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Keynote
Wednesday, May 2nd, 2018
8:30 AM

Transformation from QA to Engineering: Testing in the Fast Lane

Presented by:

Jennifer Scandariato

iCIMS

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Jennifer Scandariato

iCIMS

Jennifer Scandariato is the director of test engineering and leads the Women in Technology initiative at iCIMS, the leading provider of innovative software-as-a-service talent acquisition solutions. Jennifer has more than twenty-one years of experience developing technical solutions to drive growth and profitability while increasing customer satisfaction through high quality and overall engineering effectiveness. She is a frequent keynote speaker at schools, as well as women and leadership conferences in the New York metropolitan area.

Transform your Team from QA to Test Engineering
Testing in the Fast Lane

Jennifer Scandariato
Senior Director, Cloud Services iCIMS

@JScan

Introduction

@JScan

Jennifer Scandariato

iCIMS, Inc.

- Senior Director, Cloud Services *(previously Director of Test Engineering)*
- Currently leading all Enterprise Architecture, Engineering, Data Governance, Administration, Business Relationship Management, Data Analytics
- President & Lead WIT community & initiative
- 24+ years of experience developing technical solutions and engineering effectiveness
- Passionate supporter of economic empowerment, environmental causes, and advocate for women in technology

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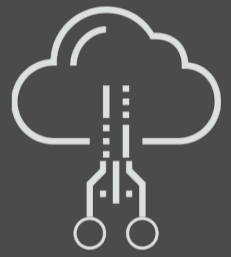
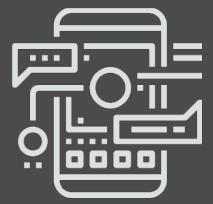
icims

Enterprise Technologies Cloud Services



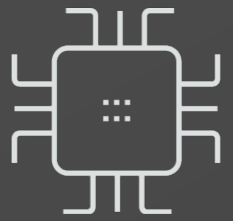
Enterprise Cloud Technologies

Fully in the Cloud and adoption of Cloud native technologies



Architecture & Engineering

Databases, software capabilities, applications, etc. engineered to leverage the power of **cloud** resources to solve business problems



Data Governance

Data management of all the data which an organization has to ensure that high data quality exists throughout the complete lifecycle of the data

Data Analytics & Decision Support

Visibility into business metrics using Enterprise Systems and moving toward predictive analytics

System Administration & Monitoring

Administration and discipline as a practice designed to help IT professionals escape the short-term, reactive nature and become more proactive and strategic

Business Change Management & BRM

Capture and govern processes, deliver new system capabilities, transformation of the **business**, and embed **change** in many functional groups with the goal of achieving program benefits

Topics

- Introduce iCIMS (who are we)
- Labs – what we do!
- The testing landscape at iCIMS
- Challenges around test automation
- The need to transform
- Our transformation journey
- The results we achieved

About iCIMS

- 17 years in business | ~650 Employees | 3,500+ Customers | $150M + ARR
- Acquisitions include **JobMagic** for social recruiting (2012) and **TextRecruit** (2018) for text recruiting and artificial intelligence
- Growing Organically and *3x Faster* than the Overall Market
- **#1 Best-of-Breed Provider** and #2 in Overall Market Share
- Dozens of *Fortune* 500 clients
- **Financially strong**: committed to balancing both growth and long-term stability.
- **Global**: iCIMS technology supports 1.8 million global users each year across more than 70 countries around the globe
- **Our Promise:** no one works harder than iCIMS at delivering a phenomenal customer experience.

Best Places to Work 2015 glassdoor

ANITA B.ORG TOP COMPANIES for WOMEN TECHNOLOGISTS /17 LEADERSHIP INDEX

ANITA B.ORG TOP COMPANIES for WOMEN TECHNOLOGISTS /17 CHANGE ALLIANCE

NJBIZ Best Places to Work NJ 2017

6 consecutive years

Inc. 5000

11 consecutive years

2017 STEVIE SILVER WINNER FOR SALES & CUSTOMER SERVICE

2016 SILVER STEVIE WINNER AMERICAN BUSINESS AWARDS

Best in Biz 2016 AWARDS 6th annual WINNER

HRO TODAY Baker's Dozen Customer Satisfaction Ratings TALENT MANAGEMENT SOFTWARE 2016 Winner

2016 WINNER FAST50 A PROGRAM OF NJBIZ CELEBRATING THE DYNAMIC GROWTH OF NEW JERSEY COMPANIES

8 consecutive years

Deloitte. Technology Fast 500™

4 consecutive years

Forbes 2017 THE Cloud100 WORLD'S BEST CLOUD COMPANIES BESSEMER VENTURE PARTNERS salesforce ventures

2 consecutive years

Enterprise Customers

Southwest

"We knew we wanted something that was specifically focused on recruiting, so there was never a question on selecting best-of-breed over an HCM suite provider."

