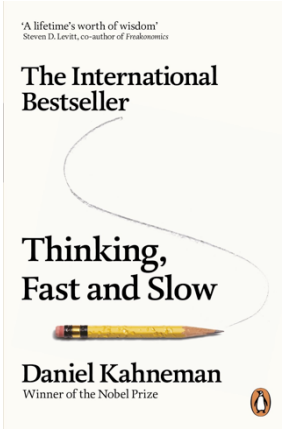


Thinking, Fast and Slow…
With Software Development

Daniel Bryant
Principal Consultant, OpenCredo

daniel.bryant@opencredo.com
@danielbryantuk

OpenCredo

Think More Deliberately

- Our decision making can be flawed…
- Apply process and models (as appropriate)
- Build, measure, learn…
- Collaborate more (and better)

Who Am I?

- Principal Consultant at OpenCredo
  - ✓ Agile transformations
  - ✓ DevOps methodologies
  - ✓ Microservices and Cloud

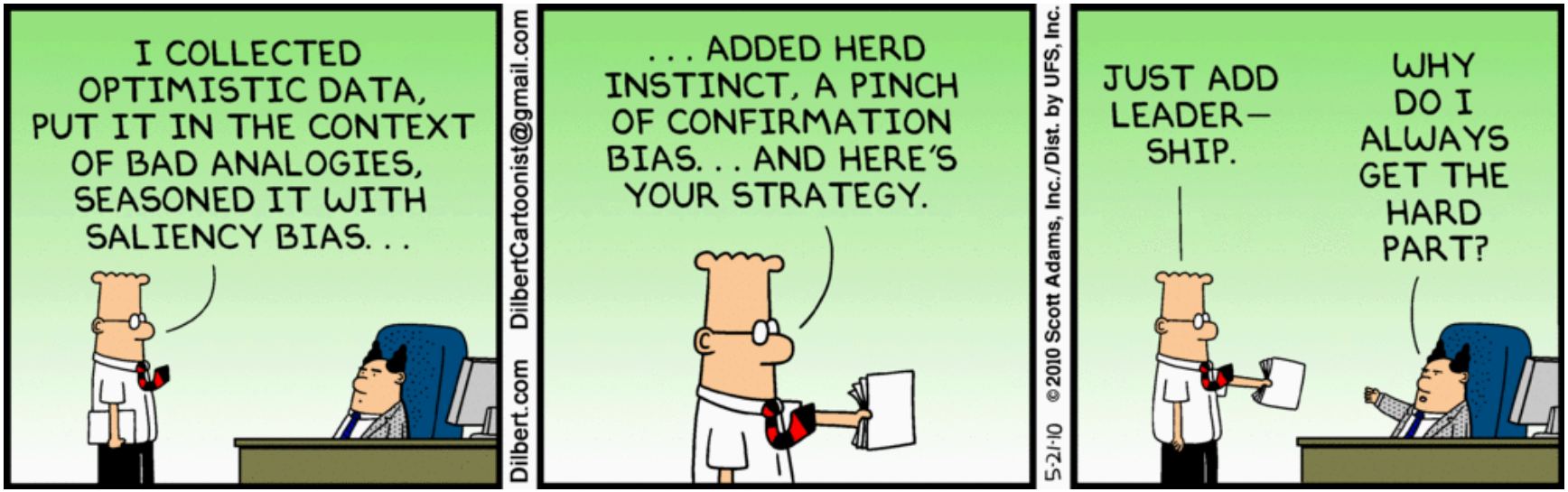
- London Java Community Associate

- Adopt OpenJDK and JSR

- InfoQ Editor and DZone MVB

OpenCredo

Workplace Decision Making…



dilbert.com/strip/2010-08-24

Your Thinking: A Tale of Two Systems…

System 1:

fast, instinctive, emotional, subconscious

System 2:

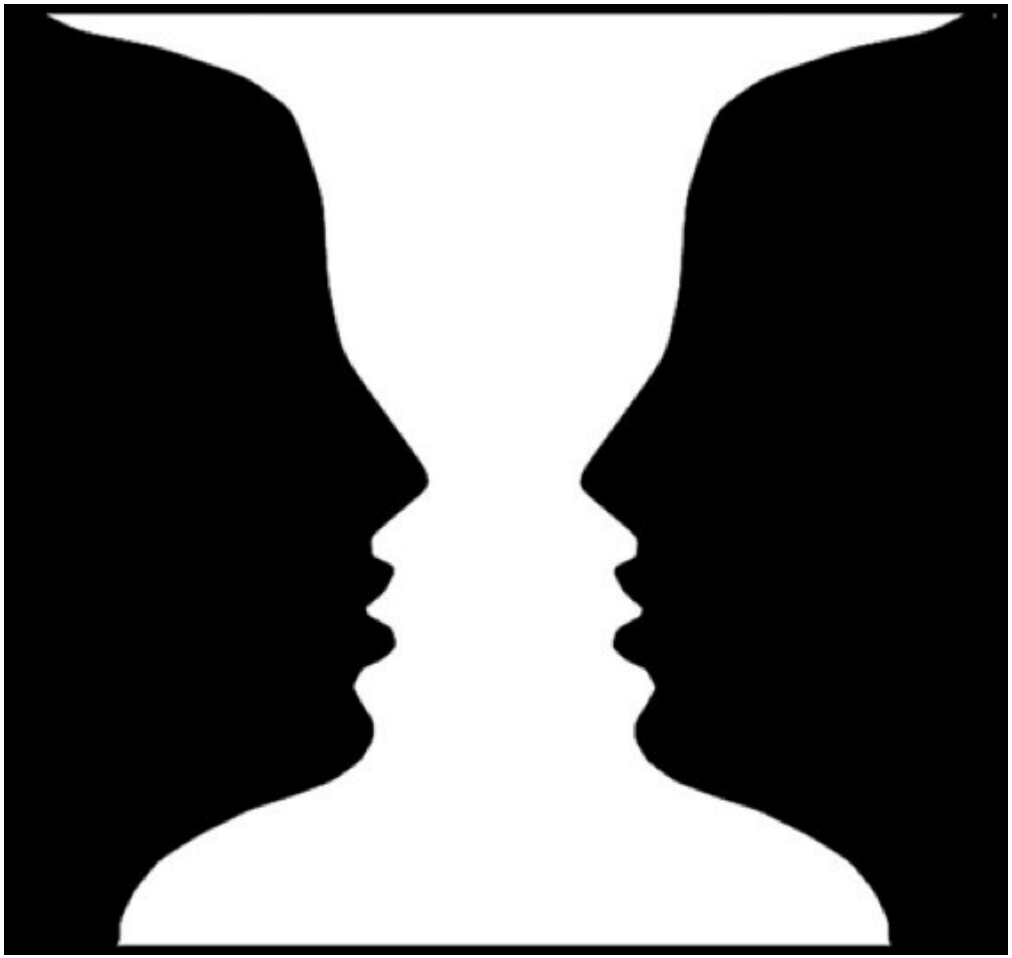
slower, deliberate, reasoning, conscious

