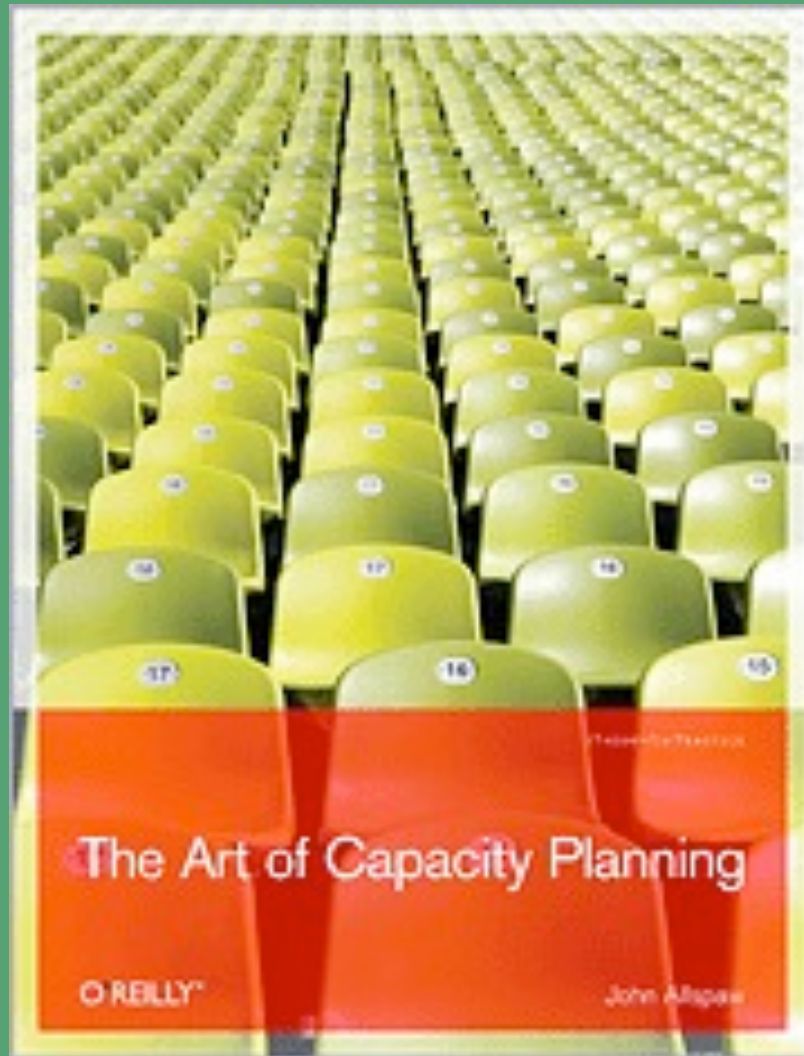


ESCALATION AND RESPONSE

OUTAGE SCENARIOS

JOHN ALLSPAUGH

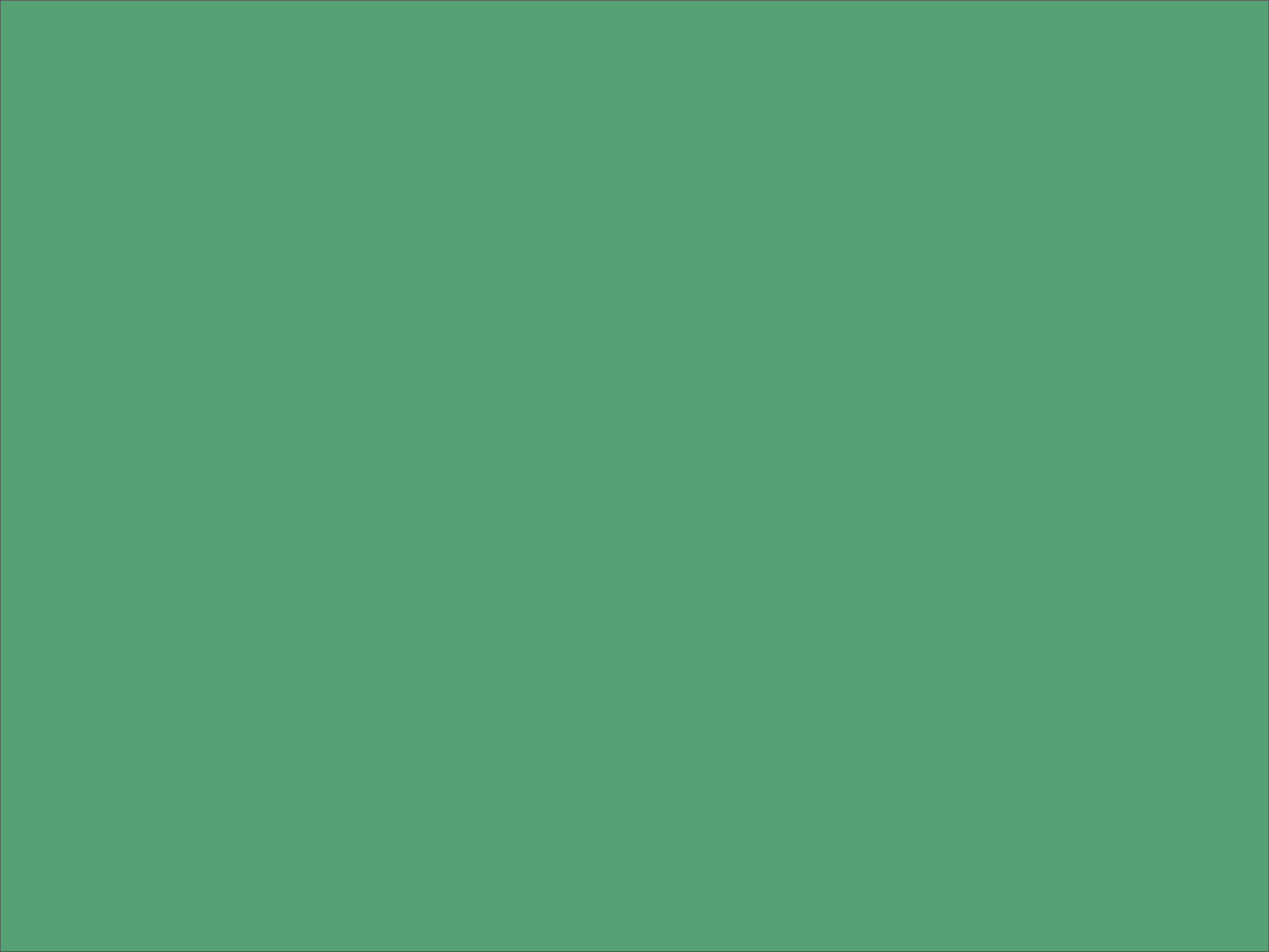
Etsy



TROUBLESHOOTING

This is NOT about troubleshooting

Or, not just about troubleshooting



- HROs
- Decision Making
- Communication
- Team Coordination
- A little bit of psychology





How important is this?