icims

Journey at iCIMS

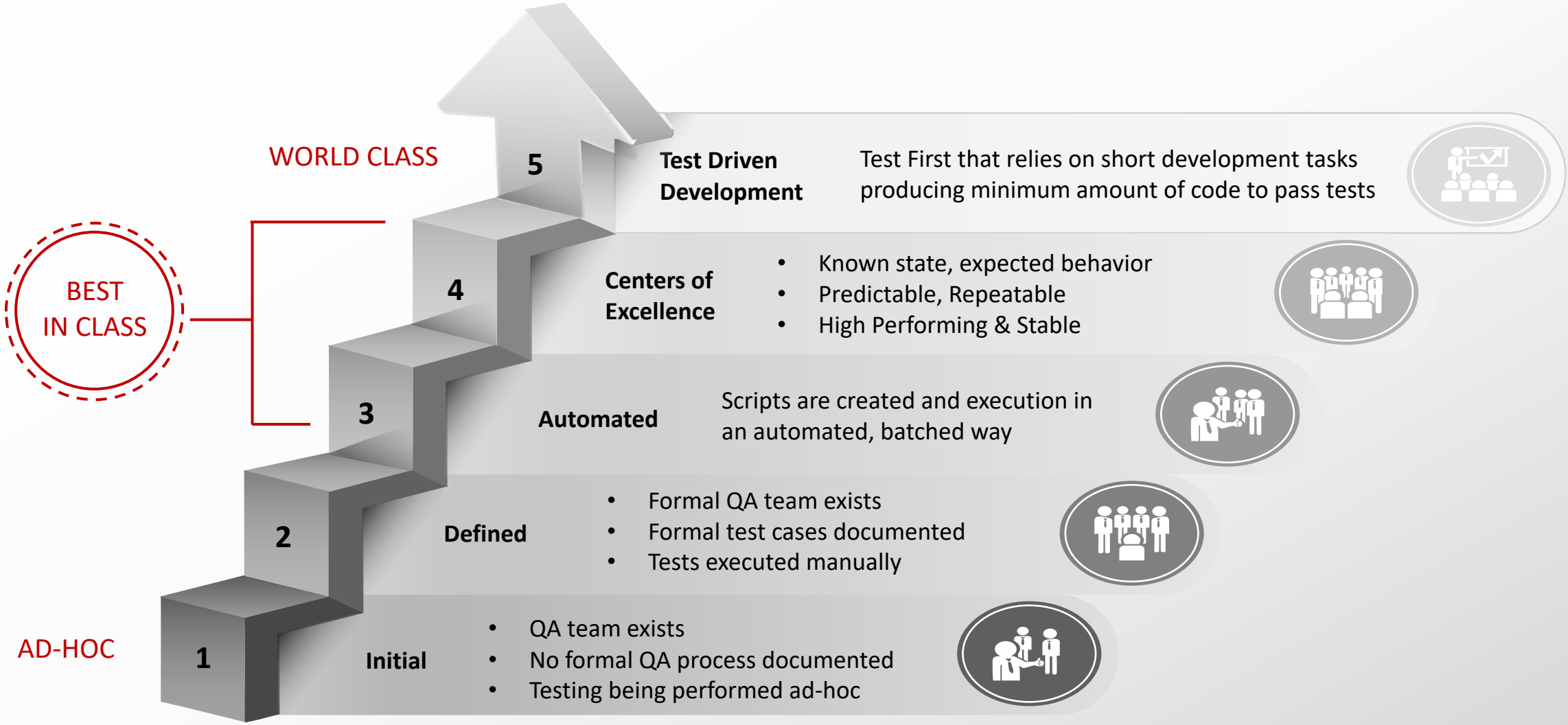
2015
Stabilize and Mature QA

2016
'Shift Left' & CoE

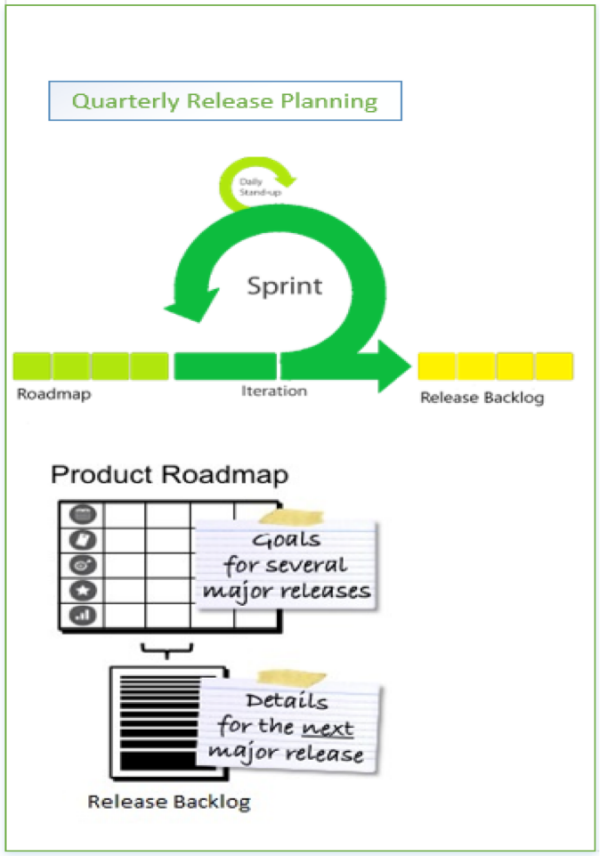
2017
Transformation
(QA -> Test Engineering)

