

How ExxonMobil Teaches People to Think Like an Expert

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APQC Conference

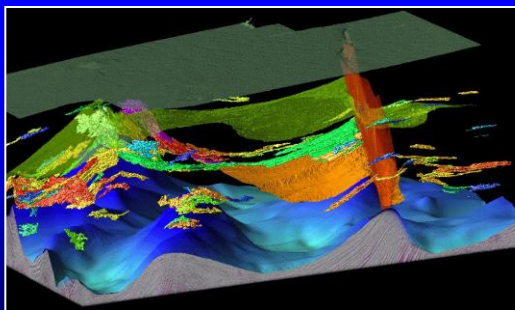
29 April 2010

Purpose

1. Share ExxonMobil's experience with Technical Master Classes
2. Describe the core components
3. Why it works



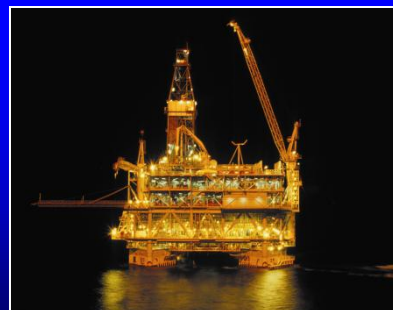
ExxonMobil Upstream



Exploration



Development



Production



*Gas and Power
Marketing*

Upstream Research Company (URC)

URC - Taking a Leadership Role in:

- Developing and globally deploying high impact technologies
- Providing expertise and solutions
- Training the industry's most capable technical workforce



Training Strategy

Strategy

- Develop the industry's premier technical workforce through excellence in knowledge and technology transfer.

Drivers for ExxonMobil's Upstream Training Program

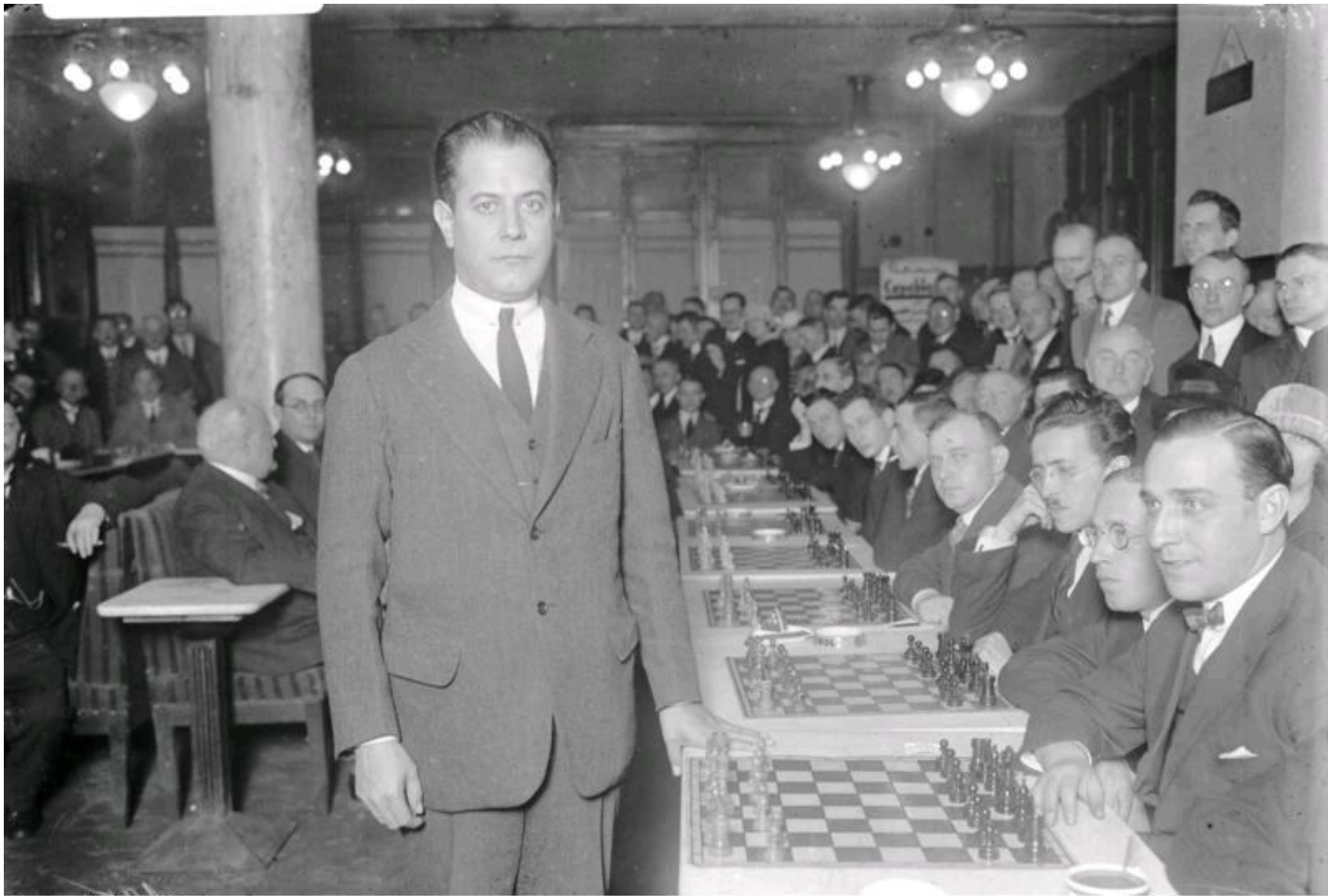
- Overall program: Relevant, high-value employee development programs that drive business success
- Technology Delivery: Linkage of latest proprietary research program to the training program
- Quality: Leveraging ExxonMobil world class experts, proprietary datasets, and training effectiveness capabilities
- Relationships: Training develops relationships between the instructors (the experts) and the students as well as between the students

