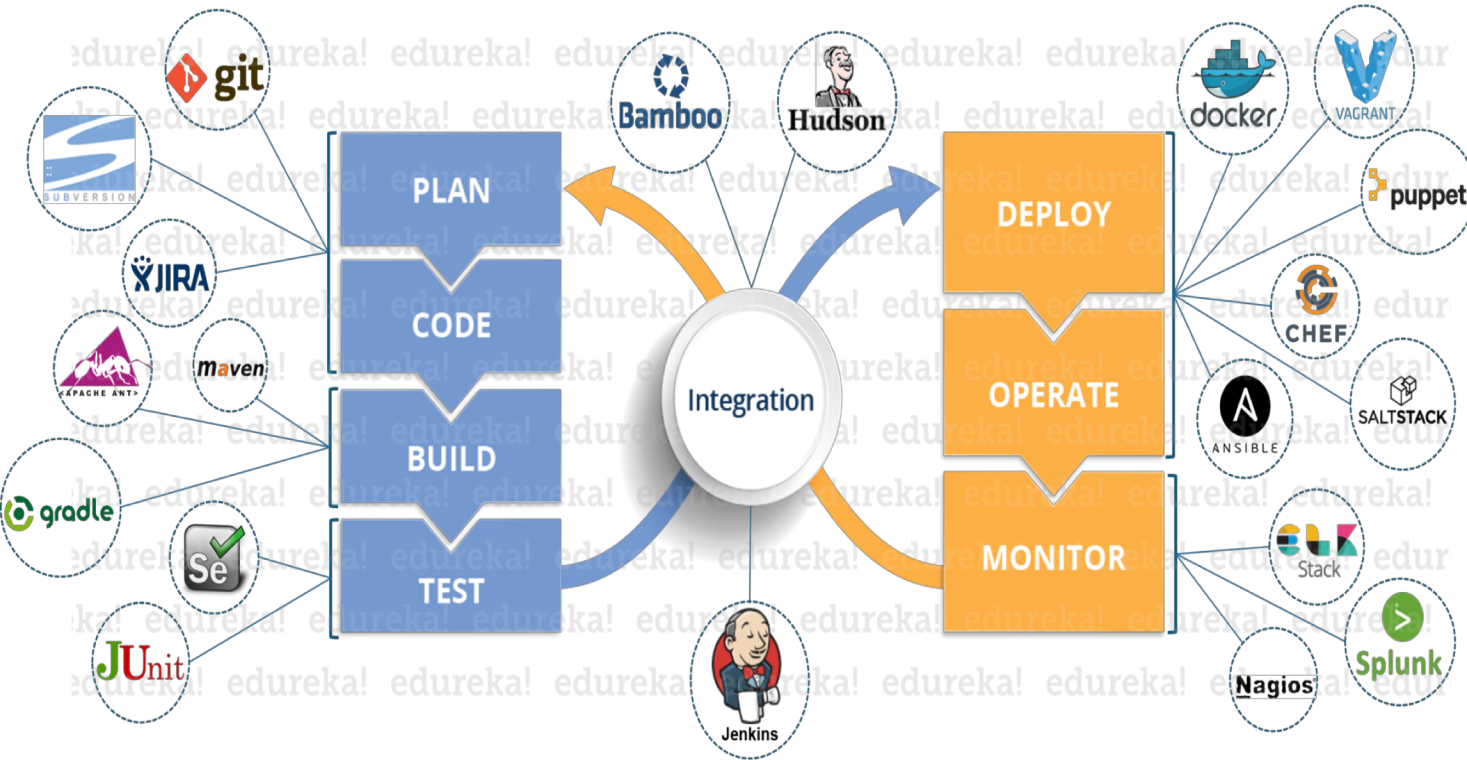- Value, Meaning, and Prediction

What is DevOps?