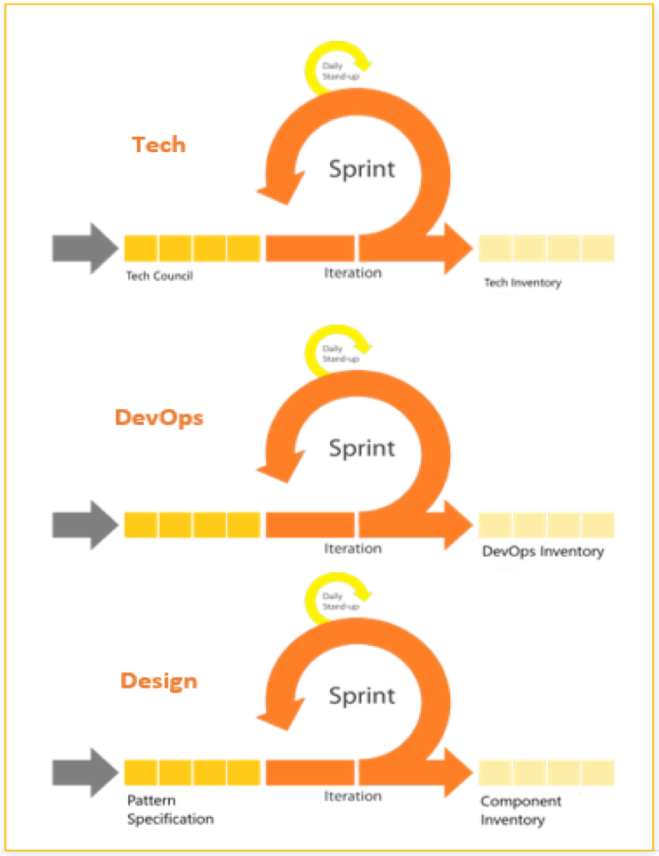
2018
Agility & Acceleration

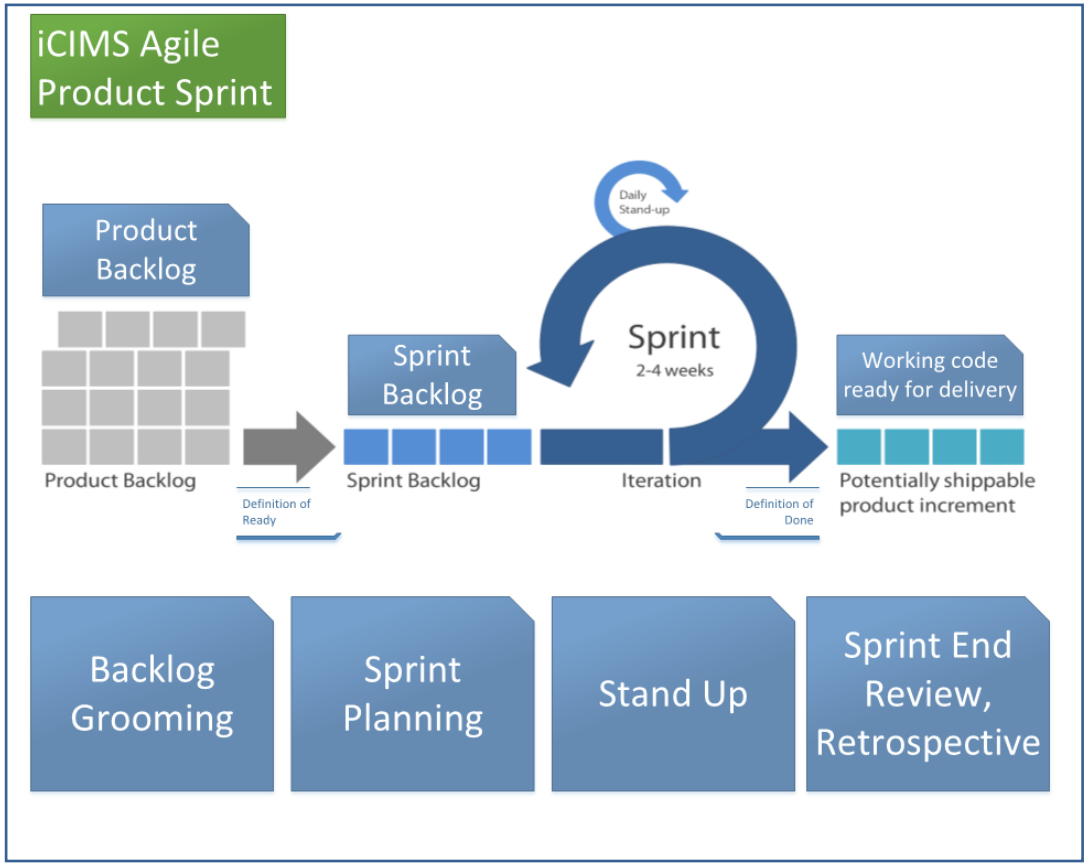
Five Stages of Test Maturity For Growth at iCIMS



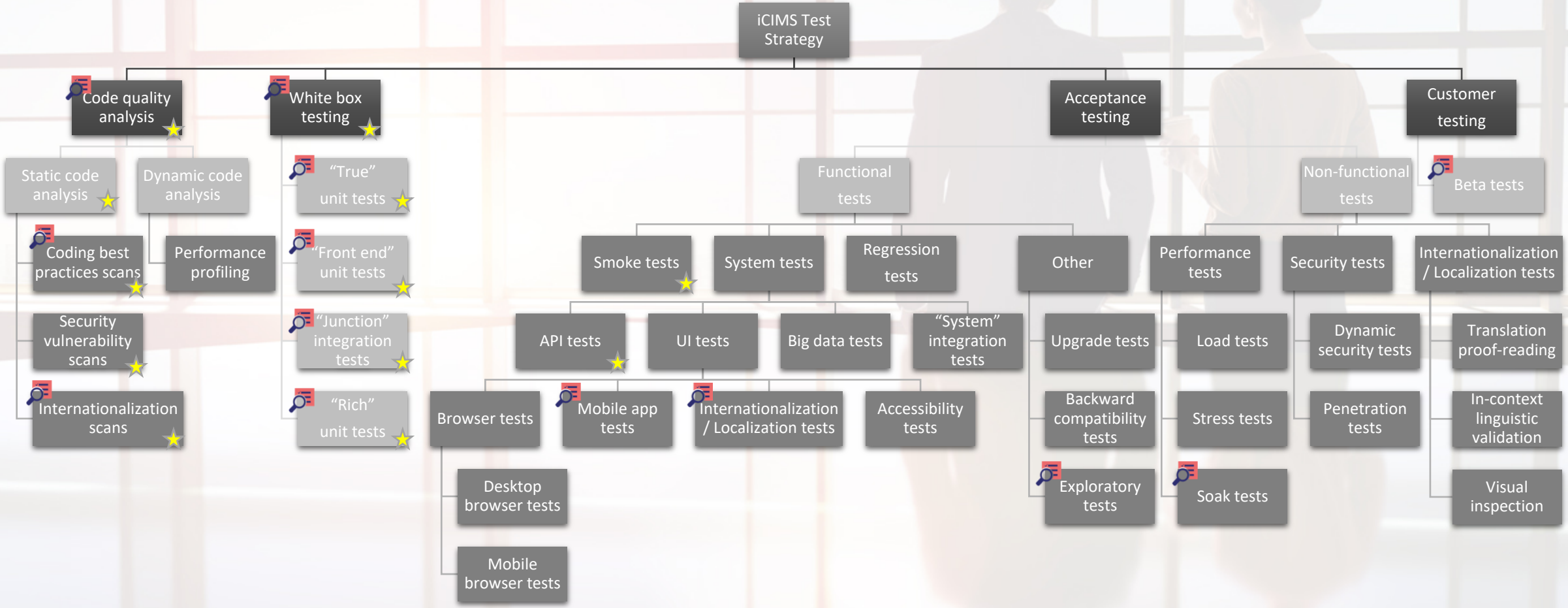
We are Agile (SCRUM)







So, what does our Test Strategy Look Like at iCIMS?