Steps

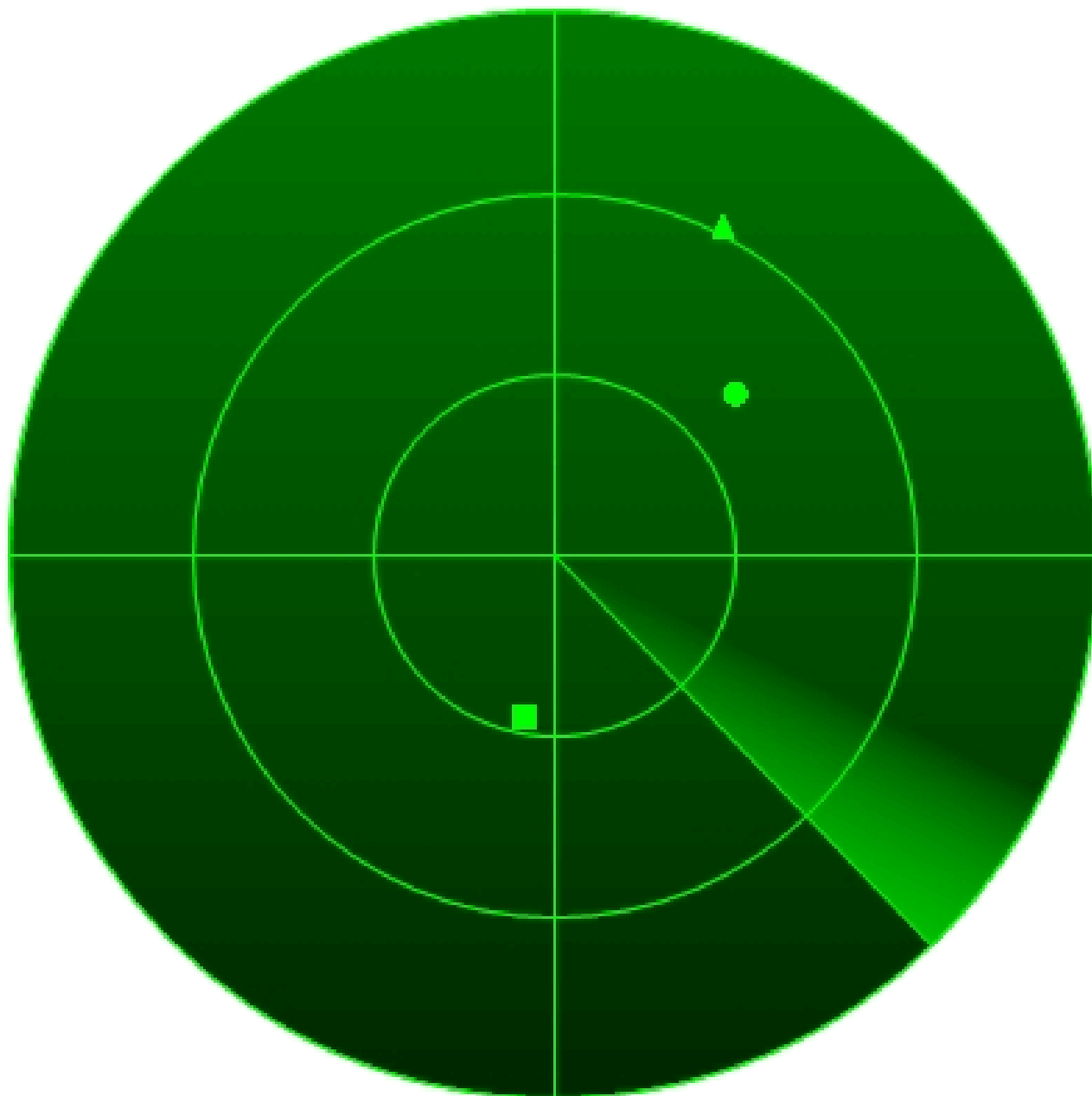
1. Understand why expertise is hard to transfer.
2. Determine how serious the potential expertise loss is for your organization.
3. Decide what tools to use to develop expertise.
 - ❑ Master class
4. Determine your overall strategy for retaining expertise
5. Plan what you need to do to implement an expertise development program