Amazon.com

Github.com

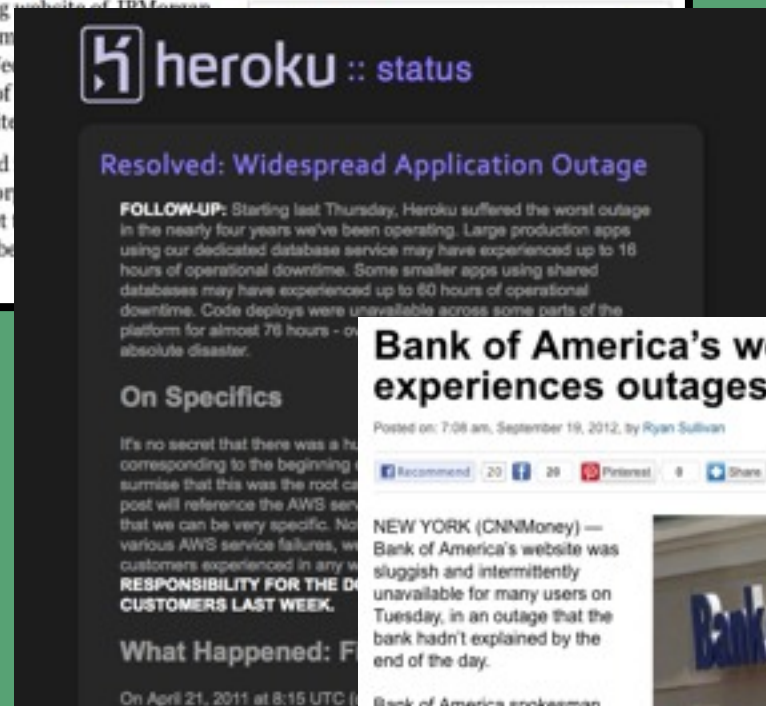
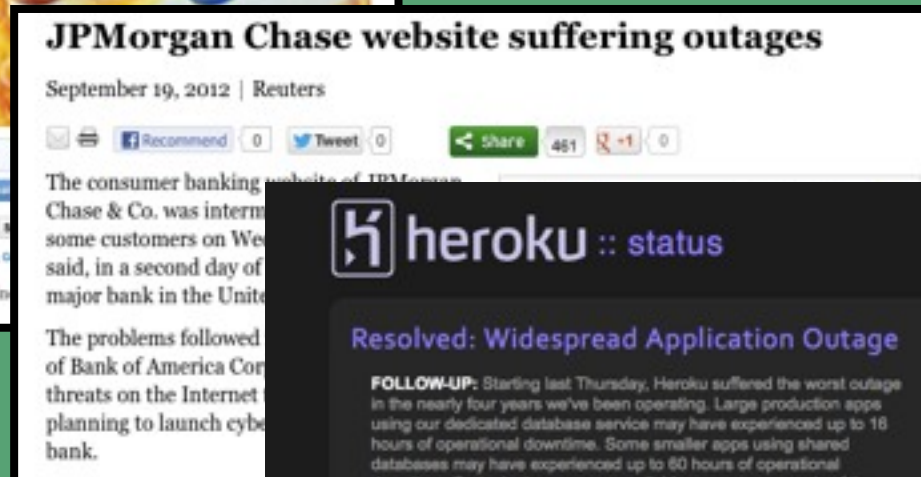
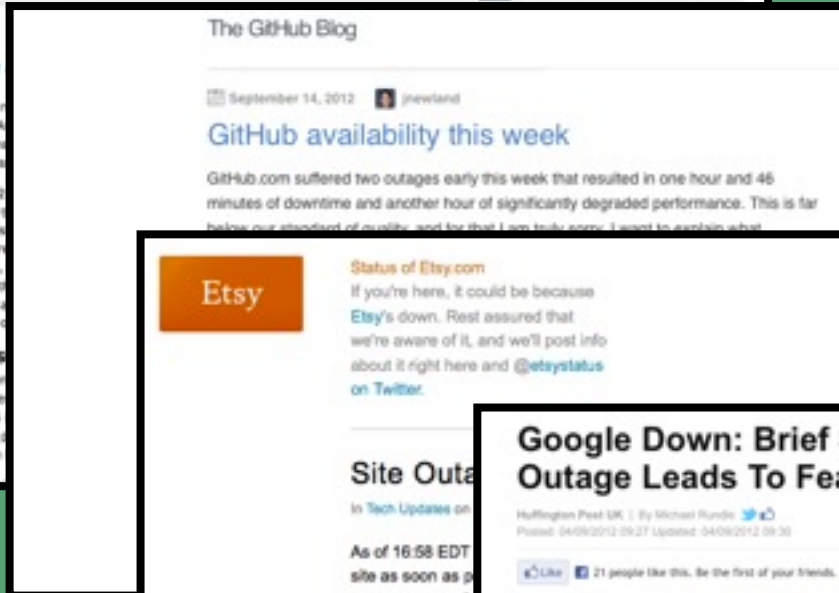
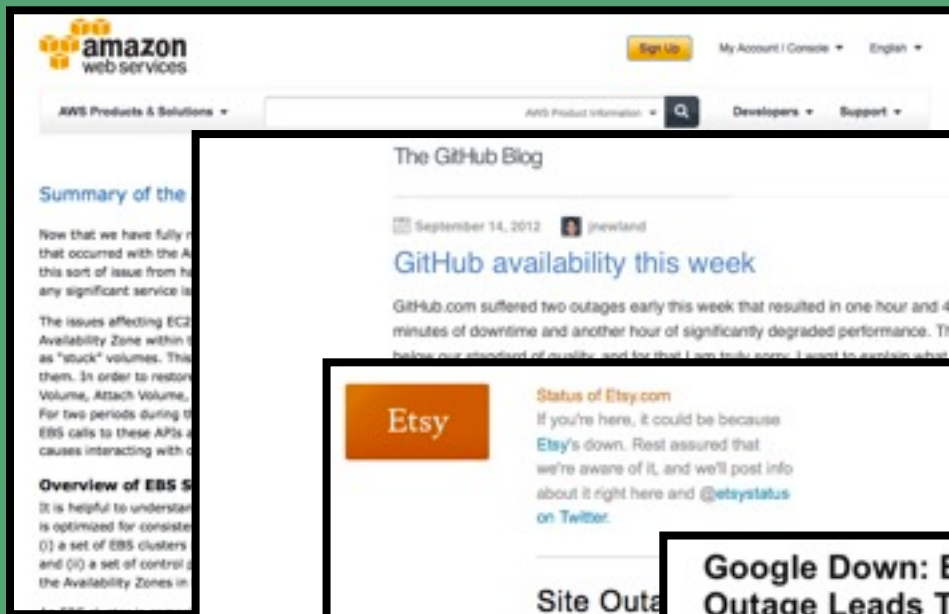
Etsy.com

