AGILE IN GOVERNMENT:
THEORY, PRACTICE, AND PROOF IT WORKS

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2020 Project Management Symposium

What We'll Cover Today…

☐ **Must Have**

☐ **Should Have**

☐ **Could Have**

- My War Stories Summary   5 min
- Modern Agile in Government   10 min
- War Story 2 Details: FFP (National Archives)   10 min
- Wrap Up with Q&A   5 min
- War Story 1 Details: T&M with Options (CNIC) 10 min

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My Agile In Government War Stories

**Navy Shore Energy Program,
Energy Return on Investment (eROI) Support**
Booz Allen Hamilton (BAH)

Scope: Build software to identify, evaluate, and select $500M/yr. in shore energy projects

Total Cost: $5M over 4 years (T&M)
o 2 Fully Cross-Functional Teams
o BAH Personnel: 8 (1 PM, 3 Devs, 4 BA/Testers)
o Navy Personnel: 5 (1 PgM, 3 Officers, 1 Analyst)

Output: Project ROI: 50
o QA/QC avoided $20M/yr. in net-loss projects
o Improved selection by $30M/yr. annualized returns
o Modeled investments with 95% accuracy by year 3
o BAH sole sourced the $10M/yr. Renewables Program

**National Archives Records Administration (NARA),
Electronic Records Administration (ERA)**
International Business Machines (IBM)

Scope: Pilot a new record management system in Amazon Web Services (AWS) to process, store, and search >100 PB.

Total Cost: $20M over 1 year (FFP)
o 6 Fully Cross-Functional Teams
o IBM Personnel: 35 (15 Devs, 10 BA/Testers, 4 Arch, 4 SAs, 2 PMs)
o NARA Personnel: 15 (Product Owners, Testers, Architects)

Output: Project Profit: ~40%
o Delivered on-time and budget
o Developed a new distributed Agile Method, "Near-Site Agile"
o First-ever Agile project using all IT Departments (Sys, QC, PM)
o "IBM Project of the Year 2016," out of 4,000 projects globally

Slide 3

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A Decade of Experience

MODERN AGILE IN GOVERNMENT: GET READY TO BE AMAZED!

Early Success of Agile in Government

California's Department of Social Services

- 10 years without one line of working code
- The State of California turned to 18F
- In 2015, the State of California began and in one year had a working system.
  - Used by more than 20,000 social workers
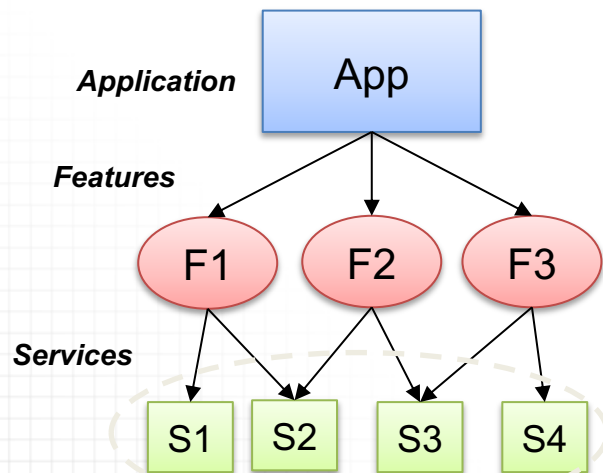 - Manages over 500,000 cases of child abuse and neglect annually

Whiteboard used for planning attack missions

Air Forces Central Command (AFCENT) HQ

Source: https://www.fastcompany.com/40588729/the-air-force-learned-to-code-and-saved-the-pentagon-millions

- AFCENT had software but after 5 years it..
  - "Didn't work" and "wasn't fixable"
  - Cost $745M (was competitively bid)
  - Took 9 hrs for 3 people to plan fueling
- Kessel Run was started w/ Google & Caltech
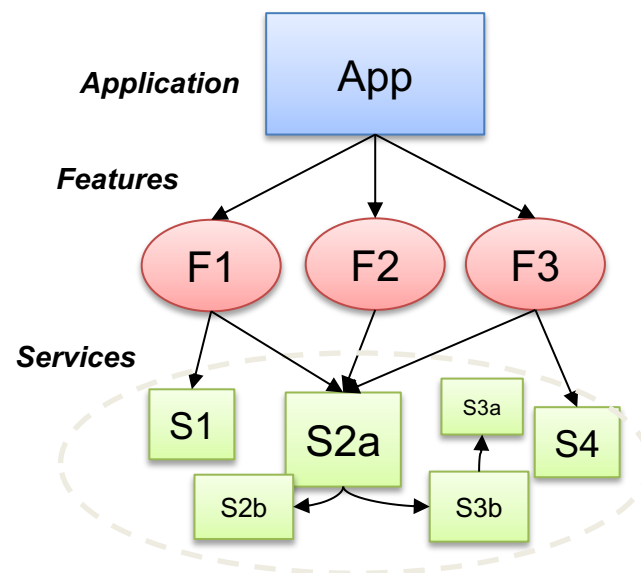- Project "Jigsaw" took just 6 months and $2M
- It now saves $12M a month in fuel

Slide 5

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Agile Engineering is Modular for Fast Delivery

Traditional

Application → App
Features → F1, F2, F3
Services → S1, S2, S3, S4

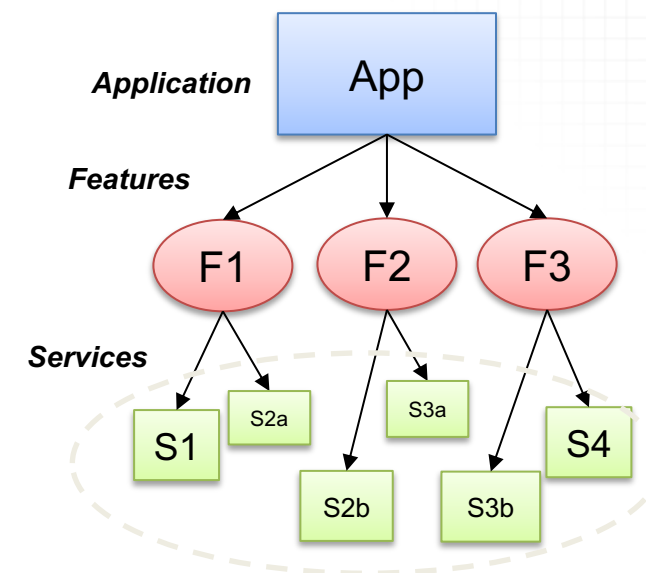*High reuse of components means a "Tightly Coupled" design.*
- *Small changes have big costs*
- *Lower costs if no changes*

