PRINCIPLES BEFORE PRACTICES

HOW TO TRANSFORM YOUR TESTING PRACTICES WITH BASIC AND ADVANCED PRINCIPLES

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A LITTLE BACKGROUND

- **Many years ago, I heard a great analogy about conveying and applying knowledge.**
- **If I were to teach someone how to wash dishes, I could:**
  - Teach all the variations needed for every type of dish, cookware and utensil, or…
  - I could teach principles and let the person adapt the methods to whatever they needed to wash.

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THINGS LIKE...

- Rinse off the big foodstuff first.
- Save the really messy dishes until the end so you don't get everything else in the sink messy too.
- Use hot water, but not too hot or else you will scald yourself.
- Be careful with sharp knives in sudsy water…

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SIMILARLY, IN TESTING...

- Take some sample tests early and find where the big problem areas seem to be.
- Don't test the really complex areas at first. Get your bearings first.
- Have strong tests, but if you make every test strong, you may not have time to finish.
- Early testing is good, expect when the thing you are testing isn't ready even for early testing.
- Test automation is not automatic.

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COMMON QUESTIONS

- **Which tools do we use in certain situations?**
- **Which techniques are "best" for a project?**
- **How do we adjust tools and techniques?**

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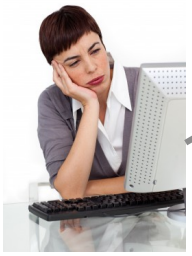
WHAT WE WANT



No Knowledge

1 week

Mastery

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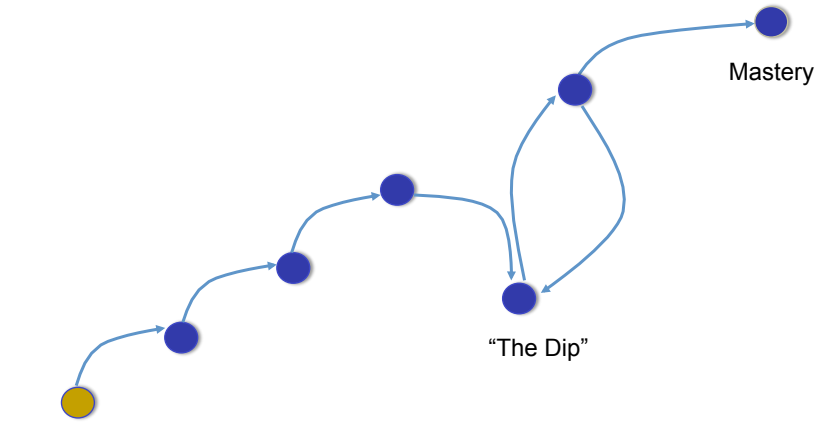
REALISTIC VIEW



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TESTING IS VERY NUANCED

- **There are small to large variables on any project that require you to:**
  - Select certain techniques
  - Apply a technique differently
- **In essence, testing is context-driven**
  - Which is one of the "Big 7" principles

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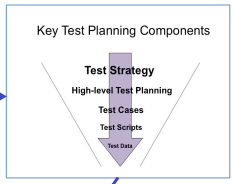
FROM CLASSROOM TO PRACTICE

Learning Objectives

Instruction



Visual Aids

Exercises

Retention

Application

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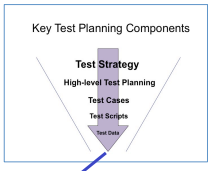
BUT, IT GETS WORSE

Learning Objectives

Instruction



Visual Aids

Exercises

Retention for multiple people

Application by multiple people

Passage of time. Needs change, organizations change

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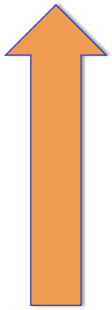
WHY?