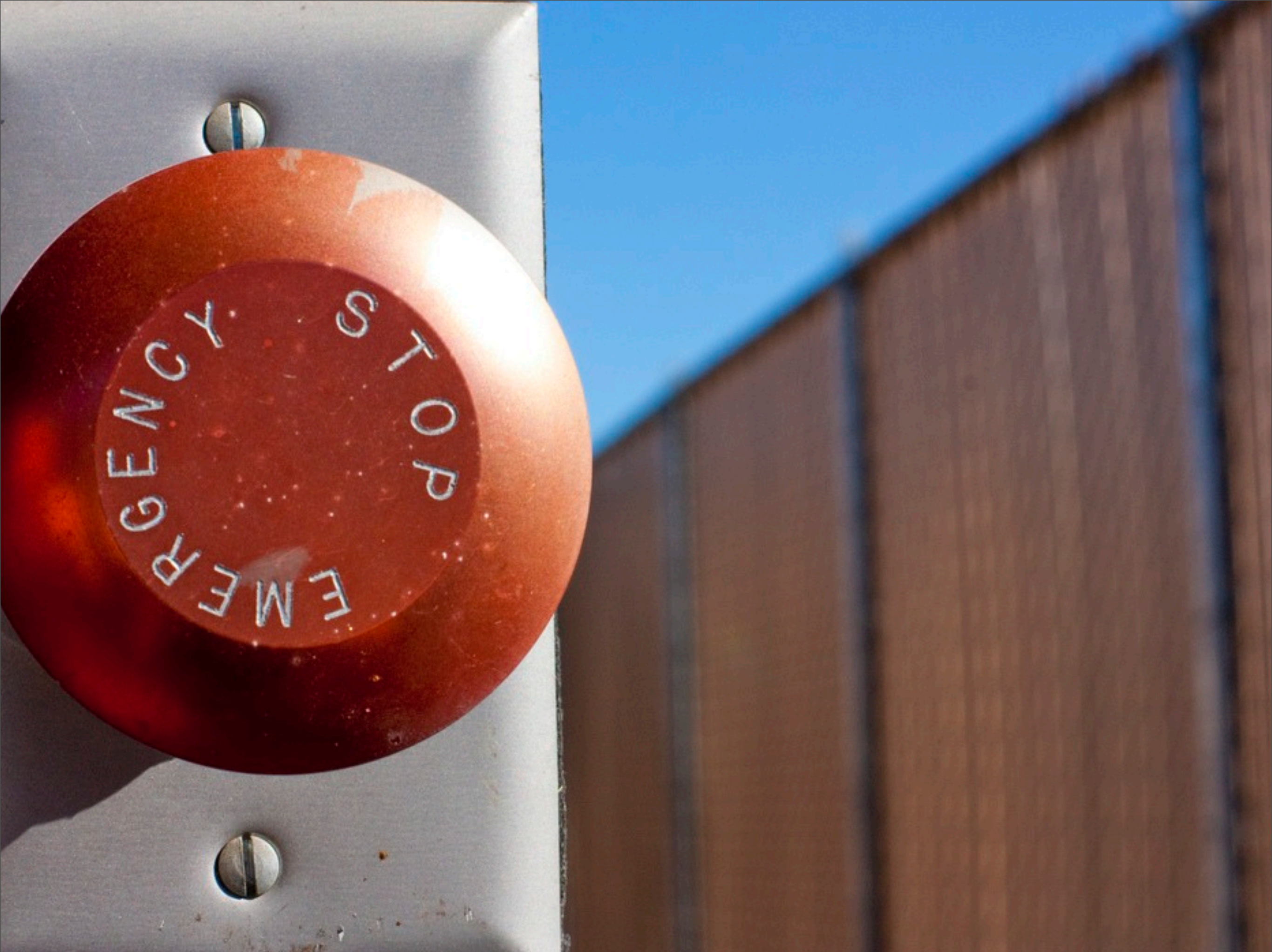
Google

JP Morgan

Heroku

Bank of America





Where to learn from?





Wednesday, April 24, 13



Wednesday, April 24, 13



AP The Associated Press 
@AP

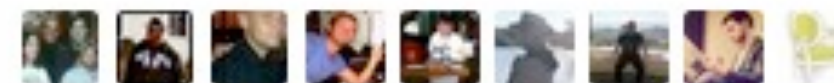
 Follow

Breaking: Two Explosions in the White House and Barack Obama is injured

 Reply  Retweet  Favorite  More

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15
FAVORITES



1:07 PM - 23 Apr 13

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Dr. Richard Cook, Velocity US 2012

http://www.youtube.com/watch?v=R_PDc0HFdPO

“The Self-Designing High-Reliability Organization: Aircraft Carrier Flight Operations at Sea”

Rochlin, La Porte, and Roberts. Naval War College Review 1987

<http://govleaders.org/reliability.htm>

High Reliability Organizations



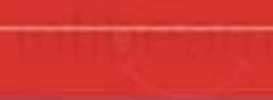
SECOND EDITION

MANAGING THE UNEXPECTED



Resilient Performance in an
Age of Uncertainty

KARL E. WEICK AND
KATHLEEN M. SUTCLIFFE



What Goes On?

Jens Rasmussen, 1983

Senior Member, IEEE

“Skills, Rules, and Knowledge; Signals, Signs, and Symbols, and Other Distinctions in Human Performance Models”

IEEE Transactions On Systems, Man, and Cybernetics, May 1983

SKILL - BASED

Simple, routine

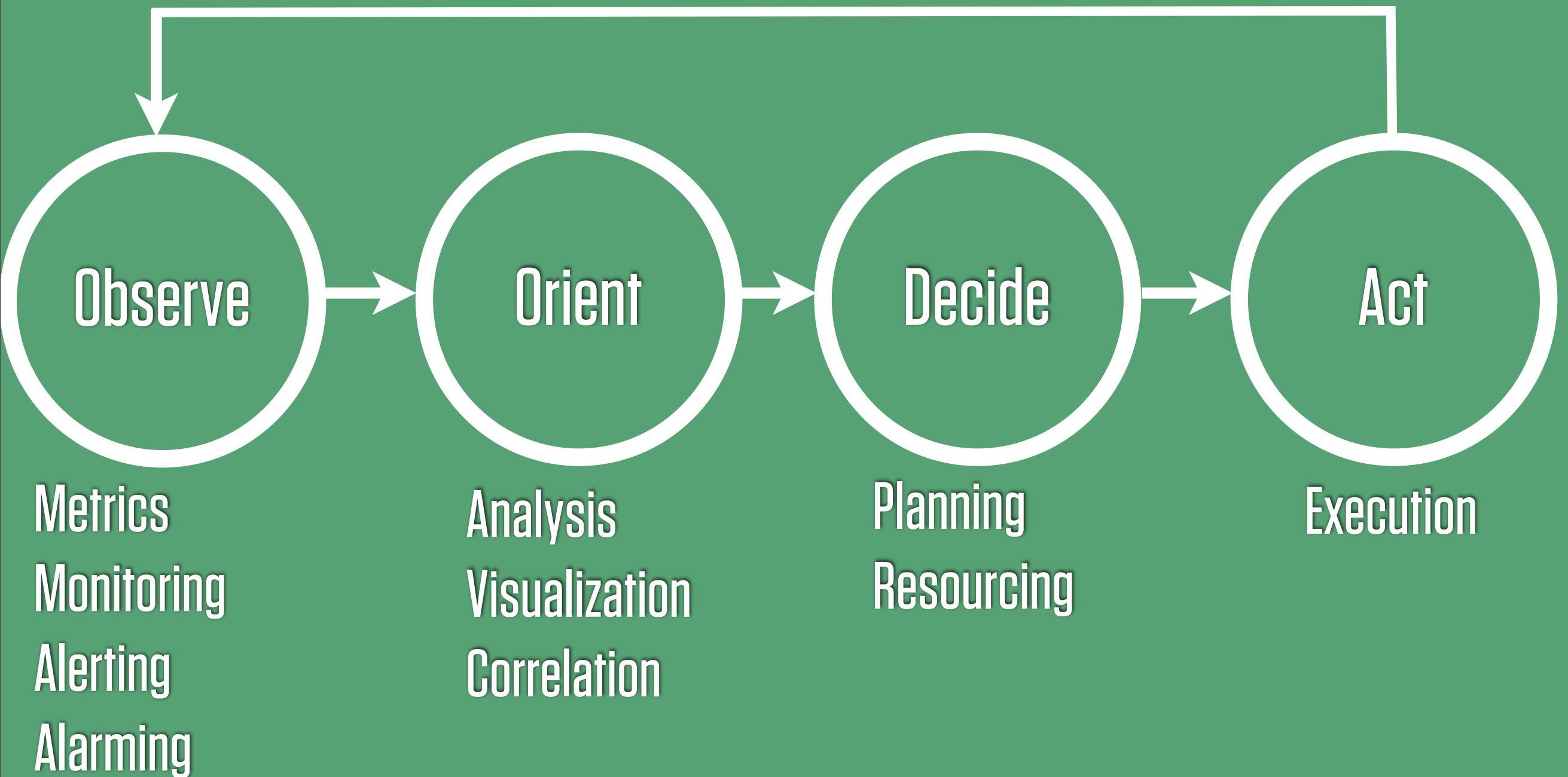
RULE - BASED

Knowable, but unfamiliar

KNOWLEDGE - BASED

WTF IS GOING ON?

OODA Loop



credit: <http://blog.b3k.us/ooda.html>

Characteristics of response to escalating scenarios

Characteristics of response to escalating scenarios

...tend to neglect how processes develop within time (awareness of rates) versus assessing how things are in the moment

“On the Difficulties People Have in Dealing With Complexity” Dietrich Doerner, 1980

Characteristics of response to escalating scenarios

...have difficulty in dealing with exponential developments (hard to imagine how fast something can change, or accelerate)

“On the Difficulties People Have in Dealing With Complexity” Dietrich Doerner, 1980

Characteristics of response to escalating scenarios

...inclined to think in causal SERIES, instead of causal NETS.