Lean

Application → App
Features → F1, F2, F3
Services → S1, S2a, S2b, S3a, S3b, S4

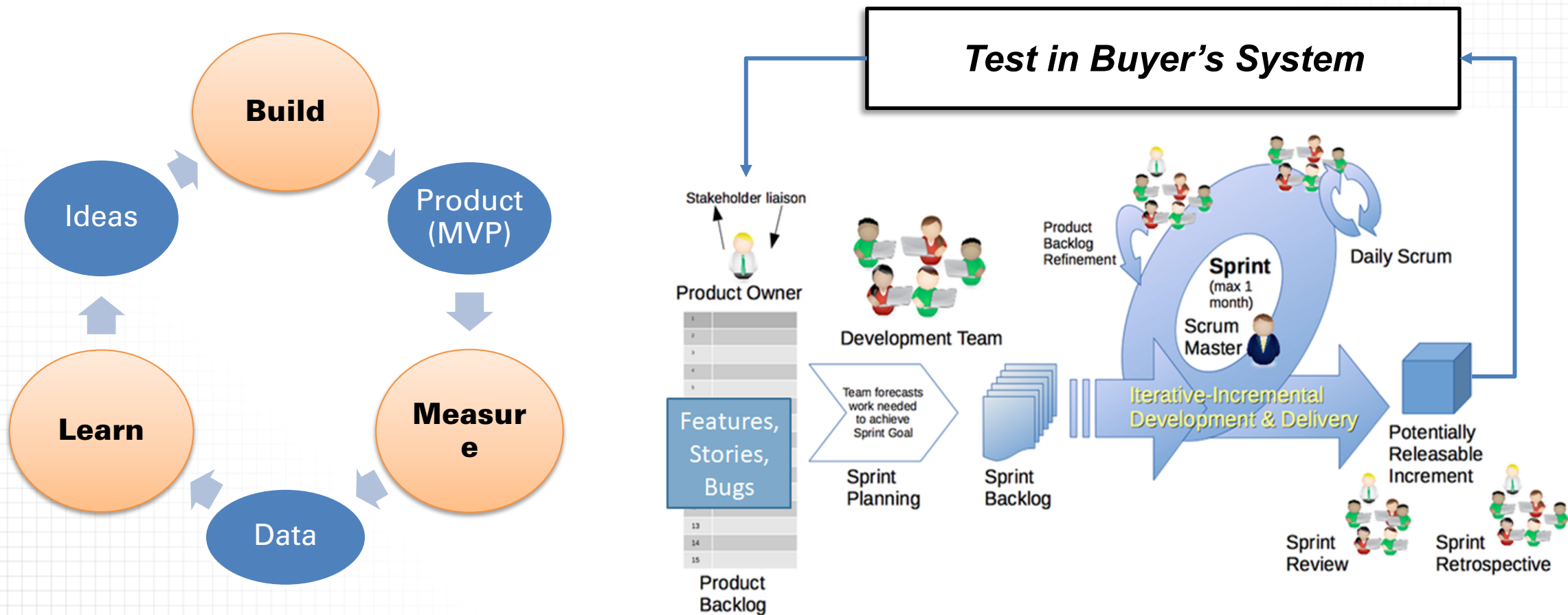*Lean designs "Evolve" as each feature is developed*
- *Uses "just enough" feature by feature*
- *Reuses as possible to lower costs*
- *Often results in complex final product*

Agile

Application → App
Features → F1, F2, F3
Services → S1, S2a, S2b, S3a, S3b, S4

Low or no reuse of components means a "Decoupled" Modular design.
- *Small changes have small costs*
- *Can release single Features quickly*
- *Higher cost if no expected changes*

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Agile Searches for Solutions in Small Batches

Build

Ideas

Product (MVP)

Learn

Measure

Data

Test in Buyer's System

Stakeholder liaison

Product Owner

Development Team

Features, Stories, Bugs

Team forecasts work needed to achieve Sprint Goal

Sprint Planning

Sprint Backlog

Product Backlog Refinement

Sprint (max 1 month)

Scrum Master

Daily Scrum

Iterative-Incremental Development & Delivery

Potentially Releasable Increment

Sprint Review

Sprint Retrospective

Product Backlog

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Is Agile in Government Possible?

Actually, it's encouraged by law…

FAR Subpart 39.103

This section implements 41 U.S.C. 2308. Modular contracting is intended to reduce program risk and to incentivize contractor performance while meeting the Government's need for timely access to rapidly changing technology…

Agile Acquisition 101 (Increment 2)
https://www.youtube.com/watch?time_continue=30&v=Md3IrifEb4I

- Follows federal acquisitions standards
  - Definitive value of delivery of capabilities
  - Delivered within a set period of performance
  - In-line with an IGCE

- Modular Acquisitions highly encouraged by FAR 39
  - Incentivizes contractor performance
  - Reduces program risk

- NDAA 2018+ encourages continuous Agile approach for software, suggesting the use of DevOps and weekly "spirals, spins, or sprints"

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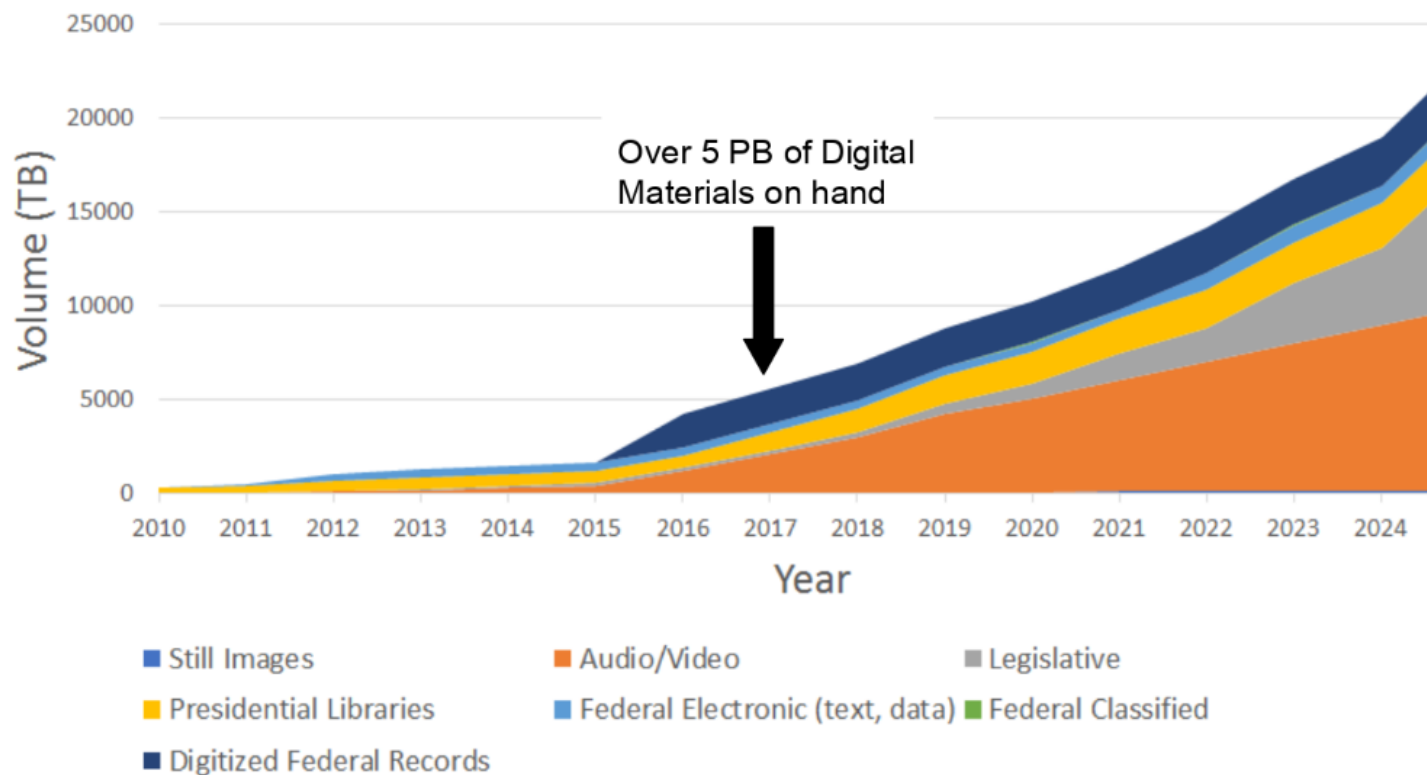
Hopeful for a Transparent Future