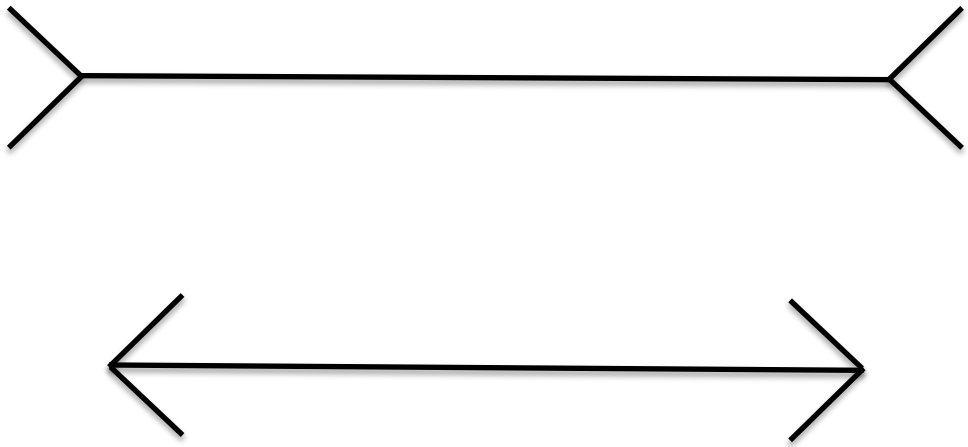
2 + 2 = ?

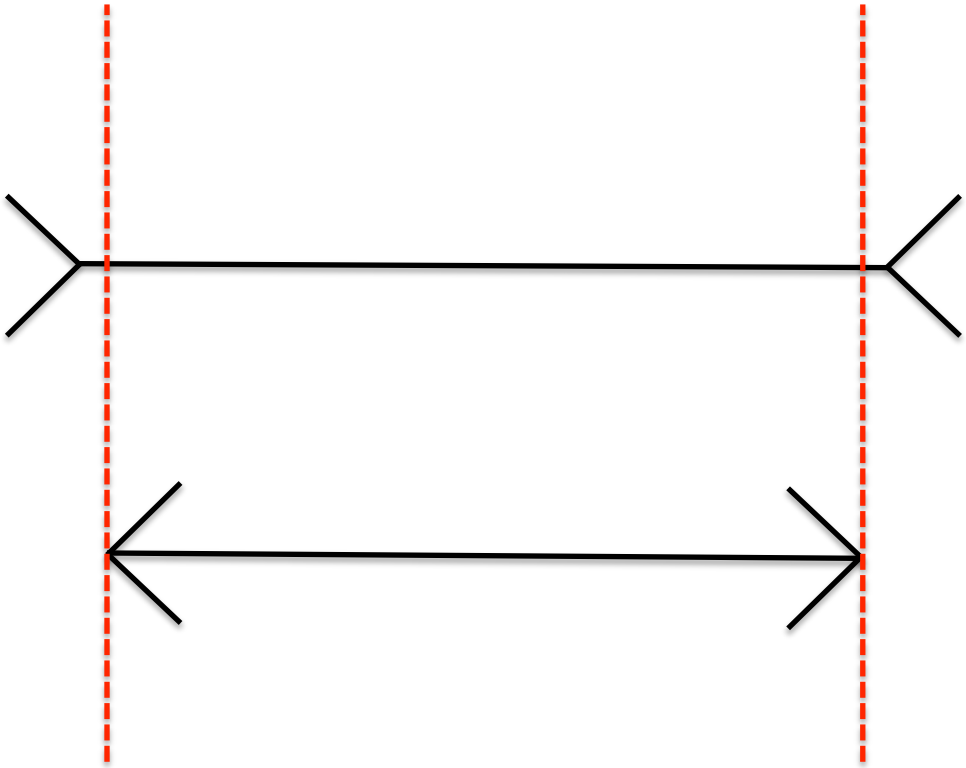
(24 / 2) * (1 / 3) = ?