A therefore B,

instead of

A, therefore B and C (therefore D and E), etc.

“On the Difficulties People Have in Dealing With Complexity” Dietrich Doerner, 1980

PITFALLS

Thematic Vagabonding

PITFALLS

Goal Fixation

PITFALLS

Heroism

Non-communicating lone wolf-isms



TEAMS

- Divide and conquer applied to problem space, division of labor
- Incident resolution vs. Problem resolution
- Reproducibility
- Fault Tolerance Effects

TEAMS

Shotgun debugging

JOINT ACTIVITY

- Interpredictability
- Common Ground
- Directability

<http://csel.eng.ohio-state.edu/woods/distributed/CG%20final.pdf>



Interpredictability



Common Ground

Directability



Improvisation

IMPROVISATION





IMPROVISATION

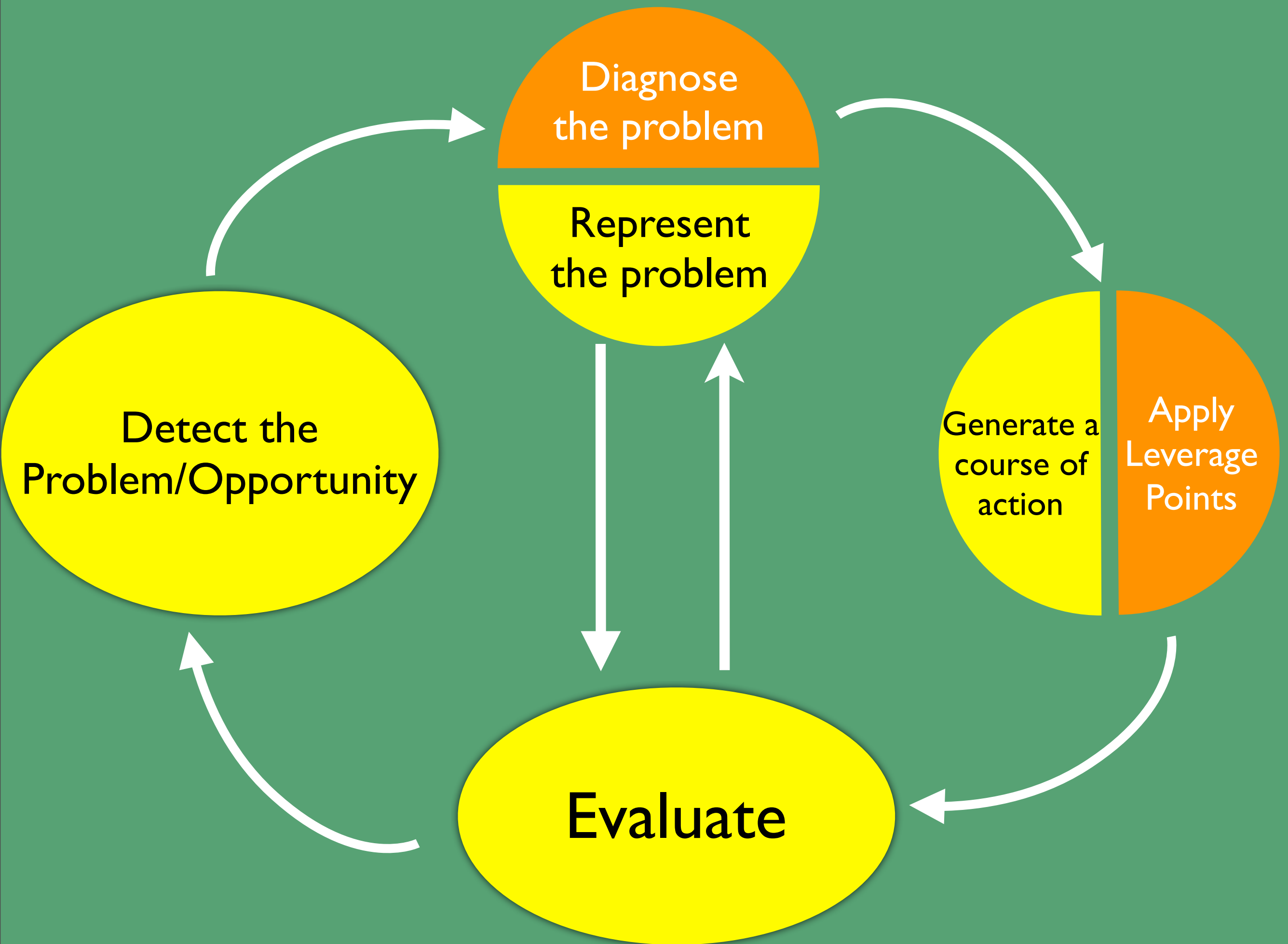


Improvisation



"...you can't improvise on nothing; you got to improvise on something."

Charles Mingus



Communication

- Explicitness
- Timing
- Assertiveness



Communication

Passive

Assertive
(be here)