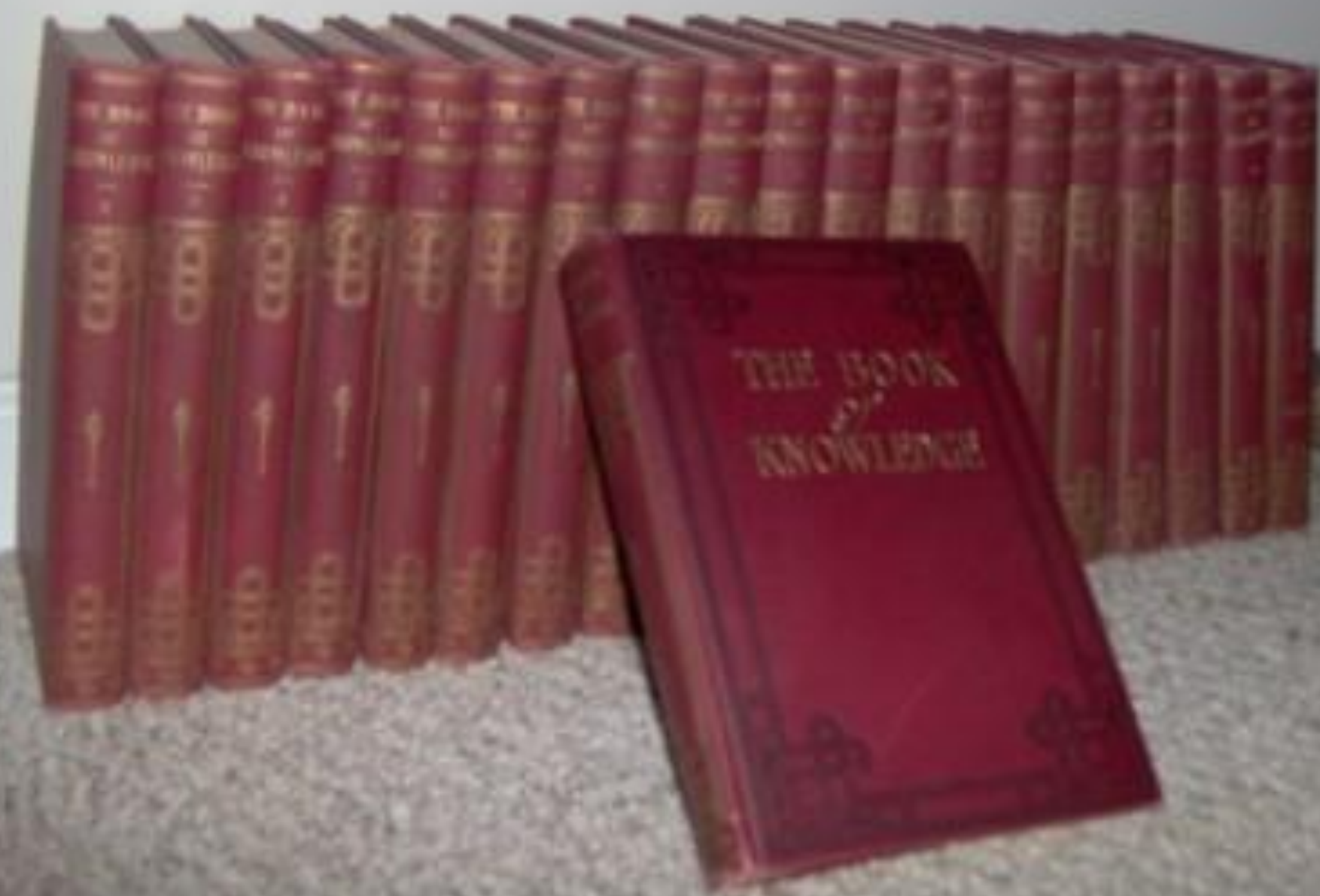
Steps

1. **Understand why is expertise hard to transfer.**
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 - ❑ **Technical master class**
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Foto: o. Ang. | Juni 1929





Why is expertise hard to transfer?



