Ben Rockwood
Director of Systems Engineering
Joyent, Inc.

The DevOps Transformation

From here to there and why

Section 1

What is DevOps?

DevOps is a ***cultural*** and ***professional*** movement.

Adam Jacob

It’s not a tool (thing).

It’s not a title (person).

It's not just dev & ops.

*dev*ops*

CAMS

- Culture
- Automation
- Measurement
- Sharing

John Willis



It’s a banner for change.

Re-envisioning the IT World



"We are the music makers,
And we are the dreamers of dreams,"

Arthur O'Shaughnessy (1874)

The world is changable, if we only have the courage to break with the status quo (overcome inertia)

Pro Tip #1

DevOps is a journey
of discovery,
not a destination.

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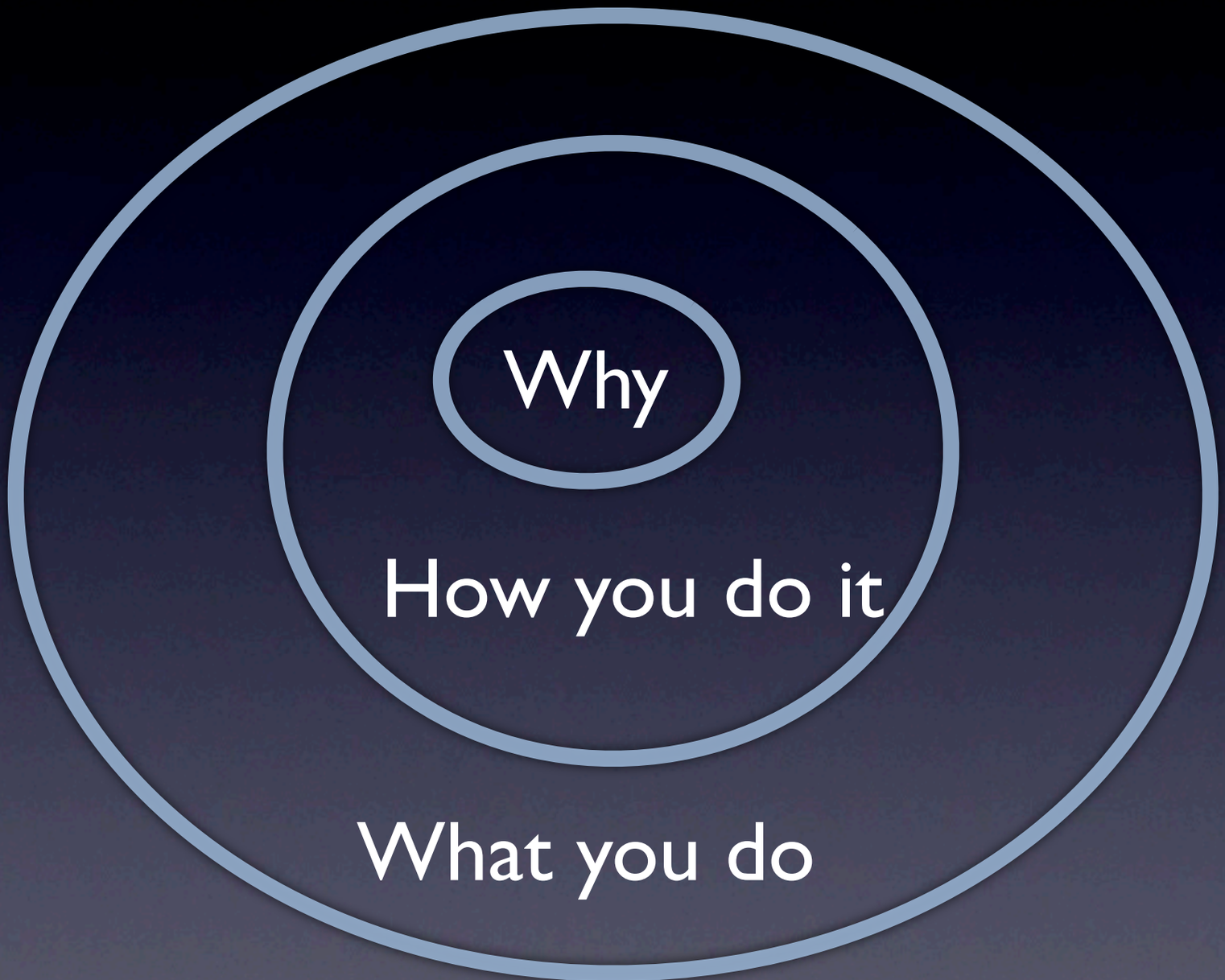
Please join the global conversation!

DevOps Deconstruction

- Collaboration of People
- Convergence of Process
- Creation & Exploitation of Tools

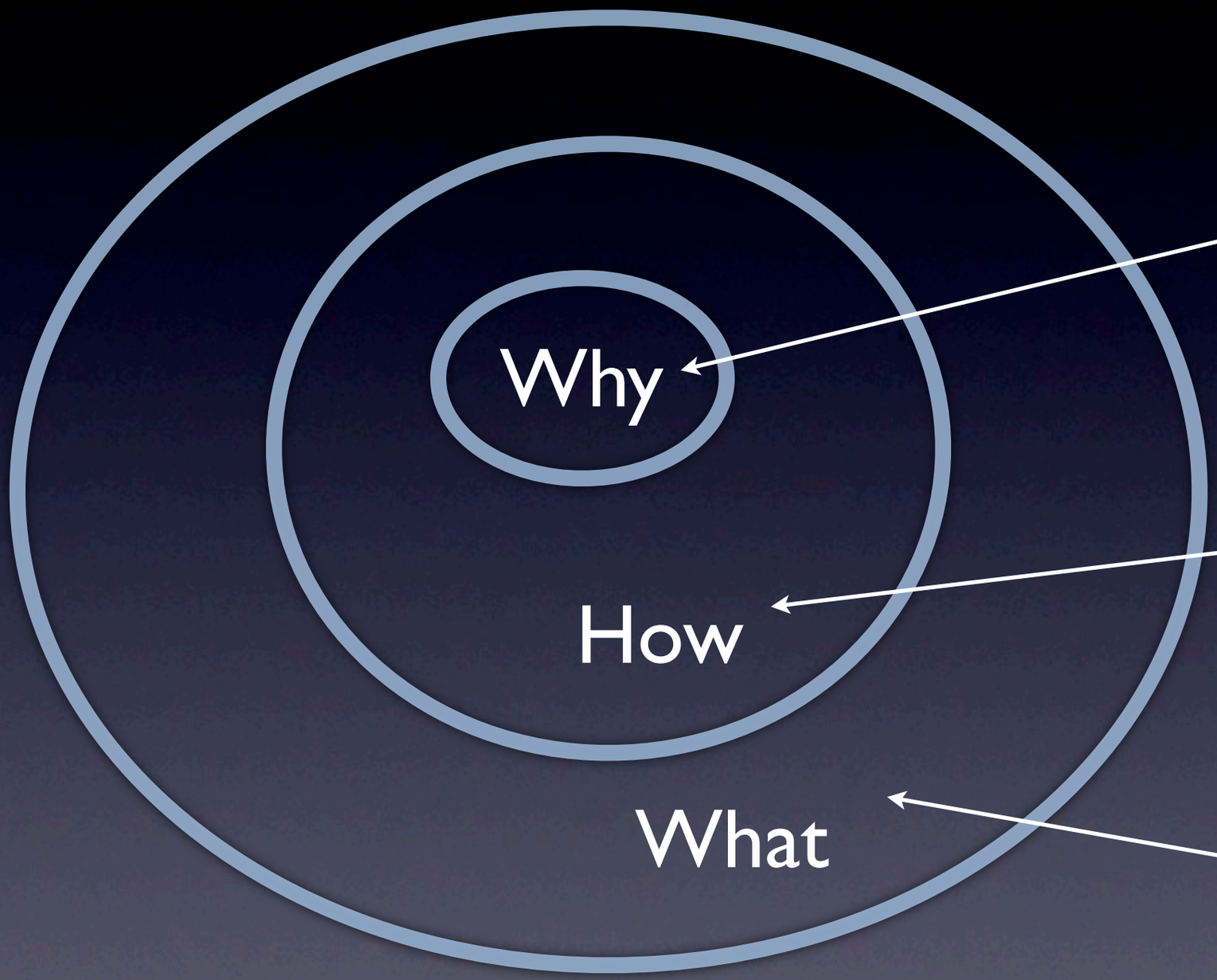
In that order, not the reverse.