Aggressive

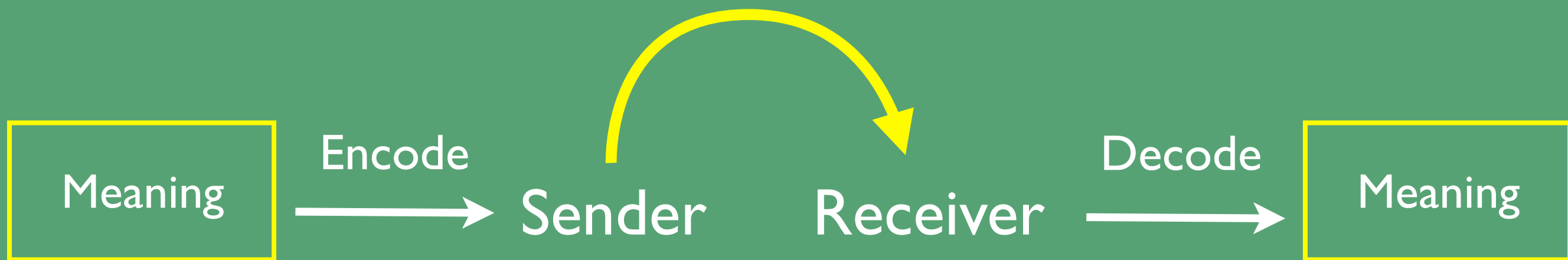




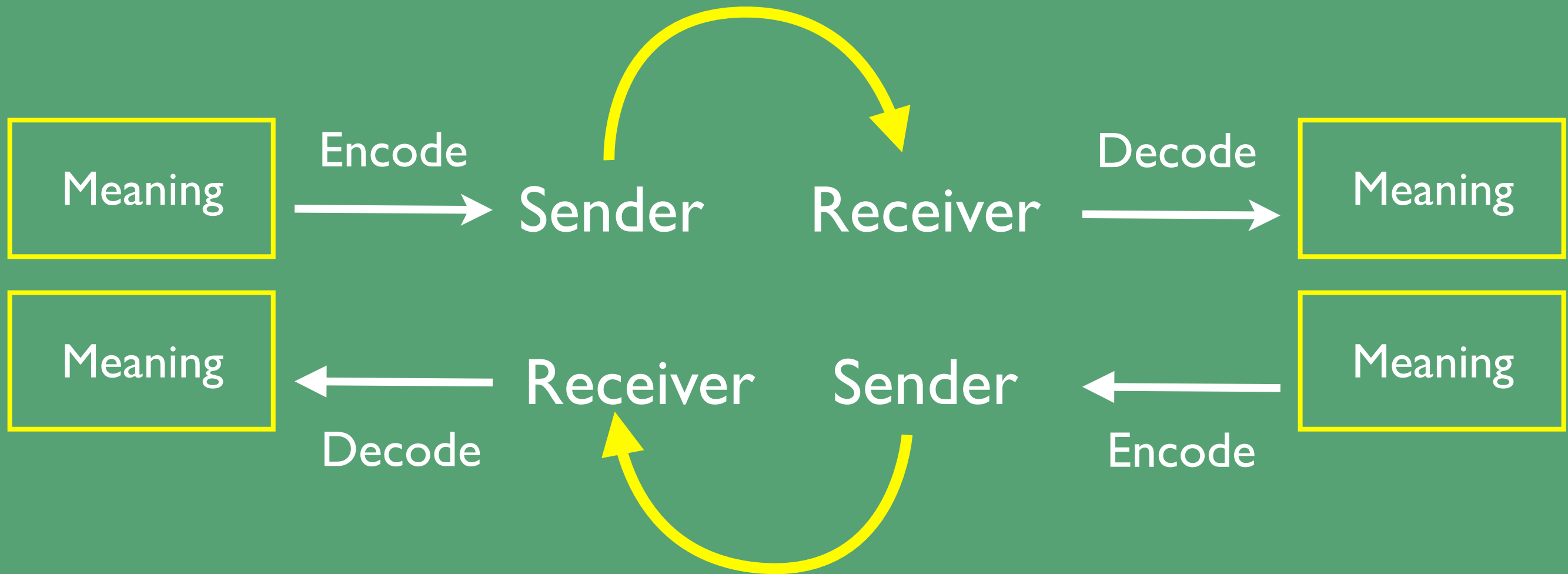
Communication

- IRC?
- Face-To-Face?
- Conference Call?
- Morse Code?

Transmission



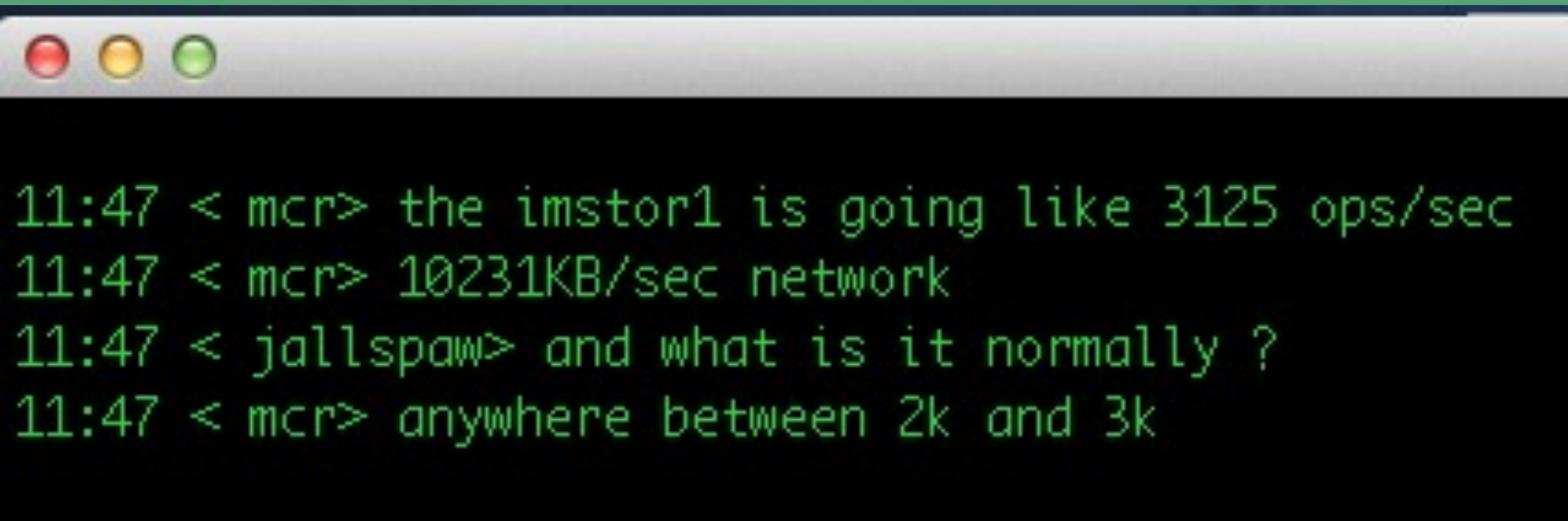
Transmission



Transmission

Feedback

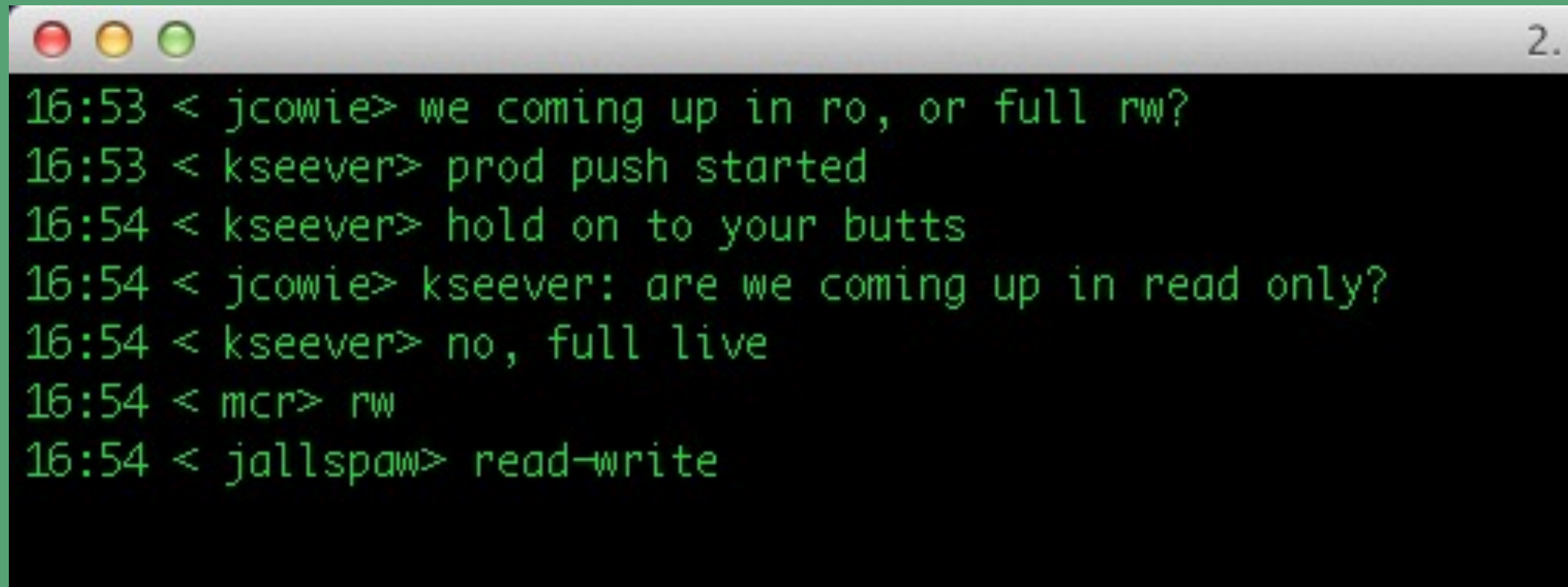
Informational



```
11:47 < mcr> the imstor1 is going like 3125 ops/sec  
11:47 < mcr> 10231KB/sec network  
11:47 < jallspaw> and what is it normally ?  
11:47 < mcr> anywhere between 2k and 3k
```