Explicit Library

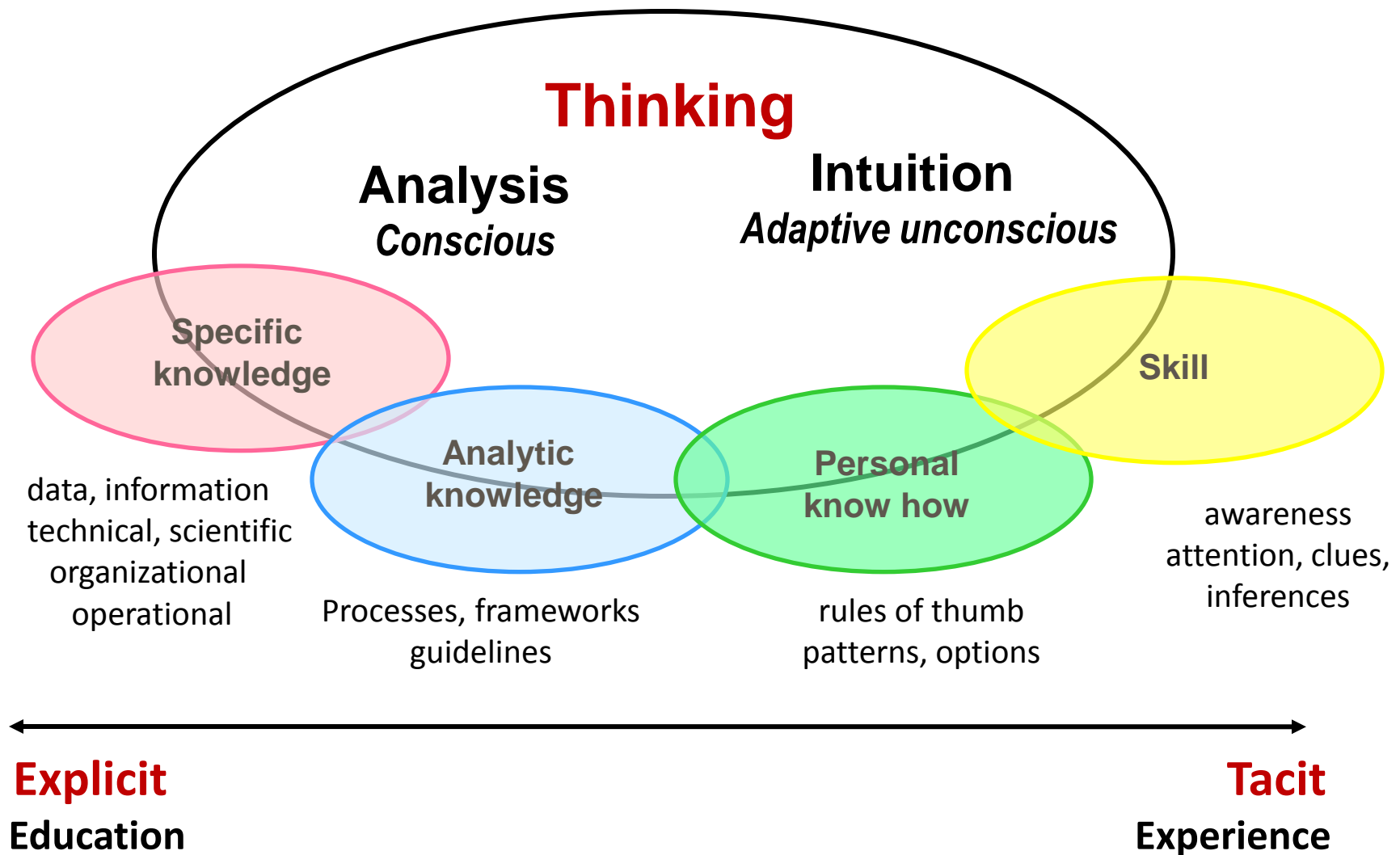
Tacit Personal Network



“In experience there is both
the thought and the
thinking.”

- Pema Chodron

Expertise is Multi-Dimensional



The Intuitive Side of Expertise



“Law is 50% content 50% in the intuition. Intuition always comes from thinking of things from a different point of view.”

– Senior Law Partner

“Mathematics is the form in which we express our understanding of nature, but it is not the content of that understanding.”

– Werner Heisenberg

“When you suddenly see the problem, something happens that you have the answer, before you are able to put it into words. It is done subconsciously.”

– Barbara McClintock, geneticist

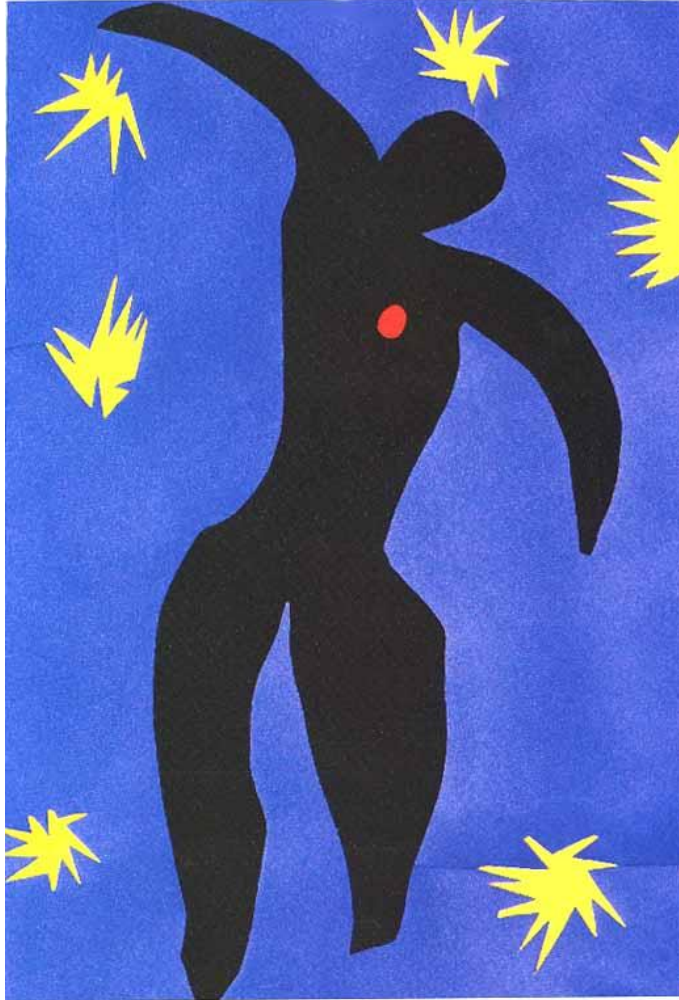
Research:

- ❑ When teaching, experts leave out 30%-50% of what they did.