WAR STORY 2: NATIONAL ARCHIVES ERA 2.0 FIRM-FIXED PRICE

National Archives Electronic Records Platform

- National Archives was facing a "Digital Wave" in electronic records
  - 15 years after the Netscape
  - All records in government end up at National Archives

- NARA's first attempt to solve this problem spent hundreds of millions, but returned a defunct product
  - Could no longer trust an open-ended T&M contract
  - Required using Firm-Fixed Price and total contract control

- Enterprise Architects identified the need to move to cloud
  - Can't afford up-front build-out
  - Need services for enormous load spikes
  - Cloud ideal since records arrive at once at the end of GFY

NARA's Policy Was to Use Data-At-Rest
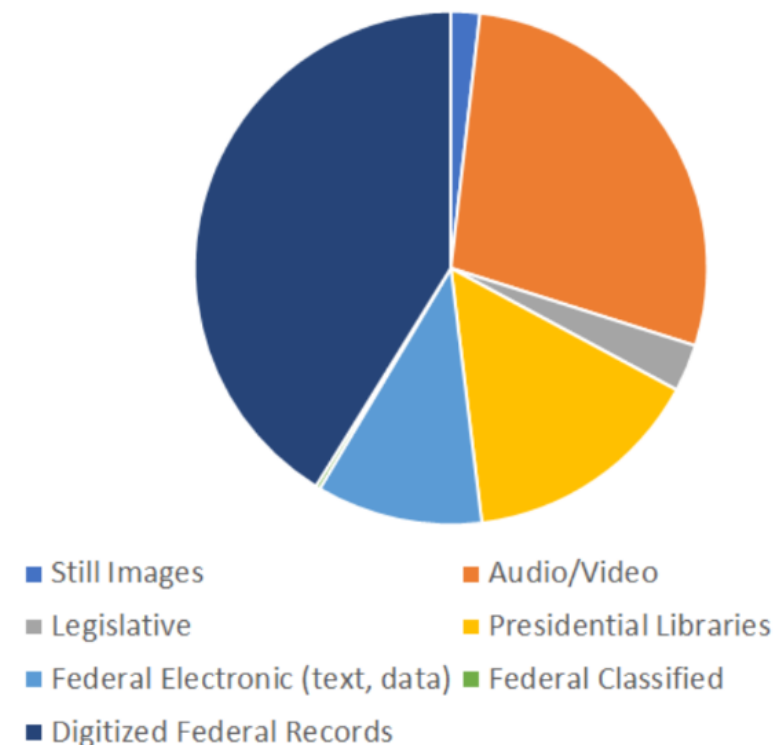
Diagrams prepared by provided by National Archives and Records Administration (NARA), Systems Engineering Division