- **Let's look at the lowest four levels of the Bloom Taxonomy:**



K4 (Analyze) - Assimilate
K3 (Do) - Practices
K2 (Understand) – Principles, concepts, theory
K1 (Remember) - Facts

4 Foundation learning objectives

The great majority of Foundation Level learning objectives

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7 GENERAL TESTING PRINCIPLES

- **Testing shows the presence of defects**
- **Exhaustive testing is impossible**
- **Early testing**
- **Defect clustering**
- **Pesticide paradox**
- **Testing is context dependent**
- **Absence-of-errors fallacy**

Source: ISTQB Foundation Level Syllabus

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THERE ARE MANY OTHER IMPLICIT PRINCIPLES

- **Not every failure is a defect.**
- **Not every test can or should be automated.**
- **Test automation doesn't replace the need for manual testing**
- **It doesn't matter how good your test is, if you are testing the wrong version.**

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CLIMBING K2

- **People normally dislike this level of learning.**
  - Conceptual
  - Theoretical
  - Hands-off
  - Requires deeper understanding
  - Takes longer to build the basis of understanding

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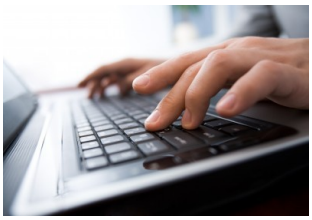
ANOTHER CHALLENGE

- **"Just show us how to use the tool."**
  - The students
- **"We want a course with all practical application and little or no theory."**
  - Management



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A LITTLE TIME GOES BY…

- **"We don't know really get how to design tests for our applications. We just learned on the case study example."**
  - Students
- **"The students passed the exam but we are still struggling in how to implement the techniques."**
  - Management

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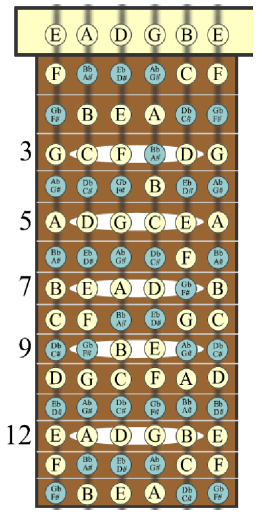
AN EXAMPLE FROM MUSIC

- **It is possible to learn to play an instrument from mimicking someone else.**
  - The Suzuki Method
  - However, you are able to play only specific songs.
- **Professional musicians, even many rock stars, understand music theory!**
  - Blues, heavy metal and other styles are all based on different types of scales and tunings.



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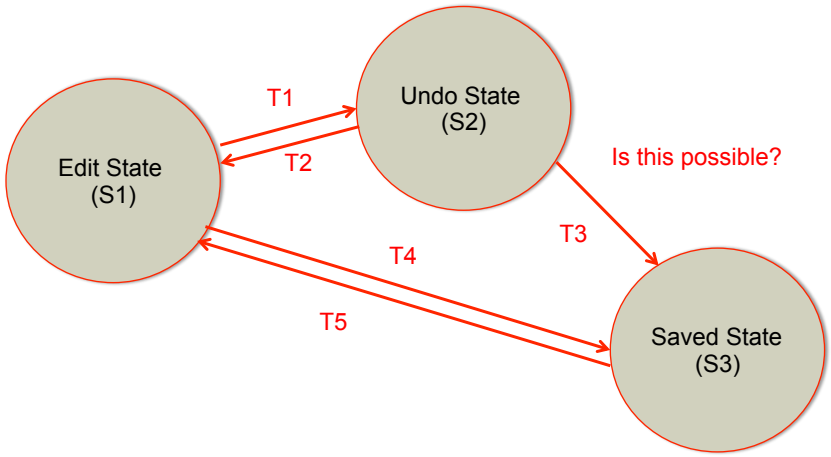
TWO EXAMPLES

EXAMPLE 1 – STATE TRANSITION TESTING

- **Key Principles**
  - Used when there are finite, identifiable "states" of operation or behavior.
    - Defined in a state-transition model
  - Finds defects when:
    - Transition(s) between states are incorrect
    - State behavior is incorrect
    - The S-T model is incorrect
  - *Primarily* used with interactive and transactional applications, but can be used with batch applications as well.
  - This is not the "front line" of testing, but can reveal some deeper defects.