Sherlock Holmes

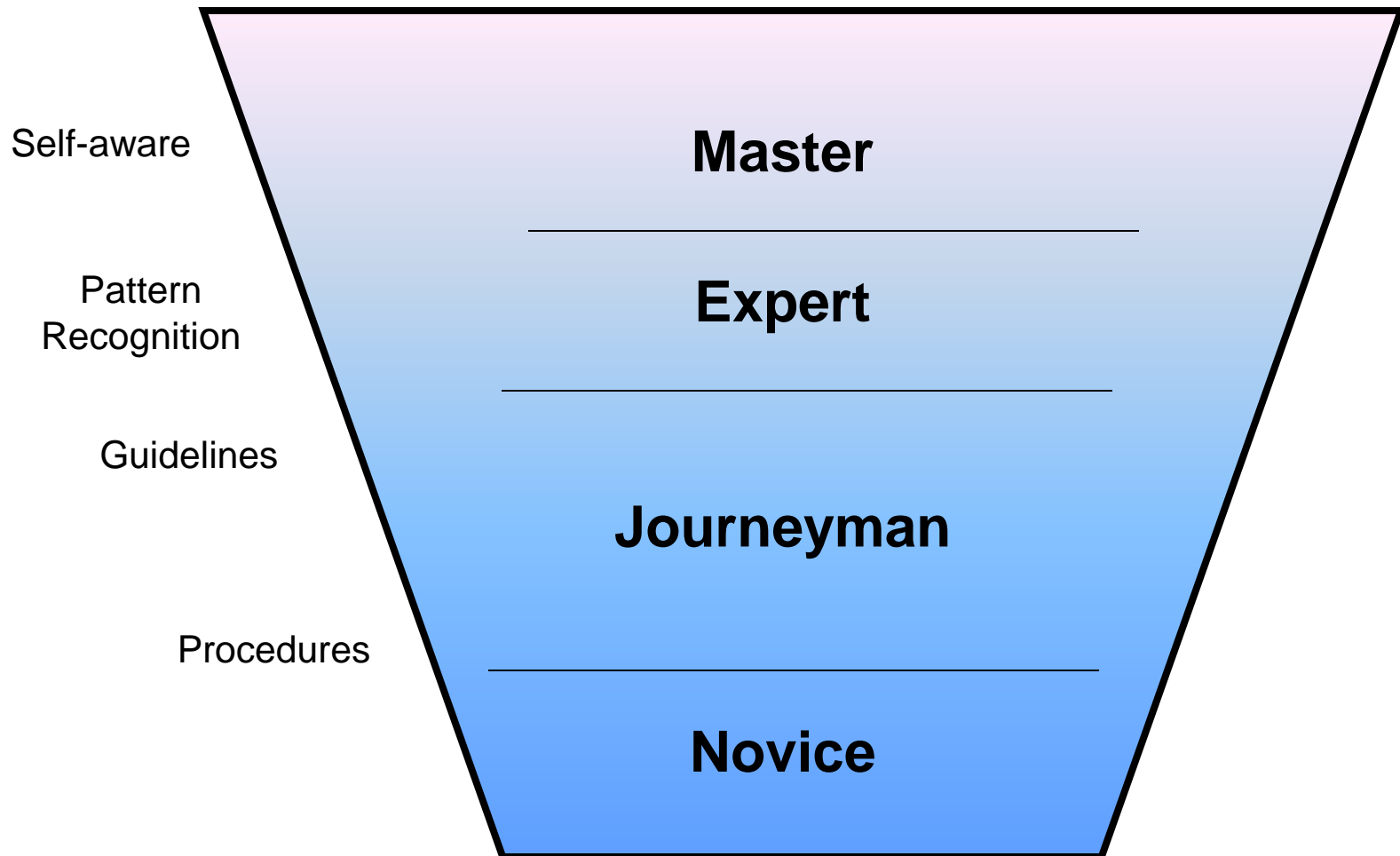


Research on Learning



*The things that are
acquired consciously
permit us to express
ourselves
unconsciously with a
certain richness.
- Henri Matisse*

Developing Expertise is a Shift in Seeing



Deliberate Practice



“Deliberate practice entails sustained efforts to do something you can’t do well. Only by working at what you can’t do can you turn into the expert you want to become.”