Can be used for build verification (fast running)

2018 focus area

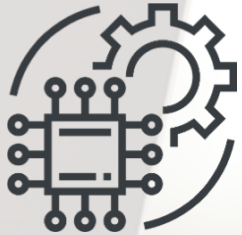
Test Labs – Centers of Excellence (CoE's)

Performance

Security

Accessibility

Localization



Agile Engineering

Team Composition & Challenges

RELEASE PIPELINE

Our SDET's were **outnumbered!**

Test Automation Tools and Technologies @ iCIMS

Jenkins

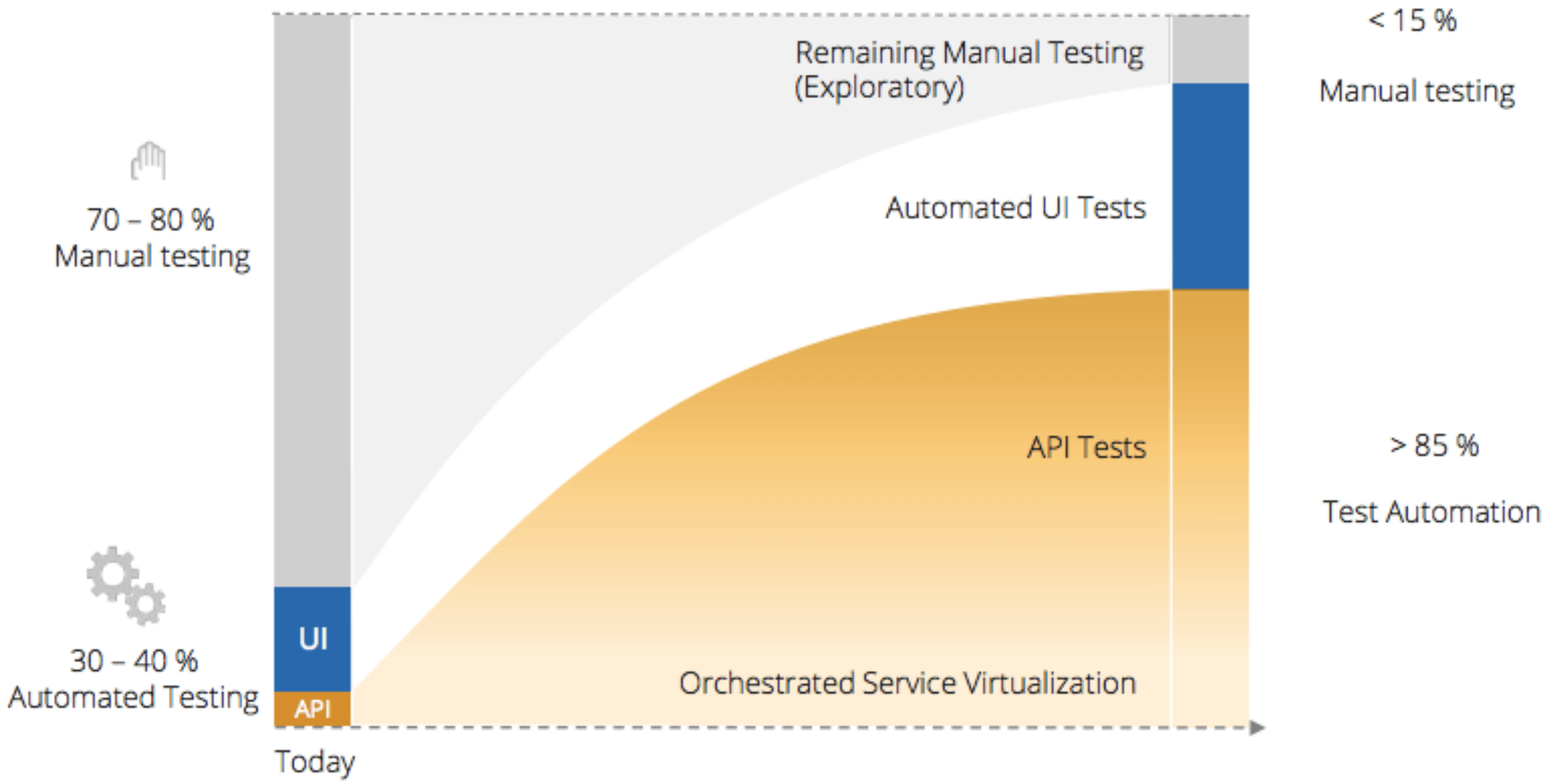
TestNG

icims

Our Automation Test Coverage Was Flat

1. **Effort** - The time to execute manual test cases is lengthy
2. **Quality** - We find defects too late in the SDLC
3. **Time to Market** - Developers don't have enough runway to fix defects prior to a push to production

The future of test automation (source: Tricentis)



Now what?

Option 1: Hire Help

Option 2: Train Your Team

Transform people, process & strategy

Option 3: Do Nothing

"What if we don't change at all ...
and something magical just happens."

