The Limits of “I’ll know it when I see it”

Sean Murphy on March 2024

Overview: Three Perspectives on Expertise

- **Individual Expert:** I will solve it FOR you
- **Delegation**: I will explain to YOU how to solve it
- **Team Work**: COLLABORATE with experts on bigger problems
  - *Blending Expertise*

Key Take-Aways

- How to recognize experts
- How to codify your expertise
- How to improve your expertise
- How to transfer expertise: coach others to improve
- How to collaborate with other experts on a project

Why I Focus on Expertise

- Primary basis of differentiation for new products & services
- Experts store patterns of success and failure
  - Enables pattern recognition – rapid accurate assessment
  - Mental simulation to predict outcomes of a plan of action
- Patterns underpin design efforts, improvisation, error detection and recovery
- Competitive advantage flows from expert collaborating

Why Listen To Me

- I've spent four decades curating expert insights into checklists, decision trees, procedures, and software.
- For the last two decades I have helped early stage entrepreneurs find early customers
- Typical products include rule checkers, design tools, and simulation environments
- I've helped teams of experts achieve common ground

Question for the Audience

- Individual contributor
- Manager / project manager
- Consultant
- Solo entrepreneur
- Startup founding team

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Question for the Audience: Discipline

- Engineering
- Sales & marketing
- Finance & operations
- Executive management

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Individual Expertise

I will solve it for you

- What is it?
- How to recognize it
  - Same field
  - Other fields
- How to develop it

Photo Credit: JD Hancock (@JDHancock) "Robby the Robot: Into The Unknown!"
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What is Expertise?

"Experts perceive things that are invisible to novices, such as the characteristics of a typical situation. They make high-quality decisions under extreme time pressure. When difficulties arise, experts find opportunities for improvising solutions."

Gary Klein "Sources of Power"

How To Spot An Expert

- Can make high quality judgments from small amount of data in a short time
- Knows key questions
- Can spot what's missing or does not fit
- Can predict outcomes

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Question for the Audience

How do you recognize an expert?

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Challenges of Individual Expertise

- Accumulated over a decade or more
- Often unconscious competence
  - Intuition and second nature
  - Become automatic and easy
- Not always available to introspection

I'll know it when I see it

Expertise Examples

1. I'll know it when I see it – pap smear example
2. Engineer example
3. Physician example

“I’ll Know It When I See It” Example

- Pap smear example
  - A Gestalt: The whole is more than sum of parts
  - A detail you see that is often overlooked

