

Evidence-Based Management: Helping Leaders Make Better Decisions

**Segment 1:
What is Evidence-Based Management?**

Evidence-Based Management is

the practice of making organizational decisions based upon conscientious use of

- ▶ **science-based principles & knowledge**
- ▶ **valid & relevant organizational facts**
- ▶ **critical thinking aided by decision supports**
- ▶ **ethical considerations (i.e., effects on stakeholders)**

Why EBMgt?

- ▶ **Better decisions by using practices that work (and avoiding those that don't!)**
- ▶ **Defensible decisions that stand up to scrutiny (using best evidence and best process)**
- ▶ **Developing your expertise throughout your career (experience can be a poor teacher – bad habits!)**
 - *20 years of valid experience is different than 1 year of invalid experience repeated 20 times!*

What Does EBMgt Look Like?

**Evidence-based Piloting?
A Case of Chesley Sullenberger**



Landing at Hudson River

“On January 15, 2009, Chesley Sullenberger had successfully executed an emergency water landing of US Airways Flight 1549 in the Hudson River off Manhattan, New York City, after the aircraft had been disabled by striking a flock of Canada geese during its initial climb out of LaGuardia Airport. All of the 155 passengers and crew aboard the aircraft survived.”

What happened?

<http://www.youtube.com/watch?v=mLFZTzR5u84>

<http://www.youtube.com/watch?v=gjXCuIRjPas>

Flight 1549 Cockpit Recording

National Transportation Safety Board

- ▶ **Sullenberger: Birds! we got one rol- both of 'em rolling back. mayday mayday mayday. uh this is uh Cactus fifteen thirty nine hit birds, we've lost thrust (in/on) both engines we're turning back towards LaGuardia.**
- ▶ *Control Tower: ok uh, you need to return to LaGuardia? turn left heading of uh two two zero.*
- ▶ *Cactus fifteen twenty nine, if we can get it for you do you want to try to land runway one three?*
- ▶ *arright Cactus fifteen forty nine its gonna be left traffic for runway three one.*
- ▶ **unable.**
- ▶ *okay, what do you need to land?*
- ▶ *Cactus fifteen (twenty) nine runway four's available if you wanna make left traffic to runway four.*

Flight 1549 Cockpit Recording

National Transportation Safety Board

- ▶ **I'm not sure we can make any runway. uh **what's over to our right** anything in New Jersey maybe Teterboro?**
- ▶ *Cactus fifteen twenty nine turn right two eight zero, you can land runway one at **Teterboro**.*
- ▶ **we can't do it. we're gonna be **in the Hudson**.**
- ▶ ***I'm sorry say again** Cactus? Cactus uh.... Cactus fifteen forty nine radar contact is lost you also got Newark airport off your two o'clock in about seven miles.*
- ▶ *two one zero uh forty seven eighteen. **I think he said he's goin in the Hudson**.*
- ▶ **got any ideas?**
- ▶ *actually not. ... if you can uh....you got uh runway uh two nine available at Newark it'll be two o'clock and seven miles.*
- ▶ **we're gonna brace.**

Evidence-based piloting?

What Sully did were...

▶ **Use of scientific findings**

- Chesley Sullenberger, USAIR pilot, has been a **visiting scholar** at UC Berkeley's Collaborative for Catastrophic Risk Management since 2007
- Does **research** on how to make decisions to maintain safety despite technological complexity and crisis conditions

▶ **Reliance on Reliable and Valid Organizational Facts**

- Has written and analyzed **aviation accident reports** for over 20 years

Evidence-based piloting?

What Sully did were...

▶ **Mindful decision making**

- Formal Education to **Prime His Decision Making Skills**: Sully is a graduate of the U.S. Air Force Academy and holds masters degrees from both Purdue University in Industrial Psychology and the University of Northern Colorado in Public Administration
- Used **Decision Aids** to Support Good Decision: As Sully considered what decision to make that day, he had his copilot review and follow all checklists on board relevant to crash landings

Evidence-based piloting?

What Sully did were...