DO NOTHING

iCIMS Chose Option 2

OUR TRANSFORMATION
JOURNEY:
People

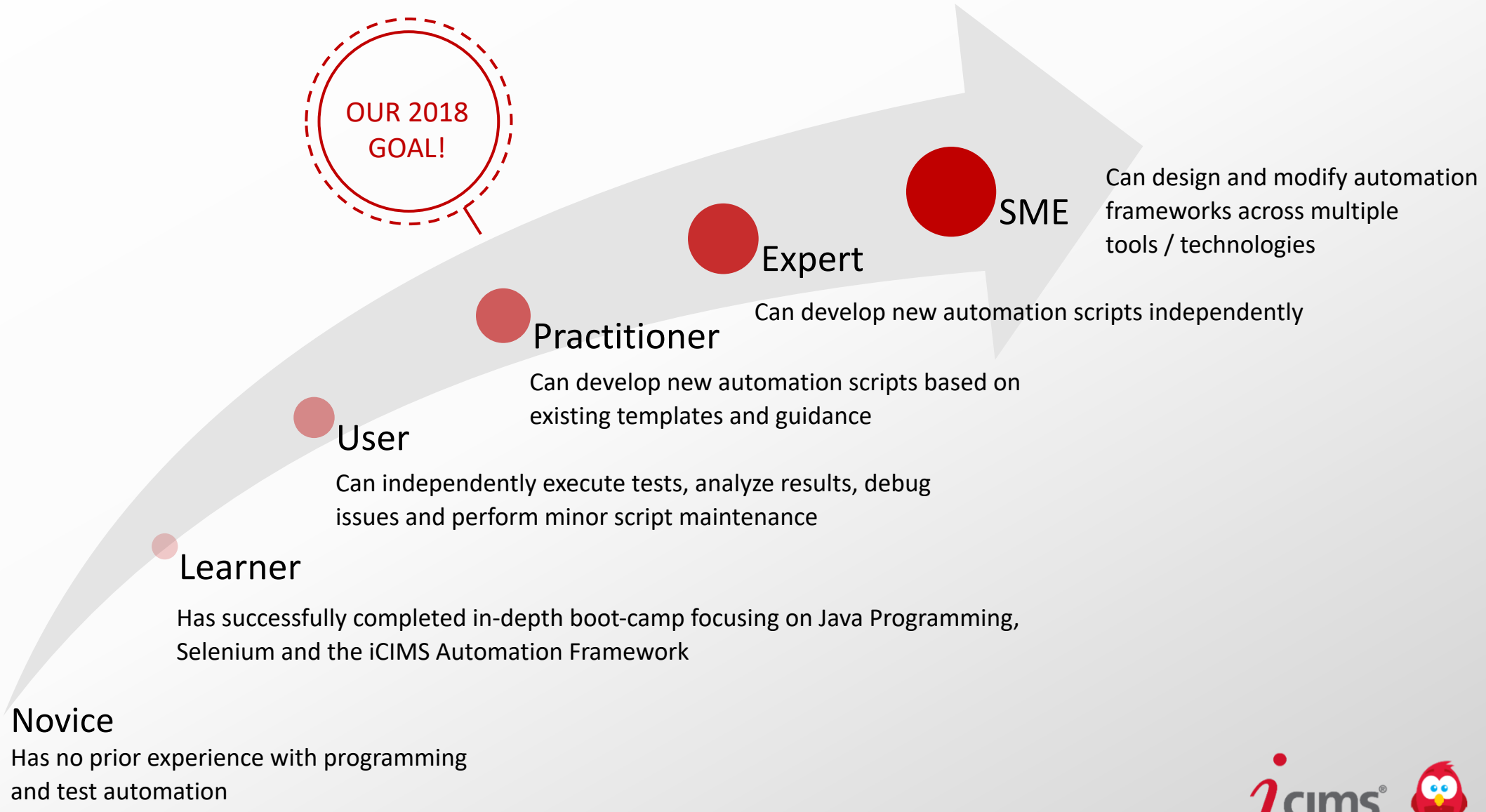
Phase 1:
Conception

Brainstorming and Convincing…

- We started by brainstorming for ideas on how to accomplish this transformation
- We collaborated with HR
- I had to convince my leaders this was the right thing to do
- We worked together to identify how to make this successful

Top-Level Challenge & Gaining Buy-in

Establish our goals and define next steps



Reconcile new job descriptions…

Manual testers

SDETS

Tester IV

SDET IV

Tester III

SDET III

Tester II

SDET II

Tester I

SDET I

HR APPROVED!

NEW DESIGNATION

Test Engineers

Phase 2:
Initial Communication

Talk to the Team

Present the idea at team town-hall

Follow up with one on one meetings with each individual
Lay out the goals for the program clearly

This is a good thing for their career

Address Concerns and Fears

"I hate my new job title! SDET was so cool ☹"

"How will I compete with the SDET's?"

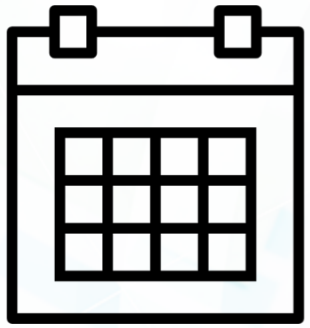
KEEP CALM AND REASSURE

"It feels like I am getting demoted!"

"Will I lose my job?"

Phase 3:
Bootcamp

Prepare for the Boot Camp




Lay down course structure: 100 -> 200 -> 300
(Awareness -> Practitioner -> Certification)

Identify "professors":
In-house Vs. External

Prepare training material

Leverage existing SDET's as "buddies" to the manual testers

Hands-on exercises

Course Structure

100 Test Engineering

Course	Duration
Software Quality Assurance Basics	3 hours
iCIMS Test Strategy	2 hours
Accessibility Testing	1 hour
Performance Testing	1 hour
Security Testing	1 hour
Localization Testing	1 hour
Microservices Testing	1 hour

200 Test Engineering

Course	Duration
Java Basics	10 hours
Java Advanced I	2 hours
Java Advanced II	2 hours
Selenium User	4 hours
Selenium Practitioner	4 hours
Selenium Expert	4 hours

300 Test Engineering

Course	Duration
iCIMS Test Automation Framework	4 hours
Mobile Test Automation using Appium	2 hours
API Test Automation using Rest Assured	2 hours
Security Testing Tools	2 hours
Accessibility Testing Tools	2 hours

Overall training time: 48 hours

Schedule and Execute

- Divided the team into 2 groups
- Assigned a “buddy” for each person
- Scheduled a series of 2 hour sessions:
  - 14 hours of Java training
  - 12 hours of Selenium training
- Across a 3-month period for each group

Java

Java Basics & Programming Concepts

- Eclipse IDE – introduction, installation & set-up
- Variables
- Fundamental data types & their operators
- Conditional operators
- String methods
- Conditional statements (if/else, switch)
- Looping statements (for, while)
- Arrays
- Packages
- Exception handling
- Lists
- Read and write files
- Use Java API

Object Oriented Programming Concepts

- Create classes and objects
- Class fields
- Methods and constructors
- Method overloading
- Set/get methods
- Class/field/method modifiers
- Xpath and CSS selector syntax

Java Advanced Concepts I

- Class inheritance
- Base classes
- Method overriding
- Polymorphism
- Interfaces
- Static classes
- Inner classes
- Abstract classes

Java Advanced Concepts II

- Code refactoring
- Design patterns

Selenium

Selenium User

- Introduction to Selenium
- A brief history of Selenium
- The Selenium suite of tools
- Selenium IDE
- Locators
- Script execution using the Taurus automation framework

Selenium Practitioner

- WebDriver deep-dive
- Test design patterns
- Basic script creation and maintenance using Taurus

Selenium Expert

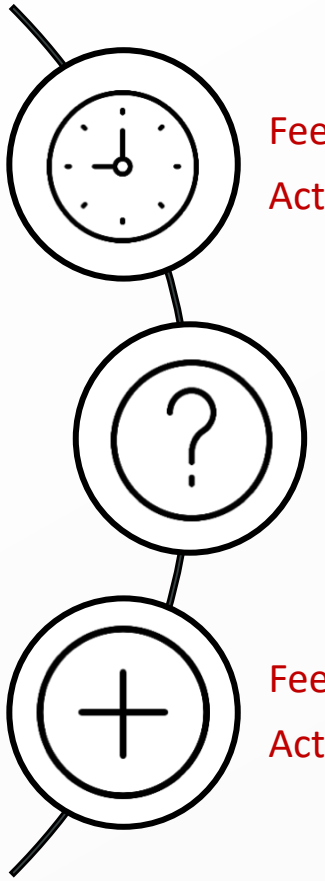
- Special considerations while using WebDriver
- Selenium internals
- Selenium Grid
- Taurus framework deep-dive