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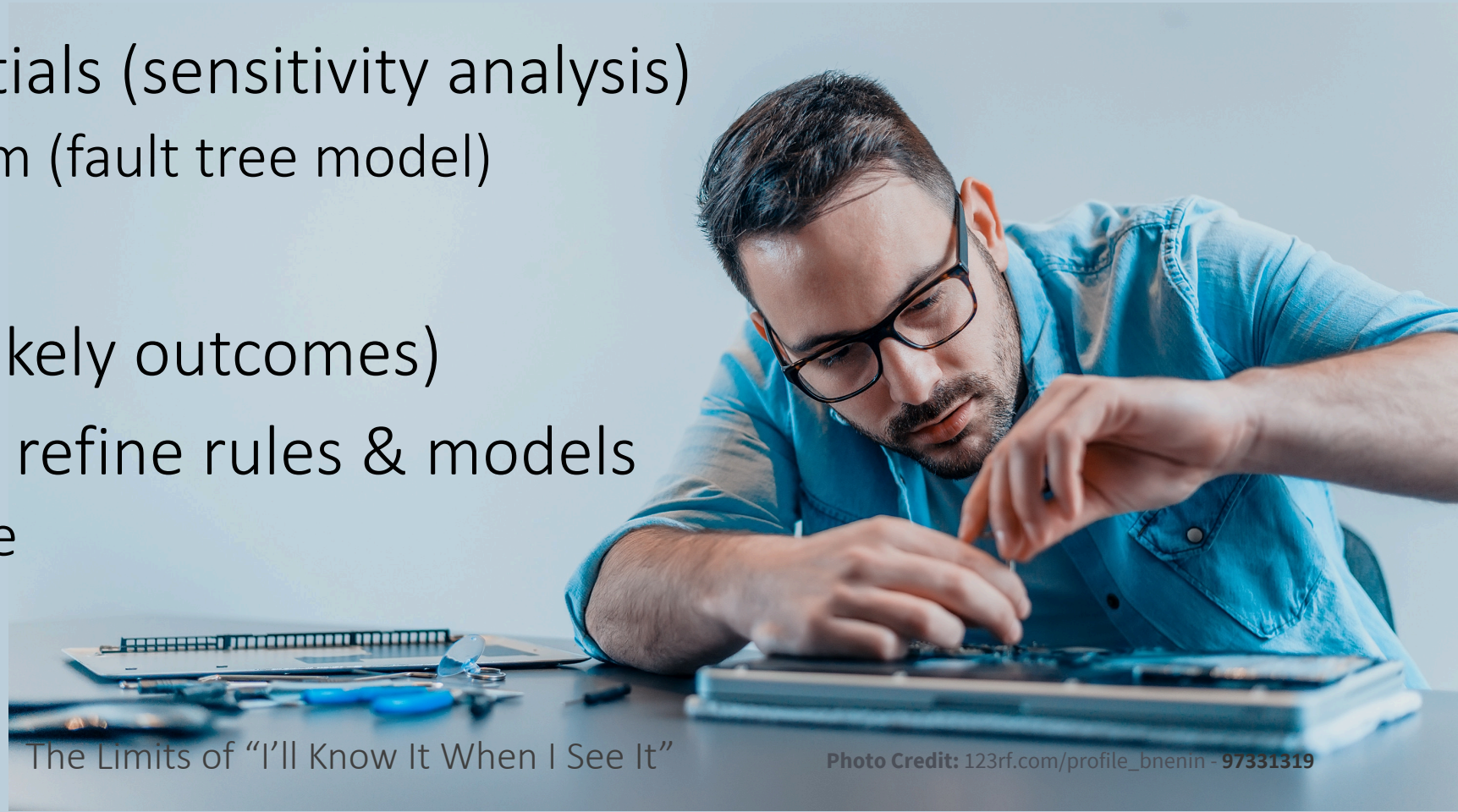
Example Of Expertise: Engineer

- Facts / observations: customer symptoms
- Hypotheses: root cause
- Validate / differentials (sensitivity analysis)
  - Confirm/disconfirm (fault tree model)
- Propose solution
- Outline benefits (likely outcomes)
- Track outcomes to refine rules & models
  - Deliberate practice



Example Of Expertise: Physician

1. Elicit symptoms (may include tests)
2. Offer a diagnosis (root cause analysis)
3. Explain differentials (sensitivity analysis)
4. Suggest a prescription (course of action)
5. Outline prognosis (likely outcomes)
6. Use outcomes to refine rules & models

Expertise: Personal Mastery

- Master not only the technical
  - But also emotional aspects of a problem
  - Self-debugging
- A deliberate practice
  - Predict outcomes of a decision & follow-up
  - 10,000 hour rule (Ericsson)

"They can because they think they can" - Virgil

RECAP: What Is Expertise?

- Ability to make quality judgments from
  - Small amount of data
  - Answers to key questions
  - Short time frame
- Pattern recognition from key details
- Deliberate practice
  - Predict results
  - Track outcome & reconcile with prediction

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I Will Help YOU Solve It

- Two types of delegation
  - Crystallize & codify
  - Form a small team with a shared mission

Effective Delegation

Crystallize & Codify

- Externalize insights
- Formalize approach
- Thought process available for evaluation
  - Basis for self-improvement
- Defined and repeatable process