- A merging of development and operations
- Strong communication, collaboration, and integration between software engineers and information infrastructurists
- Enables rapid evolution of products or services
  - Reduces risk
  - Improves quality
  - Reduces costs

DevOps + Continuous Delivery Cycle

1. Business Need / Use Cases — Product Owner
2. Software Development Team — eclipse, Visual Studio
3. Software Check in — git
4. Automated Software Build — Jenkins, Bamboo, Visual Studio
5. Automated Test Scripts — Jenkins
6. Automated Deployment — puppet labs, CHEF
7. Monitoring/Operations — System Center

5

http://www.99percentage.com/devops-testing.php

Continuous Integration

http://www.quora.com/What-is-DevOps

Continuous Deployment

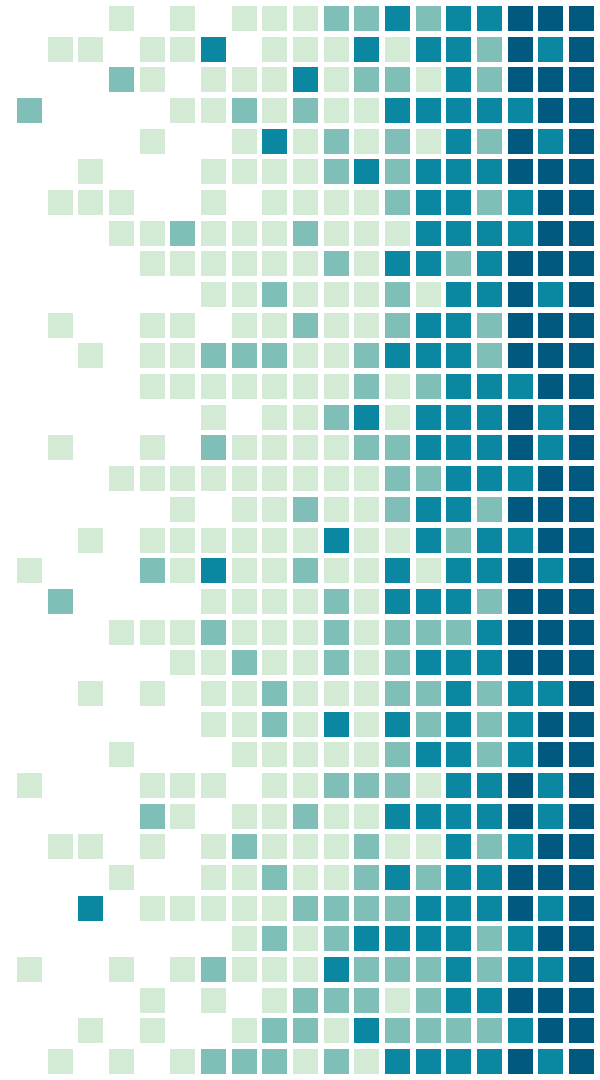http://www.quora.com/What-is-DevOps
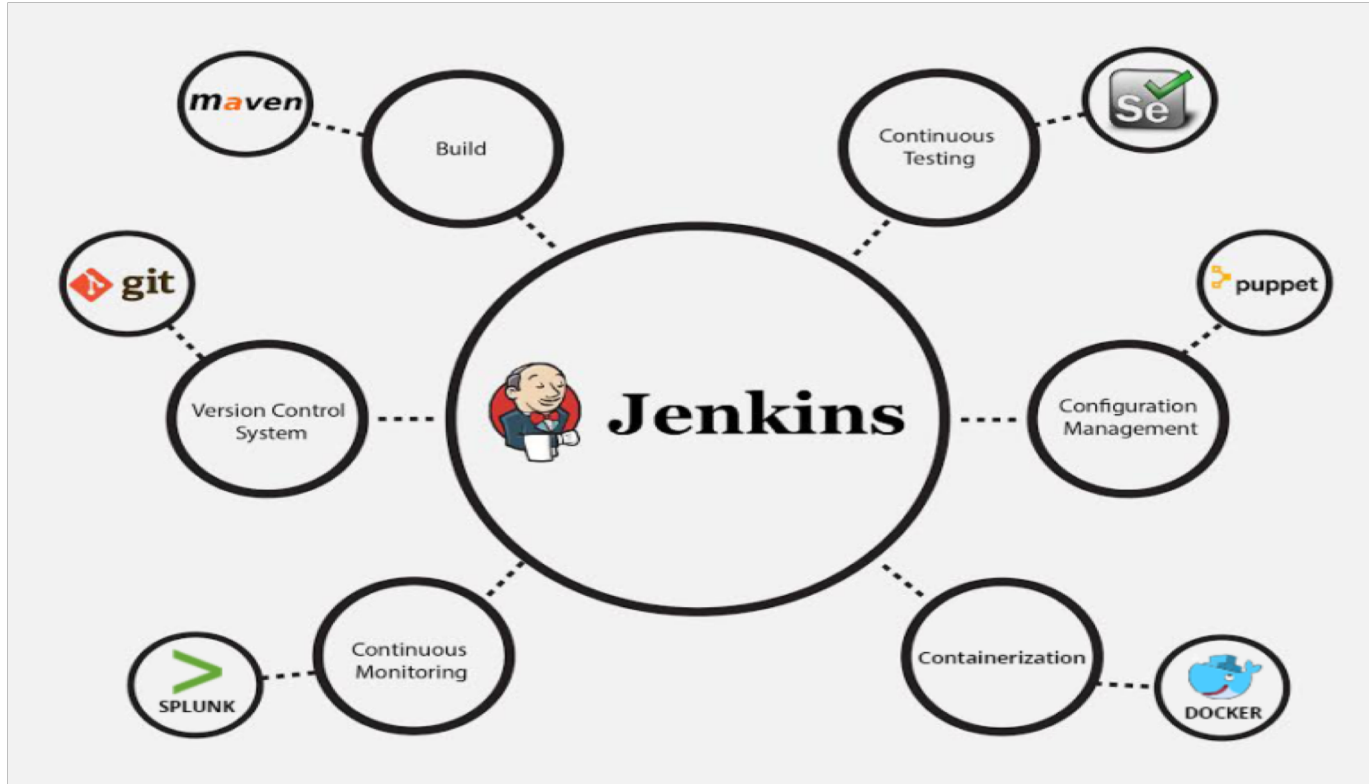
Why 'do' DevOps?

