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App Tx Workshop

Version 1.0
September 2017

Agenda

- Role of an Architect in AppTx
- Evolutionary Architecture/ 12 Factor Apps
- App Tx Scoping
- Q+A

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Workshop

Role of an Architect

What does an Architect do

Key things that the architect should focus on

- Identify architectural style and patterns that would guide the team in technology decisions
- Constantly monitor for the architecture for obsolescence terms of technology changes, business requirement changes.
- Educate the organization about the evolving industry and technology trends and have experience in a broad range of products, platforms, tools and techniques.
- Constantly monitor for the application compliance and conformance to the architecture
- Ride the elevator from the the ground floor to the C-suite - Effectively communicate up the management and down to the engineers. Must have the business domain expertise

'Ibilities'

Non-functional requirements

- Things like reliability, scalability, agility, etc.
- https://en.wikipedia.org/wiki/List_of_system_quality_attributes
- Business needs define the '*ibilities*'

- accessibility
- accountability
- accuracy
- adaptability
- administrability
- affordability
- agility [Toll] (see Common Subsets below)
- auditability
- autonomy [Erl]
- availability
- compatibility
- composability [Erl]
- configurability
- correctness
- credibility
- customizability
- debugability
- degradability
- determinability
- demonstrability
- dependability
- deployability
- discoverability [Erl]
- distributability
- durability
- effectiveness
- efficiency

Sample Business Goals

“It takes forever to release new features. We see opportunities to sell to new customers, we **want to respond to change** fast.”

“We can’t predict the usage patterns of our customers. **The load on the system can change unpredictably.”**

“Due to regulatory requirements we need to complete 99% of the user requests within 2 minutes. And our **product must meet those expectations.”**

Evolvability

Entropy in an software system always grows (2nd law)

- Decay in software system happens over time
- Architecture has to maintain equilibrium between agility and resilience
- Predictability in software is shot – focus on being pro-active and adaptable (don't get stuck doing Chef scripts in a Docker world.)

Evolvability

Domain Driven Design

- In complex business domains, it is hard to design a system upfront to manage the complexity
- DDD focusses on an iterative approach to understanding domain and implementing it
- Continuous delivery becomes important in DDD
- Big ball of mud can evolve along 0 dimensions
- Layered architecture can evolve along 1 dimension
- None of these architectures support evolution of business domain
- Microservices support evolution along multiple business domains

Workshop

Evolutionary Architecture

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Evolutionary Architecture and Microservices

Architecture that changes continually to meet the understanding of evolving domain needs.

- Changes can happen in N dimensions where N being the various business domains
- Each microservice is organized around business capabilities
- Last Responsible Moment
- Polyglot persistence breaks tight coupling at the database tier
- Decentralized data management
- Bring the pain forward - continuously integrate and deploy frequently

Bring the pain forward

Continuous Delivery

Organized around business capabilities

Polyglot persistence

Evolutionary Architecture and Microservices

The Delivery Pipeline

- **Commit** daily
- Only **build** packages once
- **Deploy** the same way everywhere
- **Smoke** test deployments
- **Keep** environments similar
- If anything breaks, **STOP THE LINE**

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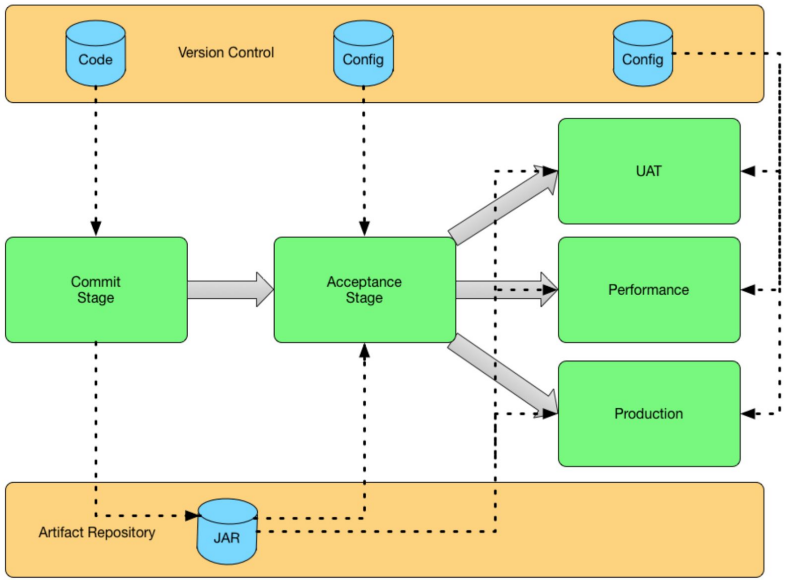