AN UNDO FUNCTION

- **Let's say we are testing an application with an "undo" function.**



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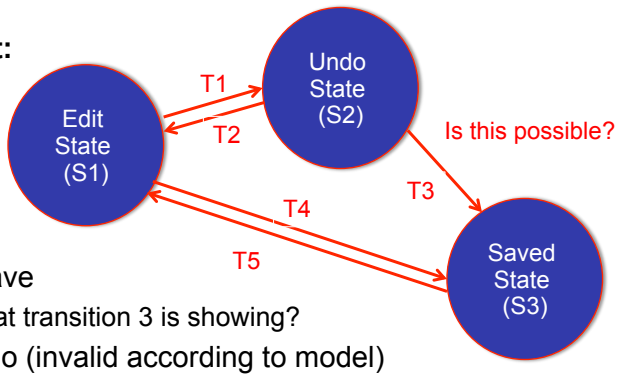
HOW TO APPLY

- **We will certainly test:**
  - Edit functions
  - Undo function
  - Save function
- **But what about?:**
  - Edit, Undo, then Save
    - Is that really what transition 3 is showing?
  - Edit, Save, the Undo (invalid according to model)
  - Edit, Save, Edit, Undo, then Save
  - Edit, then multiple undo actions
  - Undo action without any edits



This is the practice level!

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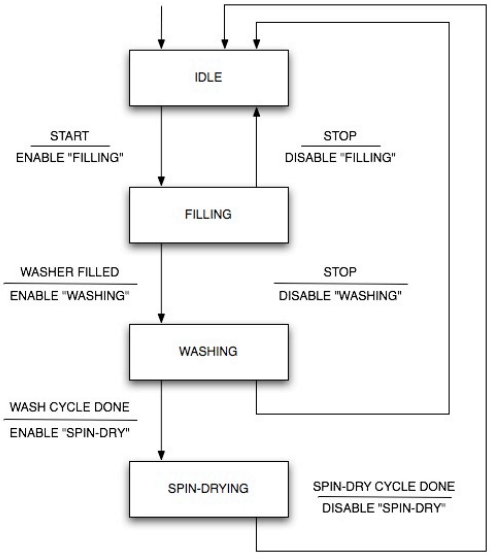
SIMPLE EXAMPLE