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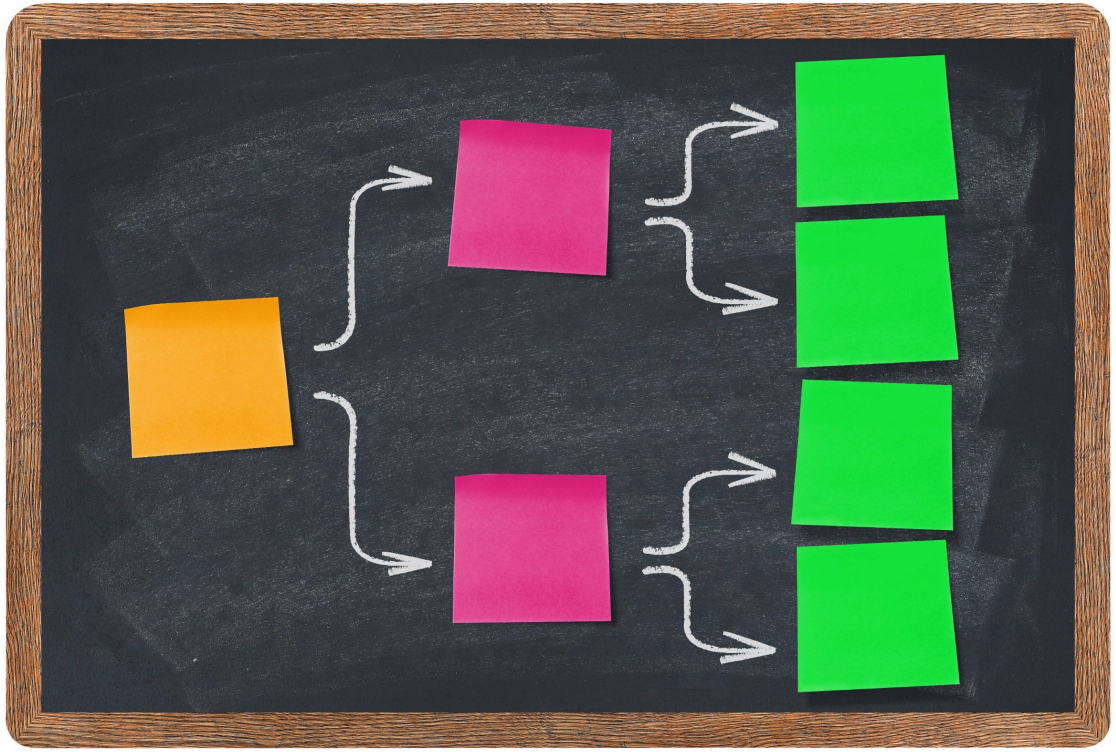
Approaches To Crystallize & Codify

- Structured Observations, Case Studies, Test Cases
- Categories, Rules of Thumb, and Guidelines
- Checklists, Recipes, and Procedures
- Sketches and Diagrams
- Models, Theories, and Analogies
- Software, Spreadsheets, and Simulations

Now That It's Out Of Your Head

- You can have conversations
  - Solicit suggestions for improvement
  - Compare notes with other experts
  - Refine based on broader experience



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Questions For Audience: Crystallize

- How do you capture your expertise?
  - I will jot or sketch on a 3x5 card
- Anyone want to offer an example?

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Two Types of Delegation

- ✓ Crystallize & codify
- ➢ Form a small team with a shared mission

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When the Problem Is Bigger Than One Person

- You need a team
  - Often with several experts
  - Shared mission

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Keys To Forming A Small Team

- A common mission or desired end
- Metrics for measuring progress
- Shared situational awareness
- Each member can link actions to goals

Product Team Example

- One Table / Two-Pizza Meeting
- Need different engineering experts
  - Power, mechanical, software, …
- Engineering is about tradeoffs
  - Cost, performance, development time

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RECAP: I Will Help YOU Solve It

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Effective Delegation

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Individual Expertise vs. Team Decision Making

- Two key differences
  - Trust
  - Shared situational awareness

New challenge:

Blending expertise on a team

Shared Situational Awareness

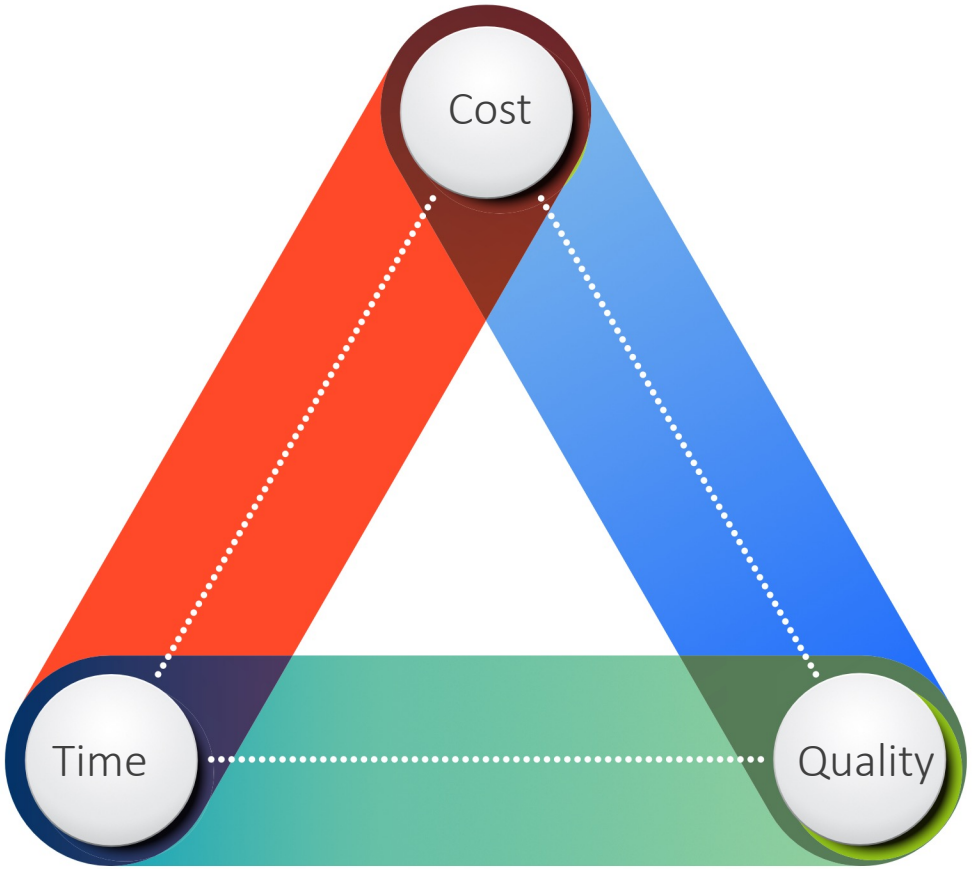
- Requires active communication
- Requires tools and for shared memory

Question for audience

- How you foster active communication?
- What tools do you use for team memory?

Tradeoffs and Constraints

- Budget
- Time
- Performance
- Risk



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Tradeoff and Constraints Example

- Board level design 1982-2024
  - Analog and digital electronics
  - Complex parts -> PAL – > FPGA/ASIC
  - Software
  - Timing megahertz -> gigahertz
  - Thermal: forced air convection -> liquid cool

Each domain needs an expert and the ability to negotiate tradeoffs

Tradeoff and Constraints Stories

- Transform domain specific representation to common language for analysis
- Written code specification vs. mockup
- Isometric drawing vs. 3D printed model

Questions For Audience

- What crises has your team managed?
  - Who were the experts around the table?
  - What constraints were the most important?
  - What constraints were the least important?

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Story: Losing Touch With The "Facts on the Ground" at the Customer

- Expertise is no good without facts
- Major customer sends new RFP
  - With no warning
  - Due in two weeks
- Exec team left largest account on autopilot
  - Account team talked to old contacts
  - But customer had a new leadership team

Always "Go and See"

Questions For Audience

- Have you ever been on a team that lost touch with the “facts on the ground”?
- When your map/dashboard no longer matched what was happening?
- How did you realize it?
- How did you address it?

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Story: Experts Always Have 3 Plans

- A novice follows a recipe
- A journeyman knows a method & variations
- An expert knows many ways
  - Mental model of unfolding situation
  - Defer decisions until “last possible moment” when deferring is a decision
  - Avoid irreversible changes when fixing crisis
  - Start on slow sure expensive path to fix & work to improve

RECAP: Expert Collaboration

- Common language and understanding
  - For constraints
  - For trade-offs
- Every major decision should document
  - How will we tell if this works
  - When will we know?
  - What will we do if it doesn't?