– K. Anders Ericsson

Every day I make a little progress
- Paul Cezanne



Technical Master Classes



Henley Business School: Knowledge Retention

13 Public Sector

- Ministry of Defence
- Department of Health
- Audit Commission
- US Army Battle Command
- The Federal Reserve Bank
- Jet Propulsion Laboratory
- Tennessee Valley Authority
- Sandia National Labs
- NASA
- English School System
- The Carbon Trust
- Parliamentary and Health Services Ombudsman

18 Private Sector

- IBM
- Shell Oil
- Boeing
- Mindtree
- Unisys
- MWH
- Hewlett Packard
- Cadbury Schweppes
- Northrop Grumman
- SteikmanElliot
- Hyder
- Taylor Woodrow
- PRP Architects
- GlaxoSmithKline
- Unilever
- Fluor
- Wipro
- Xerox

Thinking Tools for Developing Expertise



- ☐ Technical master classes
- ☐ Cognitive apprenticeships
- ☐ Simulations & mini-simulations

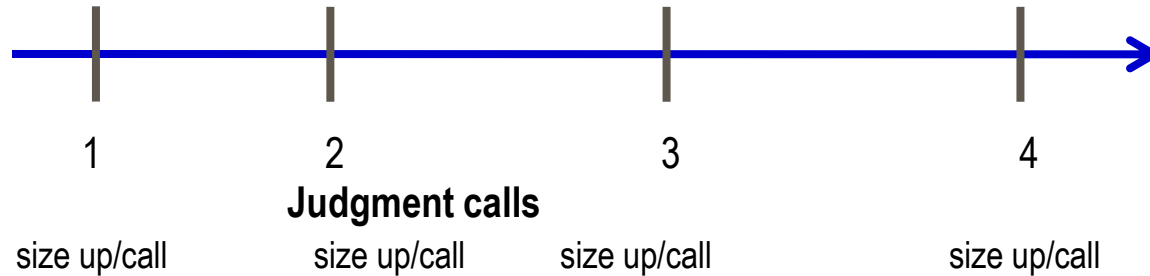
Deliverable: Increase the repertoire of learner

Master Class



Master Class: Case - Based Learning

- Focus on decision points that require judgment.



- Learning objectives
- Background
- Information/data
- Pressures



What Happens in a Master Class

- ☐ Orient learners

- ☐ Case 1:

 - ☐ Expert describes background & dilemma

 - ☐ Explore the situation

 - ☐ Make a judgment call

 - ☐ Joint reflection on learning

- ☐ Case 2 & subsequent:

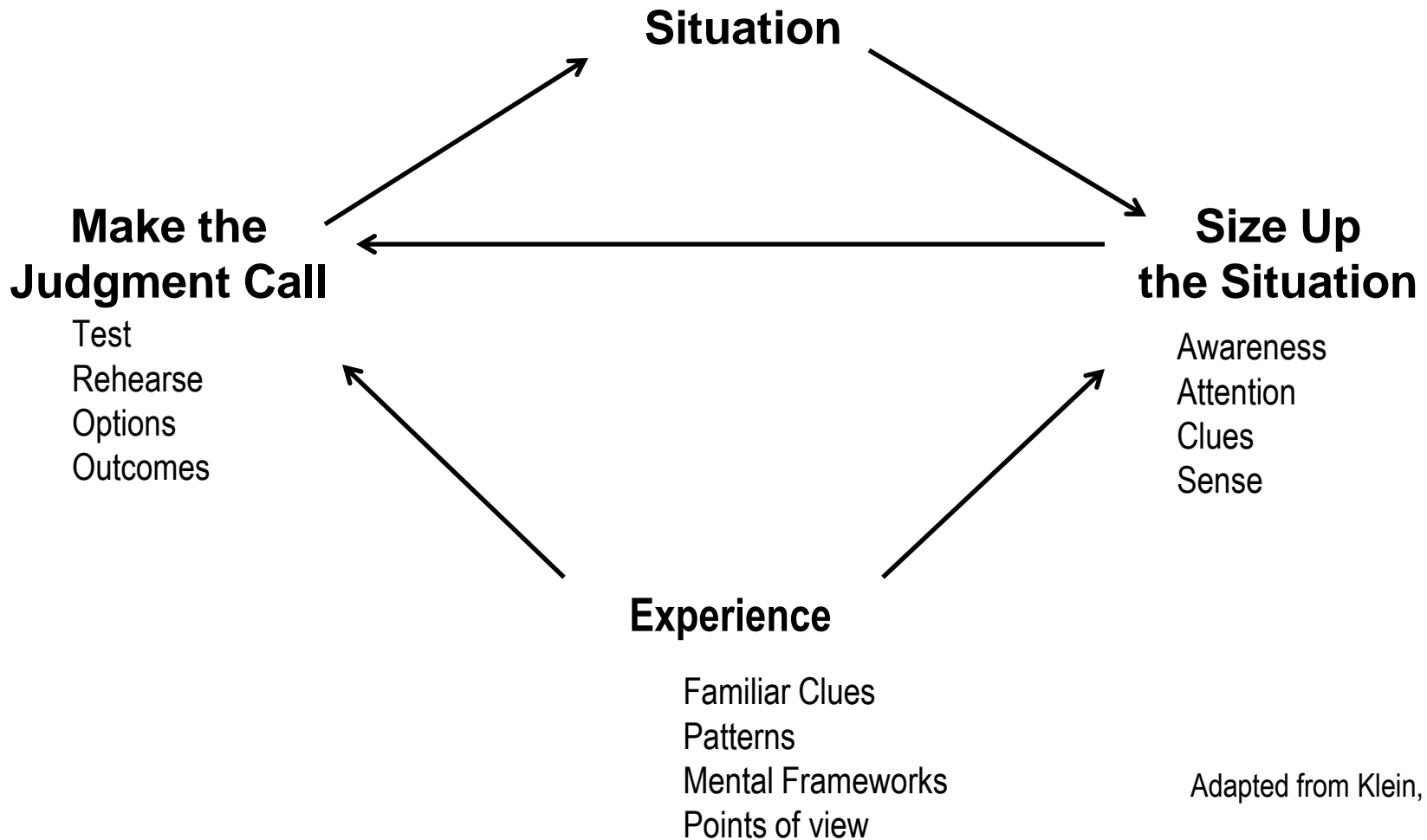
 - ☐ Expert describes background & dilemma