The Delivery Gap Between:

- Test and Developer Teams
- Operations Team
- Business Services

Developers View:

- Mostly delivers features after testing in development systems

- Development systems are sometimes different than production

- Developers have faster turn around time w.r.t features

- Not much concern about the infrastructure and deployment impact because of the code changes

Operations View:

- Worries more about PSR (predictive state representation)

- Rewarded mainly for uptime

- Lesser turn around time w.r.t feature deployment and testing due to large number of builds

- Very much concerned about the infrastructure and deployment impact because of the code changes

Agile + DevOps = ?

The new software engineering.

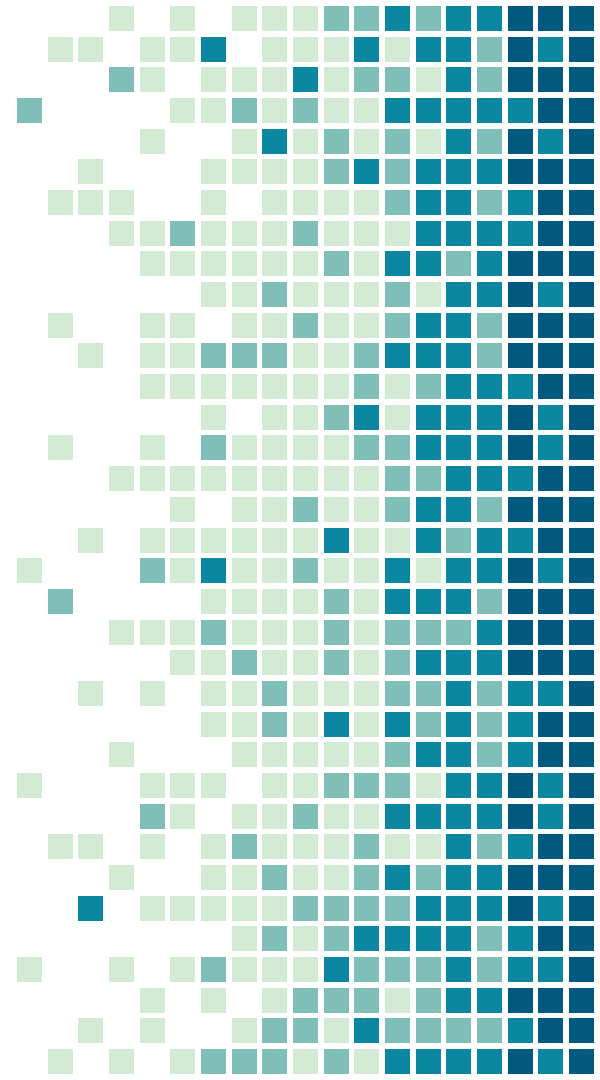- IDE ∧ AI
- Unstructured data