Simon Sinek's Golden Circle



Ted Talk: Simon Sinek: How great leaders inspire action"

Simon Sinek's Golden Circle



Motivation,
Values,
Belief

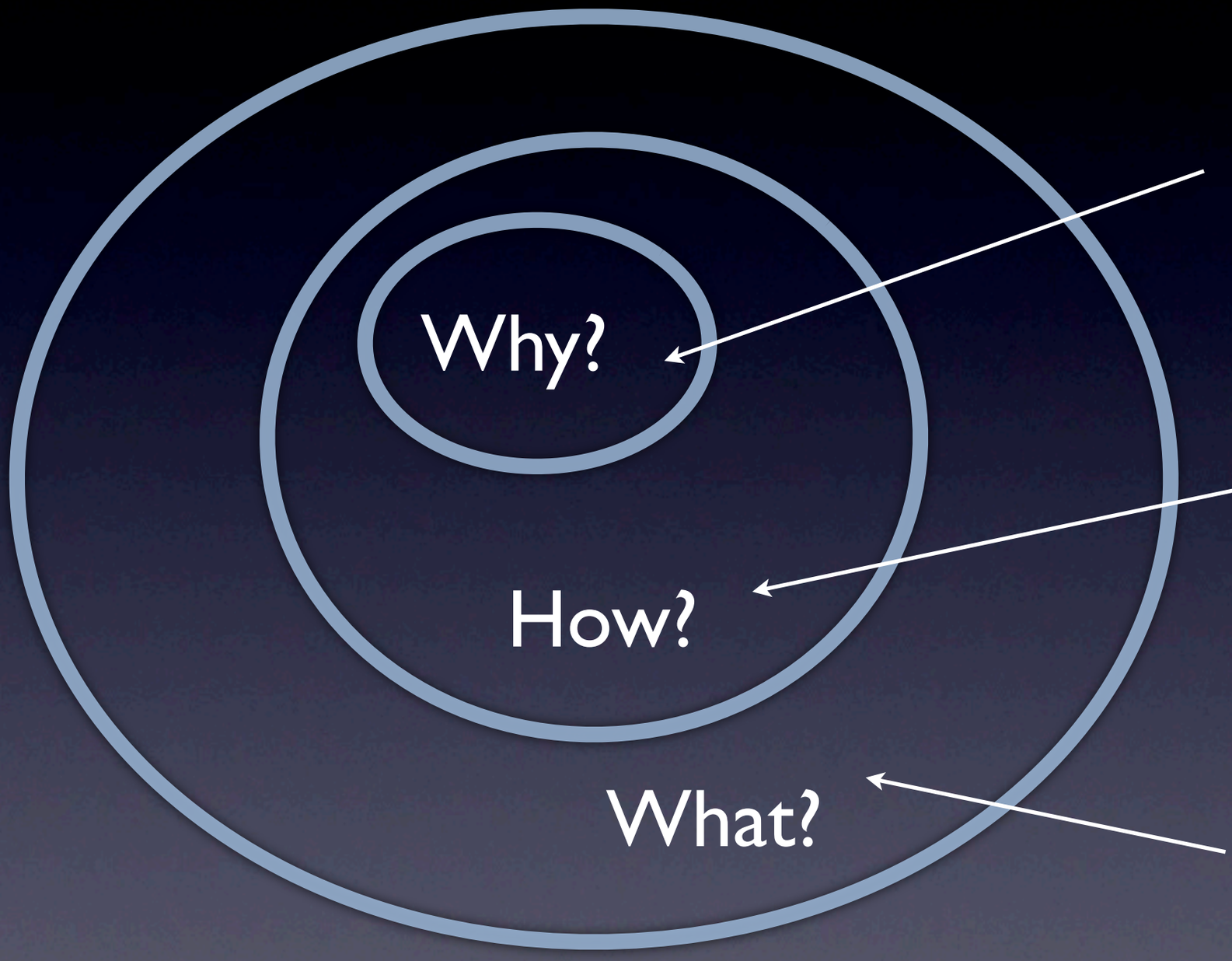
(Both make up the limbic brain,
feelings, behavior, decision making, no language)

Method

Product

(Maps to Neo-Cortex;
Rational Thought & Language)