Bring the pain forward

Continuous Delivery

Organized around business capabilities

Polyglot persistence

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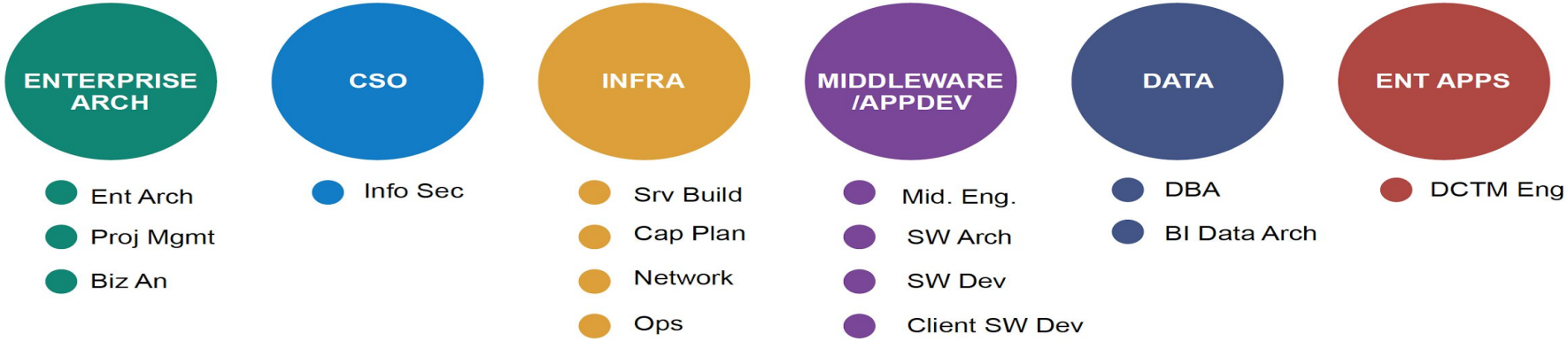
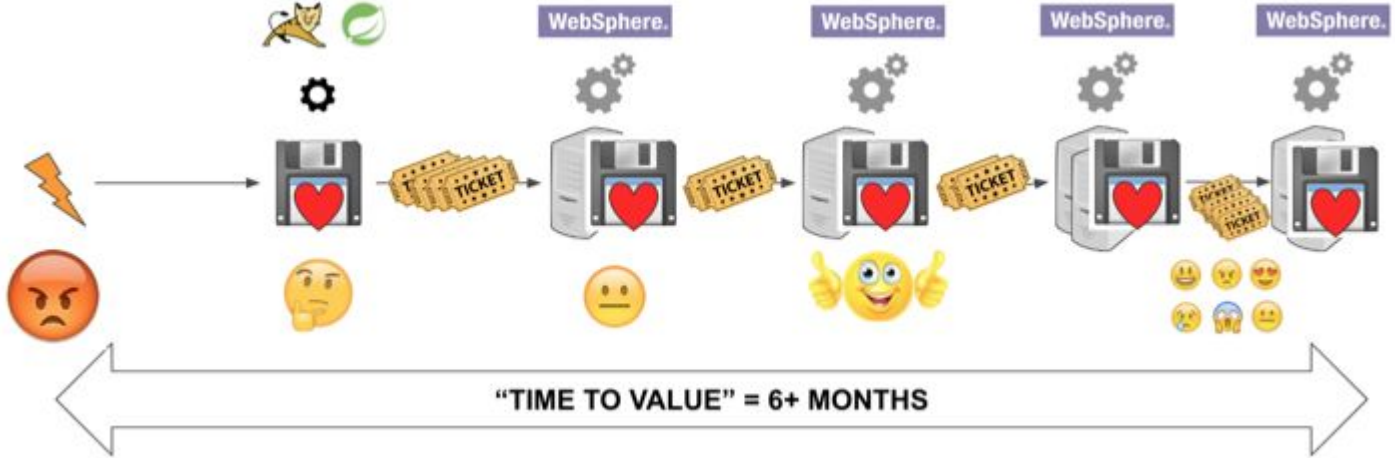
Roles Involved in the SDLC





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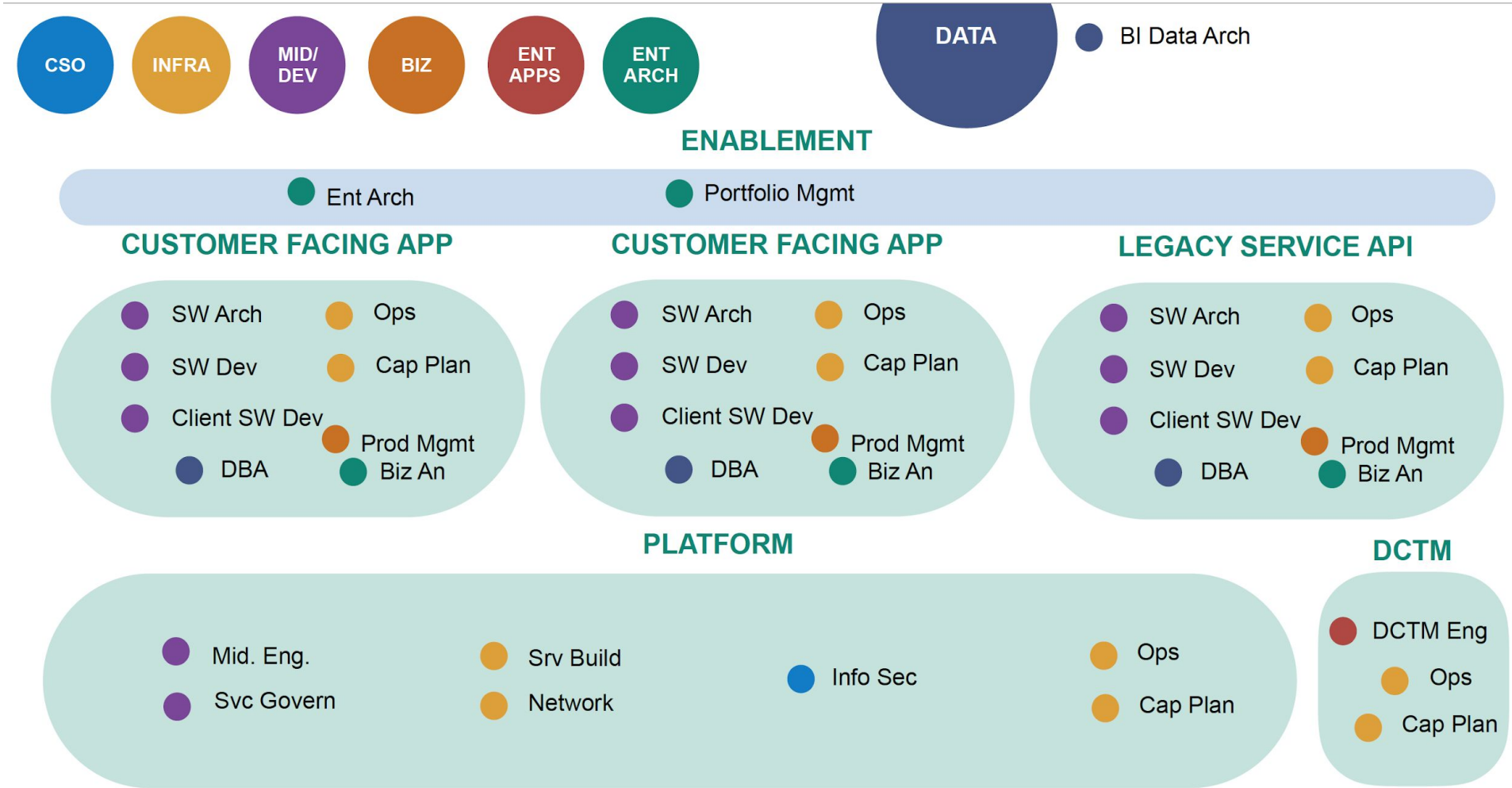
Reducing the cost of change