NARA Built the Roadmap

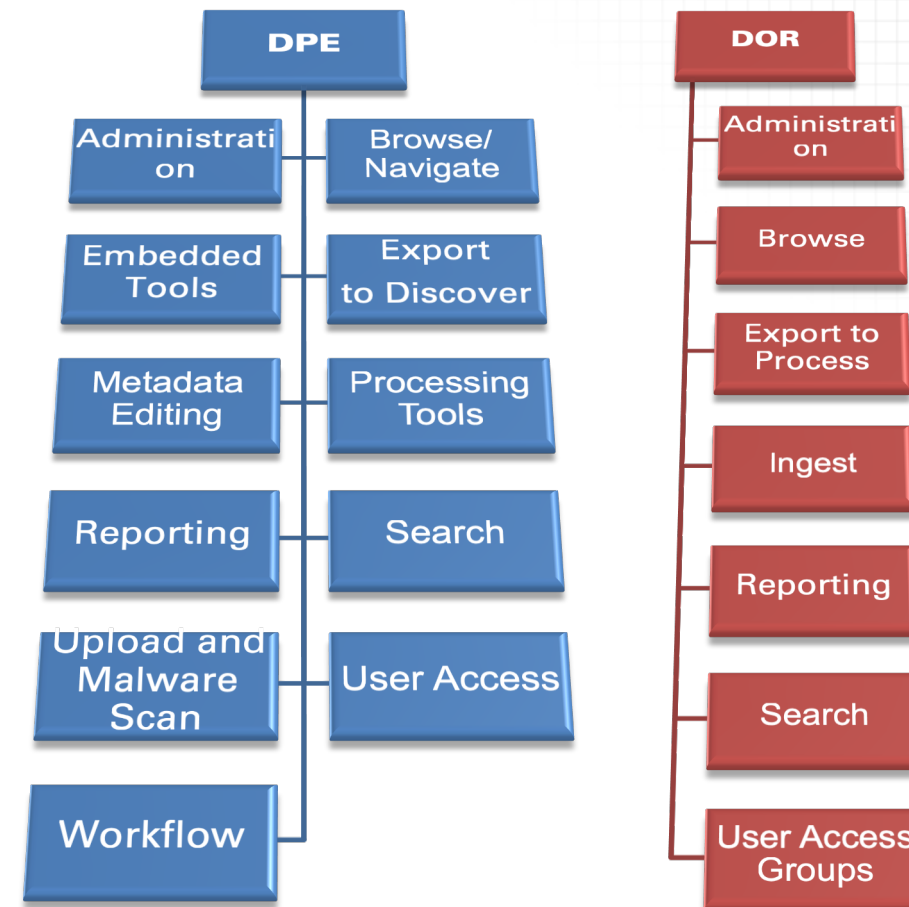## Identify Modules and Key Capabilities
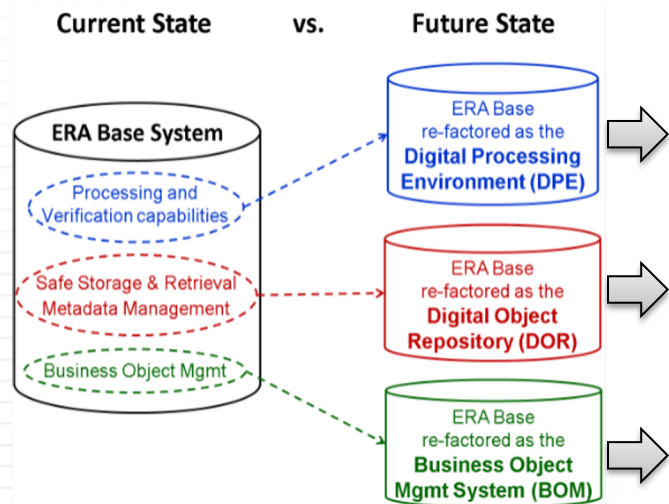
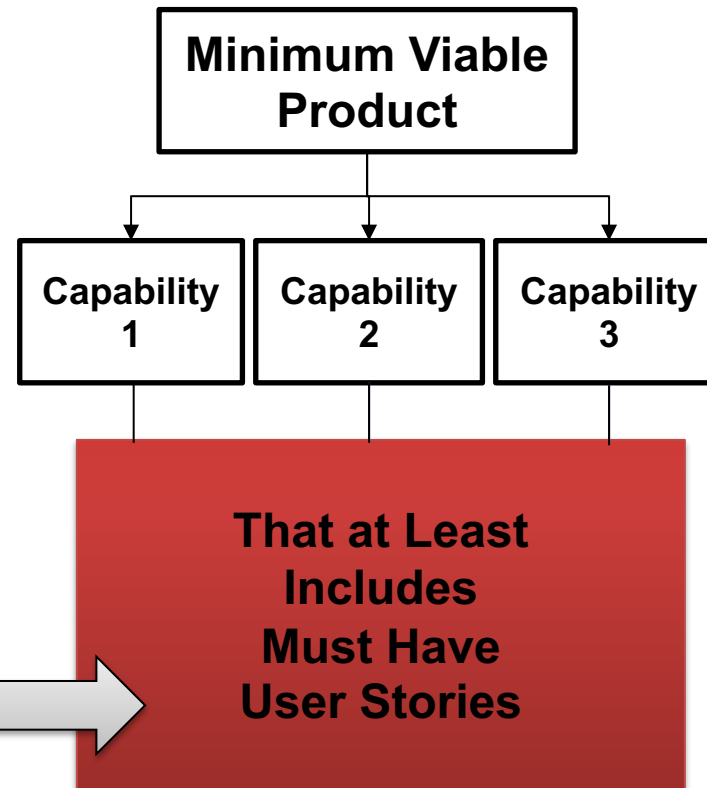## Schedule the Capabilities

Breakdown of Features

Diagrams prepared by provided by National Archives and Records Administration (NARA), Systems Engineering Division

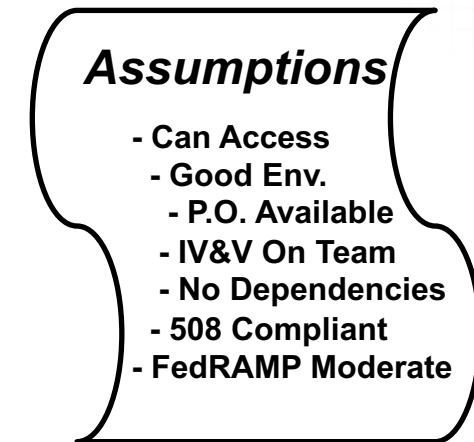# NARA and IBM Established the FFP Approach

1. Reviewed Backlog of User Stories

Could Haves

Should Haves

Must Haves

2. Guaranteed MVP Capabilities

Minimum Viable Product

Capability 1

Capability 2

Capability 3

That at Least Includes Must Have User Stories

3. Agreed Upon Assumptions

Assumptions

- Can Access
- Good Env.
- P.O. Available
- IV&V On Team
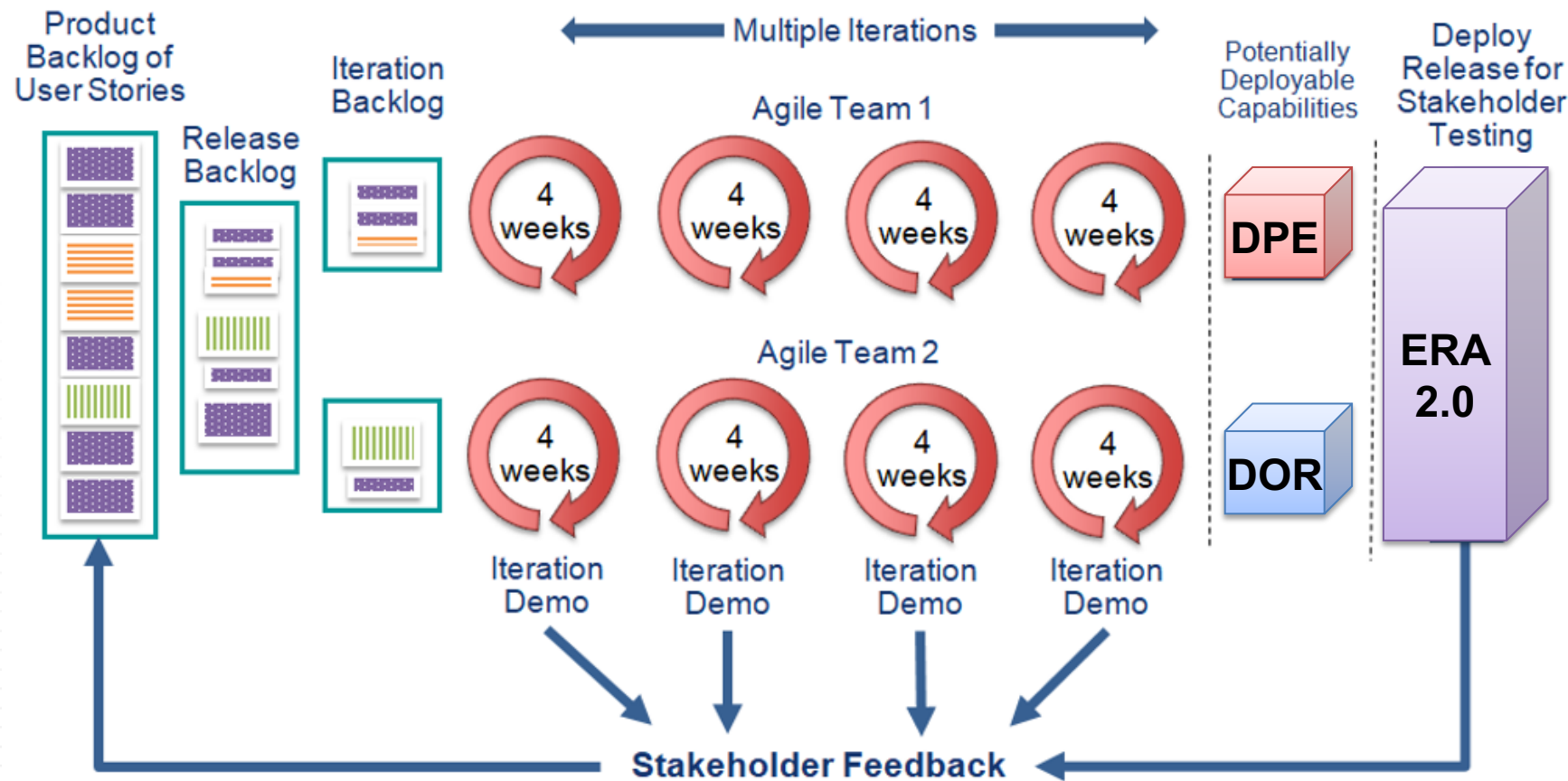- No Dependencies
- 508 Compliant
- FedRAMP Moderate