Golden Circle in DevOps

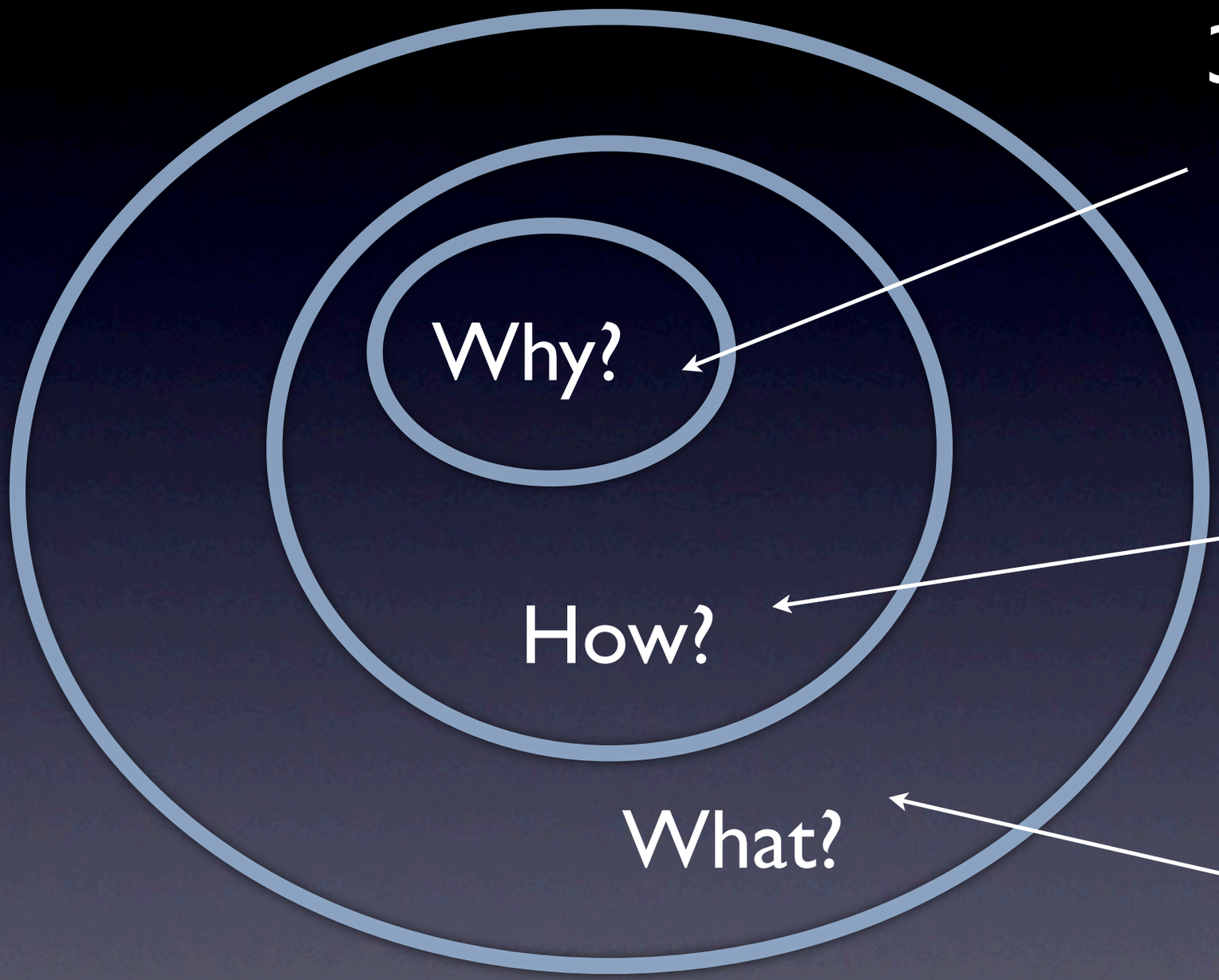


1: Quality through Collaboration is our motivation

2: Process & Tools is how

3: Build awesome services

DevOps Done Wrong



3: To improve efficiency of infrastructure management

2: Building Process around automation

1: Automate using Configuration Management



"Why is the only true source of power. Without it you are powerless."

Ackoff's 5 Contents of the Mind





Insight

Why

How to

Who, What, When, Where
How much..

Architect

Systems Engineer

Jr SA/Support



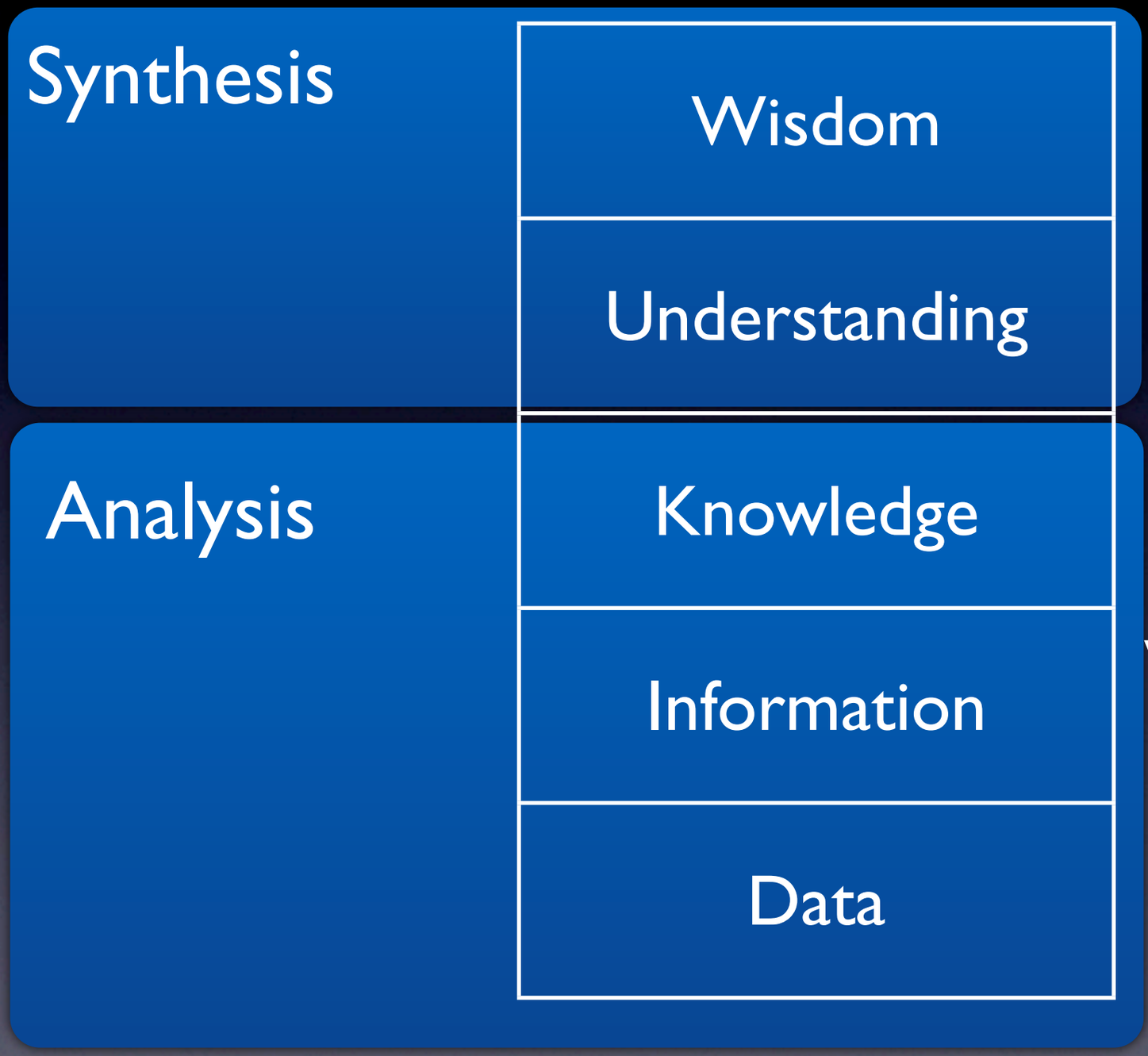
Insight

Why

How to

Who, What, When, Where
How much..

Systems Thinking



Insight

Why

How to

Who, What, When, Where
How much..

Systems Thinking

- Systems Thinking is concerned with the interaction of the parts to form a whole
- Systems Dynamics is concerned with the feedback loops between the parts
- “A system can not understand itself.” -W. Edwards Deming

Pro Tip #2

DevOps starts with why,
with a holistic vision,
and supports that vision with
process and tools.