- Security countermeasure libraries
- VR development environments
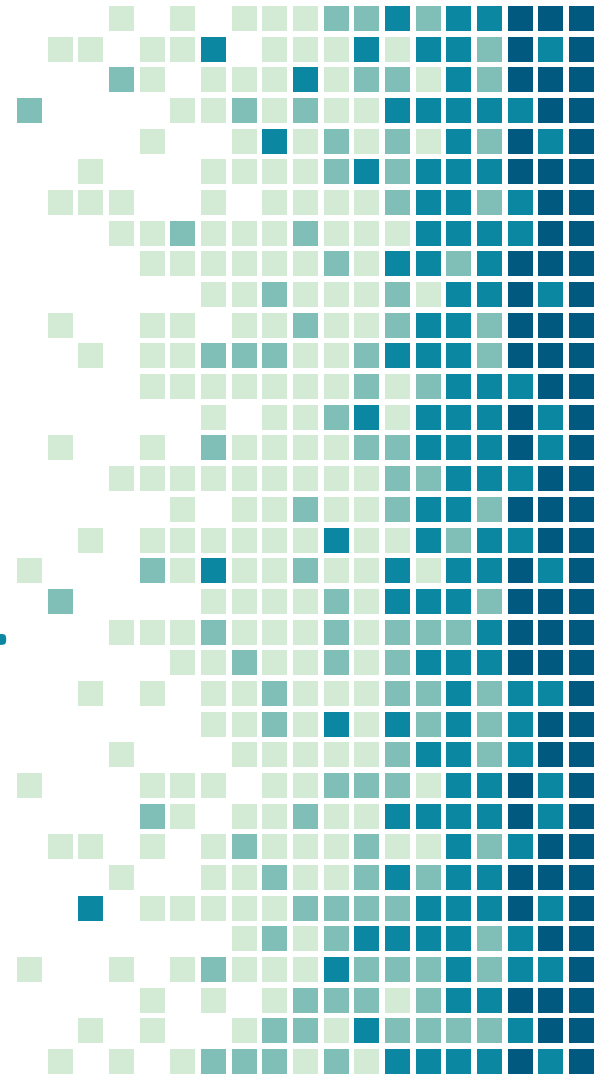
When to use DevOps?

NOW

- Amazon Web Services (EC2)
- IBM Hybrid-Cloud
- Microsoft Azure

BIG DATA

"Information at your fingertips."

* Bill Gates, November 12, 1990 Comdex, Las Vegas, NV, USA

http://www.proudlyserving.com/archives/2005/05/information_at.html

Isaac Asimov: Father of Big Data?

- **Born Issak Y. Ozimov, 1920 - 1992**
- **Professor of Biochemistry at BU**
- **Published _Foundation_ in 1942**
- **"Psychohistory" -Data analytics covering 12,000 years of the Earth being the administrative ruling planet in the Galatic Empire**

https://www.amazon.com/gp/product/B000FC1PWA/ref=series_dp_rw_ca_1
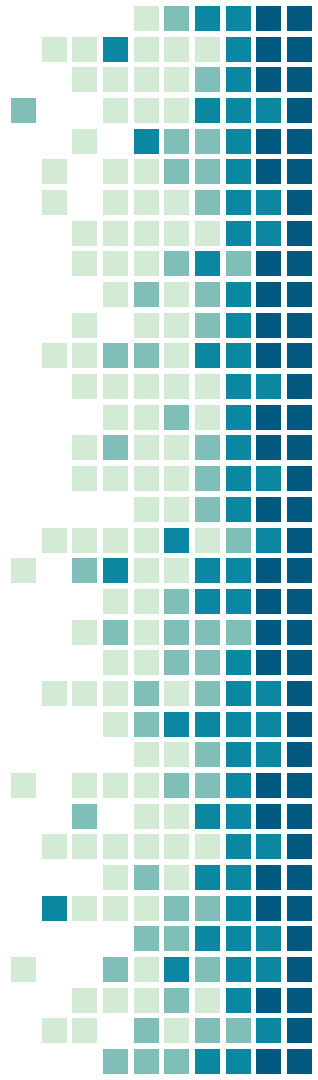
Big Data Specifics, Sources, Sizes