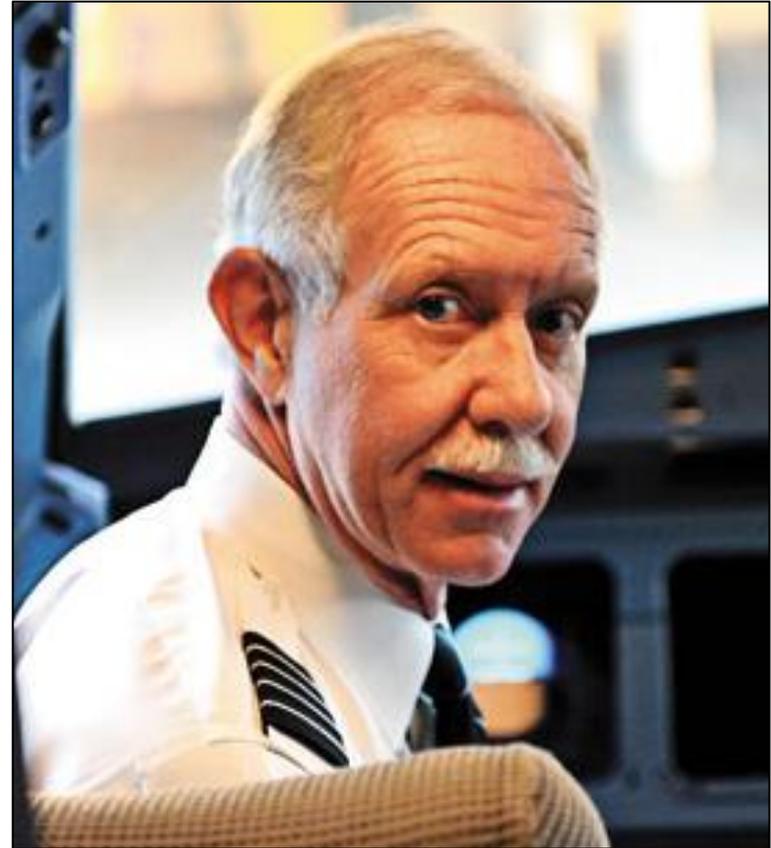
▶ **Ethics and Responsibility to Stakeholders**

- The last person to leave the plane, Chesley Sullenberger twice **walked the plane's aisle** to check all passengers were off
- Sully's last act onboard was to grab the **passenger list**. Used on-shore to verify rescue of all passengers and crew

In Sullenberger's own words

“One way of looking at this might be that for 42 years, I've been making small, regular deposits in this bank of **experience, education and training.”**

And on January 15, the balance was sufficient so that I could make a very large withdrawal.”



Evidence-Based Management

as Zeitgeist

The Zeitgeist

EBMgt as the sprit of the time

- ▶ **Evidence-based practice movements abound in medicine, education, and public policy**
- ▶ **Management research from psychology, engineering, operations research (etc.) yields 1000s of studies annually**
- ▶ **Internet (i. e. google scholar) gives ready access**
- ▶ **Innovative companies now hiring “Chief Evidence Officer”**
- ▶ **Public demands accountability (quality decisions that are defensible)**

EBMgt overcomes limits of unaided decisions

The “human” problem

- ▶ **Bounded Rationality**
- ▶ **The Small Numbers Problem of Individual Experience**
- ▶ **Prone to See Patterns Even in Random Data**

Evidence-based practice

- ▶ **Critical Thinking**
- ▶ **Decision Supports**
- ▶ **Research**
 - Large Ns > individual experience
 - Controls reduce bias

EBMgt overcomes limits of unaided decisions

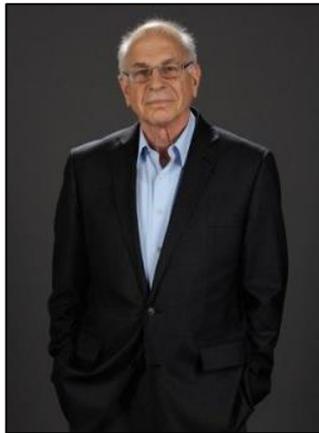
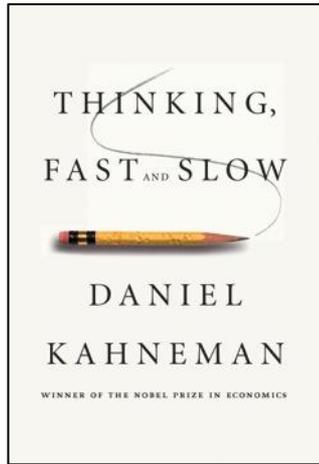
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Problem: Individual Experience
 - ▶ **Prone to See Patterns Even in Random Data**
- 

Evidence-based practice

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Bounded rationality



System 1

- Fast
- Intuitive, associative
- Heuristics & biases

System 2

- Slow (lazy)
- Deliberate, 'reasoning'
- Rational

What do we do to become Evidence-Based Managers?