Feedback

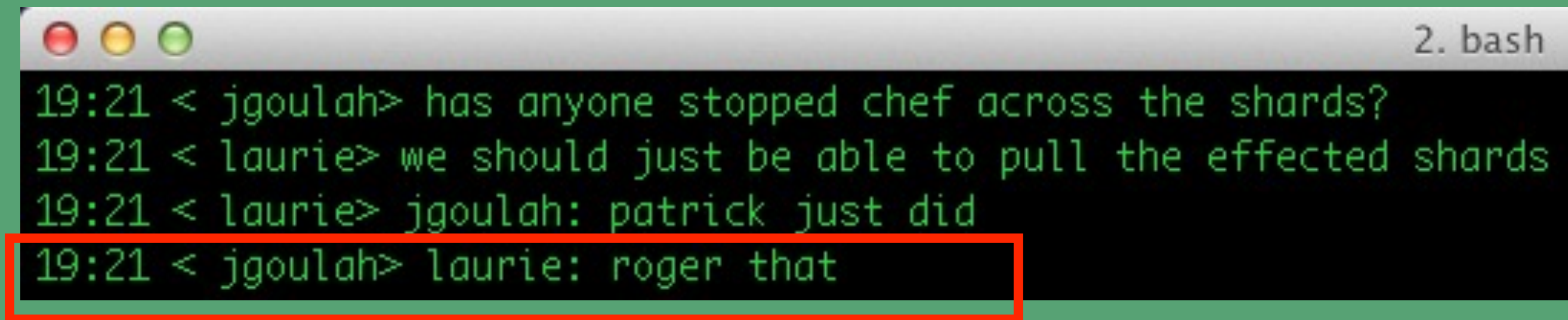
Corrective

A terminal window with a grey title bar containing three colored window control buttons (red, yellow, green) on the left and a small '2.' on the right. The main area is black with green text showing an IRC chat log.

```
16:53 < jcowie> we coming up in ro, or full rw?  
16:53 < kseever> prod push started  
16:54 < kseever> hold on to your butts  
16:54 < jcowie> kseever: are we coming up in read only?  
16:54 < kseever> no, full live  
16:54 < mcr> rw  
16:54 < jallspaw> read-write
```

Feedback

Reinforcing

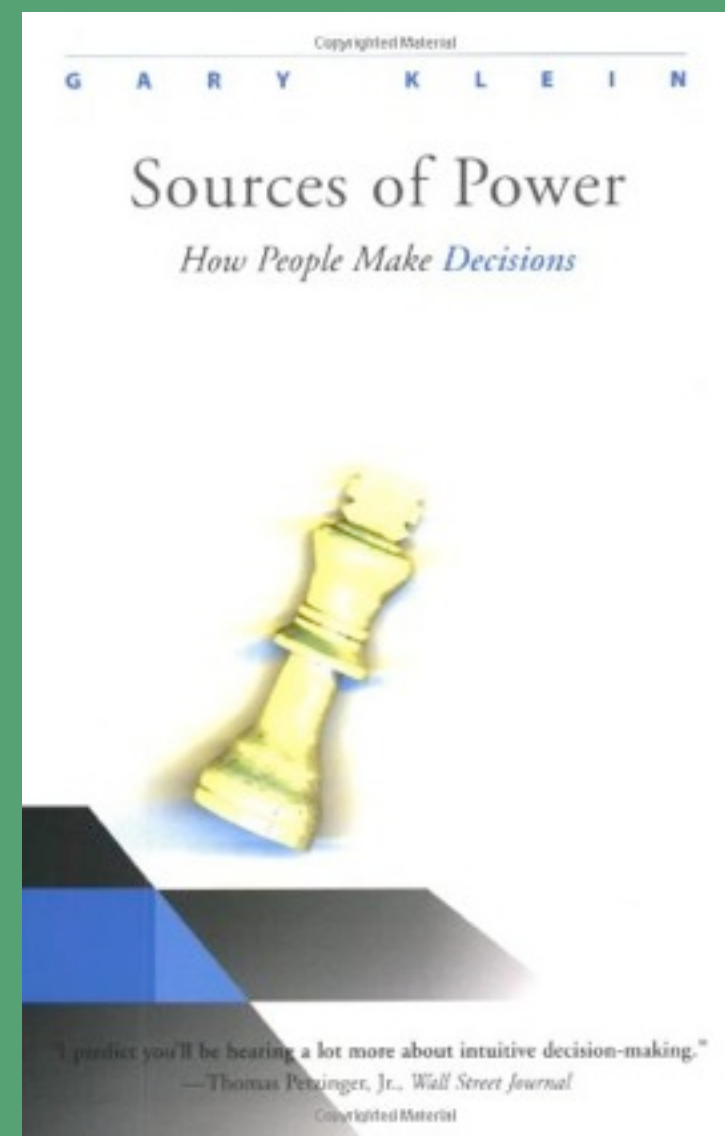
A terminal window with a title bar containing three colored buttons (red, yellow, green) and the text "2. bash". The terminal displays a chat conversation with four lines of text. The last line is highlighted with a red rectangular border.

```
19:21 < jgoulah> has anyone stopped chef across the shards?  
19:21 < laurie> we should just be able to pull the effected shards  
19:21 < laurie> jgoulah: patrick just did  
19:21 < jgoulah> laurie: roger that
```


Decision Making

Naturalistic Decision Making (NDM)

Gary Klein



Decision Making

Step One: What is the problem?

Decision Making

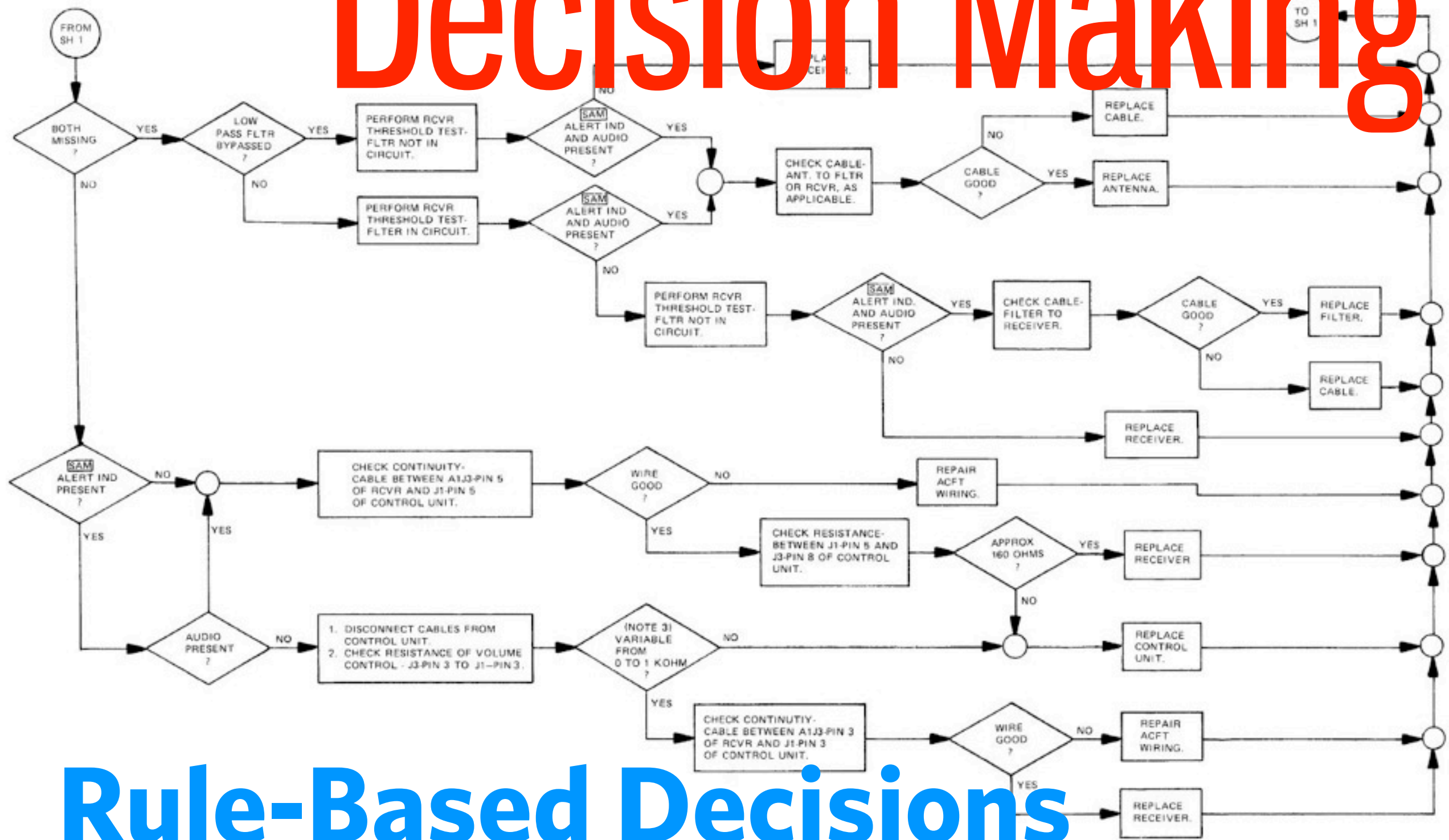
Step Two: What shall I do?