 - ☐ Learners think through the situation, expert coaches

 - ☐ Expert describes experiences related to the case

 - ☐ Joint reflection on learning

Judgment Calls



Decision Point: Sizing up

Climb into the experience of the expert – what he/she sees

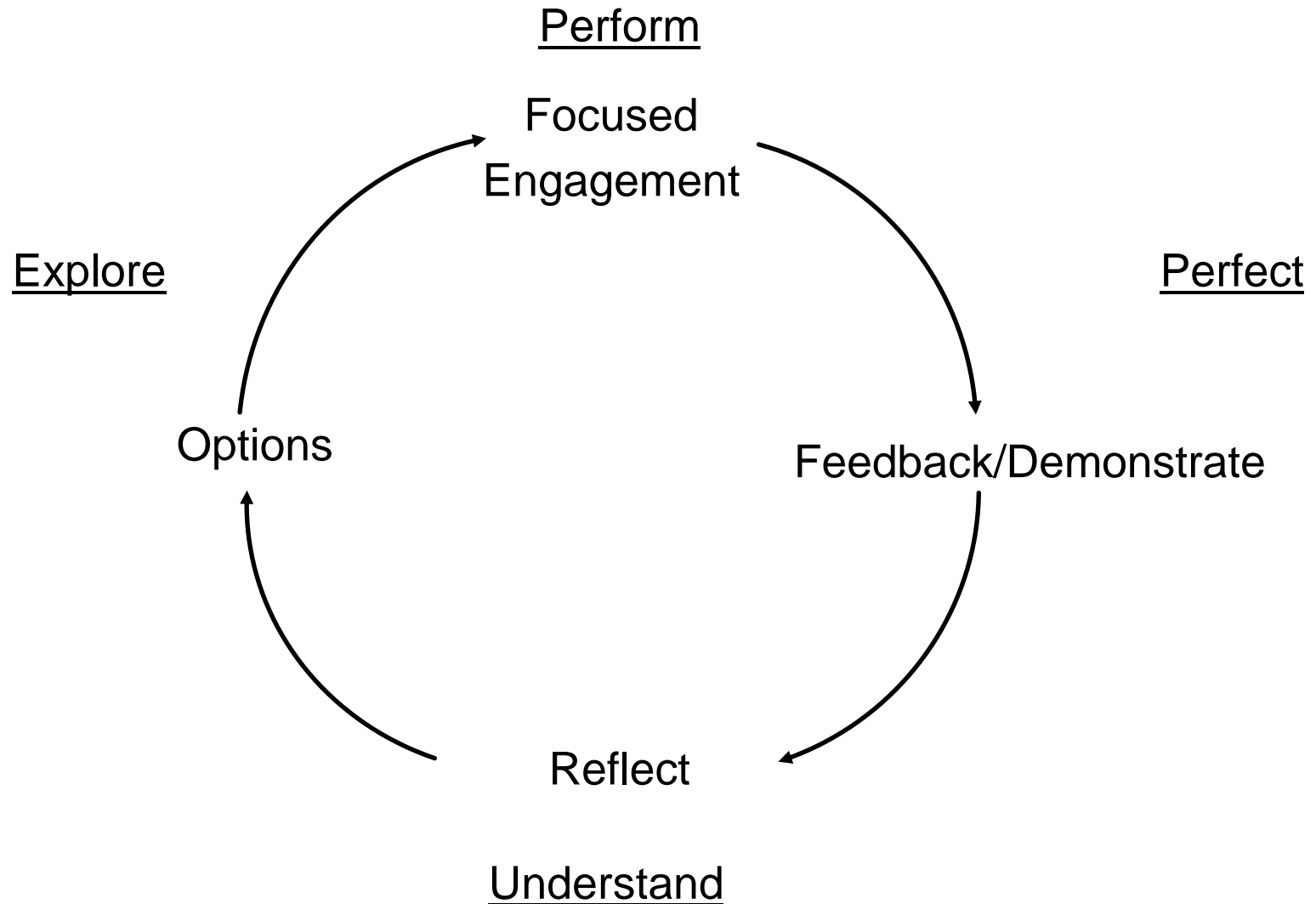
- ☐ **Awareness:** What was happening?
- ☐ **Intention:** Do you have a specific goal or aim?
- ☐ **Attention:** Data & information examined, who did you talk to? What concerned or looking for?
- ☐ **Clues, noise & patterns:** What larger patterns do you see, what does this remind you of?
- ☐ **Experience:** What other situations come to mind?
- ☐ **Points of view:** what points of view are you looking at the situation from?
- ☐ **Inference:** What do you suppose is going on?