Dev



Ops

Should be this.



Dev Ops

The reality is usually this.

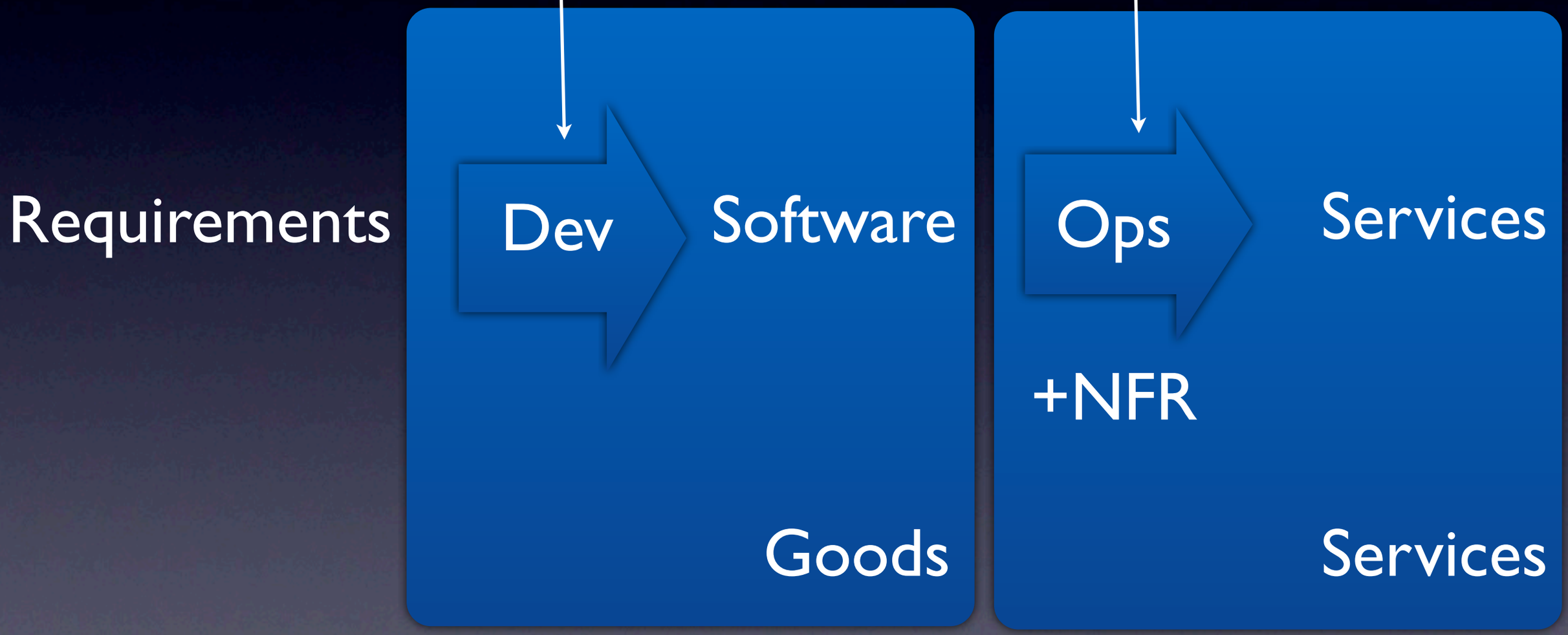
The Value Stream



Silo'ed Priorities

Get it out on time, no defects.

Get it up. Keep it up. Cheap.



Who's responsible for quality?

What is Quality?

- ISO-9000: "Degree to which a set of inherent characteristics fulfills requirements."
- Dr. Juran: "Fitness for use."
- Crosby: "Conformance to requirements."
- 6 Sigma: "Number of defects per million opportunities."

And you wonder how we used waterfall so long....

What is quality really?

- The degree to which a good or service is what the customer expects it to be.
- Examples: The Big Mac, Velveeta, Steak

Quality Software

- Does what it purports to do
- Is intuitive and easy to use
- Is quick and responsive; given the task
- Observable (“Whats it doing?!”)

Quality Service

- Does what it purports to do
- Is intuitive and easy to use (Friendly)
- Is quick and responsive; given the task
- Observable (“Whats it doing?!”)
- Available
- Self-Service if possible

“Efficiency is doing things right; effectiveness is doing the right things.”

Peter Drucker

Pro Tip #3

Quality is a result *effectiveness* of the *interactions* across the entire value stream.