Decision Making

Recognition-Primed Decisions



Decision Making



Rule-Based Decisions

Decision Making

Choice decisions

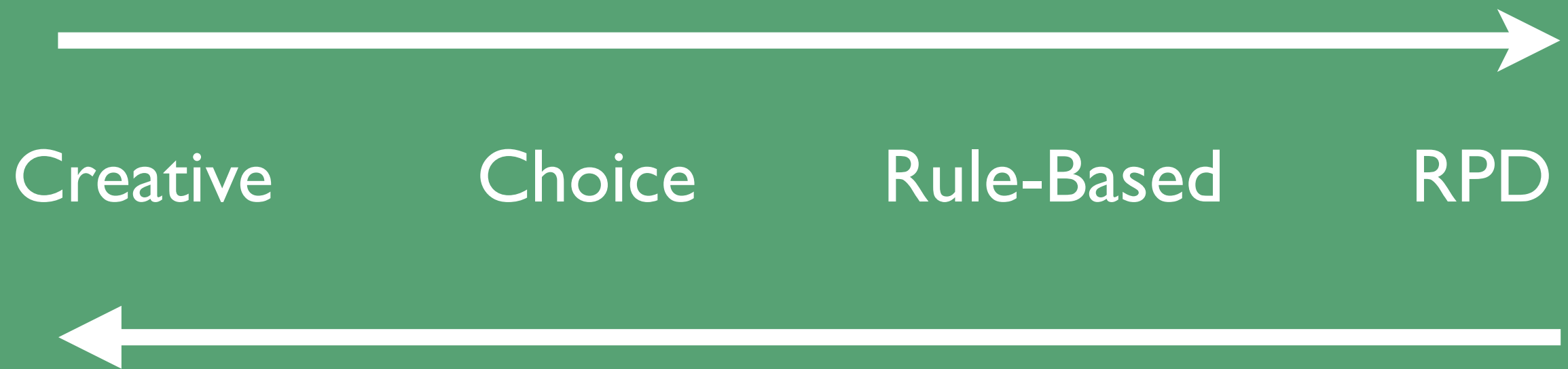
Decision Making

Creative decisions



Decision Making

Decreasing cognitive effort
Decreasing effects of stress



Creative

Choice

Rule-Based

RPD

Increasing cognitive effort
Increasing effects of stress

PRE-Mortems

POST Mortems

<http://codeascraft.etsy.com/2012/05/22/blameless-postmortems/>



Controls

“Human Error”

- An attribution AFTER the fact
- A symptom, not a cause
- “Root” cause?
- Useless labeling
- Using the term is the largest indicator that learning is not your goal

Mature Role of Automation

“Ironies of Automation” - Lisanne Bainbridge

<http://www.bainbrdg.demon.co.uk/Papers/Ironies.html>

Mature Role of Automation

- Moves humans from manual operator to supervisor
- Extends and augments human abilities, doesn't replace it
- Doesn't remove "human error"
- Are brittle
- Recognize that there is **always** discretionary space for humans
- Recognizes the **Law of Stretched Systems**

Law of Stretched Systems

- Moves humans from manual operator to supervisor
- Extends and augments human abilities, doesn't replaceRecognizes the Law of Stretched Systems

Law of Stretched Systems

“Every system is stretched to operate at its capacity; as soon as there is some improvement, for example, in the form of new technology, it will be exploited to achieve a new intensity and tempo of activity”

D. Woods, E. Hollnagel, “Joint Cognitive Systems: Patterns” 2006

SUMMARY

“In preparing for battle, I have
always found that plans are useless
but planning is indispensable.”

- Eisenhower

So what can we do?