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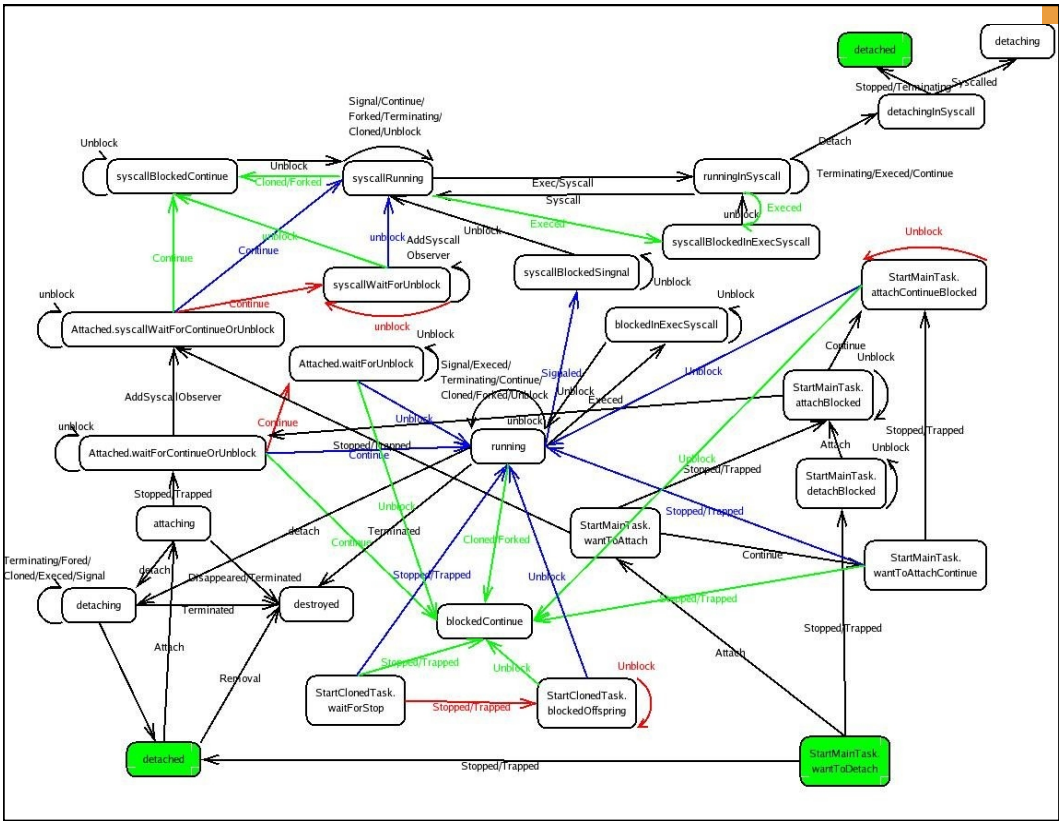
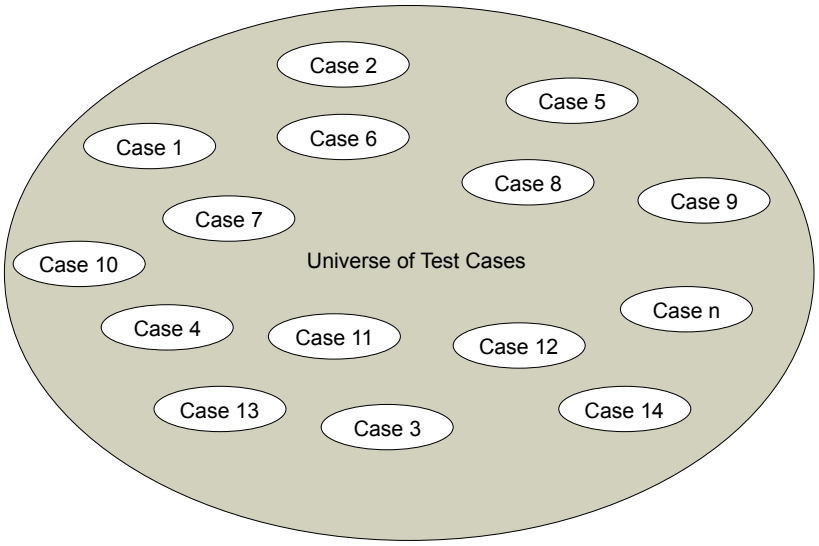


EXAMPLE #2 – RISK-BASED TESTING

- **Key Principles**
  - Used when you can't test the basic layer of functionality and/or when you need to prioritize testing to meet delivery schedules
  - The higher the risk, the more intense the test should be
  - Helps by:
    - Focusing on areas that might experience high levels of loss
    - Giving lesser attention to trivial or less important functions
    - Tracing and mitigating risks identified during testing
  - Can be used in just about any application as long as you are able to intelligently identify and measure risk.
  - It is possible to miss some risks and some defects.
    - Risk is a possibility, not a certainty
    - Our knowledge is limited
    - Some things will likely not get tested