Specifics

- What is the best route to drive?
- Will there be any bad weather?
- What is the best way to invest my money?
- Should I take that school loan?
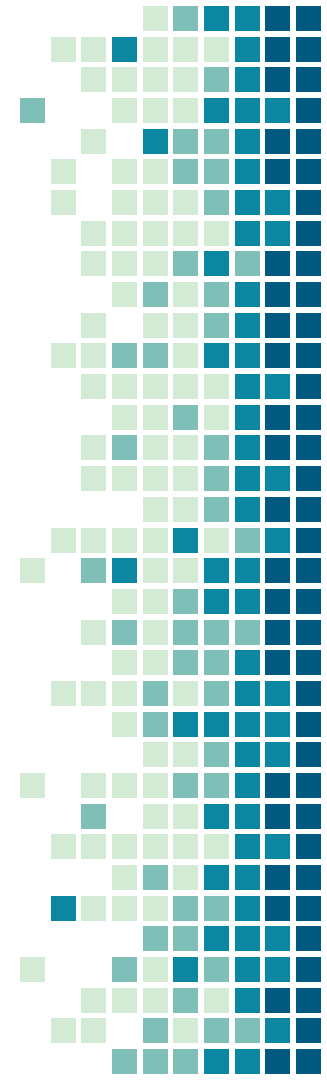- Which laptop should I buy? What have others done in similar cases?

Sources

- Sensors
- Digital footprint
- Health care
- Public service consumption
- Purchasing of goods and services
- Education and government
- IOT (Internet of Things)

Sizes *

- Each day: 20 quintillion bits **(2 x 10^{19})**
- Each minute:
  - 16M texts
  - 156M emails
  - 15K GIFs
  - 240K Google Searches
- Last 2 yrs, 90% of all data generated
- May 2017 report from Forbes

* https://www.forbes.com/sites/bernardmarr/2018/05/21/
how-much-data-do-we-create-every-day-the-mind-blowing-stats-everyone-should-read/#335b7b2960ba

Big Data Value, Meaning, Prediction
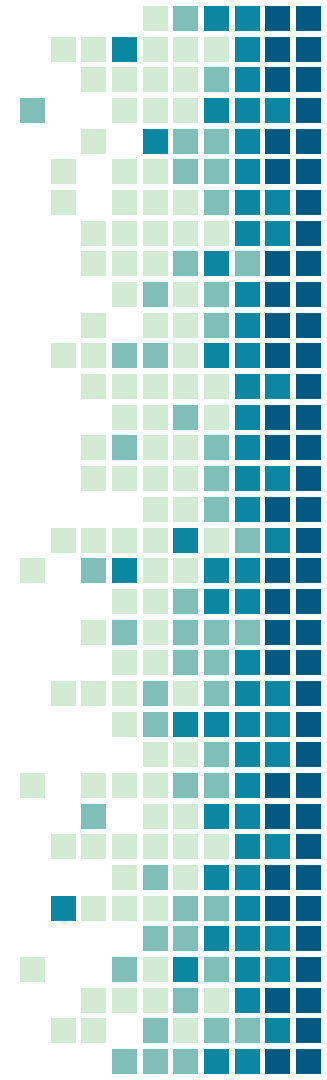
Value

- Modeling and forecasts
- Complex visualization
  - Exploration
  - Simulation
- Pattern detection
- Clustering of sameness and differences

Meaning

- Weather alerts
- Grand challenges
  - Volcanology
  - Seismology
  - Solar Physics
  - Drug research
- Longer life
- Smaller carbon impact
- AI

Prediction

- Social network analysis (SNA)
  - Clickstream data
  - Similarity ranking
  - Graph data mining
- Deep learning
- Autonomous computing
- AR, VR

https://www.slideshare.net/hemapani/introduction-to-big-data

Digital Avatar Safety?

Baz Edwards   Oct 14, 2016

Adversary and Cybersecurity

Big Data Safety?

Illustration by Alex Castro / The Verge

https://qph.fs.quoracdn.net/main-qimg-7f1d5edca8f466ed15025c578a06525d-c

THANKS!

Any questions?