CSO
INFRA
MID/ DEV
BIZ
ENT APPS
ENT ARCH
DATA
BI Data Arch
ENABLEMENT
Ent Arch
Portfolio Mgmt
CUSTOMER FACING APP
SW Arch
Ops
SW Dev
Cap Plan
Client SW Dev
Prod Mgmt
DBA
Biz An
CUSTOMER FACING APP
SW Arch
Ops
SW Dev
Cap Plan
Client SW Dev
Prod Mgmt
DBA
Biz An
LEGACY SERVICE API
SW Arch
Ops
SW Dev
Cap Plan
Client SW Dev
Prod Mgmt
DBA
Biz An
PLATFORM
Mid. Eng.
Svc Govern
Srv Build
Network
Info Sec
Ops
Cap Plan
DCTM
DCTM Eng
Ops
Cap Plan

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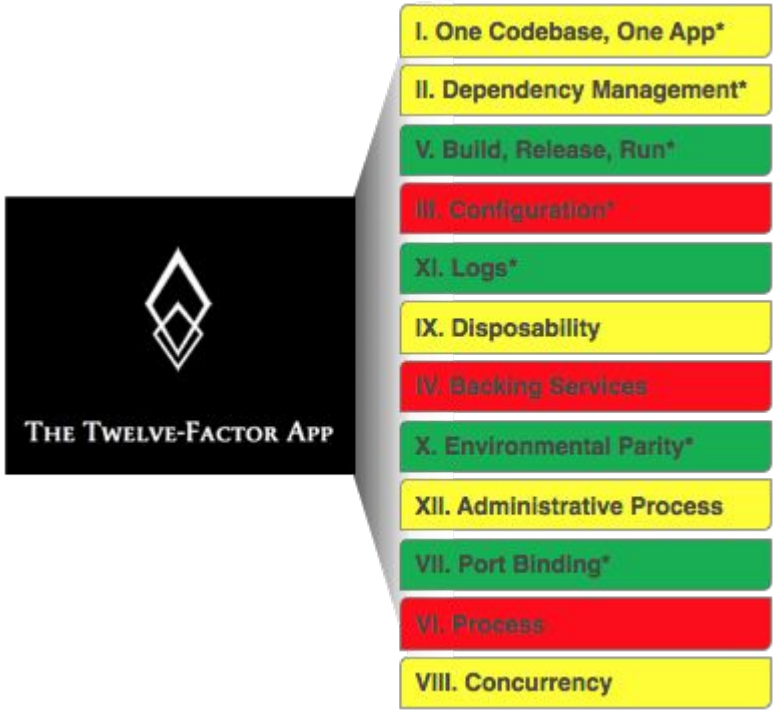
What is Cloud?

Cloud describes any computing environment in which computing, networking, and storage resources can be provisioned and released elastically in an on-demand, self-service manner.

Cloud-Native



One Code base

Dependency management
Build, Release, Run

Configuration

Logs

Disposability

Backing Services

Env

Admin Processes

Port binding

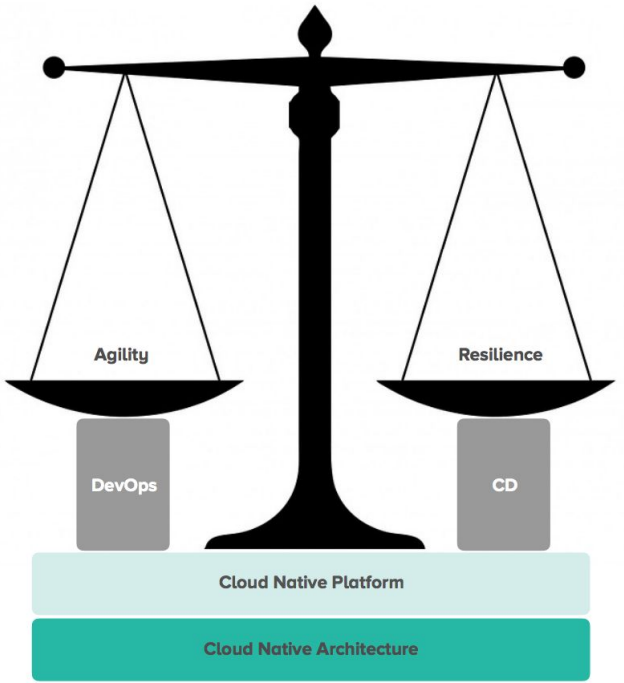
Processes

Concurrency
Telemetry

Authentication and Authorization

Cloud-Native *'ibilities'*

- **Modularity (via Microservices)**
- Observability
- Deployability
- Testability
- Disposability
- Replaceability




Cloud-Native Maturity Model
Cloud-Native
Microservices architecture
API-first design
Cloud Resilient
Fault-tolerant and resilient design
Cloud-agnostic runtime implementation
Bundled metrics and monitoring
Proactive failure testing
Cloud Friendly
12 Factor App methodology
Horizontally scalable
Leverages platform for high availability
Cloud Ready
No permanent disk access
Self-contained application
Platform-managed ports and networking
Consumes platform-managed backing services

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Three columns of content

Big Ball of Mud

- Which virtualization technologies are in use for application deployment?
- Are any additional virtualization technologies being explored? Public cloud?
- What tools & automation are used for application operations?
- What is the process for maintaining, patching and upgrading environments today?

Layered Architecture

- Which virtualization technologies are in use for application deployment?
- Are any additional virtualization technologies being explored? Public cloud?
- What tools & automation are used for application operations?
- What is the process for maintaining, patching and upgrading environments today?
- Are you using/exploring Continuous Integration and Continuous Delivery pipelines?

Microservices Architecture

- Which virtualization technologies are in use for application deployment?
- Are any additional virtualization technologies being explored? Public cloud?
- What tools & automation are used for application operations?