Five Good Habits becoming EBMgr

- ▶ **Get evidence into the conversation**
- ▶ **Learn and use evidence in your area of practice**
- ▶ **Learn to gather evidence**
- ▶ **Become “decision aware”**
- ▶ **Reflect on decision’s ethical implications**

1. Get evidence into the conversation

- ▶ Regularly ask **“what’s the evidence...?”**
- ▶ **Discuss with your seatmates (3 minutes)**
 - What’s a practice in your organization that you suspect might be NOT evidence-based?
 - Please share your discussion with class

2. Learn and use evidence in your area of practice

- ▶ Focus on **action principles** where science is clear (on-going practice of a professional manager)
- ▶ Focus on **business facts** based on valid metrics relevant to your decisions (on-going practice of responsible & transparent organization)

2a. Focus on action principles where science is clear

▶ **Rely on science-based sources**

- Example: Locke's Handbook of Organizational Behavior (access electronic copy in blackboard)
- Peer-reviewed research, especially meta-analyses

▶ **Reduce dysfunctional variations in practice**

- Build effective **routines, procedures, checklists**

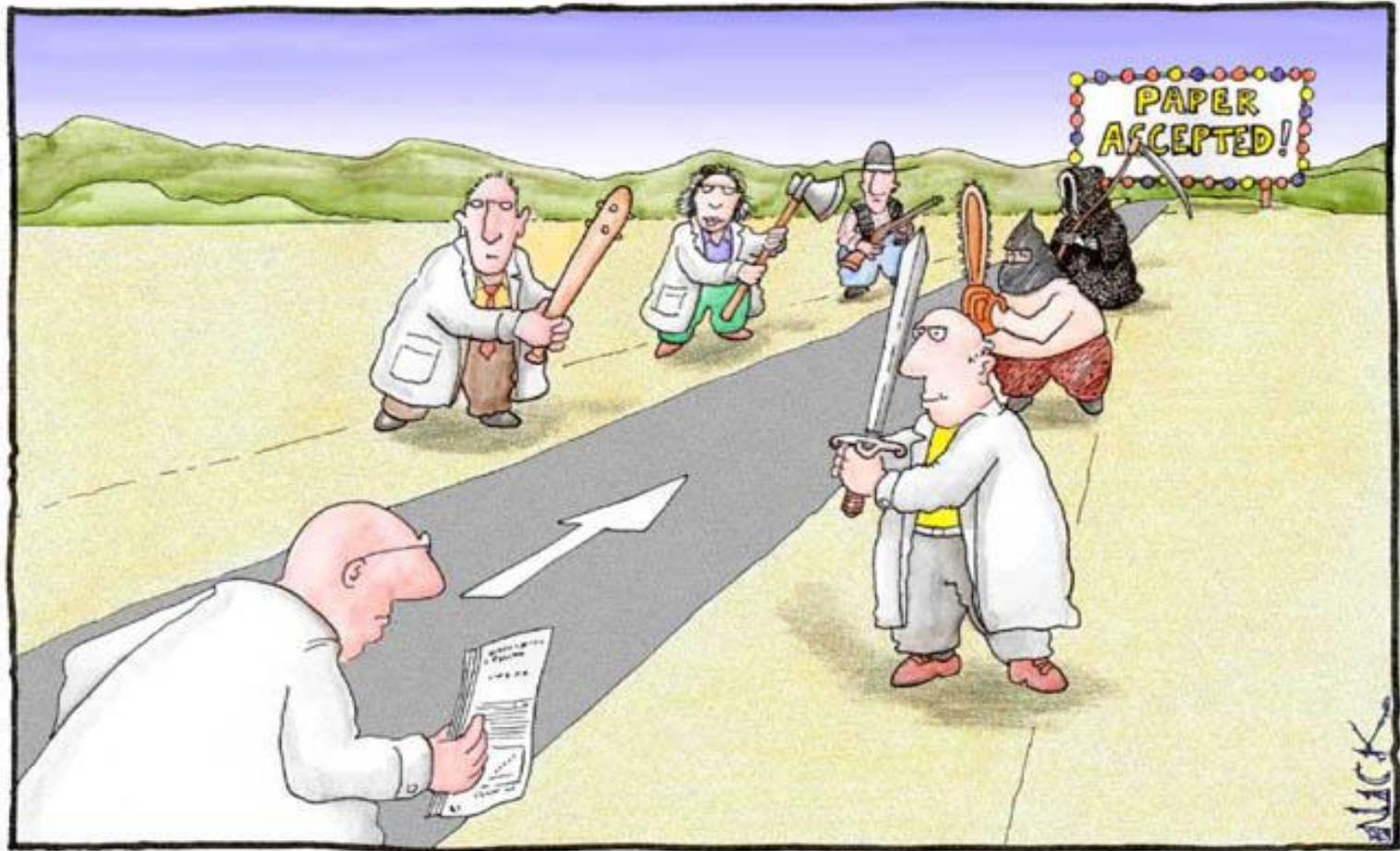
What is evidence?