Agile Manifesto

Individuals and interactions over processes and tools

Working software over comprehensive documentation

Customer collaboration over contract negotiation

Responding to change over following a plan

2001

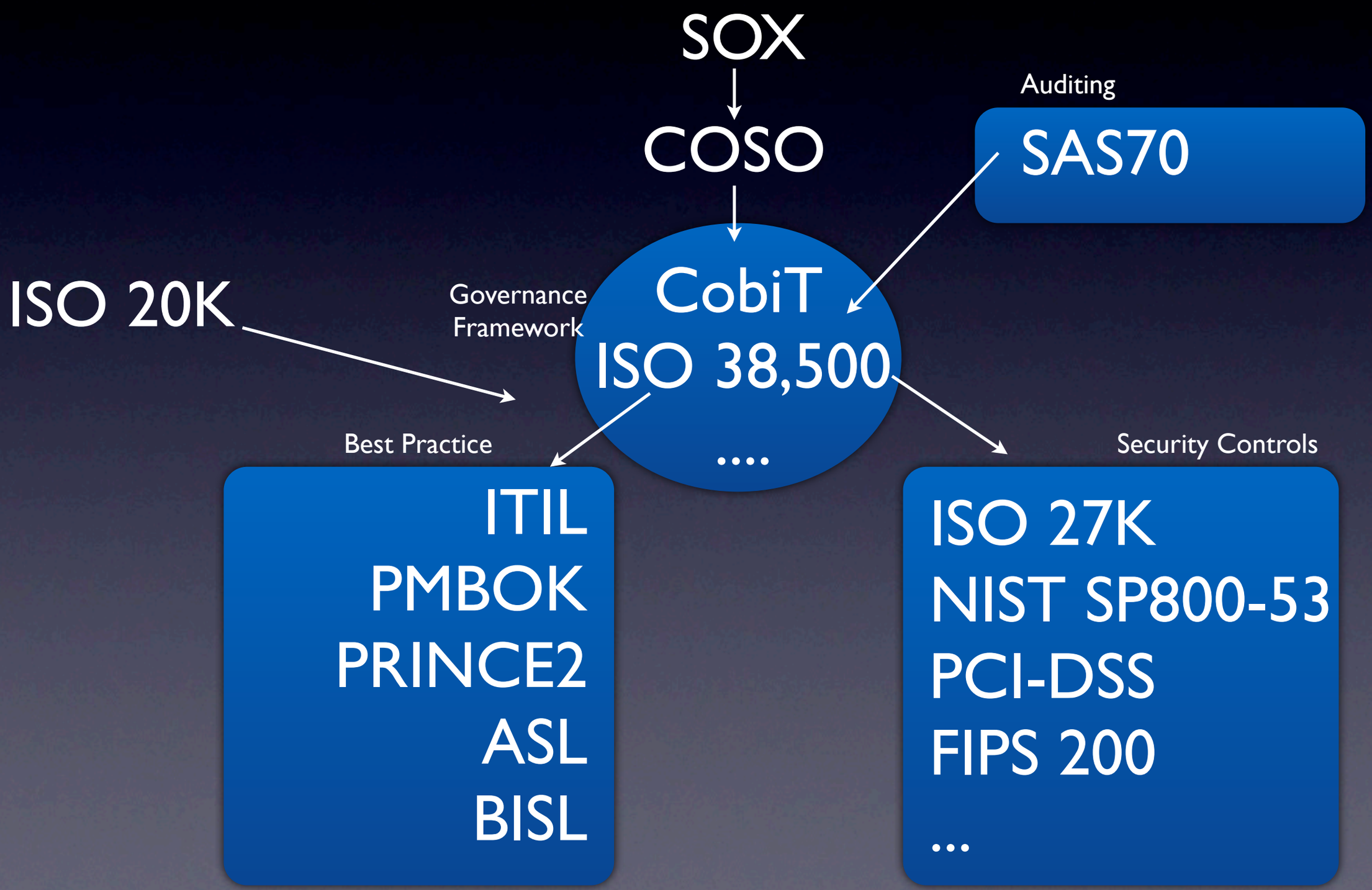
Agile Advantages

- Non-Prescriptive
- Simple philosophy became an umbrella
- Applies to both the developer and the product management alike
- Widely known and easy to grok.

IT Service Management

- Control Objectives for Information and related Technology (CobiT)
- Capability Maturity Model Integration (CMMI) for Service
- IT Infrastructure Library (ITIL)
- ISO Standards: 20K, 27001, 38500
- NIST SP800-53, PCI DSS, FIPS 200, TIA-942

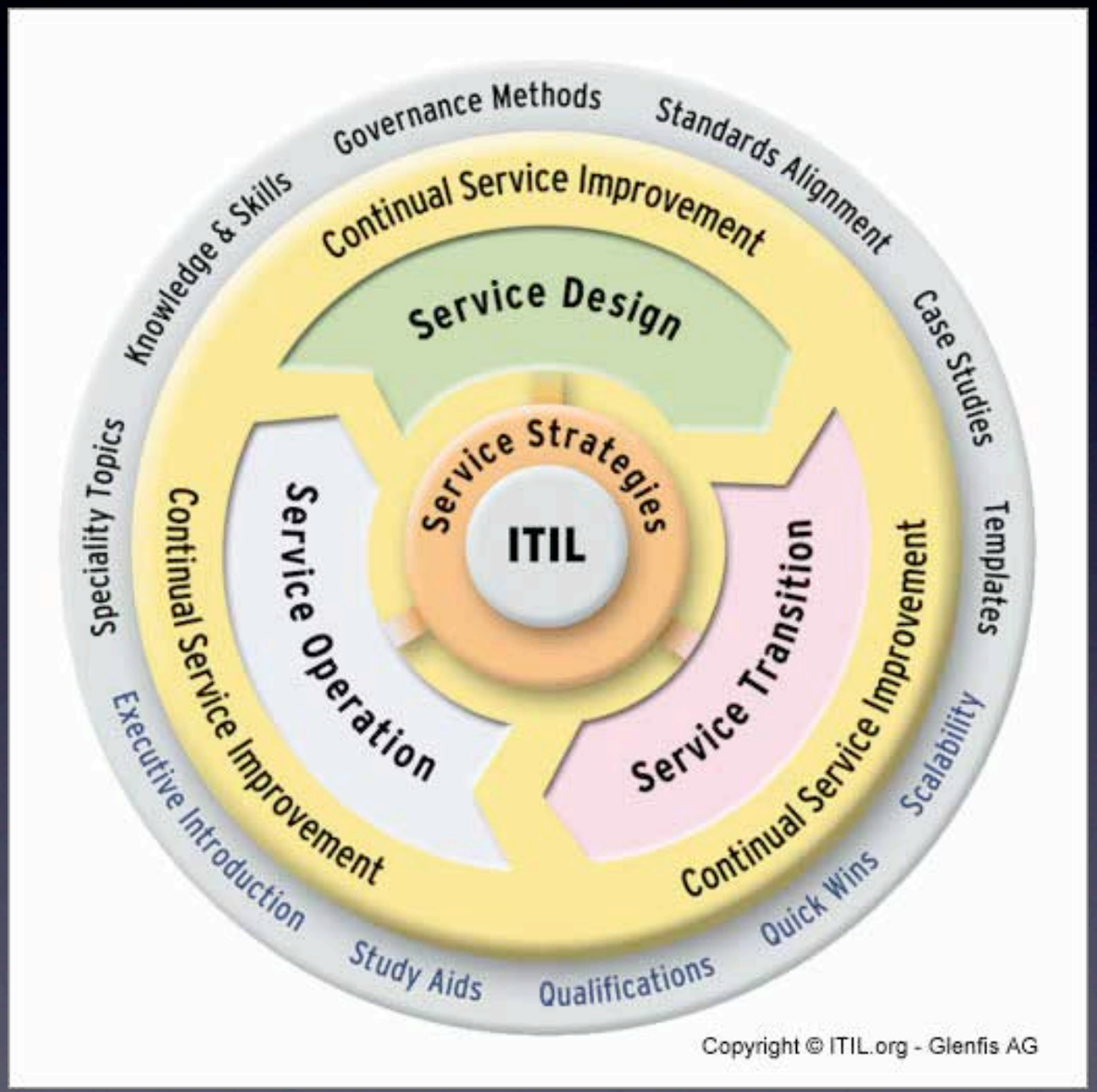
Making Sense of ITSM



Problems with ITSM

- Compliance Driven
- Security Focused
- Complex, Complicated, and Bureaucratic
- Pushed down from the top on already over-burdened staff
- Consultant Heavy
- Hard to grok. Most info 2nd hand.