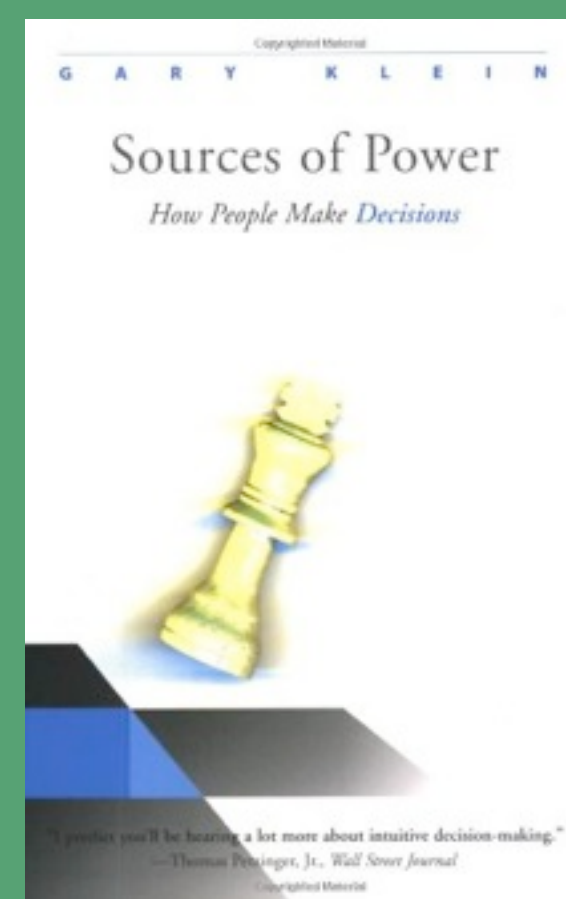
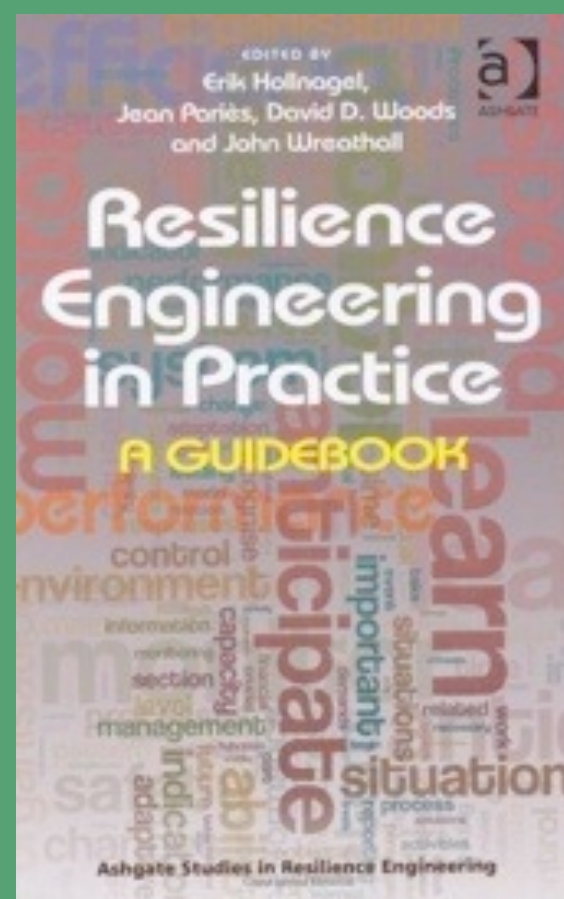
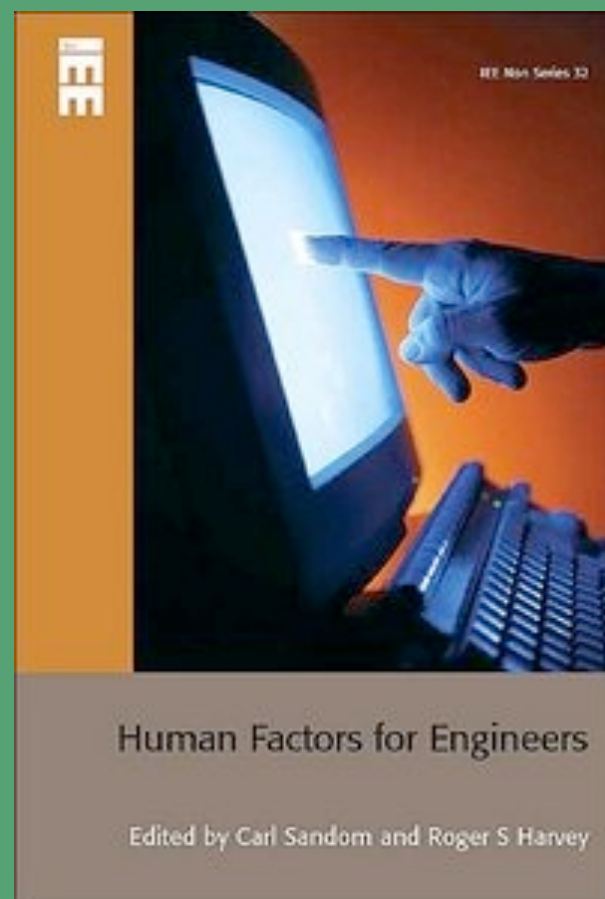
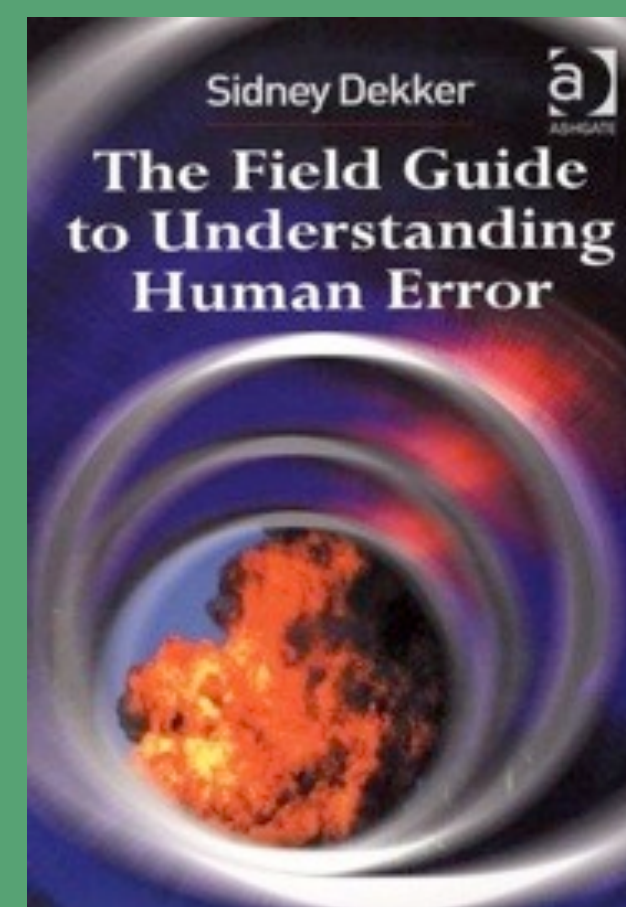
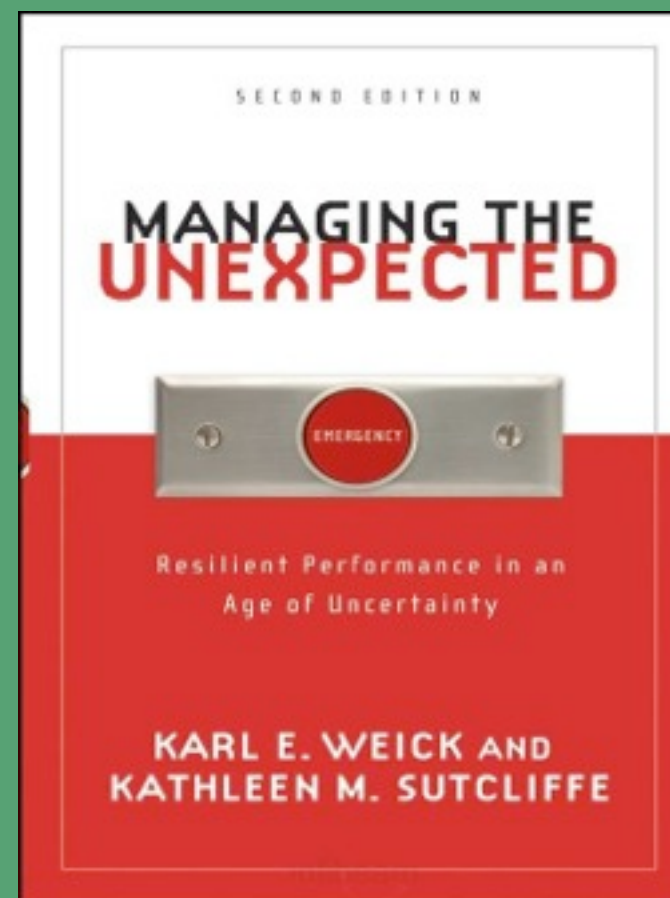
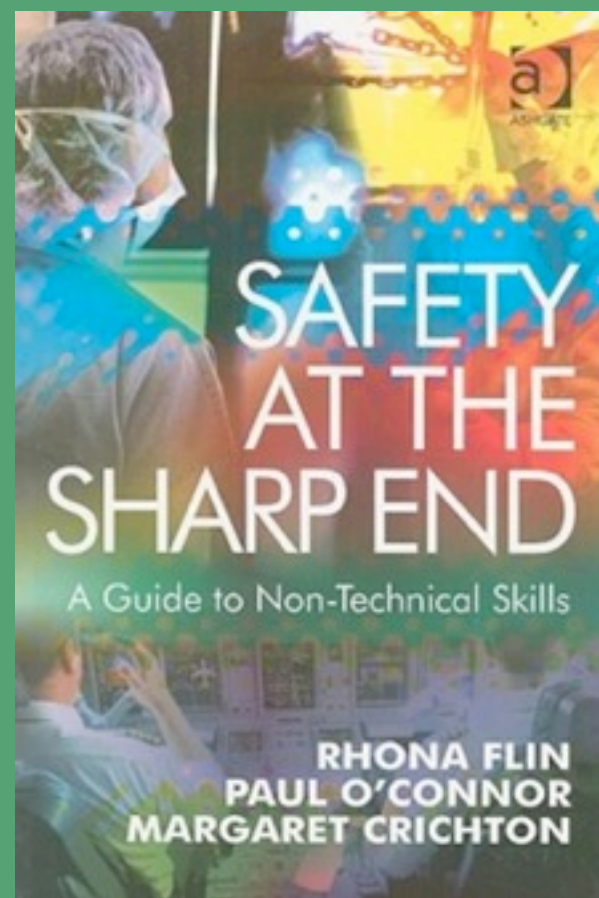
We develop our Non-Technical Skills

- Communication
- Decision Making
- Improvisation

So what can we do?

We tailor our environment to adapt

- Learning from outages (PostMortem)
- Anticipating problems (PreMortem)
- Gather Meta-Metrics



THE END