$$2 + 2 = 4$$

$$(24 / 2) * (1 / 3) = 4$$





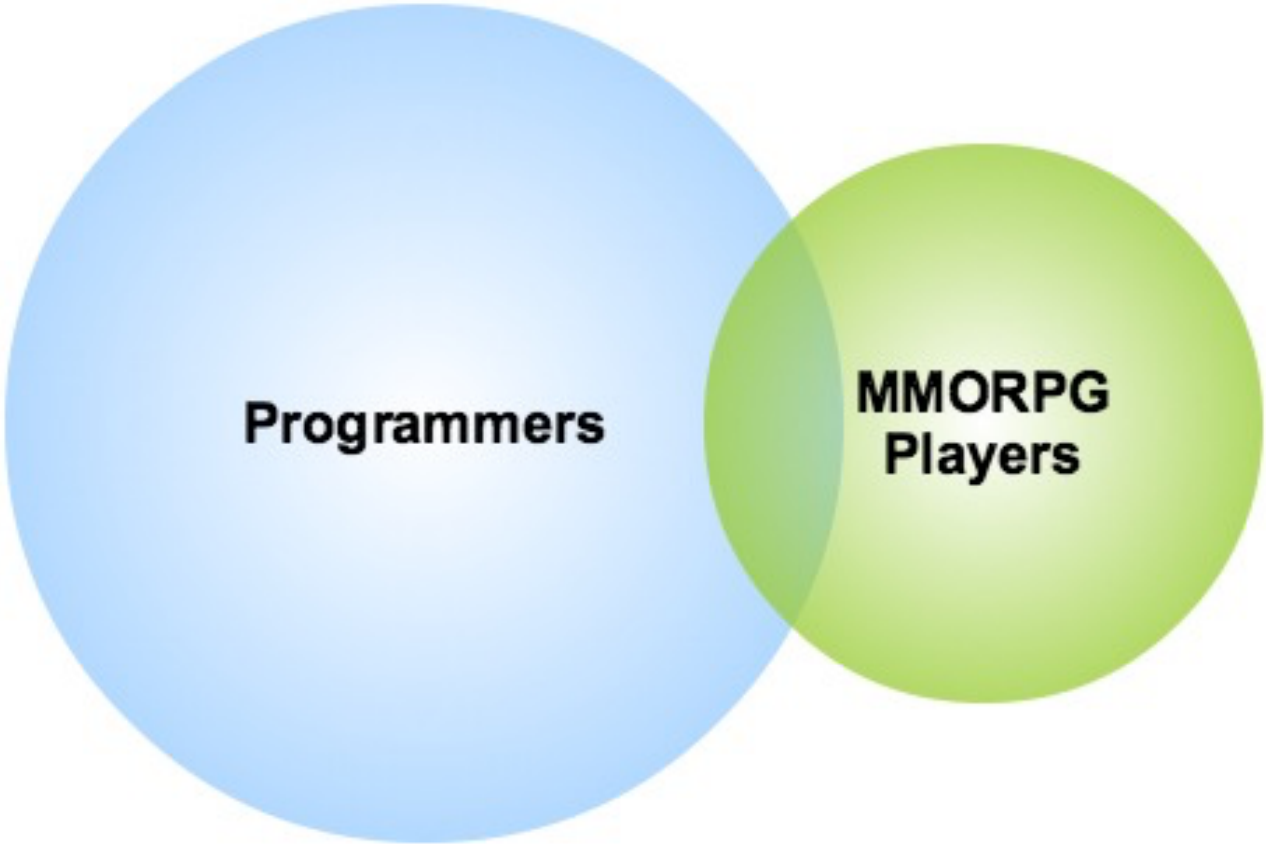


Bob is a single male in his 20's who is bright, quiet, likes science fiction and fantasy, and avoids interacting with people in the real world

Which is more probable?

- Bob is a programmer
- Bob is a programmer and plays MMORPG?

Conjunction Fallacy



Your Thinking: A Tale of Two Systems…

System 1:

fast, instinctive, emotional, subconscious

Rapid, associative, and has systemic errors

System 2:

slower, deliberate, reasoning, conscious

Lazy, and causal (not statistical)

Heuristics / biases affecting software developers

Availability Heuristic

"If something can be recalled, it must be important"

'Hipster-itis'

e.g. the 'best' architectural style

Microservices

- The current flavour of the month!
- Frameworks and products emerging
- Virtuous (vicious?) circle

“MongoDB is Web Scale”

www.mongodb-is-web-scale.com/

"MySQL is slow as a dog. MongoDB will run circles around MySQL because MongoDB is web scale."

"MongoDB does have some impressive benchmarks, but they do some interesting things to get those numbers. For example, when you write to MongoDB, you stage your data to be written [to disk] at a later time."

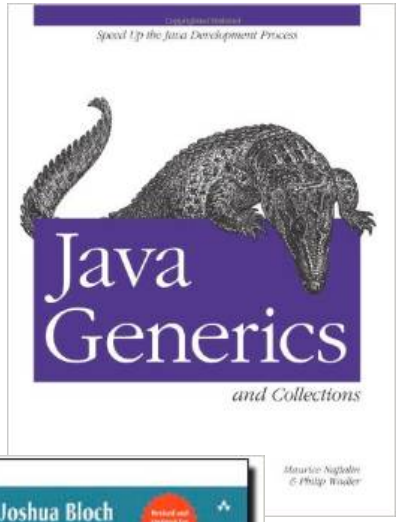
"If that's what they need to do to get those kickass benchmarks, then it's a great design."

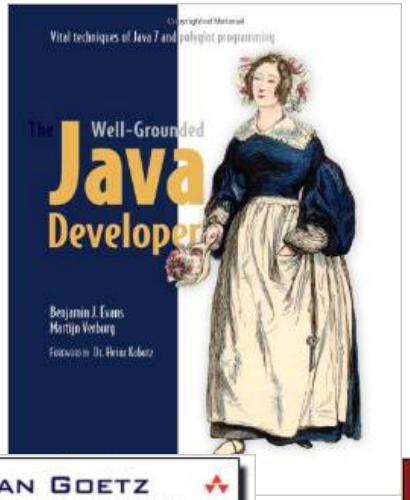
"..... If you were stupid enough to totally ignore durability just to get benchmarks, then **I suggest you pipe your data to /dev/null. It will be very fast.**"

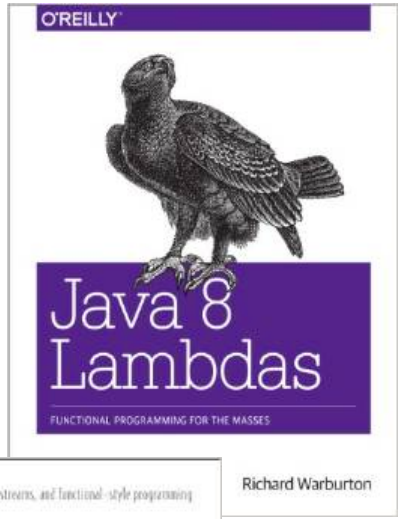
Availability: Think Professionally

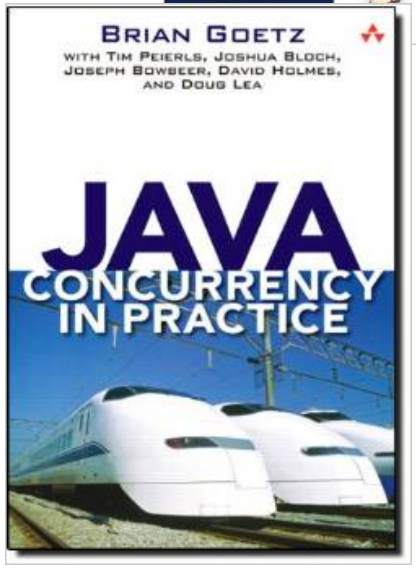
- Stop… engage system 2
- Spike/prototype, experiment, evaluate…
- Constant learning
  - Find trusted mentors
  - Read the classics
  - Cultivate blogs