Master Class: Making the Call

How do you make the judgment call on what to do?

- ☐ **Attention:** Gut sense?
- ☐ **Perspectives:** Which do you consider?
- ☐ **Considerations:** Business, technical, organizational?
- ☐ **Pressure:** What time and other pressures?
- ☐ **Options:** Do you think through different ones?
- ☐ **Experience:** Any you draw from?
- ☐ **Risk:** What could go wrong?
- ☐ **Rehearsal:** Do you think through different options?
- ☐ **Choice:** What would you do?
- ☐ **Test:** How do you plan to monitor the outcome?

How a Technical Master Class Works



Skills to Teach Expertise

Spontaneous Think Aloud

- ❑ Research: Forget 50%, don't do things in logical order
- ❑ Source: Cognitive science
- ❑ Restrictions: Expert needs to talk without much editing
Some people just can't talk and think simultaneously
- ❑ Aids: prompts, data, inquiry from learners, facilitator questioning

Skills to Teach Expertise

Socratic Coaching

- ❑ Research:
 - ❑ Questions to explore how someone thinks
 - ❑ Clues, relationships and patterns
- ❑ Source: Cognitive Task Analysis & Foundation for Critical Thinking
- ❑ Restrictions: live, not rehearsed
- ❑ Aids: facilitator guidance, questions from learners, prompts, data

Experts' Tips on Teaching Expertise

- ❑ **Entice learners think.** Ask, don't tell.
- ❑ **Help learners make new links.** They, not you, have to make the connections.
- ❑ **Pass on a point of view.** Show them how you think.
- ❑ **Challenge them to understand.** Help learners understand the principles, why something is happening.
- ❑ **Move at learners' pace.** Give them space and time to think.
- ❑ **Encourage learners to collaborate.** Their interaction is part of learning.
- ❑ **Listen to the learners and yourself.** Make sure you aren't telling them what they already know.
- ❑ **Cultivate learners' enjoyment.** Your inspiration is contagious.

An Expertise Transfer Strategy Includes:

1. Assessment of the problem and its urgency
2. The topics, experts, learners
3. The combination of methods & logic behind using them
4. Management/stakeholder engagement plan
5. The support structure
6. High-level implementation plan

Retaining Expertise

Do's

- ☐ Customize approach to your organization
- ☐ Create opportunities for practice
- ☐ Insist on real learning
- ☐ Start soon – transfer takes time

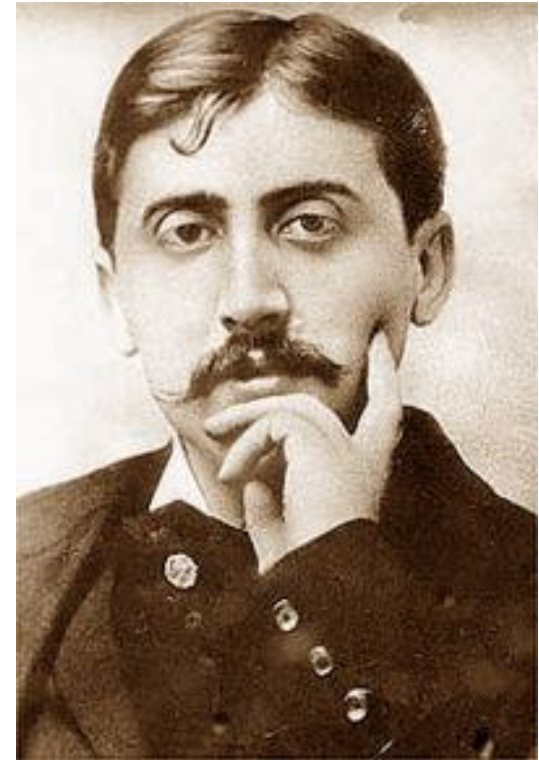
Don'ts

- ☐ Confuse specific & analytic knowledge with expertise
- ☐ Ask experts to tell good stories
- ☐ Focus on IT tools
- ☐ Collect insights before you know how you will use them

Personal: Learn a new skill. Ground your insight in experience.

“We don’t receive wisdom. We must discover it for ourselves after a journey no one can take for us or spare us, for it is a point of view about things.”

- Marcel Proust



Thank you

Articles:

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