- ▶ **Evidence is not the same as proof or hard facts**
- ▶ **Evidence can be**
 - so strong that no one doubts its correctness, or
 - so weak that it is hardly convincing at all
- ▶ **Don't confuse**
 - Evidence of effect (do!)
 - Evidence of no effect (don't!)
 - No evidence of effect (research!)

Best scientific evidence is

- ▶ based on **large N** (sample size of people/organizations)
- ▶ **well-controlled** studies with comparison groups and/or longitudinal data
- ▶ **peer-reviewed**

“Peer-reviewed” means



2b. Use reliable and valid business facts

- ▶ **large numbers** sampled relative to population
 - not single or isolated cases, e.g. sales/# sales calls
- ▶ **linked to context**
 - season, location, # of users, etc.
- ▶ **provide key indicators** for business decisions

Discuss with your seatmates ...

- ▶ What **indicators** does your organization most commonly use to make important decisions?
- ▶ Are these the “**best business facts**” you need to make these decisions?
- ▶ What indicators would be more useful, if you could get them?

How to Interpret Business Facts?

- ▶ **# Medication errors in Unit 1 were 200% greater in 2013 than Unit 2's. Is patient safety worse in Unit 1?**
- ▶ **Mike has w/10 subordinates & 20% turnover while Kim has 55 employees & 10% turnover. Is retention better in one?**
- ▶ **McDonald's stores average 300+% turnover/year. Does Mickey D. have a problem?**
- ▶ **Company A managers focus decisions on monthly cost, downtime and revenues. Company B managers focus on service quality, employee retention and profitability by customer category.**

How to Interpret Business Facts?

- ▶ **# Medication errors in Unit 1 were 200% greater in 2013 than Unit 2's. Is patient safety worse in Unit 1? Depends on number of unsafe incidents divided by # patients or # procedures—needs a control.**
- ▶ **Mike has w/10 subordinates & 20% turnover while Kim has 55 employees & 10% turnover. Is retention better in one? Hard to determine. Small N's have greater bias and are more variable.**
- ▶ **McDonald's stores average 300+% turnover/year. Does Mickey D. have a problem? Depends on industry comparison and business strategy.**
- ▶ **Company A managers focus decisions on monthly cost, downtime and revenues. Company B managers focus on service quality, employee retention and profitability by customer category. B's more diverse performance criteria can promote attention to longer-term and growth-oriented outcomes. A's narrower economic focus can promote shorter-term thinking**

3. Learn to gather evidence

- ▶ **Structure and pose a managerial question**
- ▶ **Search for best available evidence (check out Google Scholar or CEBMa website (cebma.org))**
- ▶ **Critically appraise information found**
- ▶ **Apply relevant case information to decision**
- ▶ **Write down the decision made, assumptions, and expected outcomes**
- ▶ **Evaluate outcomes over time**

How to appropriately gather evidence

5-step approach

- ▶ Formulate an **answerable question** (use PICOC)
- ▶ Search for the best available **evidence**
- ▶ Critical appraise the **quality** of the found evidence
- ▶ **Integrate** the evidence with managerial expertise and organizational concerns and apply
- ▶ Monitor and **evaluate** the results

→ a.k.a CAT

4. Become “decision aware”

- ▶ Identify different **kinds of decisions** learners face. What kinds of different **approaches** are used to them? Why?
- ▶ How can you determine whether you made a “good decision” when you cannot know the outcome?
 - (The answer to this question is what is known as “decision quality”)

“Decision Awareness” promotes decision quality

- ▶ **To manage decisions, you should know what decisions must be made.**
- ▶ **Map out decisions that affect key outcomes.**
 - Who is responsible? (Are they prepared?)
 - What information is required? (Will it be available when needed?)

Awareness calls attention to decision process.

Proper processes improve decision quality

- ▶ **What is the process for making the decision?**
- ▶ **Different processes work better...**
 - for **known known** such as routine decisions (create validated checklists and action plans)
 - for decisions with **known unknowns** (systematic sequence of considerations)
 - for decisions with **unknown unknowns** (pilot-tests and trial/ experiment)
- ▶ **Decisions have an “aftermath” and a “pre-math” that a good manager actively manages. Is the decision well-managed? Help make it so.**

5. Reflect on decision's ethical implications

- ▶ **Who are stakeholders for this decision?**
- ▶ **Possible effects?**
- ▶ **How might the decision be altered to optimize positive stakeholder effects and reduce negative?**