CONSIDER THE FOLLOWING



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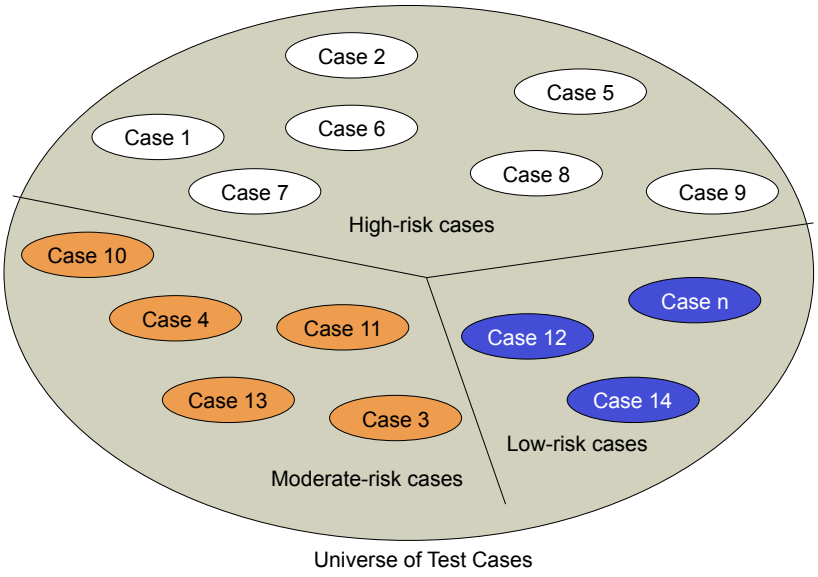
THE TEST CASE UNIVERSE SEGMENTED BY RISK



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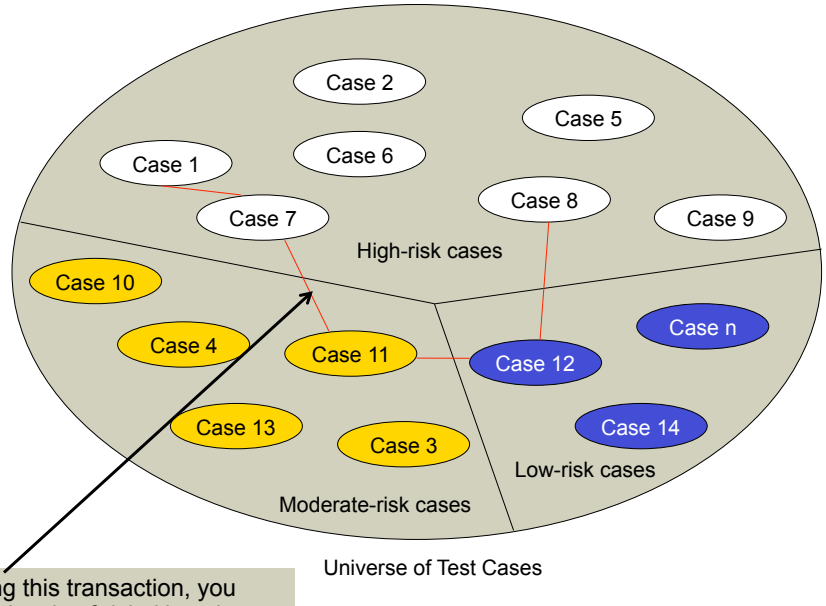
TEST CASES THAT SPAN RISK LEVELS



In testing this transaction, you span all levels of risk. How do you prioritize risk in this scenario?

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HOW TO APPLY

- **At various levels:**
  - Product risk
    - Functional risk
    - Attribute risk – Usability, performance, etc.
  - Project risk
- **But what about?:**
  - Residual risks
  - Safety critical (when everything is a "high" risk)
  - When risks are:
    - Difficult to identify
    - Change often
    - Are an excuse for reduced testing
    - Difficult to mitigate and track

This is the practice level!