IT Infrastructure Library



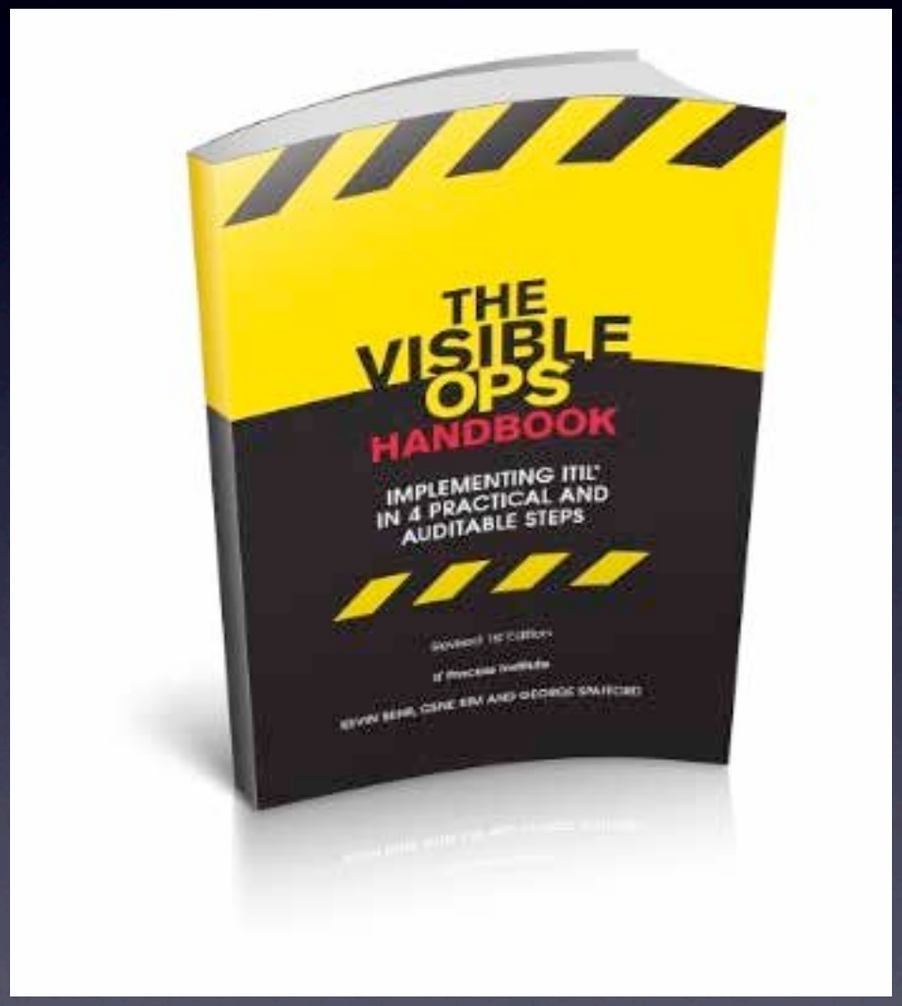


ITIL Advantage

- Most complete & respected pattern for IT
- Source for Change Management, Event/ Incident/Problem Management, CMDB, etc.
- Provides a common terminology for IT
- Chock full of good ideas! Why reinvent the wheel?

Guru session on ITIL, Thursday @ 3:30!

Visible Ops


THE
VISIBLE
OPS
HANDBOOK
IMPLEMENTING ITIL
IN 4 PRACTICAL AND
AUDITABLE STEPS



The rules don't make RPGs fun... the DM does.

It's all about how you use the rules.

ITSM in Perspective

- No idea should be rejected without consideration
- Don't view it as "all in" or "all out"
- Educate yourself on them (many are free) and use it however is most appropriate for your team/organization

Ars Gratia Artis

- Art for the Sake of Art
- Only satisfies a select few



The Fountain by Marcel Duchamp

Pro Tip #4

Agile & ITSM are both sources
from which to draw strength,
but never
at the expense of your vision.

Section 5

Cloud Changed the Game

IT Paradigm Shifts

- Virtualization stops being about consolidation and begins enabling self-service, automated infrastructure without bare metal constraints
- HPC becomes less interesting
- Role of the OS changes
- Broad platform standardization becomes realistic

Dev Paradigm Shifts

- Dev can bypass IT at will
- Dev has more experience with the APIs that drive cloud than IT (typically)
- The Great Leveler; anyone can be a player
- SCRUM, Continuous Integration, etc. speed up rate of deployment

“The Rift” Surfaces

- Increased awareness of IT and “Web Operations” sub-culture rift
- Migration of services from heavy iron into virtualized environments changes more than expected
- Over-specialization becomes an issue
- X86 Management is different

Rise of the Tools

- Commercial & Open Source "Build your own cloud" solutions speed up
- Puppet & Chef arrive alongside CFengine to tame the new complexity
- "Infrastructure As Code" starts looking realistic, as tools are more about CM than deployment
- SaaS allows IT teams to offload undesirable or complex components. (ex: PagerDuty)

Vagrant

- Create test/dev environments on your laptop
- Configure with CM
- An excellent method for using Operations "Infrastructure as Code" to empower dev, ops, qa, etc.

Pro Tip #5

The Cloud is here to stay,
and its awesome.

Contrary to popular belief, it will generate MORE demand for SA's, not less.

Operations Management



"Operations management is an area of management concerned with overseeing, designing, and redesigning business operations in the production of goods and/or services."

Wikipedia

What is Operations?

Executives

Finance

Operations

Marketing

Operations is *doing* what you do.

OM Subjects

- Operations Strategy
- Product & Service Development
- Project Management
- Process Measurement
- Financial Analysis
- Quality Management
- Forecasting
- Wait-Line Theory
- Scheduling
- LEAN
- Six Sigma
- TOC ...and more.

A Brief History of Operations Management

Understanding the genesis of the ideas we now take for granted as common sense.

Fredrick Winslow Taylor



- "The Principles of Scientific Management" (1911)
- Applied scientific method to work.
- Generally blamed for everything.

Henry Ford



- Father of "Mass Production"
- Built the Model T from 1908 ($850, $20K) to 1927 ($290, $3K).
- No formal education, worked at Edison Co from 1891 to 1899.

Alfred Sloan



- President of GM in 1923
- Did for big management what Ford did for manufacturing
- Involvement with MIT later became the Sloan Business School.
- BS EE from MIT

Sakichi Toyoda



- Started Toyoda Automatic Loom Works 1927
- Invented Jidoka (autonomous automation) [Fault Management], and "5 Whys"
- Started making cars in 1933

W.A. Shewhart



- Invented PDSA Continuous Improvement Cycle
- Worked at Bell Labs from 1925 to 1956
- Father of Statistical Process Control
- PhD in Physics

W. Edwards Deming



- Student of Shewhart
- Sent to Japan after WW2 and taught the Japanese (1950)
- Father of the Quality movement
- Ignored in US until late 1970's
- BS EE, MS/PhD Math

Taiichi Ohno



- Created the Toyota Production System in late 1940's, refined through the 1950's
- Father of Just-in-Time, Kanban, etc.
- Learned from Ford's book "Today & Tomorrow" & Deming

Shigeo Shingo



- Technical man behind TPS
- Father of SMED, Poka-Yoke (“mistake-proofing”), “Zero Quality Control”, etc.