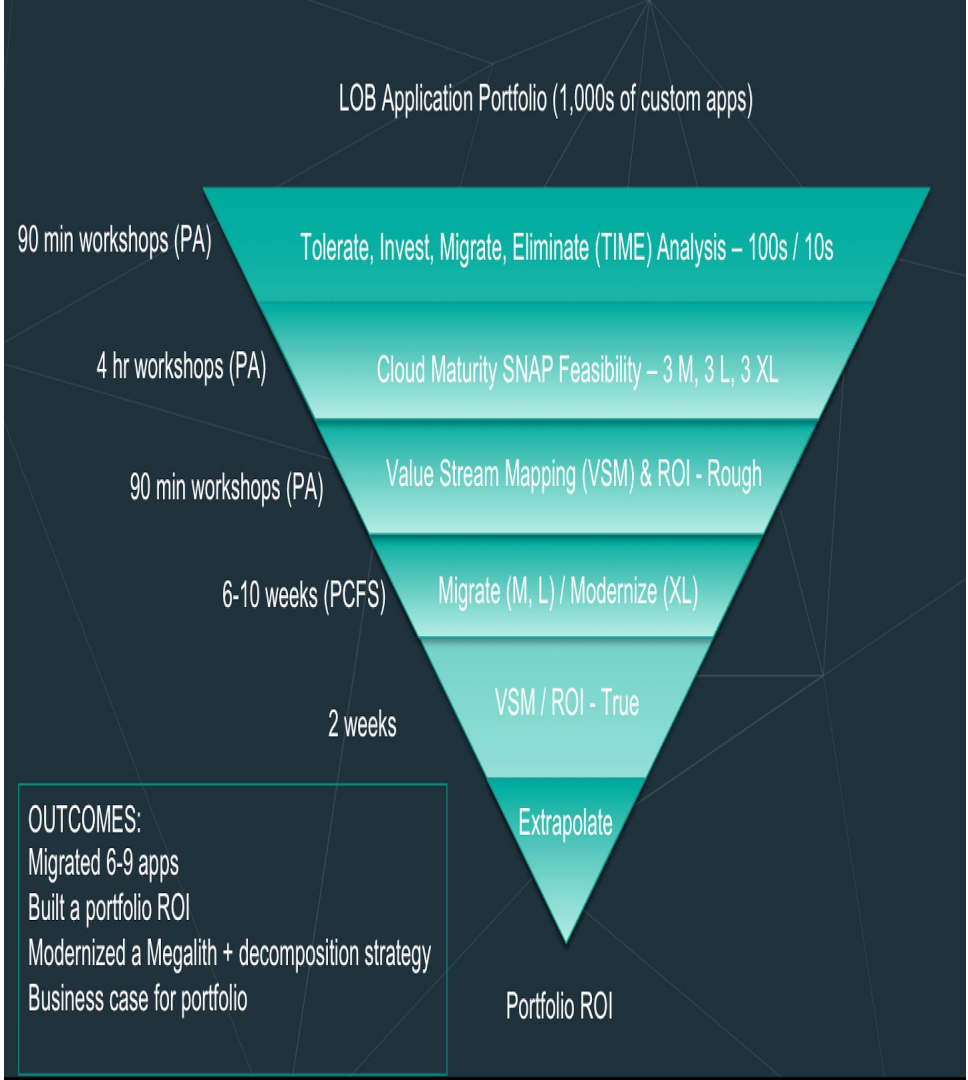
Workshop

App Tx Scoping

AppTx Scoping

Goals

- Get the Right People in Conversation
- Ask Questions and Gain Detailed Insight
- Review and Discuss an App Portfolio
- Discuss and Learn About Cloud Suitability
- Triage Apps Based on Priority & Suitability
- Determine a Subset of Apps to Focus On
- Scope an Initial Project
- Roadmap a Migration Initiative
- Identify Actions, Owners and Timeline



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Process

Brain Storming

- 100s => 50-60 Apps
- Brainstorming to rationalize the portfolio and get to a reasonable number of apps
- Affinity Mapping
- Business Domains
- Failure Domains

Bulk Prioritization

- 50-60 => 10s of apps
- Triage using 2x2 analysis
- TIME
- Stories are estimated