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A TIP TO HELP IDENTIFY YOUR PRACTICES

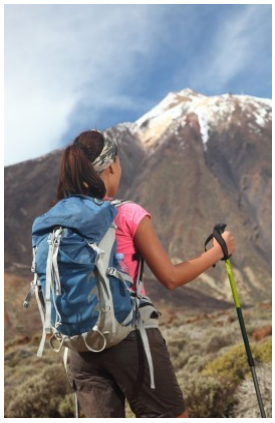
Area/Principles	Implications
Test Automation • You can't automate everything • Automation doesn't replace people • The ROI of test automation is repetition	• Select tests carefully to automate • Consider which skills will need to be built • To get payback, start with simple tests that are performed a lot.
Test Design • Test conditions form the basis of test cases • Many things can serve as a basis for test design, including experience	• Before writing test cases, have a smart way to identify test conditions. • If you don't have a good written basis for testing, you can create one.
Test Evaluation • If you can't observe the outcome of a test, you can't evaluate it • Testing is measurement	• If we can't define a way to see, report, or measure the outcome of a test, it does little good to plan it. • Since measurement of something (defects, performance, etc.) is the deliverable of testing, we should do it well.

HOW TO GAIN UNDERSTANDING

GOING FROM PRINCIPLE TO PRACTICES

A FEW EXPECTATIONS

- **This is not easy, automatic or instant**
- **This is a mental process more than anything else**
- **This is also the result of practice and experience**
- **This is not a classroom deliverable**
- **Mentoring and coaching can help you see blind spots, but they can't make you change.**



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WHAT *REALLY* HAPPENS

Instructor says, "Do it like this…"

You say…"OK"
But think, "I'm not so sure" or
"I like my way better."

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However, I know I need to improve my game. (I think)

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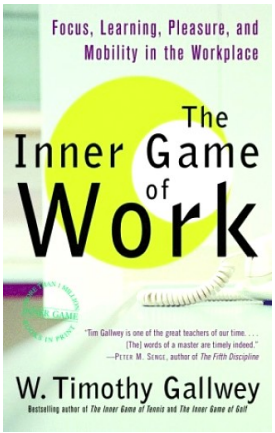
ACTUALLY, THAT'S FINE

- **Each of us know internally the way we work best.**
- **An external coach can provide tips and advice, but you know what works for you.**
- **A great resource for this is the series, "The Inner Game" by Timothy Gallwey.**



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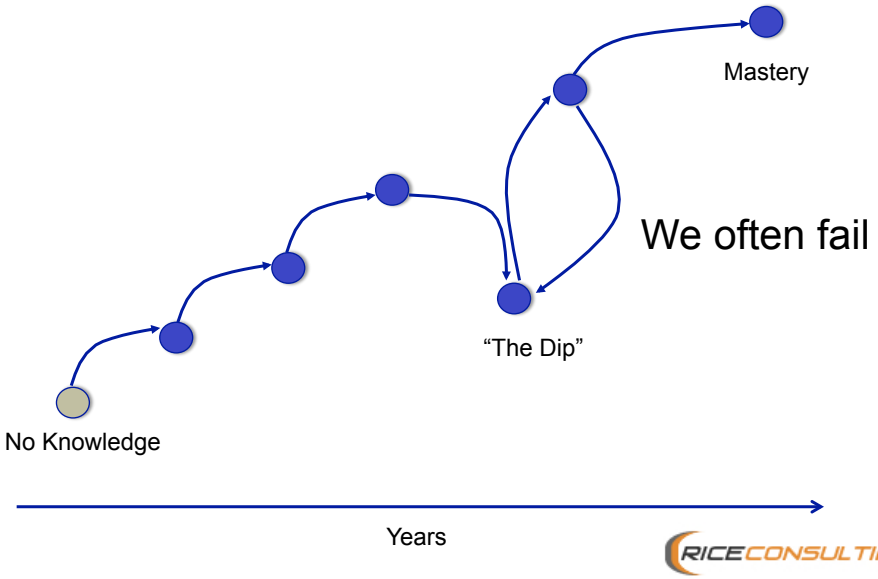
WHAT WE ARE TALKING ABOUT IS *CHANGE*