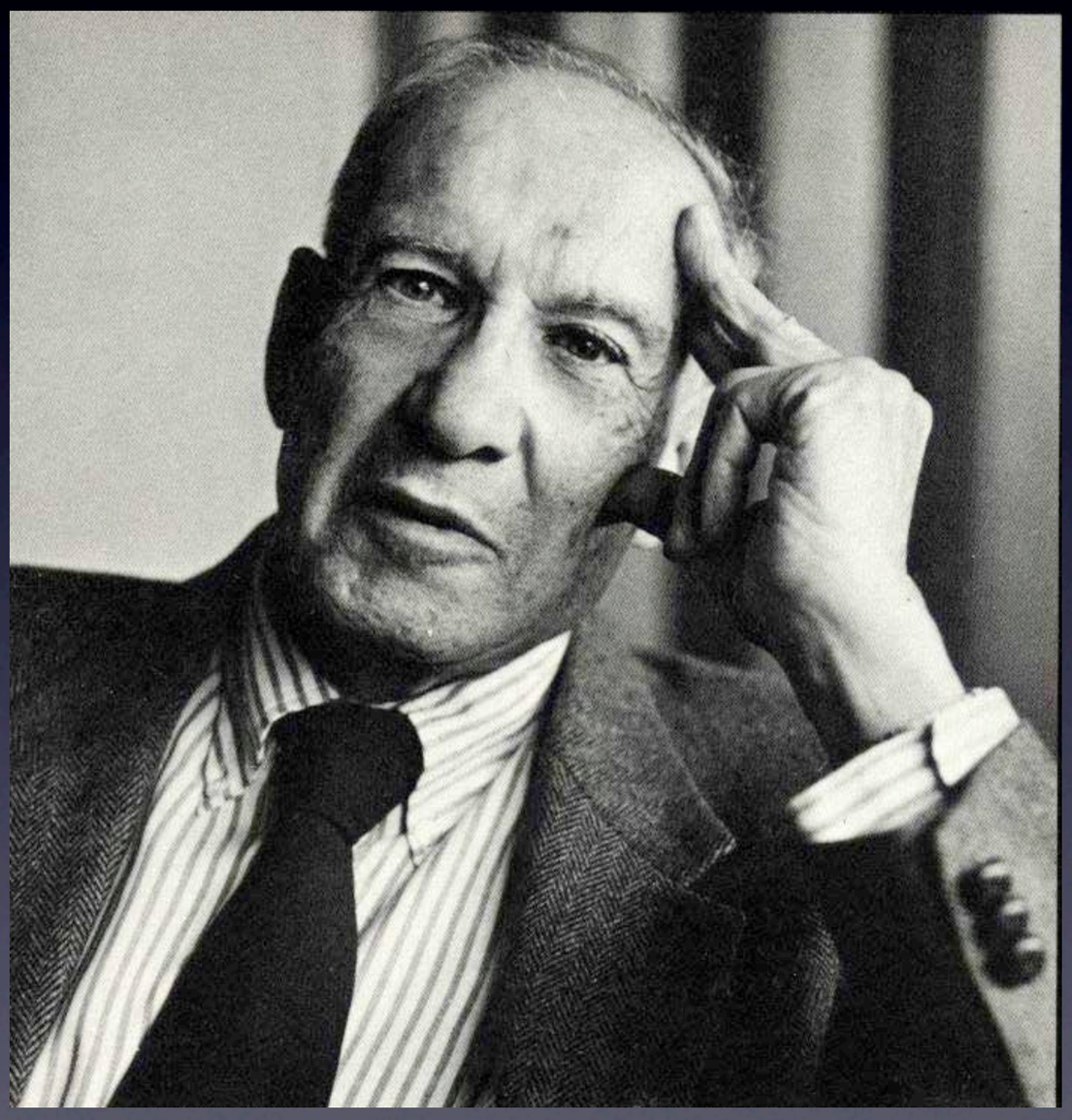


Damon Edwards

Israel Gat

http://dev2ops.org/blog/2011/8/11/full-video-of-israel-gat-interview-agile-in-enterprise-devop.html

Peter Drucker



- Father of Modern Management
- Wrote 39 management books between 1939 and 2005

Ludwig von Bertalanffy



- Father of Systems Theory
- Wrote "General Systems Theory", published in US following WW2.

Russell Ackoff



- Friend of Deming
- Pioneer in Operations Research (OR) in 1957 and Systems Theory
- (imho, the Feynman of OR)
- BS Architecture, PhD Philosophy of Science

Armand V. Feigenbaum

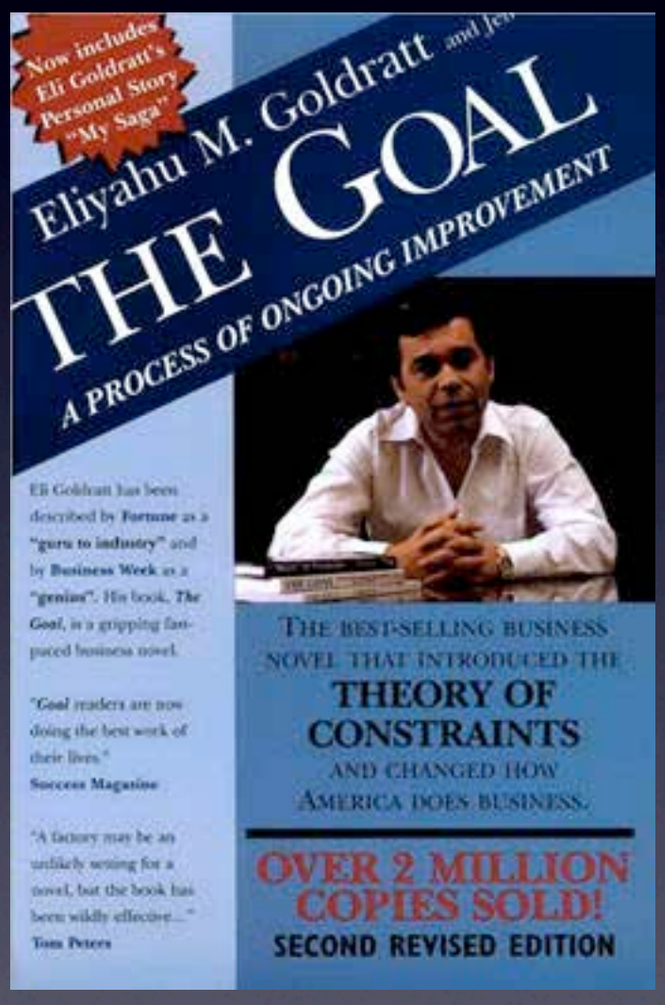


- Coined the term "Total Quality Control" (1961), which later became "Total Quality Management" (TQM)
- Together with Deming and others ideas, became basis for ISO-9000
- PhD Econ MIT