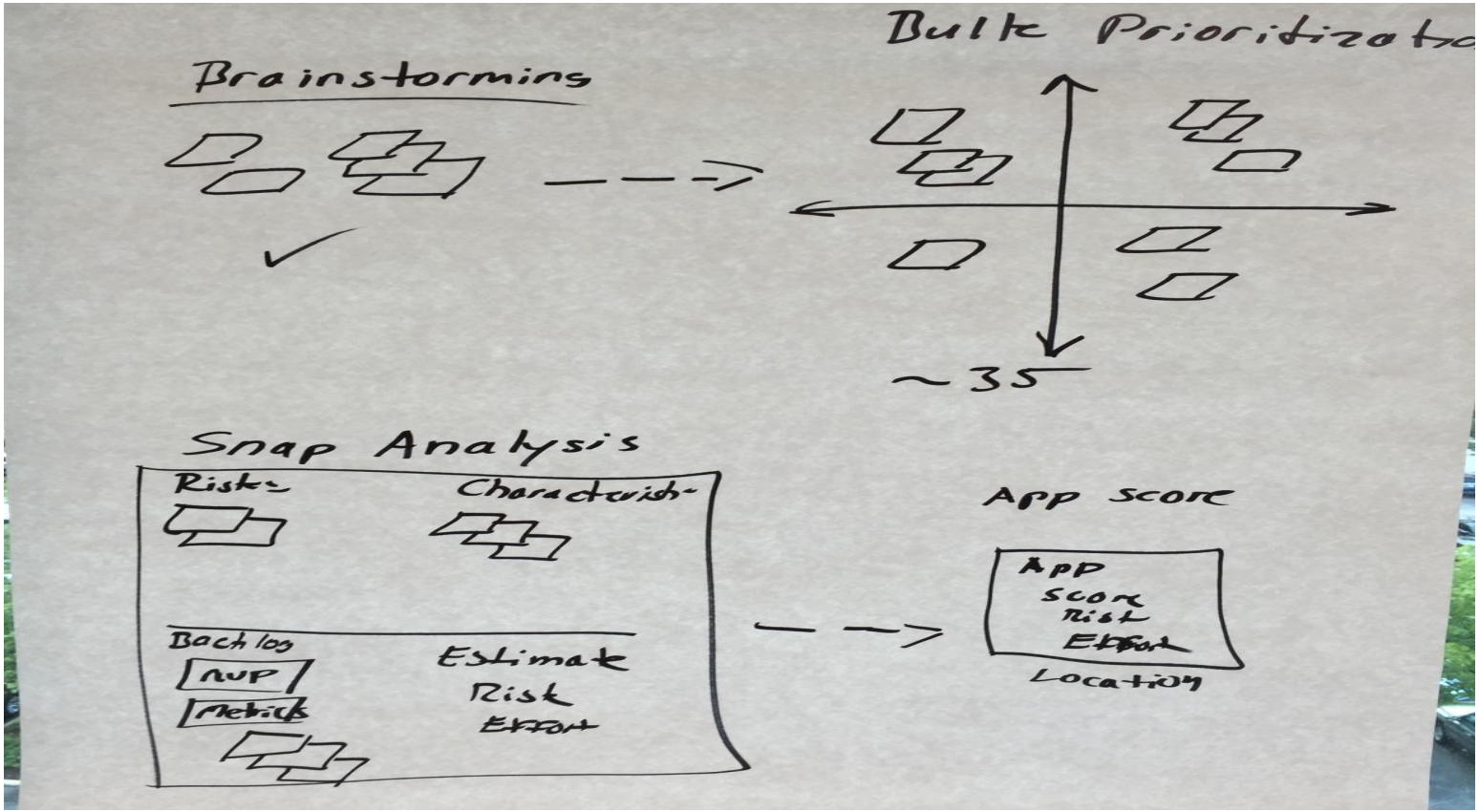
SNAP

- 10s => 4-6 apps
- Goals, App characteristics, risks, metrics discovered
- Rough Backlog built

Scoring

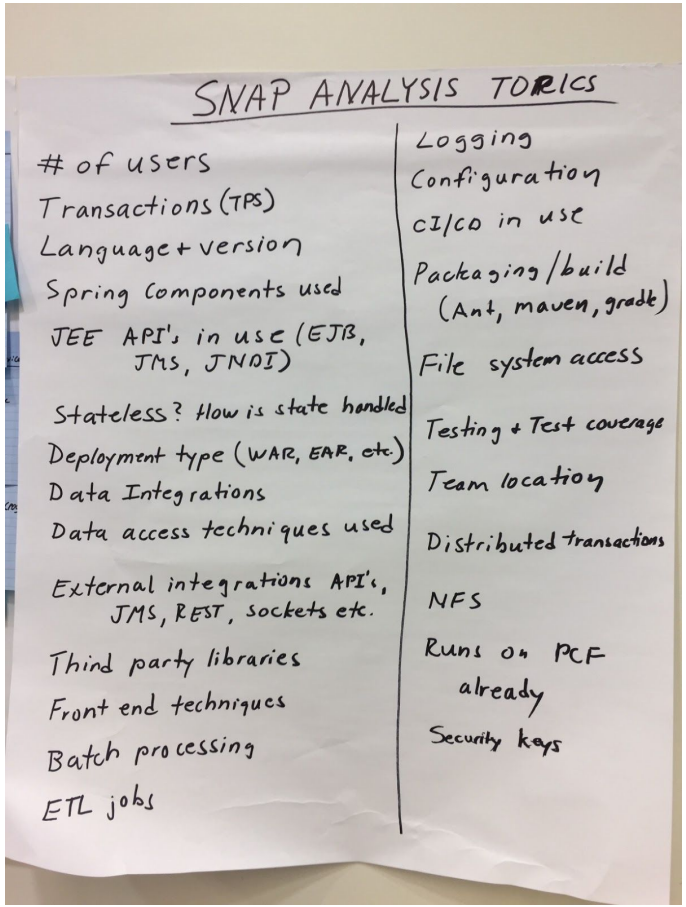
- S, M, L, XL T-shirt sizes
- Scoring on multiple dimensions

Process


Brainstorming
Bulk Prioritizat
~35
Snap Analysis
Risks
Characteristics
Backlog
NUP
Metrics
Estimate
Risk
Effort
App score
App
Score
Risk
Effort
Location

SNAP Analysis

Lightweight process to assess and score the cloud suitability of an application.



SNAP participants

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- Account Manager
- Platform Architect
- Labs Director
- Solutions Architect

Customer

- Stakeholder (Product owner)
- Architect
- Developer
- Infrastructure/Release Management

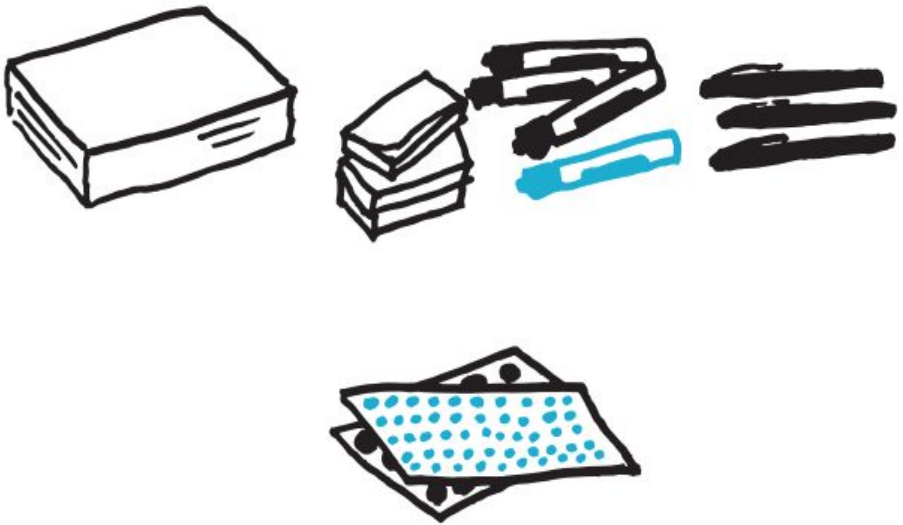
SNAP Outcomes

- Technical characteristics
- Risks
- Potential refactorings needed to replatform the app
- Metrics to validate refactoring is acceptable
- High level replatforming score
- Effort
- Risk
- Uncertainty
- Business value (optional)
- Location (optional)