Selenium SME

- Introduction to Appium
- Introduction to Cucumber
- Taurus framework refactoring and improvements
- Introduction to code coverage

Ask for Feedback

After Group #1 – Lessons Learned



Feedback: Provide dedicated time to practice and do hands-on exercises

Action: We reserved an additional 1 hour after training classes; with instructor

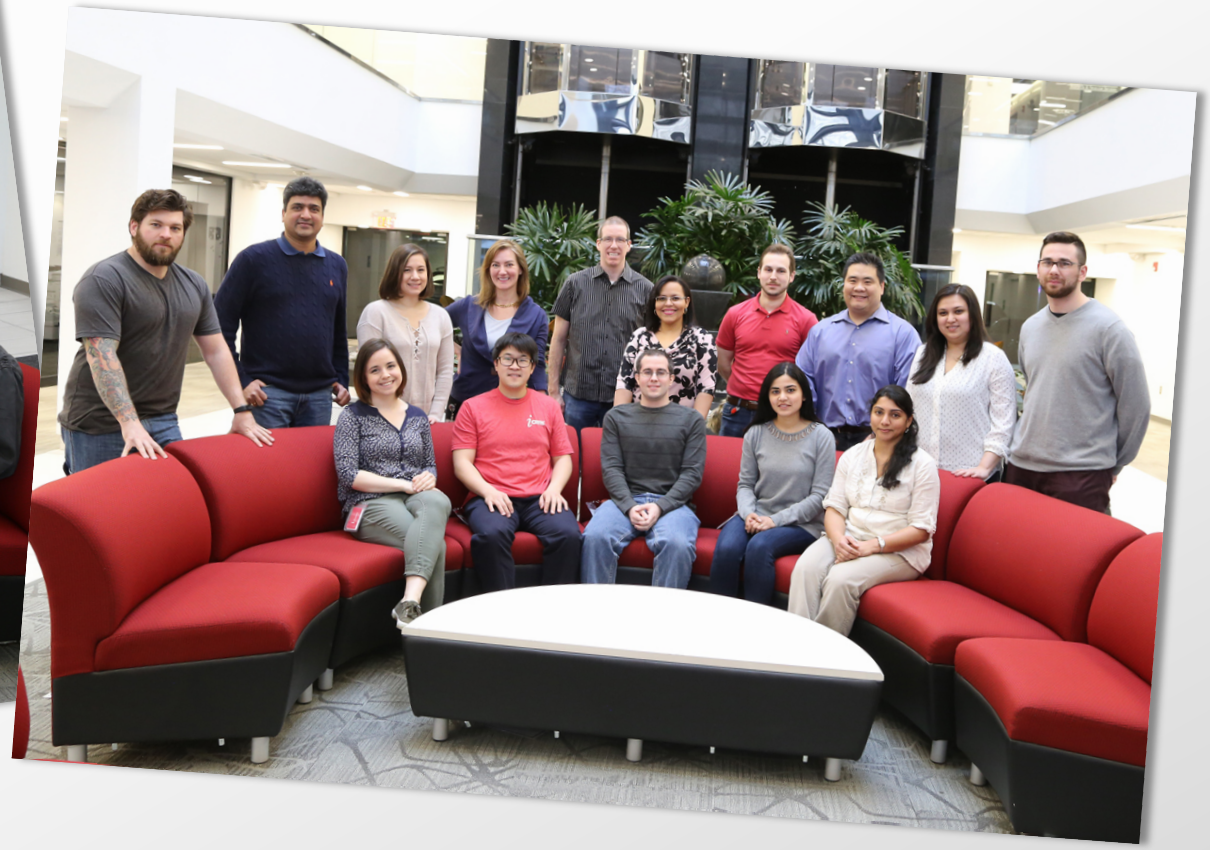
Feedback: Students needed a way to ask for quick help without interrupting work or waiting for the next class

Action: Create ‘closed’ slack channels to encourage collaboration

Feedback: Students required more training on the iCIMS test automation framework

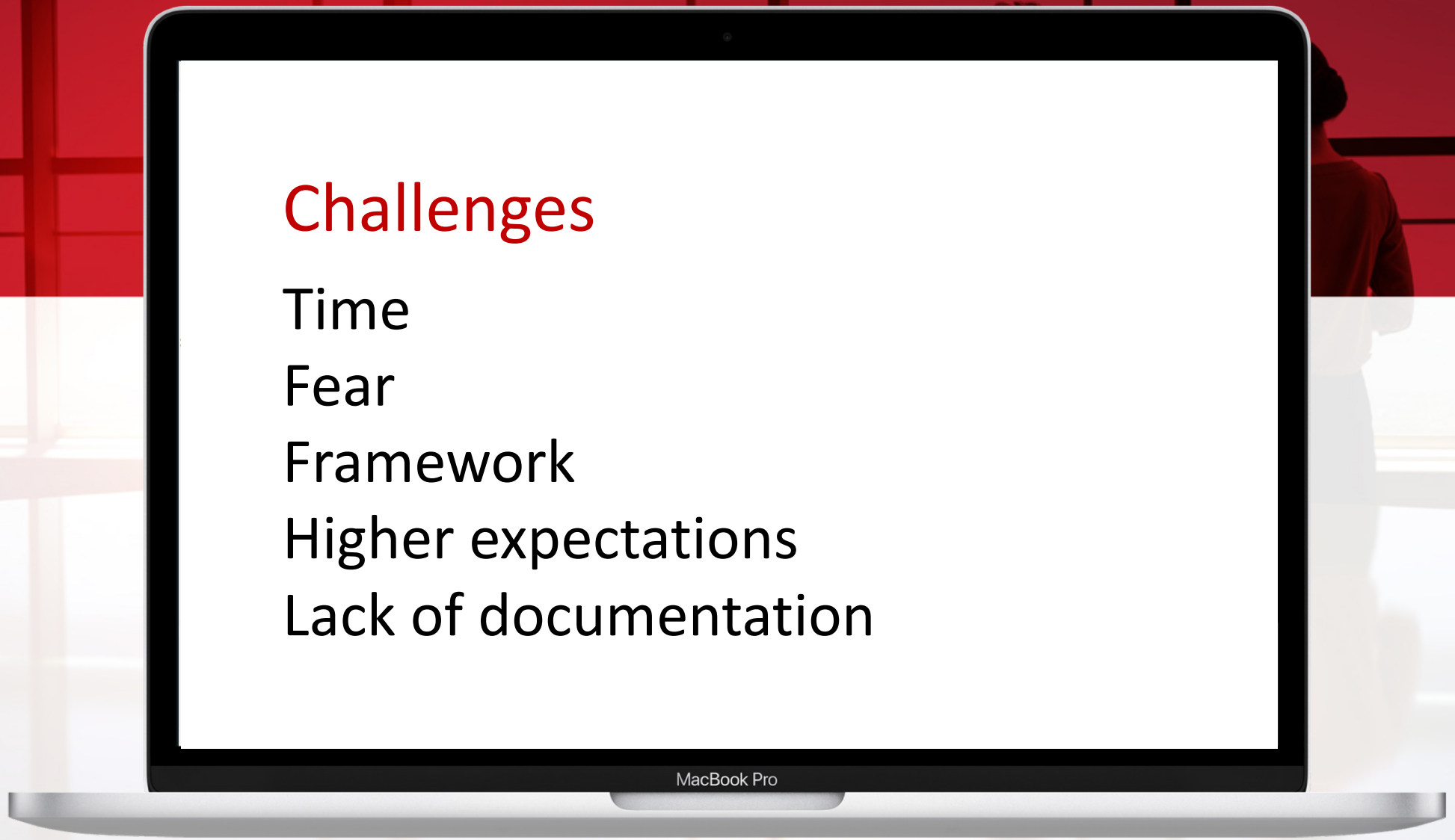
Action: Updated course with additional classes focusing on the iCIMS test automation framework