Types of Assumptions
- Operating Conditions
- Resource Availability
- Security Constraints
- Number of Users
- Performance Model
- *Definition of Done*

Slide 13

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With Enough Funding for MVP Success
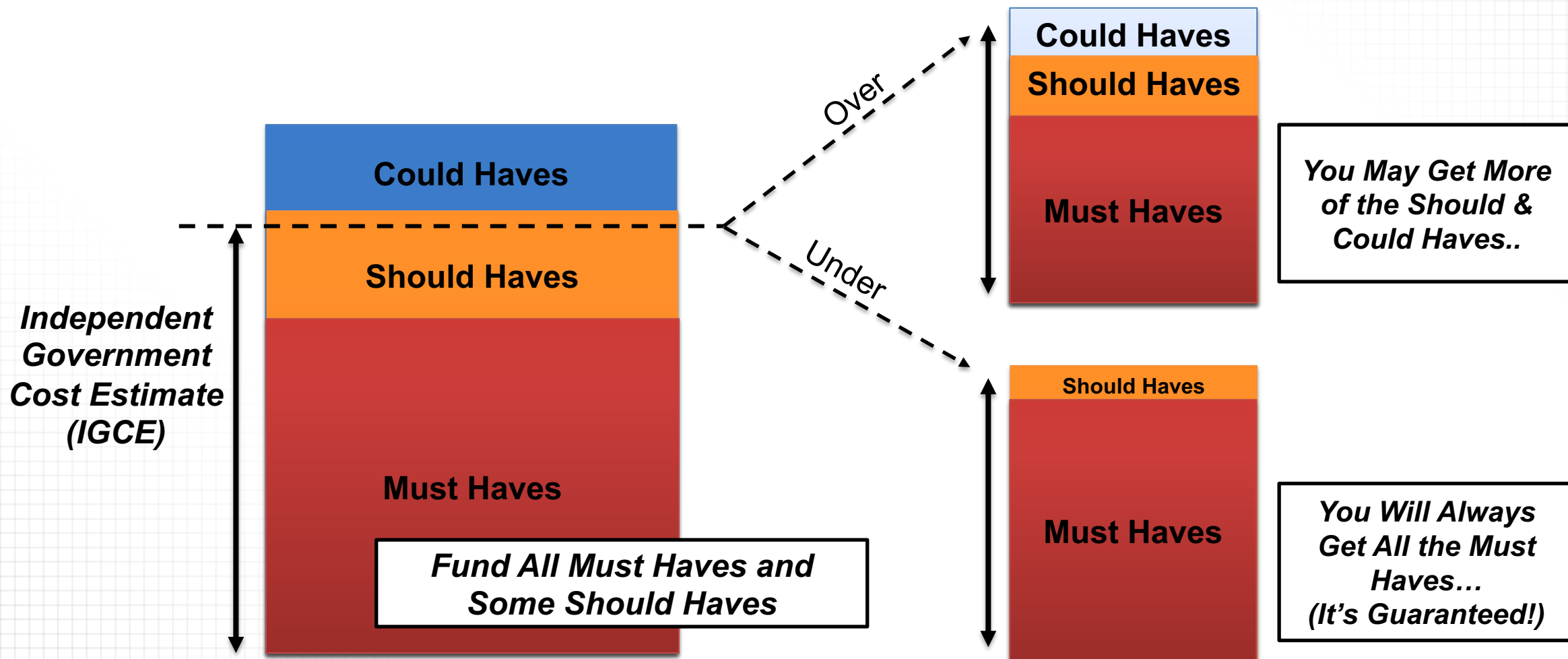
That Leveraged a Disciplined Agile Approach

Diagrams prepared by provided by National Archives and Records Administration (NARA), Systems Engineering Division

Mission-Driven Enterprises using Agile FFP

- **Agile with FFP works wonderfully**
  - Enforces increments with capability deadlines
  - Provides scope buffer to share risk and reward with parties
  - Encourages strong definitions of done for scale
  - Can leverage incentive fees for faster delivery (both sides)

- **Modular acquisitions rapidly acquire capabilities**
  - DPE and DOR delivered in 12 months
  - State of the art cloud-based Apps on Amazon's GovCloud
  - Delivered at fraction of the cost of ERA Base (predecessor)

- **Modular acquisitions with Agile encouraged by laws**
  - Built into FAR Subpart 39
  - Recently expanded for DevOps under NDAA 2018

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Some light reading…

SUMMARY & REFERENCES

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In Summary, Thank You!

- **Agile in Government is Not New!**
  – 18F provides modular acquisition services & guides
  – Air Force's Kessel Run is now the benchmark
  – Fits well within government funding & incentive model

- **Modular Agile acquisitions encouraged by law**
  – Built into FAR Subpart 39
  – Recently expanded for DevOps under NDAA 2018

- **Agile with FFP Guarantees Solution Delivery**
  – Enforces increments with capability deadlines
  – Provides scope buffer to share risk and reward
  – Encourages strong definitions of done for scale
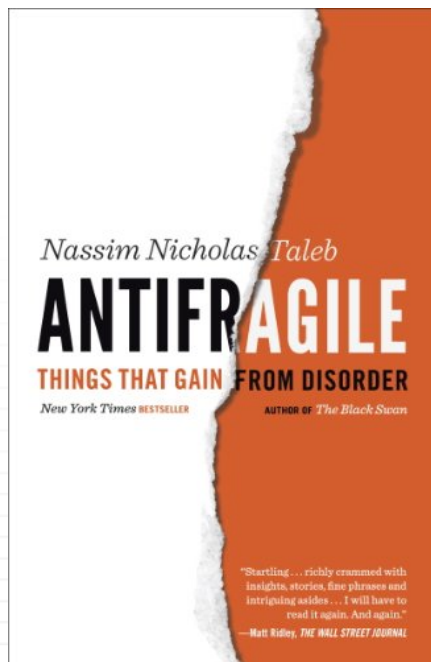 – Can leverage incentive fees for faster delivery