Limits of “I’ll Know It When I See It?”

- Individual expertise
  - Experts can make quality judgments with a small amount of data in a short time
  - They make predictions & update based on results
- Moving beyond personal expertise
  - Crystallize & codify
  - Form small teams with a shared mission
- Effective teams have many experts
- Teamwork requires clarity on facts and hypotheses

We love feedback

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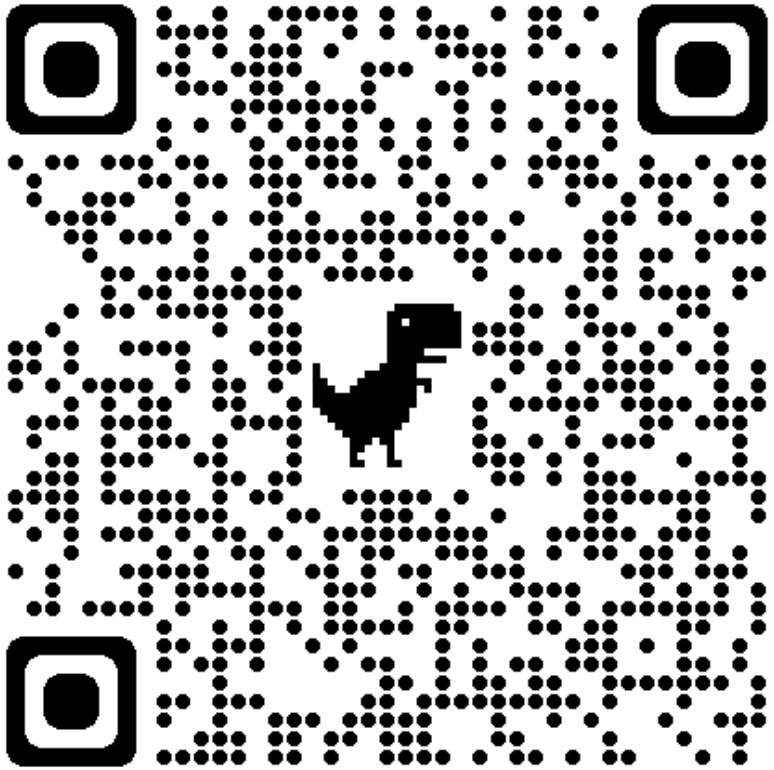

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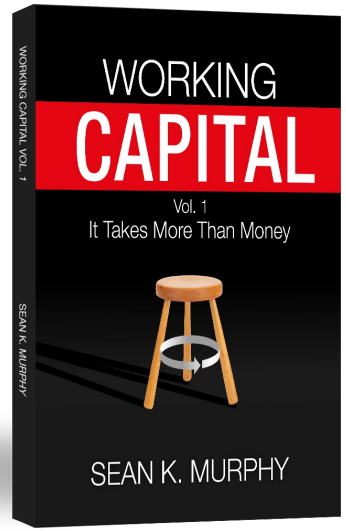

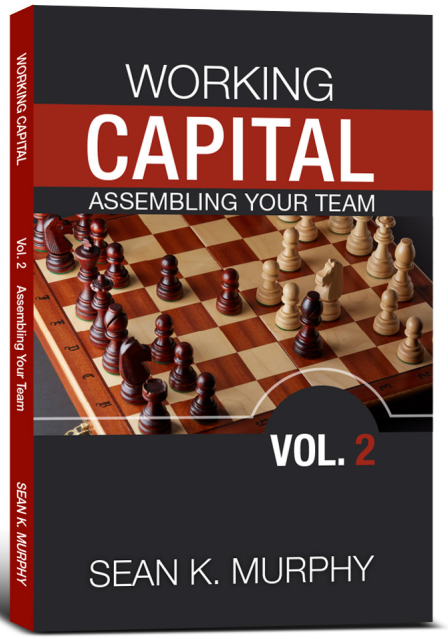

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