Transforming the World Through Quality

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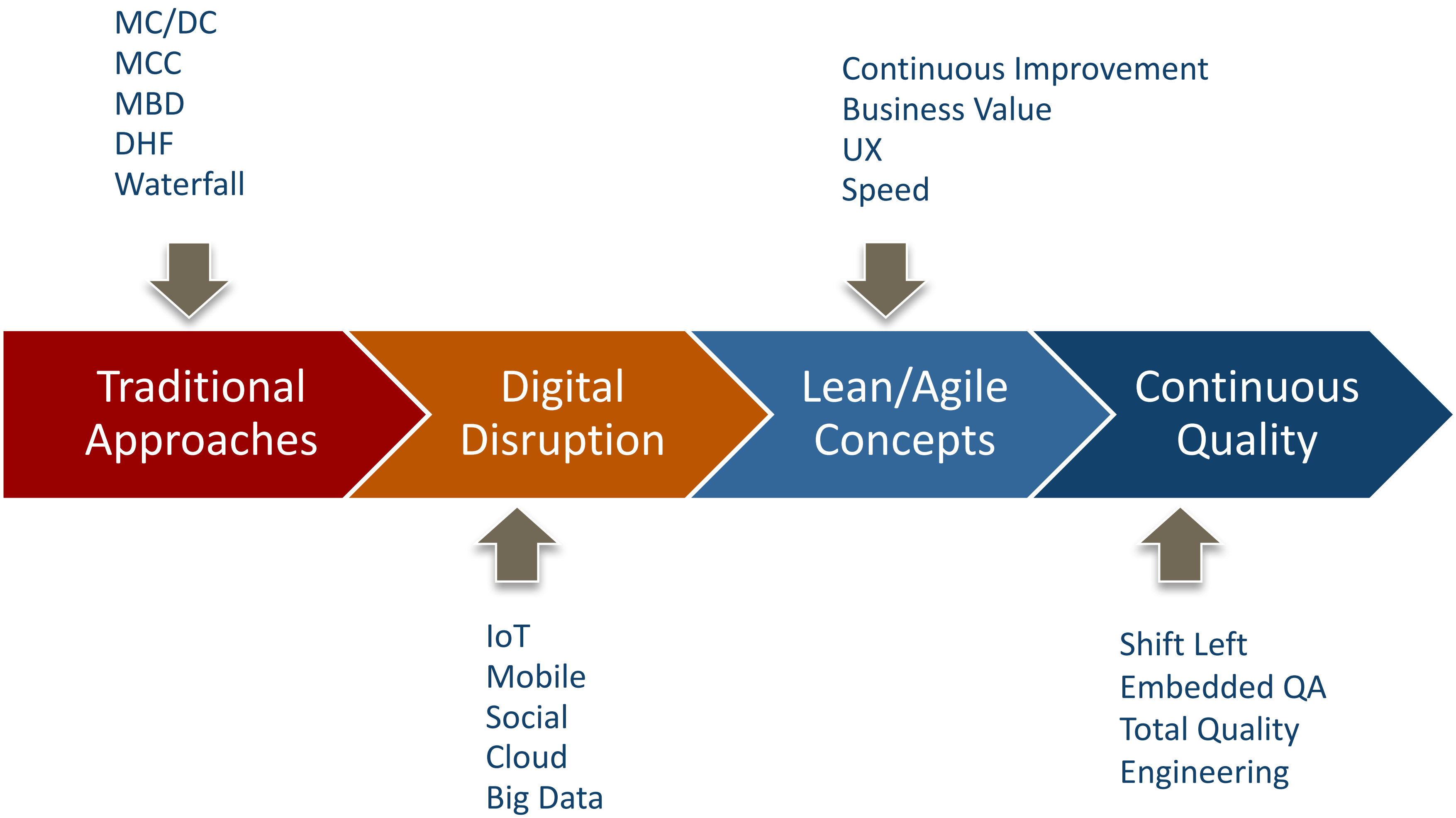
Agenda

- How Did We Get Here?
- The Fundamentals
- Approach (Best Practice)
- The Technology
- Measuring Success
- Q&A