SNAP

Supplies

- 4x4 stickies
- White paper
- Masking tape
- 5x4 stickies for notes
- Lots of white board or butcher paper
- Black markers



SNAP - Online tools

Java

- https://docs.google.com/spreadsheets/d/1hhkkqjQ9p_Qht2bpS8L1A_GcWSqj3qbX2cR2csmlrR8/edit?ts=59d65228#gid=1730650040
- https://snap-analysis.cfapps.io/#/main

.NET

- https://docs.google.com/spreadsheets/d/1w3F3eYirqGFFsQ39GKCBTtBredByNNyT-EQ2iHjJrWc/edit#gid=1730650040
- https://snap-analysis.cfapps.io/#/main

PIVOTAL PRESENTATION THEME

Statement Slides


“The only thing that will keep your developers happy is to make them feel productive.”
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Our goal is to enable you to build great products using these principles and practices.

The knowledge you absorb while working with Pivotal is as valuable as the product itself.

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What will our team look like?

WHAT WILL OUR TEAM LOOK LIKE?

We will co-locate as much as possible in order to collaborate and communicate, thus keeping feedback loops short.

PIVOTAL PRESENTATION THEME

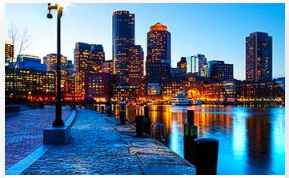
Grids and Boxes

Grid of 18

San Francisco

Atlanta

Berlin



Boston

Boulder

Chicago

Dallas

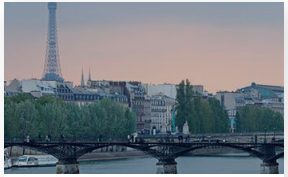
Denver

Dublin

London

Los Angeles

New York



Paris

Palo Alto

Seattle

Singapore

Sydney

Tokyo

Pivotal

Grid of 12


中信银行
CHINA CITIC BANK


COMCAST


IRS


Volkswagen


Ford


THE HOME DEPOT


aridhia


GARMIN


Bloomberg


Allstate
You're in good hands.


Solera


Humana

3 boxes

Development

Extreme Programming

Building working software at a consistent speed and quality in the face of changing requirements.

PRACTICES

- Paired Programming
- Test-Driven Development
- Short iterations
- Continuous Integration / Continuous Deployment

Design

User Centered Design

Ensuring the software solves a real problem for real users in a desirable and usable product.

PRACTICES

- User Interviews
- Ethnographic studies
- Persona definition
- Prototype creation

Product Management

Lean

Reducing the risk of building the wrong thing while comfortably changing direction

PRACTICES

- Minimum Viable Product (MVP) definition
- Lean experiments
- Identify & test assumptions
- Data driven decisions

4 boxes

Daily Standup

- One-minute meeting to discuss daily activities
- Team discuss what they did yesterday and what they'll do today

IPM

- The product manager leads the team through the backlog for that week
- The team clarifies and ensures consistency
- Stories are estimated

Iteration

- Product backlog and user stories are written and prioritised daily by the product manager.
- The team sit together, self-organise, and are highly collaborative
- Prototypes are built, tested, and refined by the designer
- User research eliminates unnecessary features

Retrospective

- The team meets to decompress, identify issues, and discuss areas for improvement
- Actions are captured for and reviewed weekly
- Retros allow teams to continuously improve and iterate the agile process

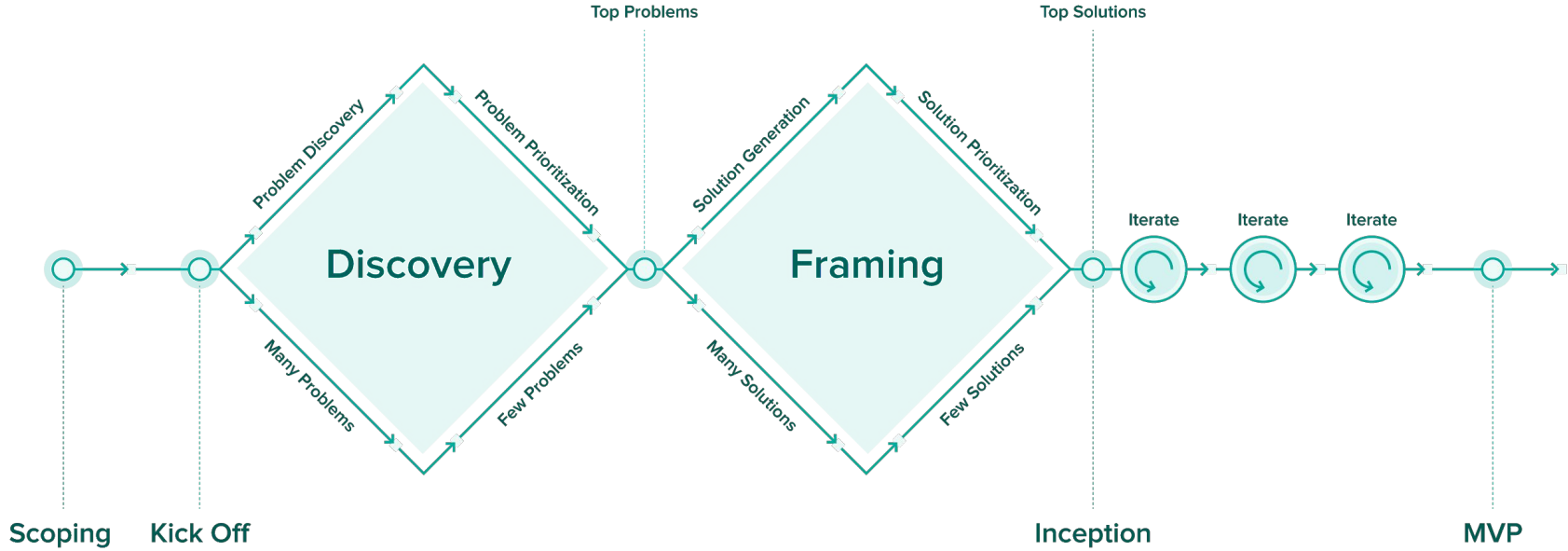
Feedback boxes

“It takes forever to release new features. We see opportunities to sell to new customers, but we **can’t respond to change** fast enough.”