Graduation Day!



Bootcamps are typically hard work! Celebrating creates comradery, it's a BIG deal – these were not programmers nor did everyone have a computer science degree!

Phase 4:
Exercise New Skills



Pearls of Wisdom

Provide opportunities to apply the skills learned ‘every day’

Start with simple activities such as script execution and maintenance, before moving up towards script development

Continue to leverage the more seasoned Test Engineers as “buddies”

Encourage people to make changes to live scripts, and reassure them that we could always revert changes if required

Implement best practices around code reviews to provide timely feedback on any script changes

Phase 5: Continuing Education

6 MONTH CHECK UP

Kaizen = Continuous Improvements

Improve overall documentation of the framework & scripts, jot down FAQ's, etc.

Improve organization of code within the framework, break down into smaller pieces where possible

Create "template" scripts that could be used as a starting point to create new scripts

Expand the training to include additional topics such as API testing, mobile testing, etc.

Continue to collect feedback that could be used to improve the transformation process

Phase 6:
Process & Strategy Transformation

Accelerating cycle times

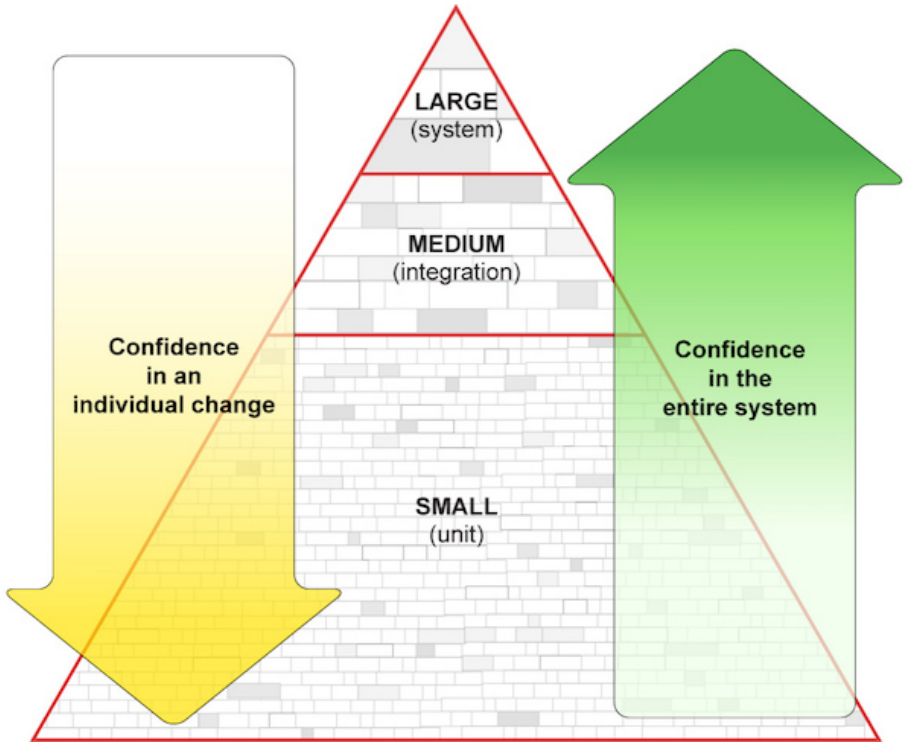
- Each concentric circle represents constraints that prevent us from accelerating
- E.g. Long build times mean long story development times, mean longer iterations mean longer release cadences means longer elapsed times for a business idea to be rolled out into production

* Illustration courtesy of Paul Hammant, independent consultant

Accelerating build cycles: Setup automated builds

Aim: really quick "build is good or bad" news

- Organize automated tests into small, medium and large buckets
- Implement the **test pyramid**, and shift the focus to writing more small & medium tests:
  - Use code coverage as a metric to drive this
- Setup automated build cycles using tools such as Jenkins:
  - A build verification to run all small tests whenever code is checked in
  - A nightly cycle to run all medium and large tests for more detailed feedback
- Integrate code frequently, work towards CI/CD
- Consider using **Test Impact Analysis** to run only a subset of tests based on what changed