Digital Technology Transformation



MC/DC
MCC
MBD
DHF
Waterfall

Continuous Improvement
Business Value
UX
Speed

Traditional Approaches

Digital Disruption

Lean/Agile Concepts

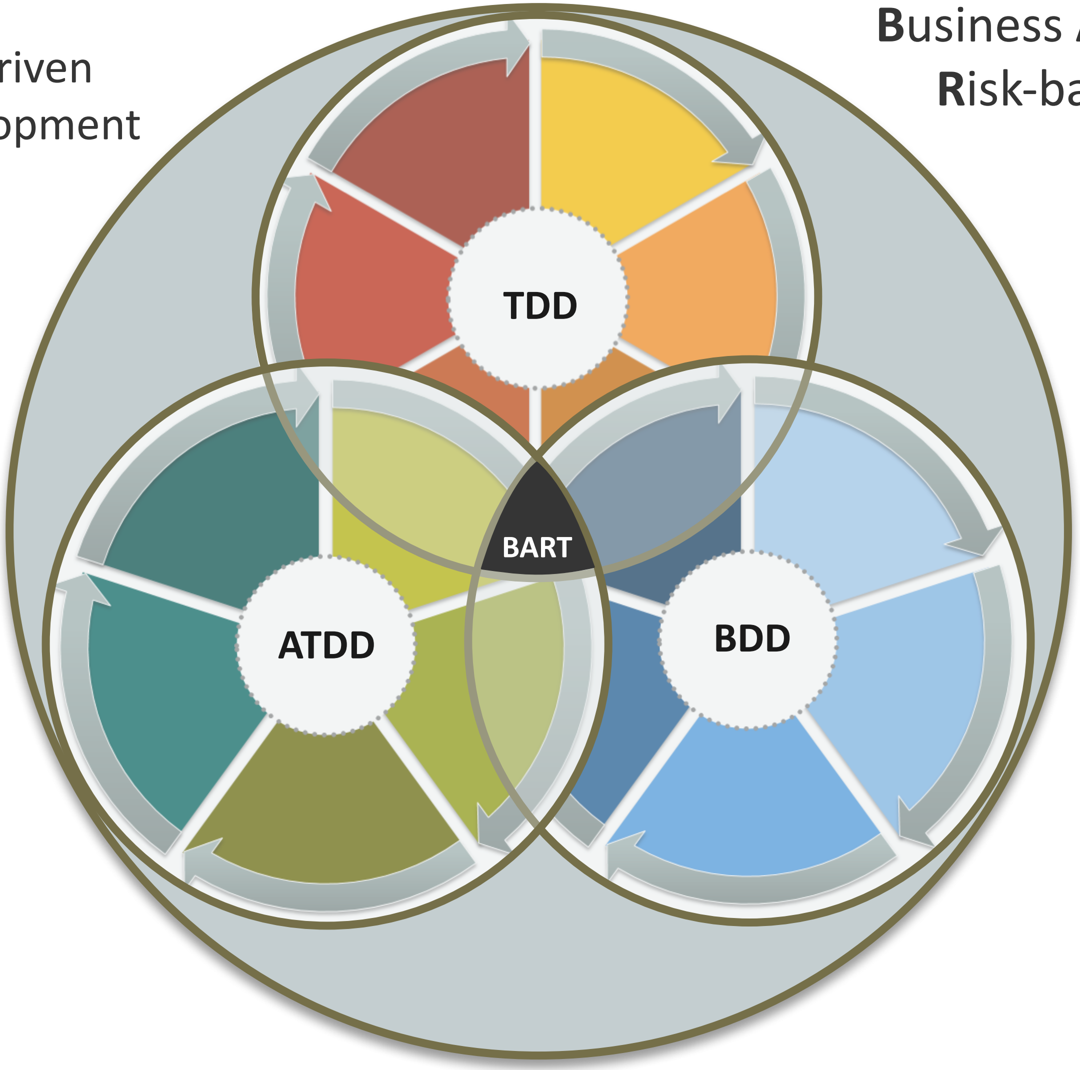
Continuous Quality

IoT
Mobile
Social
Cloud
Big Data

Shift Left
Embedded QA
Total Quality Engineering

The Fundamentals

Golden Circles of Agile Quality



Test Driven
Development

Business **A**gility through
Risk-based **T**esting

Acceptance
Test Driven
Development

Behavior Driven
Development

Understanding Your Risk is Important

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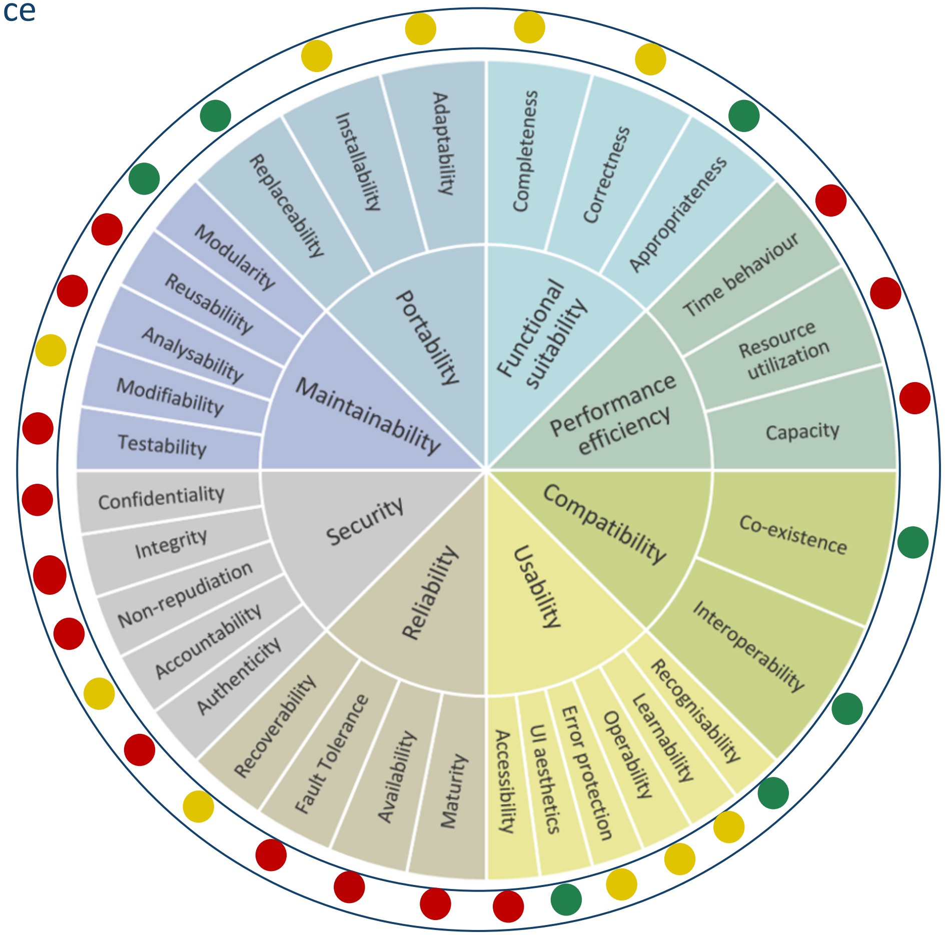
- -Prioritize Risk Areas
- -Define the Risk Tolerance
- -Fit it into Sprints
- -Report on Risks



- -Easily Identify What to Test
- -Decide How Much to Test
- -Understand When to Test
- -Active Mitigation (Anticipate)
- -Collaborate on Resolution

Quality Essentials

- **Product Quality (ISO25010 + ISO16085)**
  - 31 Quality Attributes That Require a Strategy
  - Most Organizations are Focused on Functional Stability (3 of 31)
  - Our Focus is on Enablement of the Quality Organization
  - Most Organizations are Linear in Their Testing Approach
  - We Assess Risk in Order to Deliver Business Value
  - Shift Left is a Mind-set
- **Quality in Use (ISO25010):**
  - Effectiveness
  - Efficiency
  - Satisfaction (Usefulness, Trust, Comfort, Pleasure)
  - Freedom from Risk (Economic, Safety, Environmental, Competitive)
  - Context Coverage (Completeness, Flexibility)
  - Real/Simulated Use (Real-World E2E)
- **Data Quality (ISO25012):**
  - 15 Quality Attributes That Require a Strategy
  - Data at Rest, Data in Motion, Highly Available, Confidential, Accurate
  - Data Created in Real-Time (Data as a Service – DaaS)
  - Easily Replicated, Utilized, and Cleaned up
  - Exponential Test Coverage with Minimal Additional Work

Agile Quality Approach

Shift-Left Planning

Doing the work prior to the Sprint is just as important as doing the Sprint activities. These pre-Sprint activities help QA achieve higher shift-left value.