Agile Project Management
***Professional Certificate***
Audit for Free
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https://pm.umd.edu/edx/

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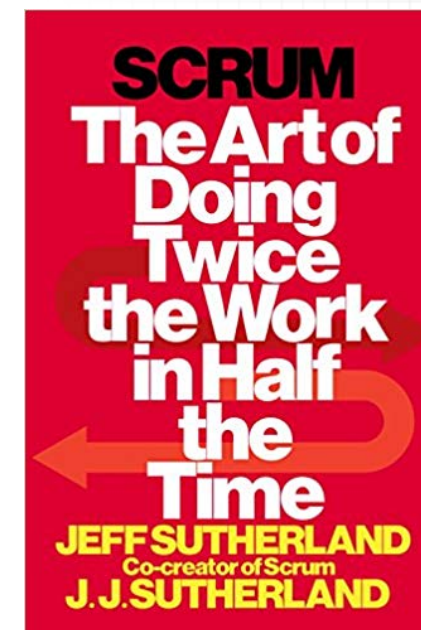# Key References and Books To Live By 1 of 2

- Author: Nassim Nicholas Taleb
- Publisher: Random House (November 27, 2012)
- Publication Date: November 27, 2012
- Sold by: Random House LLC
- ASIN: B0083DJWGO
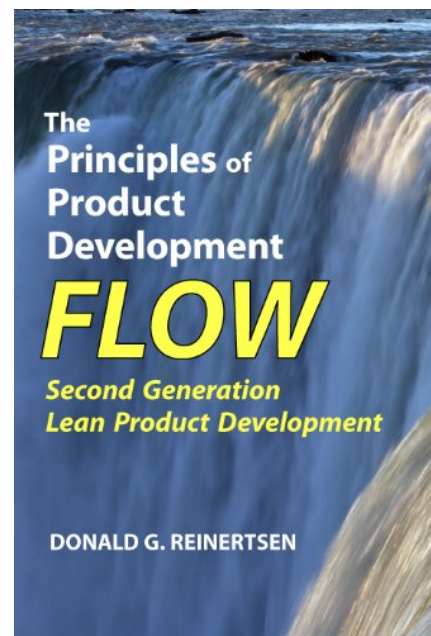
- Author: Donald G. Reinertsen
- Publisher: Celeritas Publishing (March 29, 2012)
- Publication Date: March 29, 2012
- Sold by: Amazon Digital Services LLC
- ASIN: B007TKU0O0
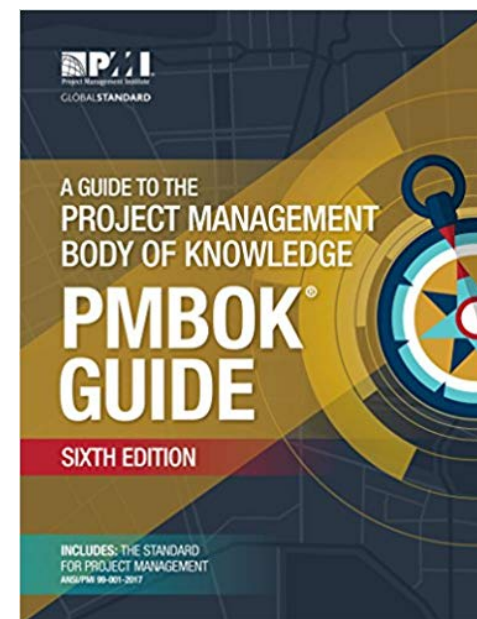
- Publisher: Project Management Institute; 6 edition
- Publication Date: September 6, 2017
- Sold by: Amazon Digital Services LLC
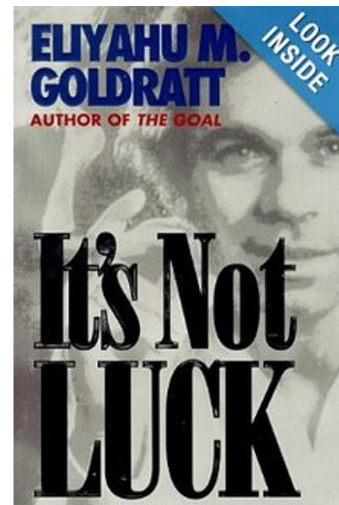- Language: English
- ASIN: B075QQCK2C

- Authour: Jeff & J.J. Sutherland
- Publisher: Currency; 1st edition
- Publication Date: September 30, 2014
- Language: English
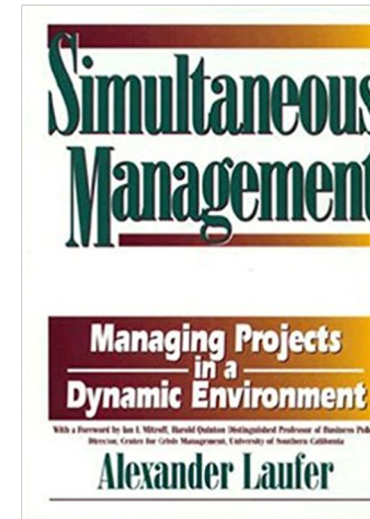- ISBN-10: 038534645X
- ISBN-13: 978-0385346450

# Key References and Books To Live By 2 of 2
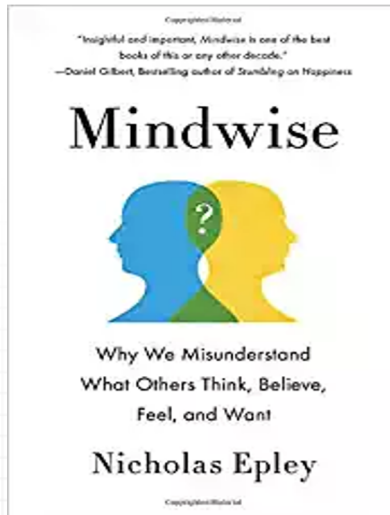
Author: Nicholas Epley
Publisher: Vintage; Reprint
edition (January 6, 2015)
Language: English
ISBN-10: 030774356X
ISBN-13: 978-0307743565

Author: Eliyahu M. Goldratt
Publisher   North River Press
Publication date: 1994
Pages   283
ISBN   0-88427-115-3
OCLC   31443609