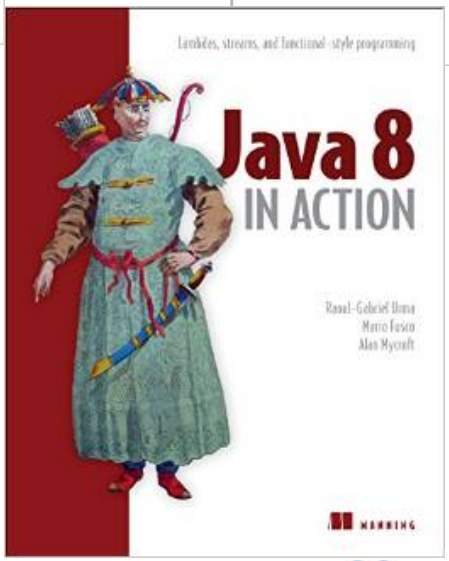
Java Fundamentals











Evaluation

"I will postpone using this shiny new framework until my peers have validated the proposed benefits with rigorous scientific experiments"

- Said by no programmer

…ever

Raible's Comparison Matrix

Matt Raible comparison matrix (bit.ly/OxUzad)

Criteria	Struts 2	Spring MVC	Wicket	JSF 2	Tapestry	Stripes	GWT	Grails	Rails	Flex	Vaadin	Lift	Play
Developer Productivity	0.50	0.50	0.50	0.50	1.00	0.50	1.00	1.00	1.00	0.00	1.00	0.50	1.00
Developer Perception	0.50	1.00	1.00	0.00	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Learning Curve	1.00	1.00	0.50	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00
Project Health	0.50	1.00	1.00	1.00	0.50	0.50	1.00	1.00	1.00	0.50	1.00	1.00	1.00
Developer Availability	0.50	1.00	0.50	1.00	1.00	0.50	1.00	0.50	1.00	1.00	0.50	0.00	0.50
Job Trends	1.00	1.00	0.50	1.00	0.50	0.00	1.00	0.50	1.00	1.00	0.00	0.00	0.50
Templating	1.00	1.00	1.00	0.50	1.00	1.00	0.50	1.00	1.00	0.50	0.50	0.50	0.50
Components	0.00	0.00	1.00	1.00	1.00	0.00	0.50	0.50	0.50	1.00	1.00	0.00	0.00
Ajax	0.50	1.00	0.50	0.50	0.50	0.50	1.00	0.50	0.50	0.50	1.00	1.00	0.50
Plugins or Add-Ons	0.50	0.00	1.00	1.00	0.50	0.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00
Scalability	1.00	1.00	0.50	0.50	0.50	1.00	1.00	0.50	0.50	0.50	0.50	1.00	1.00
Testing	1.00	1.00	0.50	0.50	1.00	1.00	0.50	1.00	1.00	0.00	0.50	0.50	1.00
i18n and l10n	1.00	1.00	1.00	0.50	1.00	1.00	1.00	1.00	0.50	0.50	1.00	1.00	1.00
Validation	1.00	1.00	1.00	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50
Multi-language Support (Groovy / Scala)	0.50	0.50	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.50
Quality of Documentation/Tutorials	0.50	1.00	0.50	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Books Published	1.00	1.00	0.50	1.00	0.50	0.50	1.00	1.00	1.00	1.00	0.50	0.50	0.00
REST Support (client and server)	0.50	1.00	0.50	0.00	0.50	0.50	0.50	1.00	1.00	0.50	0.50	0.50	0.50
Mobile / iPhone Support	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00	1.00	1.00
Degree of Risk	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.50	0.50
Totals	14.5	17	15	13.5	15	14	17	17.5	17	13.5	15.5	11.5	14

Optimistic Bias

"People tend to be overconfident, believing that they have substantial control in their lives"

I know what our customers want…

…how could I possibly be wrong?

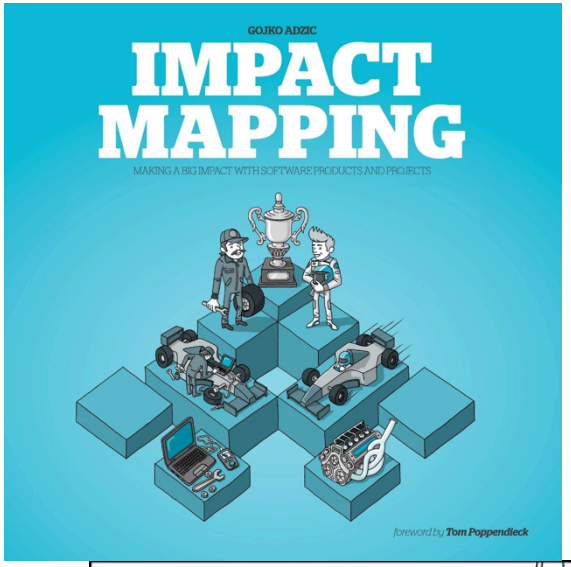
Four Factors of Optimistic Bias

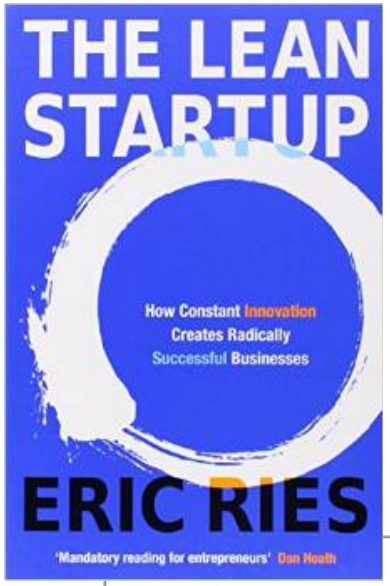
- Desired end state
  - Self-enhancement, perceived control
- Cognitive mechanisms
  - Representativeness heuristic, singular target focus
- Information about self vs target
- Overall mood