Pre-planning

- QA checks stories of **Next Sprint** – Feature Files
- QA checks stories of **Next Sprint** - Automation
- QA checks stories of **Next Sprint** - Acceptance Criteria

Grooming Sessions

- What do I need:
  - Technology (Sean/Chad)
  - Test Data (BSAs)
  - E2E (Team)
- Strategy:
  - How
  - High level estimate

Sprint Planning

- Story
  - Explain Strategy
  - Detail Estimate
  - Risk Assessment
  - Questions

QA Timeline

With our guidance, clients are able to align the testing effort within the same sprint as the development team. This approach supports speed and agility, and enables the potential “shift left” value of agile/Scrum.

Pre-Sprint	Sprint Planning (Day 1)	Test Prep & Run (Day 2-4)	Test Execution (Day 5-7)	Sprint Completion (Day 8-10)
•Risk Recommendation •Grooming future Sprint work	•Risk Acceptance •Test Strategy •Test Prep •Grooming future Sprint work	•Automation Scripting •Test Data •Feature Testing •Functional/Regression Prioritization •Smoke Testing Execution (CI)	•Smoke Testing •Automated Testing •Feature Testing •Functional/Regression Testing •Defect Management •QA Sign-off (Story) •Accept Feature •Status Reporting	•Feature Testing •End-to-end Testing •Performance Testing •Defect Management •UAT •Demo •Sign-off (Sprint) •Retrospective

Shared QA Responsibility

Analyst (Any)

- Story
- Test Data
- Functional/Regression Prioritization
- Feature Testing

- Transparency, updates to sprint goals

Shared

- Risk Recommendation
- Backlog Maintenance
- Risk Acceptance
- Test Strategy
- Definition of Ready
- Definition of Done
- Sizing
- Defect Management
- Commitment to Sprint goals
- End-to-end Testing
- QA Sign-off (Story)
- Demo
- Retrospective

Engineer (Any)

- Automation Scripting
- Smoke Testing
- Automated Testing
- Functional/Regression Testing
- Performance Testing
- Alignment to architecture

The Power of Workflows

Workflow A

Transaction 1a

□ UI/UX

□ Data Management

□ Integration

□ Risk

Transaction 2a

□ UI/UX

□ Data Management

□ Integration

□ Risk

Transaction 3a

□ UI/UX

□ Data Management

□ Integration

□ Risk

Transaction 1b

□ UI/UX

□ Data Management

□ Integration

□ Risk

Transaction 2b

□ UI/UX

□ Data Management

□ Integration

□ Risk

Transaction 3b

□ UI/UX

□ Data Management

□ Integration

□ Risk

Paired Testing

Who:

- Analyst – SME
- SDET – Technical solutions

What:

- Knowledge transfer
- Peer reviews
- Test case design sessions

Why:

- More complete technical solutions
- Better total quality
- Collaboration

How:

- One hour a day, every day
- Rotate the focus
- Keep a log

Best Practices:

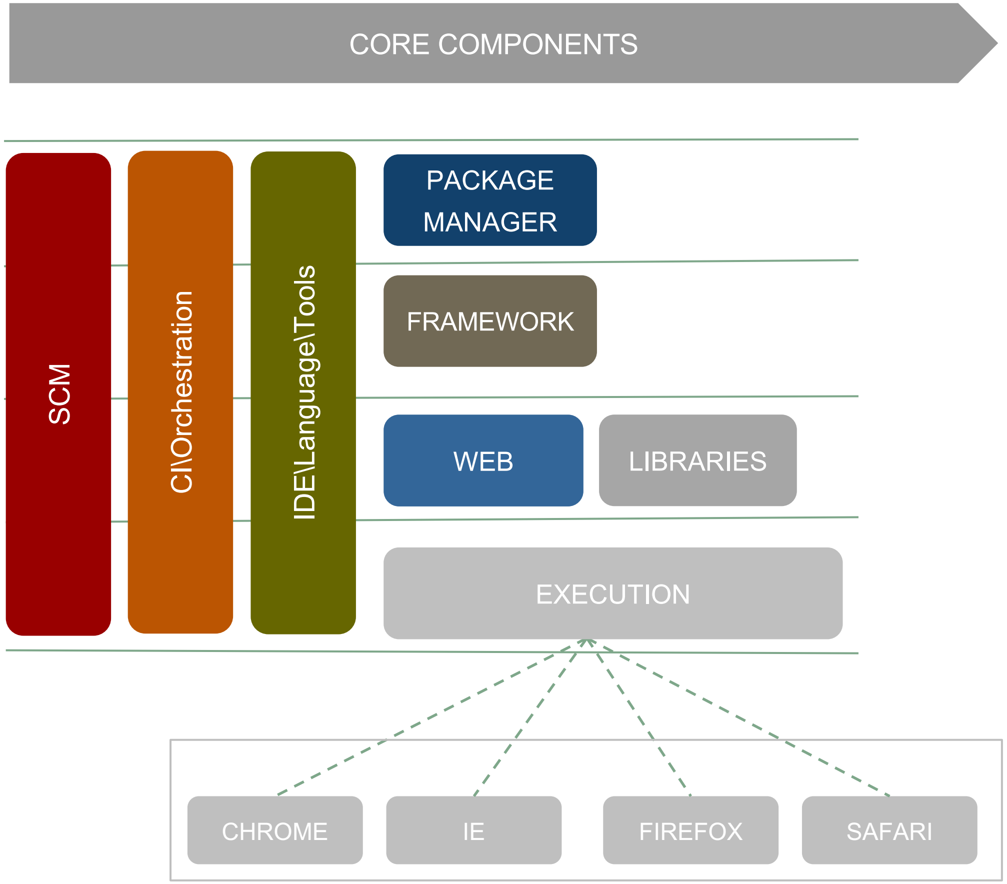
- Rotate partners every other Sprint
- Communication should be dialogues
- Be customer-driven
- Think operationally
- Create a community of practice forum
- Encourage “natural” synergies