The US Decline

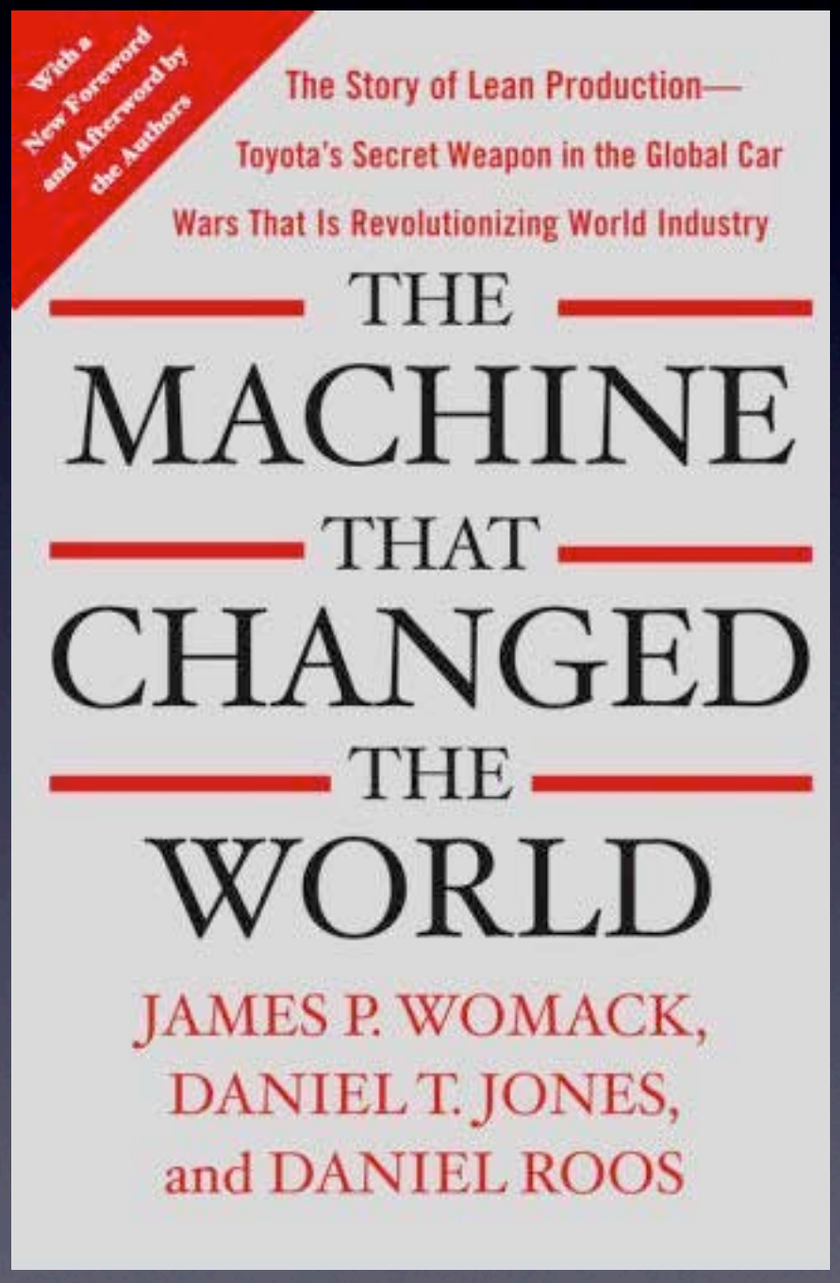
- 1973 Oil Crisis deals a nasty blow to the US Mass Production system
- Japanese weather the storm thanks to Kanban (Just in Time; Toyota Production System)
- In 1980's Japanese quality puts US to shame
- Deming in NBC documentary in 1980, publishes first book in 1983

Eliyahu Goldratt



- Created the "Theory of Constraints"
- Published in his novel "The Goal" (1984)
- Applied TOC to other areas such as project management ("Critical Chain"), sales ("Mafia Offer"), etc.

James Womack, et al

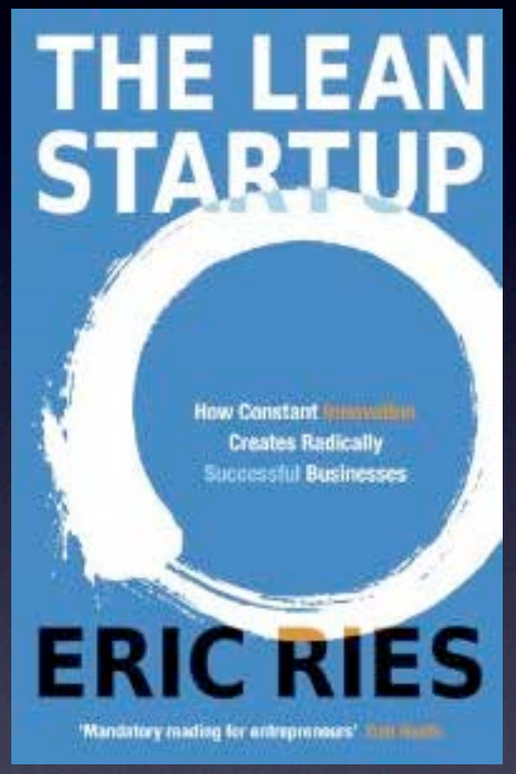


- Coined "Lean" in 1988 HBR Article.
- Becomes "The Machine that Change the World" (1990) which brought TPS to the masses.

On the Shoulders of Giants

- There is a continuous chain of ideas being condensed and re-applied again and again throughout the 20th Century.
- Today its largely rolled into “Lean”
- Many of our “new” ideas are not new at all, they are new applications of proven ideas that are simply new to this field.
- Many of the OM pioneers were geeks.


Lean IT
Enabling and Sustaining
Your Lean Transformation
Steven C. Bell • Michael A. Orzen


THE LEAN
STARTUP
How Constant Innovation
Creates Radically
Successful Businesses
ERIC RIES
'Mandatory reading for entrepreneurs'

Pro Tip #6

"Those who cannot remember the past
are condemned to repeat it"

George Santayana

These things aren't going away,
a little education will serve you for years to come.

The 3 Aspects of DevOps

dev>**OPS**

DEV<ops

DEV<>OPS

dev>OPS

- Operations centric focus on DevOps
- Adopts “Infrastructure as Code” ideal
- Considers SCRUM, Kanban, and Agile Operations Concepts
- Gets serious about metrics and holistic/ qualitative monitoring

DEV<ops

- Development centric focus on DevOps
- Adopts continuous deployment
- Embedded metrics and increased focus on operational performance
- Dev's learn about operational challenges

DEV<>OPS

- Full collaboration between teams
- Boundaries between them blur
- Both teams are accountable, full participation in emergencies and postmortem meetings
- Dev access to prod environment
- Joy.

Transitioning

- If at all possible, go directly to DEV<>OPS and grow together
- If not, do what you can to set the stage, measure results and make allies to build a case for management support.

The Most Powerful Tool in the DevOps Arsenal?



Thursday, December 8, 2011

Other Tools to Start

- Office Hours
- Sit together
- Join the other teams meetings
- Ask lots of questions
- Implement the “No Asshole Rule”
- Have fun

Pro Tip #7

If it ain't fun,
it ain't workin'.

Collaboration of People

Convergence of Process

Creation & Exploitation of Tools

* Measure Everything
* Have a systems view
* Focus on effectiveness & quality
* Learn from others and the past
* Encourage pride of workmanship (fun)

Thank You.

Join the Conversation!

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@patrickdebois
@botchagalupe
@damonedwards
@allspaw
@RealGeneKim
@jordansissel
@portertech
@lusis @LordCope
@jamesurquhart
@puppetmasterd
@netik
@atl @markimbriaco
@adamhjk
@ernestmueller
@ripienaar
@markimbriaco
@MikeOrzenLeanIT

Websites:

http://dev2ops.org
http://devopscafe.org
http://planetdevops.net