“We built something for our customers but it doesn’t meet their needs. **Users aren’t adopting our product.”**

“We handed off the requirements to IT, but then 6 months later we got a **product that didn’t meet our expectations.”**

Diagram box


Top Problems
Top Solutions
Problem Discovery
Problem Prioritization
Solution Generation
Solution Prioritization
Discovery
Framing
Iterate
Iterate
Iterate
Many Problems
Few Problems
Many Solutions
Few Solutions
Scoping
Kick Off
Inception
MVP

PIVOTAL PRESENTATION THEME

Pivotal Logos


Pivotal


Pivotal


Pivotal


Pivotal
Cloud Foundry®


TM


Pivotal
Cloud Foundry®


TM


Pivotal
Cloud Foundry®


TM


Pivotal
Container Service™


Pivotal
Container Service™


Pivotal
Container Service™


Pivotal Labs


Pivotal Labs


Pivotal Labs


Pivotal
Greenplum®


Pivotal
Greenplum®


Pivotal
Greenplum®


Pivotal
GemFire®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spring
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spring
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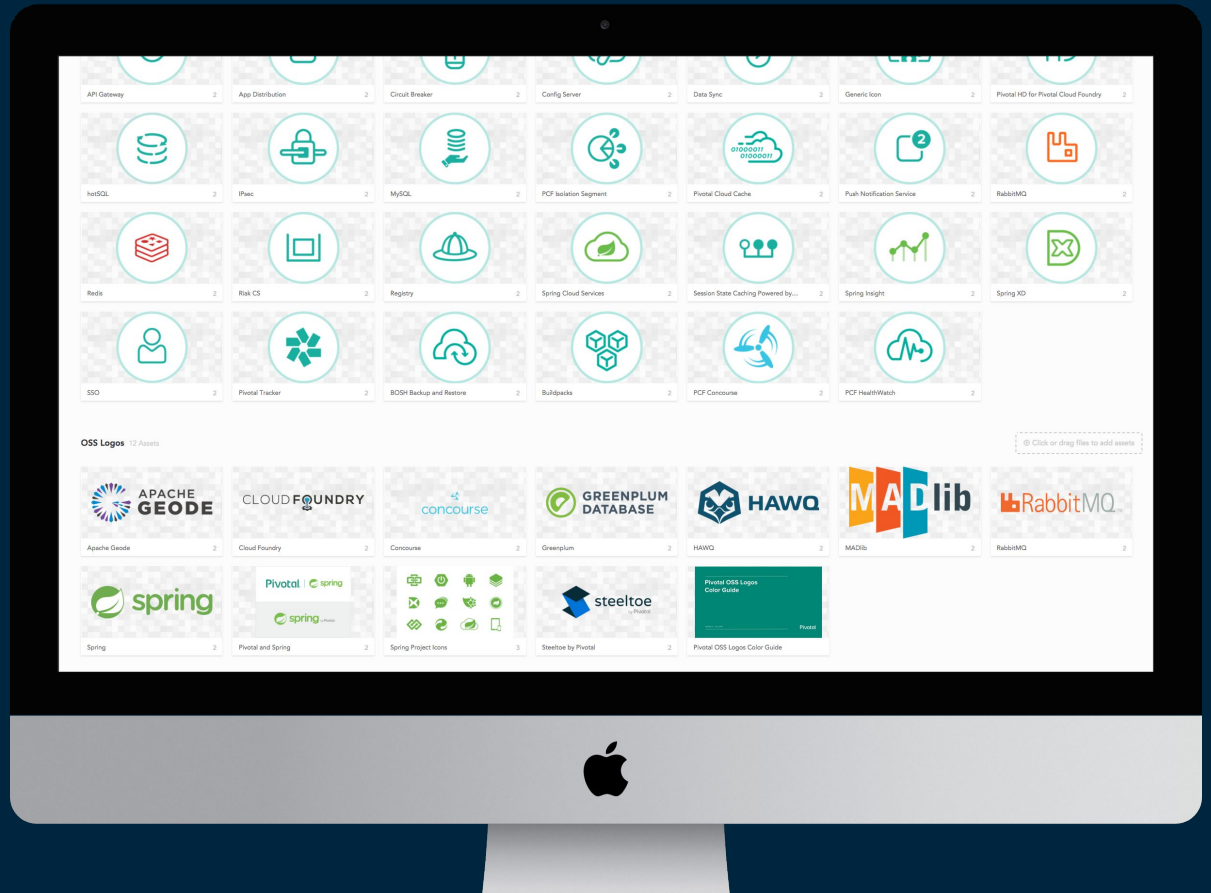
Pivotal BrandFolder

Looking for more logos or different formats?

Visit our [BrandFolder »]
(pw: keepitsimple)

There you'll also find:
- PCF Service Icons
- OSS Logos
- Event Assets
- Brand Fonts & Colors
- And More!