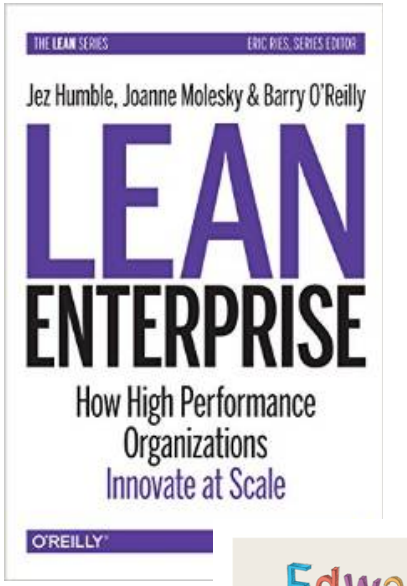
Optimism: Think Professionally

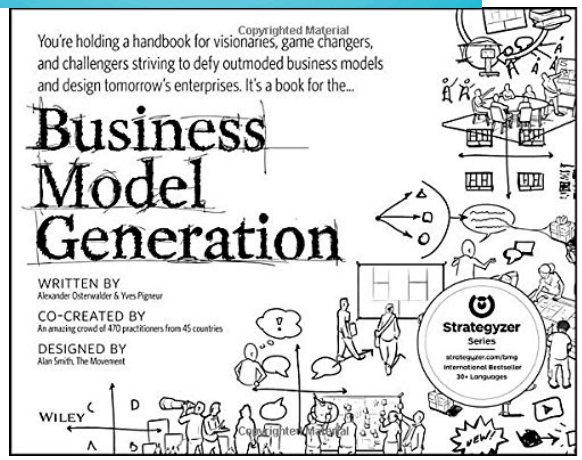
- Define clear goals
- Build, measure, learn…
- Remove uncertainty early (bit.ly/1mAb6o4)
  - "Patterns of Effective Delivery" by Dan North
- Software is inherently collaborative…

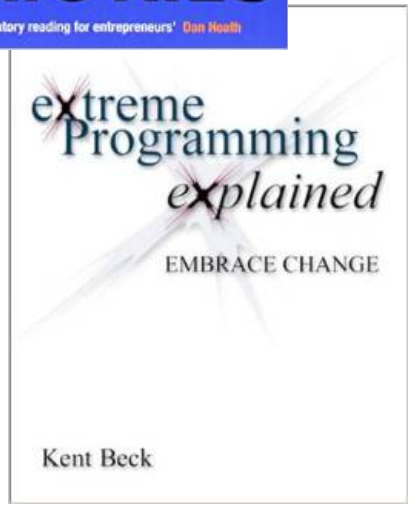
Remove (or Limit) Uncertainty

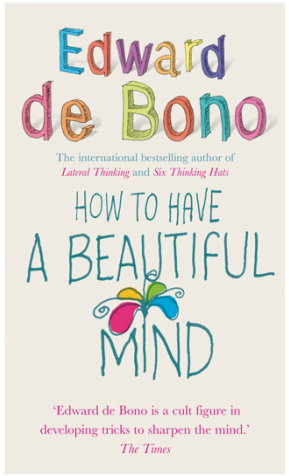












Check the HiPPO

Planning Fallacy

"A phenomenon in which predictions about how much time will be needed to complete a future task display an optimistic bias. "

Was your last project completed on time?

…and on budget?

IT Track Record…

- Sainsbury's Supply Chain Management System
  - $526m bit.ly/160SnAj
- NHS patient record system
  - £10bn bit.ly/XBzFuV
- HealthCare.gov
  - onforb.es/1k7egyb

Most Common Factors for Failure

- Unrealistic or unarticulated project goals
- Inaccurate estimates of needed resources
- Badly defined system requirements
- Poor reporting of the project's status
- Unmanaged risks
- Poor communication among customers, developers, and users
- Use of immature technology
- Inability to handle the project's complexity
- Sloppy development practices
- Poor project management
- Stakeholder politics
- Commercial pressures

Source spectrum.ieee.org/computing/software/why-software-fails

Most Common Factors for Failure

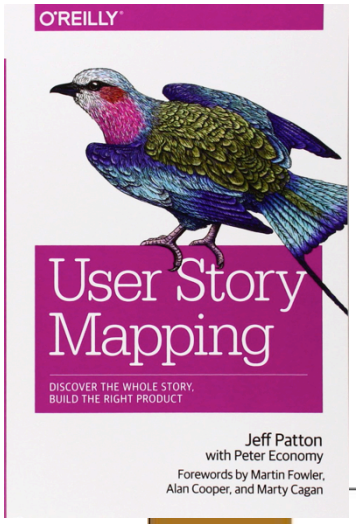
- Unrealistic or unarticulated project goals
- Inaccurate estimates of needed resources
- Badly defined system requirements
- Poor reporting of the project's status
- Unmanaged risks
- Poor communication among customers, developers, and users
- Use of immature technology
- Inability to handle the project's complexity
- Sloppy development practices
- Poor project management
- Stakeholder politics
- Commercial pressures

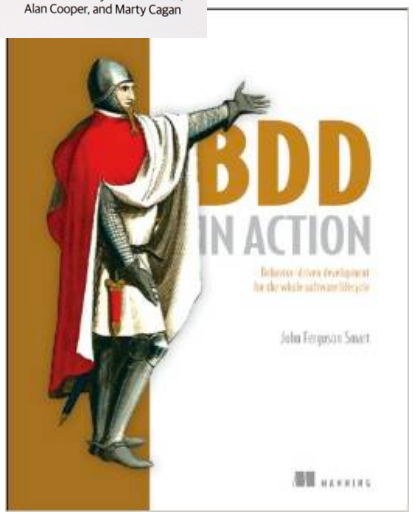
Source spectrum.ieee.org/computing/software/why-software-fails