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COMPETENCE LEVELS

	Competence	Incompetence
Conscious	Conscious Competence #3	Conscious Incompetence #2
Unconscious	Unconscious Competence #4	Unconscious Incompetence #1

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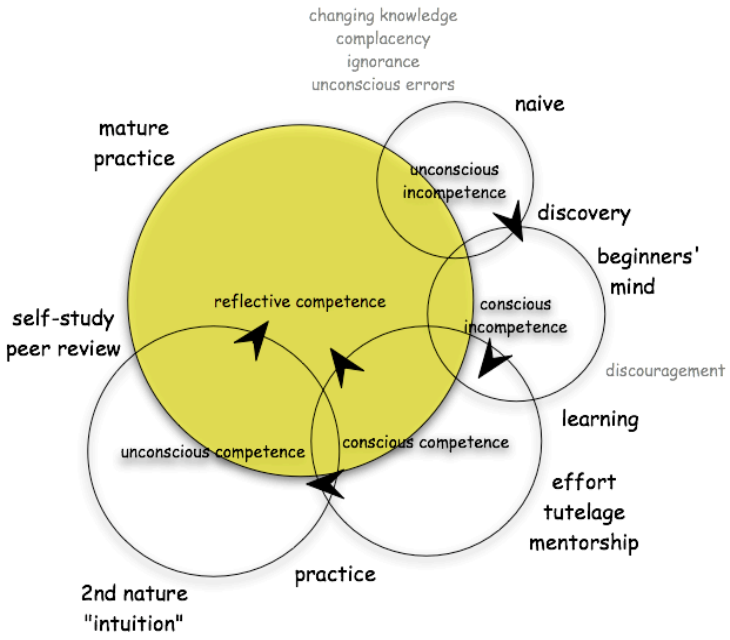

Source: Will Taylor

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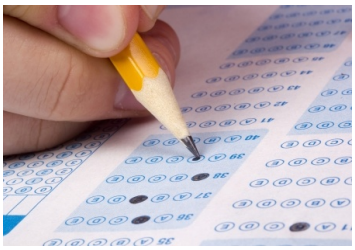
IN TAKING EXAMS

- **Don't overthink the questions.**
  - Read it carefully and think it through, but don't go back and forth too much on one question.
- **Don't rely on practice exams.**
  - They can be HUGELY misleading.
  - Instead, ask "Can I demonstrate the learning objectives?"
    - They are all clearly identified in the syllabi.
- **Read the book "Choke".**
  - It explains why we get all flustered and don't do well on exams.



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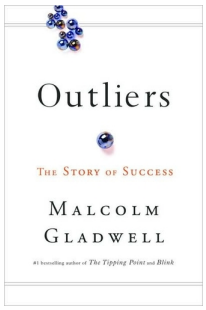
IMPLEMENTING PRACTICES

- **Pilot projects are great.**
  - Learn in the small before going to the larger scale
- **Use the "planned organic" approach**
- **Have senior management support**
- **Let others copy your success!**

FINAL THOUGHT

- **"the 10,000hr rule is a definite key in success"**
  — Malcolm Gladwell, *Outliers: The Story of Success*



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BIO - RANDALL W. RICE

- Over 35 years experience in building and testing information systems in a variety of industries and technical environments
- ASTQB Certified Tester – Foundation level, Advanced level (Full)
- Director, American Software Testing Qualification Board (ASTQB)
- Chairperson, 1995 - 2000 QAI's annual software testing conference
- Co-author with William E. Perry, *Surviving the Top Ten Challenges of Software Testing* and *Testing Dirty Systems*

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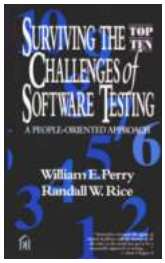

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