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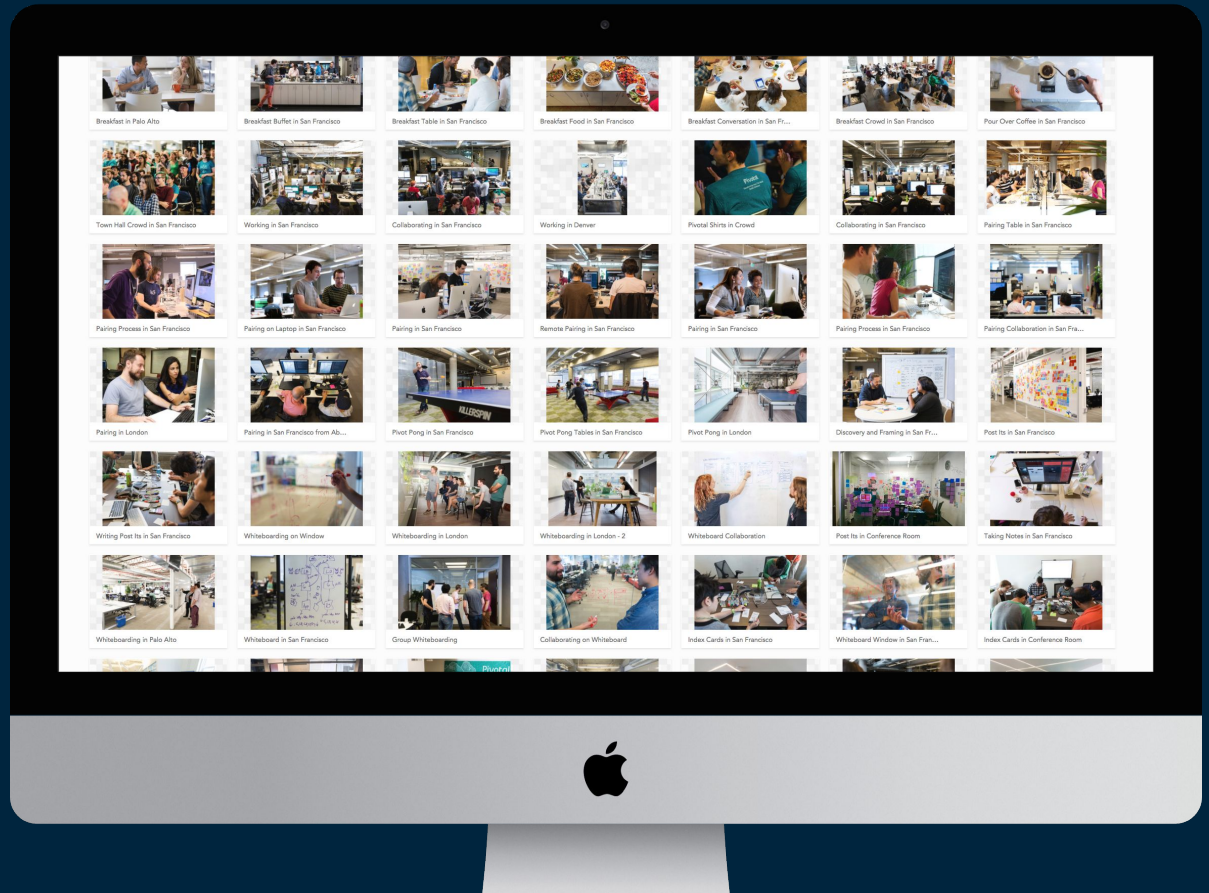
PIVOTAL PRESENTATION THEME

Photography

Pivotal Photo Library

Our Pivotal Photo Library is on its own dedicated [BrandFolder »]
(pw: keepitsimple)

New photos are added throughout the year.



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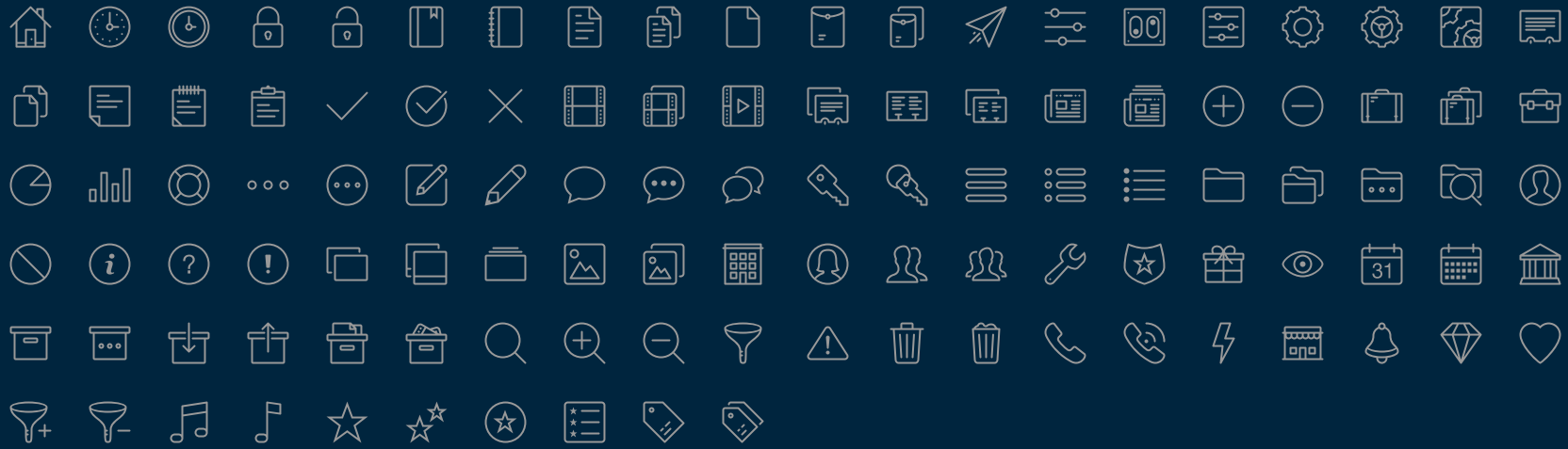
General Icons

General



Arrows

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ICONS CAN SCALE AND APPLY COLOR

Electronics

Miscellaneous

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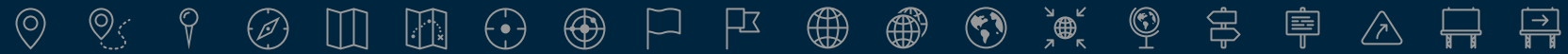
ICONS CAN SCALE AND APPLY COLOR

E-Commerce

Web

Location



ICONS CAN SCALE AND APPLY COLOR

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Looking for technology icons for diagrams?

Pivotal Diagram Kit for Google Slides is planned for Q1 2018.

PIVOTAL PRESENTATION THEME

End Slides

Transforming How The World Builds Software

Transforming How The World Builds Software