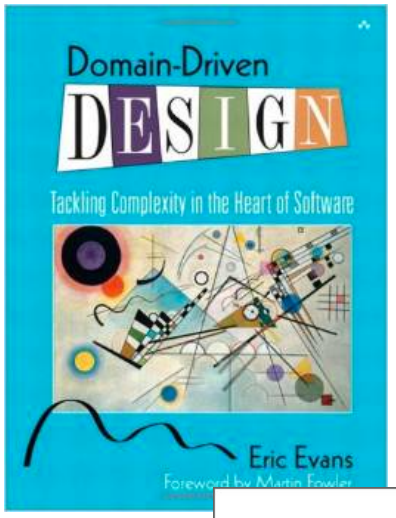
Segmentation

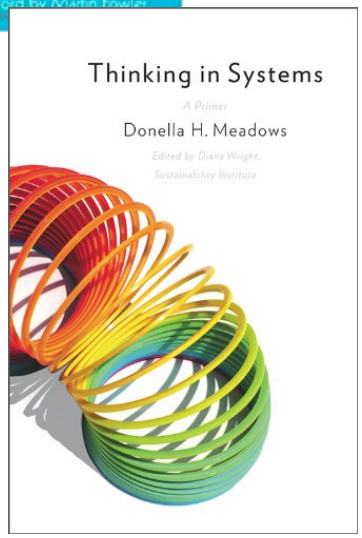
- Divide and conquer
  - SOA, microservices or modules?
  - Integration costs
- Systems thinking
- Plan, do, check (measure), act
- Improve estimation techniques

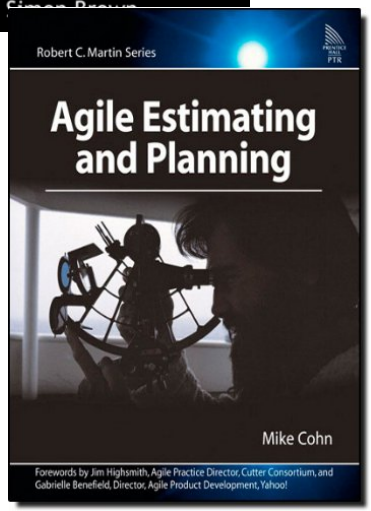
From Macro to Micro…











OpenCredo

Accept Unknown Unknowns…

dilbert.com/strips/comic/1995-11-10/

Sunk Cost Fallacy

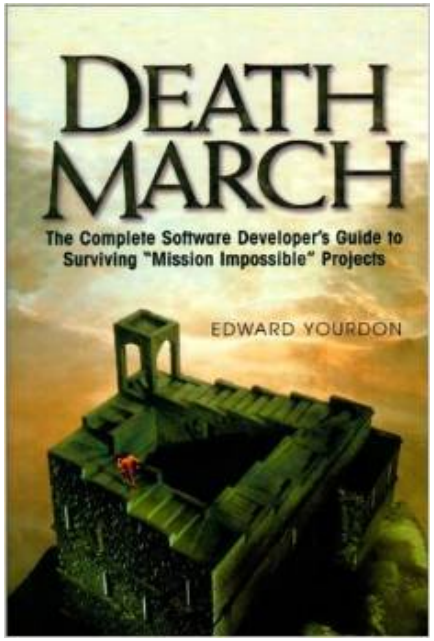
"Any past cost that has already been paid and cannot be recovered should not figure into the decision making process. "

When did you last remove a framework?

…or a library?

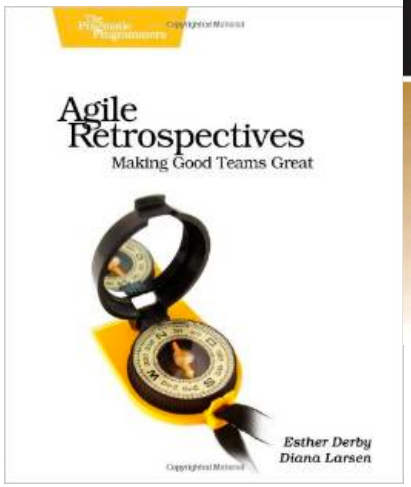
Why Are We Reluctant?

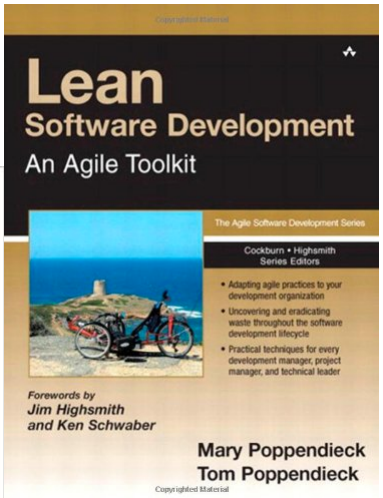
- We don't like being wrong…
- Existing effort appears wasted
  - Endowment effect
- Loss aversion
  - Twice as powerful, psychologically, as gains?



Retrospect Regularly

- Did we make the right choice?
- When was the ‘last responsible moment’?
- What can we learn?
- How can we get better?





OpenCredo

Anchoring Bias

"Common tendency to rely too heavily on the first piece of information offered when making decisions. "

How does your manager ask for estimates?

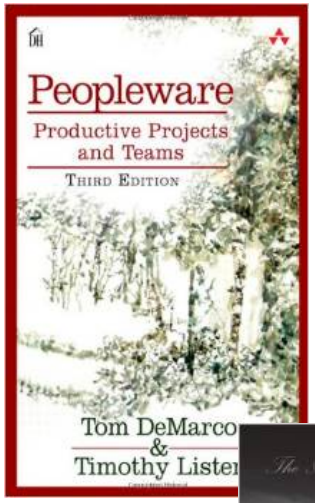
…is it an unbiased question?