* Illustration courtesy of Paul Hammant, independent consultant

Accelerating user story implementation cycle

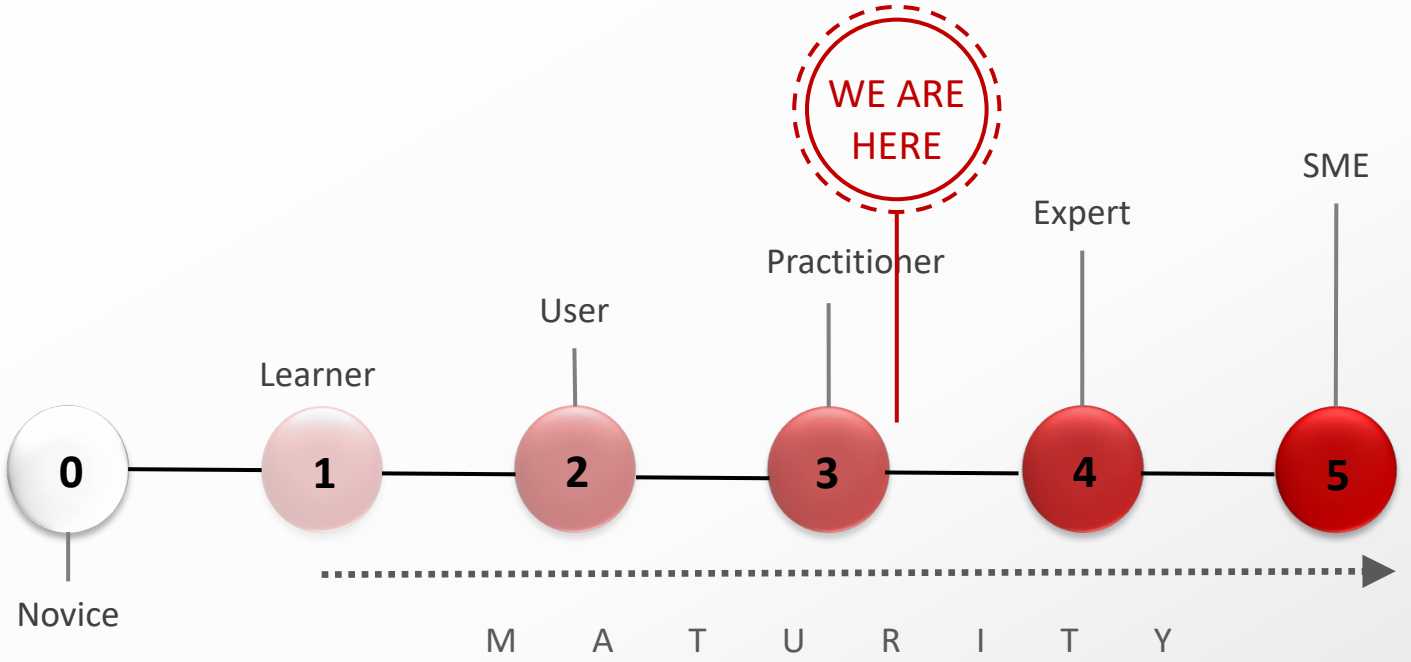
- Establish **Agile engineering CoE** to provide guidance to teams and govern Agile processes
- Break down larger stories into more manageable chunks
  - Aim for each story to be completed by a maximum of 3 – 4 days
- Clearly define the **Definition of Done (DOD)**, and enforce the teams to stick to it
  - Ensure that white box tests, along with corresponding exit criteria are part of the DOD
- Establish dashboards and email / slack notifications to ensure that the feedback from each build reaches the team as soon as possible

Accelerate release cadence

- Work towards releasing features in smaller chunks, more frequently:
  - We went from a quarterly release cycle towards monthly modular releases
- Adopt **feature toggles** to decouple new feature rollouts from releases
- Use **risk based techniques** to bring down regression cycle time:
  - Take into account key factors such as business criticality, frequency of use, development complexity for each feature
  - Fine tune using additional factors such as defect trend data and impact to existing code
- Create a **Definition of Ready (DOR)** and establish a process to ensure that teams are provided with all the resources they need before beginning to sprin
- Create communities for technology adoption, test architecture, etc. to foster shared knowledge across teams

It’s all About the Results

People Transformation – **We are on TRACK!**



Novice	Has no prior experience with programming and test automation
Learner	Has successfully completed in-depth boot-camp focusing on Java Programming, Selenium and the iCIMS Automation Framework
User	Can independently execute tests, analyze results, debug issues and perform minor script maintenance
Practitioner	Can develop new automation scripts based on existing templates and guidance
Expert	Can develop new automation scripts independently
SME	Can design and modify automation frameworks across multiple tools / technologies

Process & Strategy Transformation – **We are on TRACK!**

- All projects now have automated build validation and CI/CD dashboards

Job	Stage	develop status
Build validation	Last commit	description: Olga Glavna, Wed Apr 25 16:41:37 2018
	Compile	build: passing
	JUnit tests	build: unstable; tests: 1436/1446
	Mocha tests	build: passing; tests: 633/633
Daily build	App site deploy	build: passing
	Spring tests	build: unstable; tests: 1979/2127
	Sonar scan	build: unstable; sonarqube

- Code coverage is measured against all *net new code* being written, resulting in more small tests being written

Results

- Upskilled Engineers; more hands helping with automation
- Improved Automation Coverage across programs (above 85% for newly adopted Product Portfolios)
- Better employee engagement; employees thrilled to learn and grow
- Better synergy and mutual respect between Test Engineers and Developers
- Increased test execution productivity
  - Total: ~20,000 test cases
  - Manual execution: 50-100 test cases per team/per day
  - Automated execution: 500 test cases per team/per night
- Better test coverage
- Standardization
- Room for exploration testing

500% Increase

Testimonials

“Initially, I created an automated test for the Streaming API, testing the Person profile. This test included running an IDT, disabling the cool-off to run multiple IDTs, and receiving the correct JSON for an updated field. Using this test as a template, and with some help, I adapted it to work with the Job and Company profile types!”

-Sarala

“Just wanted to share this exciting info: one of my team’s automation script has always been failing. I am happy to say that I was able to debug and identify the issues seen and with little bit of guidance I have fixed the failed tc’s. I will send the code for review and commit the changes next week.”

-Suril

Testimonials

> This past Friday, I committed my first code. I just wanted to share this personal and professional accomplishment with you and the team involved with the java/selenium training. Thank you to everyone involved in setting up this training program and to the awesome instructors. You guys rock!!
>
> **–Tony**

Add Testimonial Video here!

Attendee Takeaways

- Software testing is often accounted for more than 50% of total development costs – lack of automation is a key root cause for this (source: Journal of Systems and Software)
- Although manual testing is valuable, by itself it cannot provide the quick and consistent feedback that DevOps paradigms such as CI/CD are built around
- Specialized skillsets are one of the biggest roadblocks to test automation – the onus is on test engineering organizations to transform themselves!
- Transformation is challenging, not impossible – all it takes is a positive intent and belief in your team coupled with guidance and process
- Transformations take time – be patient and support your team all the way

Questions?

Jennifer Scandariato

Senior Director, Cloud Services, iCIMS

www.icims.com

@JScan @iCIMS