Author: Alexander Laufer
Publisher: AMACOM
(December 2, 1996)
Language: English
ISBN-10: 0814403123
ISBN-13: 978-0814403129
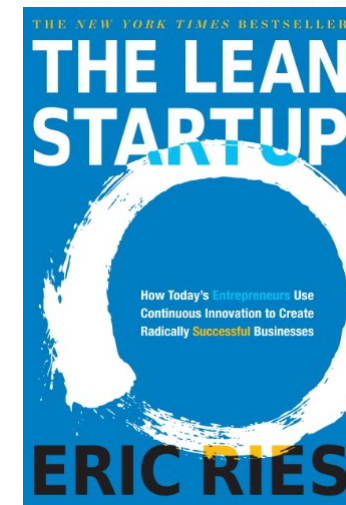
Author: Eric Ries
Publisher: Currency; 1 edition
(September 13, 2011)
Language: English
ISBN-10: 9780307887894
ISBN-13: 978-0307887894

War Story 1

BACKUP 1 OF 2

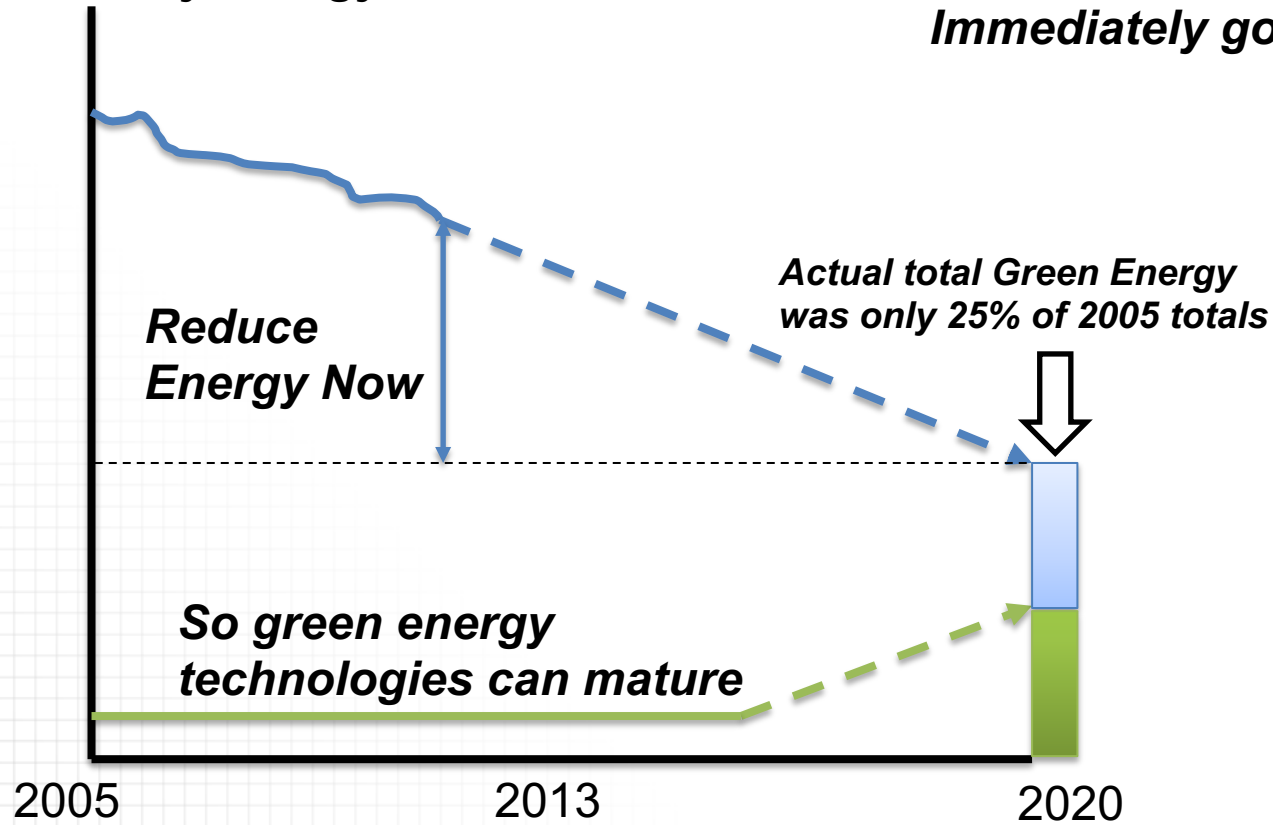Gotta Get Down to Get Up!

War Story 1: CNIC Energy Program T&M with Options

Navy's Energy Program

- Ambitious goals set by CNO and SECNAV
  - Goal 1 was 50% energy reduction
  - Goal 2 was 50% renewable energy

- Based on goals set by Bush Administration on energy security
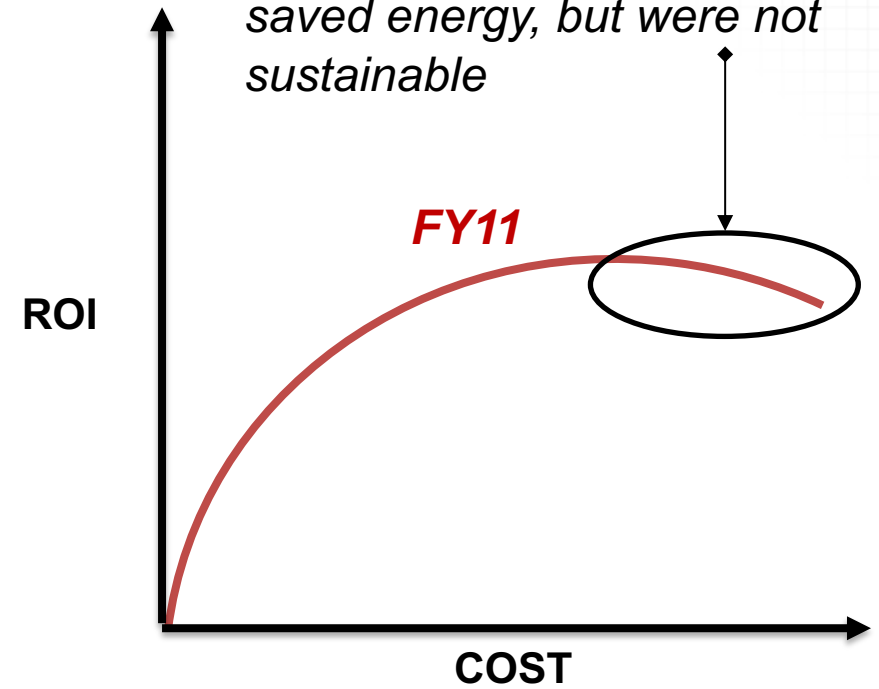
Navy Had A Great Strategy, and Got Started…

Navy Energy Use Over Time

Started in 2010, and Immediately got funding…..