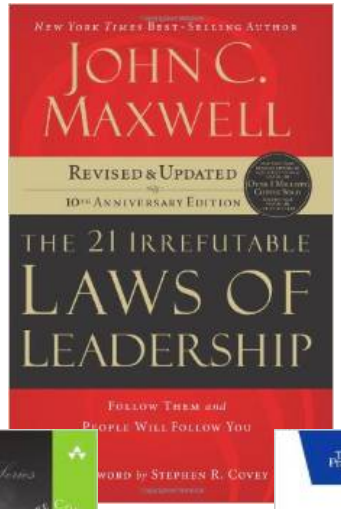

YEAH . . . THIS APPLICATION
WILL BE READY IN TWO WEEKS, RIGHT?
THAT WOULD BE GREAT . . .
imgflip.com

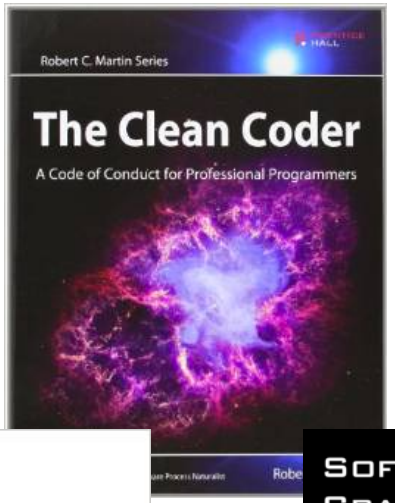
Anchoring: Think Professionally

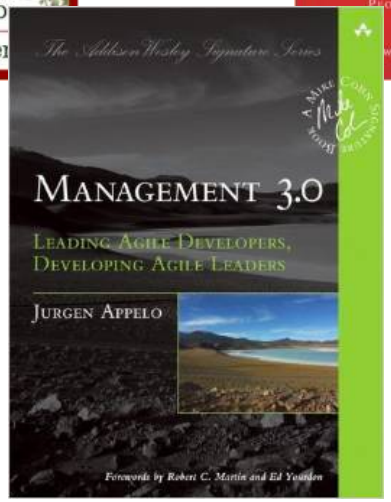
- Learn to say no…
  - Provide explanations and alternatives
- Make sure User Stories are well-defined
  - Collaboration
- Apply PERT estimations (bit.ly/1mGzuoe)

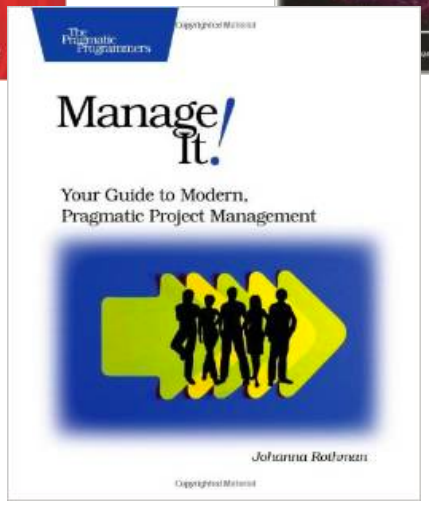
Read Your Way to Tech Lead (?)

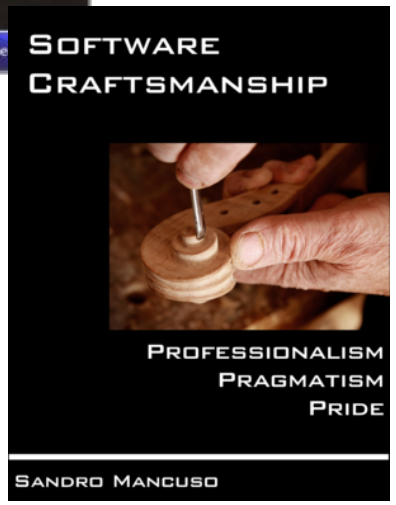












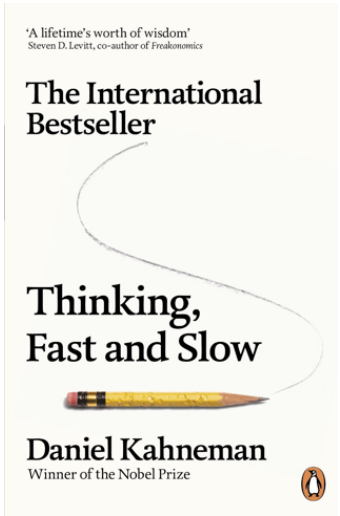
Ok, lets wrap this up…

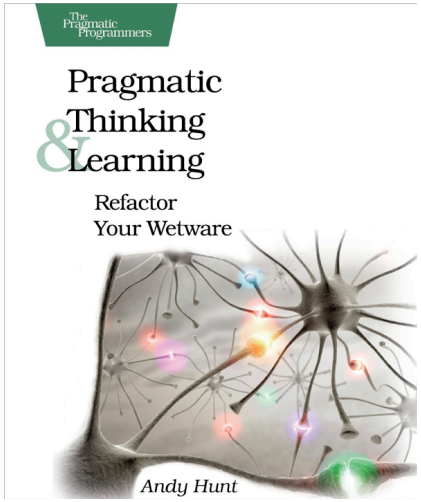
“You will be the same person in five years as you are today except for the people you meet and the books you read.”

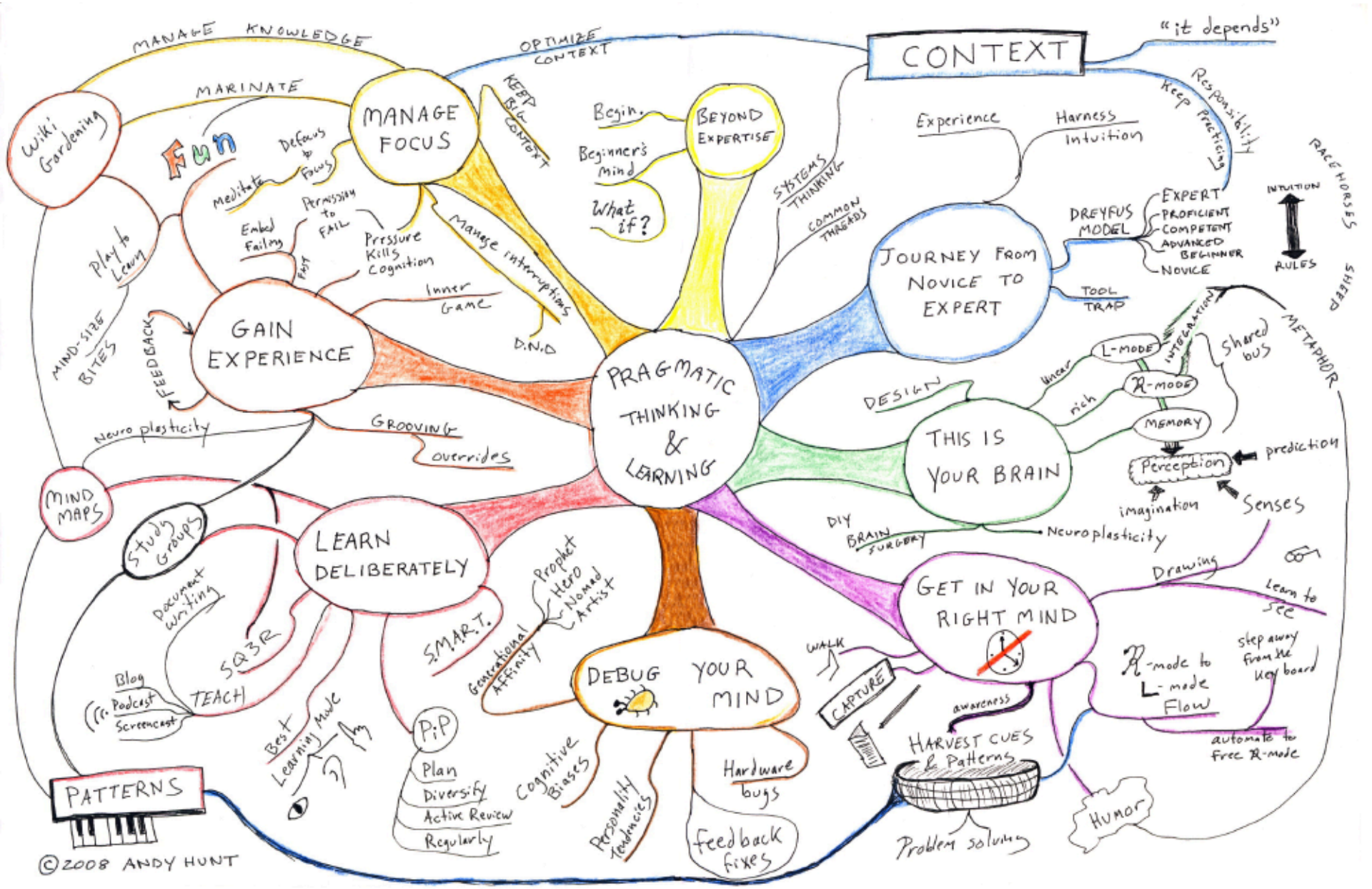
- Charlie “Tremendous” Jones

(bit.ly/1LAdQkv)

Awesome Conferences and Books






PRAGMATIC THINKING & LEARNING
MANAGE KNOWLEDGE
MARINATE
Wiki Gardening
Fun
MANAGE FOCUS
Defocus to Focus
Meditate
Permission to FAIL
Embed Failing
Pressure Kills Cognition
Manage interruptions
KEEP IN CONTEXT
OPTIMIZE CONTEXT
Play to Learn
MIND-SIZE BITES
GAIN EXPERIENCE
FEEDBACK
Inner Game
D.N.D
Neuro plasticity
GROOVING
overrides
MIND MAPS
Study Groups
LEARN DELIBERATELY
Document writing
SQ3R
TEACH
Blog
Podcast
Screencast
Best Learning Mode
PATTERNS
S.M.A.R.T.
Prophet
Hero
Nomad
Artist
Generational Affinity
P.I.P
Plan
Diversify
Active Review
Regularly
DEBUG YOUR MIND
Cognitive Biases
Personality tendencies
Hardware bugs
feedback fixes
Begin.
Beginner's Mind
What if?
BEYOND EXPERTISE
SYSTEMS THINKING
COMMON THREADS
CONTEXT
"it depends"
Responsibility
Keep Practicing
Experience
Harness Intuition
JOURNEY FROM NOVICE TO EXPERT
DREYFUS MODEL
EXPERT
PROFICIENT
COMPETENT
ADVANCED BEGINNER
NOVICE
TOOL TRAP
INTUITION
RULES
RACE HORSES
SHEEP
DESIGN
THIS IS YOUR BRAIN
L-MODE
INTEGRATION
R-MODE
MEMORY
Perception
prediction
imagination
Senses
linear
rich
Shared bus
METAPHOR
DIY BRAIN SURGERY
Neuroplasticity
GET IN YOUR RIGHT MIND
WALK
CAPTURE
awareness
HARVEST CUES & Patterns
Problem solving
Drawing
Learn to See
R-mode to L-mode Flow
step away from the key board
automate to Free R-mode
HUMOR
©2008 ANDY HUNT

OpenCredo

Summary

- Apply process and models (as appropriate)
  - Engage system 2…
- Learn, do, retrospect, (teach,) repeat
- Collaborate more (and better)

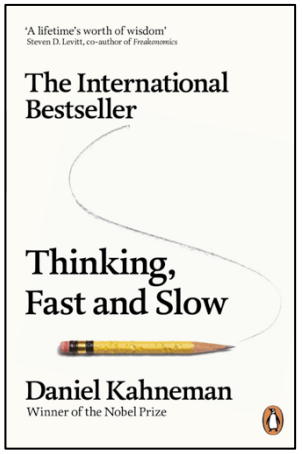
- Think more deliberately -

Thanks for Listening!

Comments and feedback are welcomed…

daniel.bryant@opencredo.com

@danielbryantuk



Thanks:

OpenCredo

RecWorks

LJC London Java Community