Navy's Initial Investment

*Only in FY11 many projects funded saved energy, but were not sustainable*

Reduce Energy Now

Actual total Green Energy was only 25% of 2005 totals

FY11

ROI

So green energy technologies can mature

2005   2013   2020

COST

Navy Energy Program's Procurement Approach

- Navy Energy Program was run by Commander Navy Installations Command (CNIC)

- CNIC needed trusted support to evaluate projects
  - Booz Allen successfully supported facilities with modeling
  - FY11 Incumbent did not support Navy's needs for tool refinement

- CNIC hedged risk with T&M, NTE with Options
  - Annual T&M contract with Not-To-Exceed (NTE) limit
  - Each year could be renewed if going well
  - Limited risk on incremental and total cost

- **Contract stated performance needs in about 3 pages**
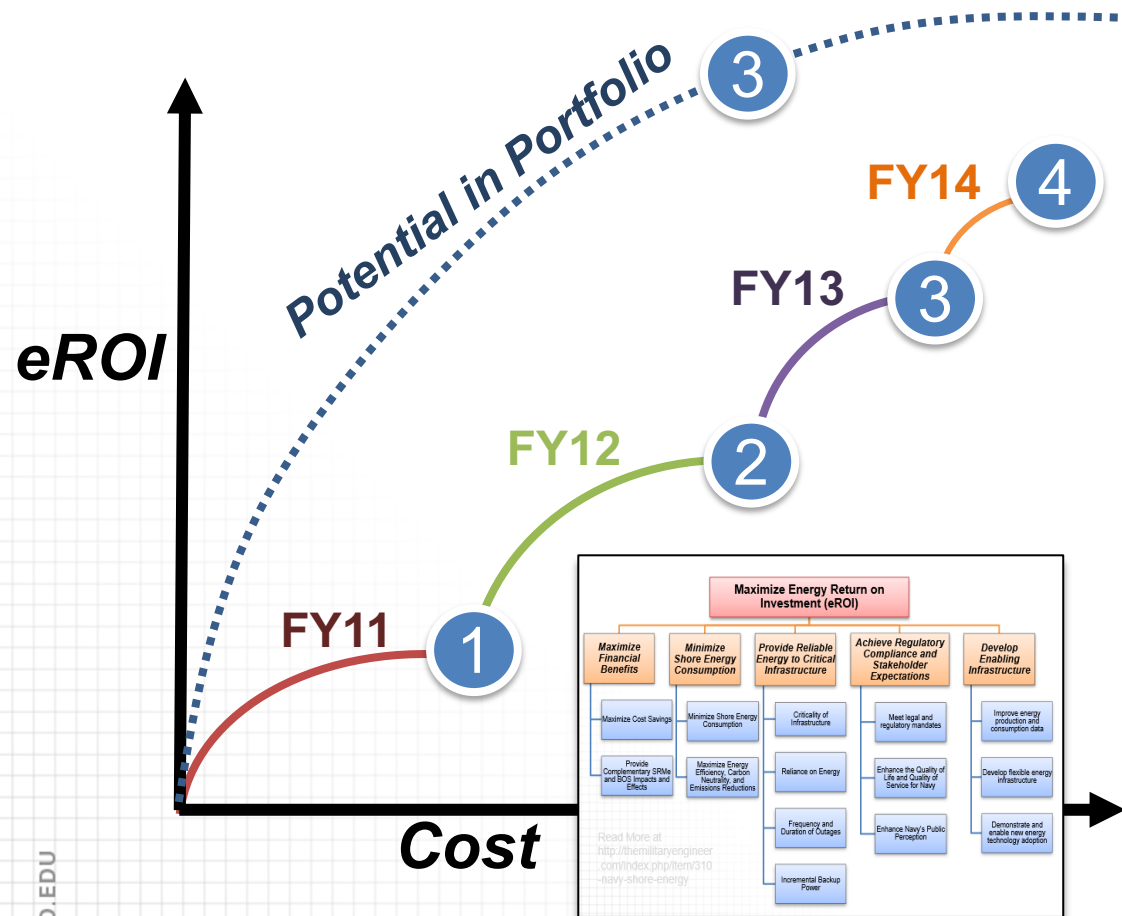
Navy Energy Project Programming Value Stream:
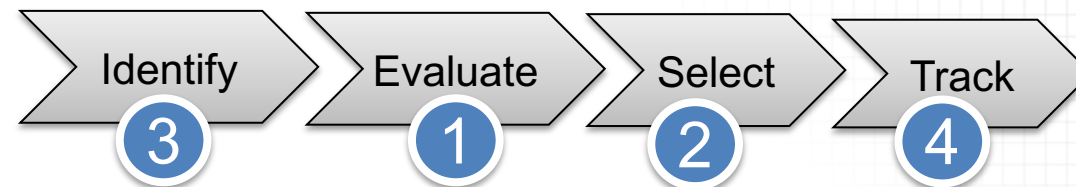
1. **Data Quality** - bad data skewed selection and cost $20M in lost investment; this also impacted billing for pass-through utilities

2. **Project Selection** - Optimizing project selection allowed the navy to explore tradeoffs; gains increased ROI by $30M NPV

3. **Project Identification** - analysis proved that many good projects remained untapped; need was for targeting and audits

4. **Project Tracking** - with so many planned projects in the pipeline, the Navy needed to know where to send its auditors effectively

Mission-Driven Enterprise using Agile T&M+

- Keys to Agile in Mission-Driven Enterprises
  - ***Program the challenge, not the solution***
  - Establish clear performance goals
  - Allow for innovation with program transparency
  - Use T&M when no clear good solution is in place

- T&M+ Incentives for Agile Team
  - Work fast to prove value quickly to get option year
  - Never stop innovating so program remains
  - Identify and validate opportunities for program growth

Details of early Agile in Government

BACKUP 2 OF 2

Modern Agile in Government: *18F*

After 10 years of not building one line of working code, the State of California turned to 18F to support its child welfare services case management system.

18F worked with California's Department of Social Services and Office of Systems Integration to :

- modular contracting,

- agile development,

- user-centered design, and

- open source practices

In 2015, the State of California began a process to modernize their child welfare services case management system.

- Used by more than 20,000 social workers

- Manages over 500,000 cases of child abuse and neglect annually

https://www.youtube.com/watch?v=lNSmF7-xisU

In one year, California had major improvements to its legacy system…

"Better than the last 15-20 years!"

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Modern Agile in Government: *Kessel Run*

In 2016, the Air Operations Center at Al Udeid in Qatar was the headquarters of AFCENT, Air Force's Central Command, overseeing operations across the Middle East.

There Airmen were using a whiteboard to manage aerial refueling, with plastic cards, physical distances, and an Excel Spreadsheet.

The process took three people nine hours to plan fueling for missions

They had software but "it didn't work" and "couldn't be fixed." The software cost $745M, was competitively bid, and took five years.

Once discovered by Caltech and Alphabet (e.g. Google), Kessel Run was initiated to teach airmen how to code, and in less than six months with $2M they designed a software application to automate refueling

This project, named "Jigsaw" now saves $12M a month in refueling costs with the added efficiencies of automating refueling

Whiteboard used for planning attack missions

Source: https://www.fastcompany.com/40588729/the-air-force-learned-to-code-and-saved-the-pentagon-millions

https://www.youtube.com/watch?v=0WBdV6fWxTY