Technology

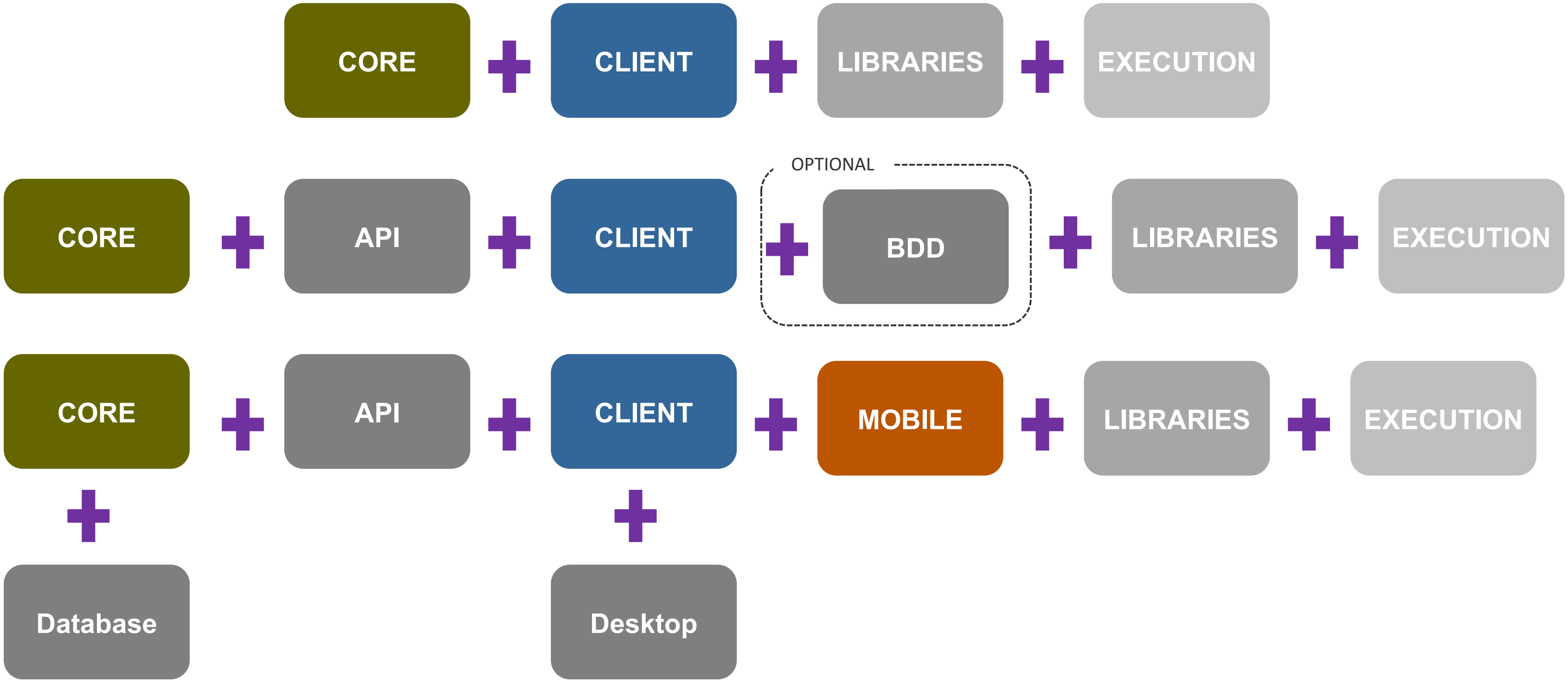
Utilizing Intelligent Test Architecture

Understanding Needs, Building Strategies, and Pragmatically Executing

- Vision & Strategy
- Quality as a Service
- Best Practices
- Enterprise Frameworks
- Quality in Use
- Data as a Service
- Analytics Services (Metrics)
- Innovation (AI, MBL, BI)
- Predictive Quality
- DevOps
- Tools Consolidation



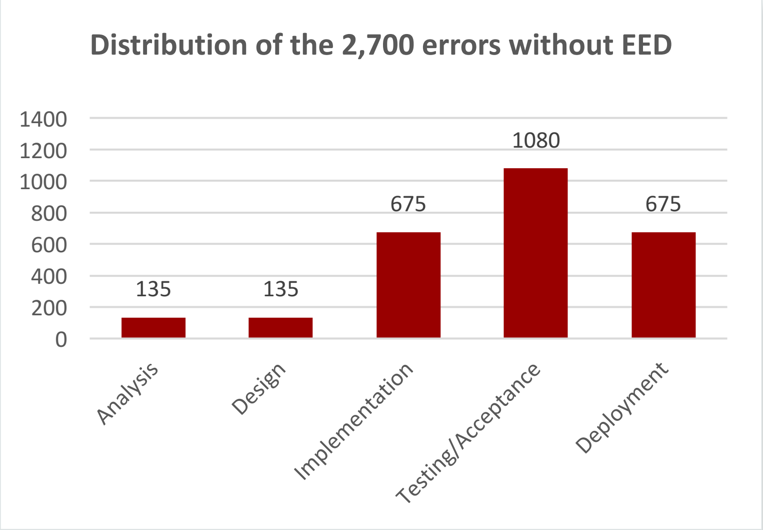
Enterprise Automation Framework



Measuring Success

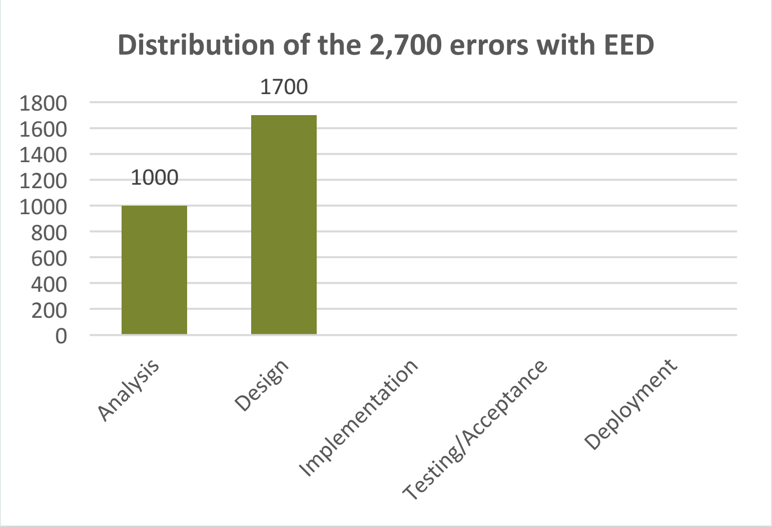
The Quality Mission

Typical Practice



Analysis:	135 x 112.20 x 1 =	$15,147
Design:	135 x 112.20 x 4 =	$60,588
Implementation:	675 x 112.20 x 12 =	$908,820
Acceptance:	1080 x 112.20 x 48 =	$5,816,448
Deployment:	(675 x 112.20 x 90)/4 =	$1,704,038
Total		$8,505,041

Best Practice

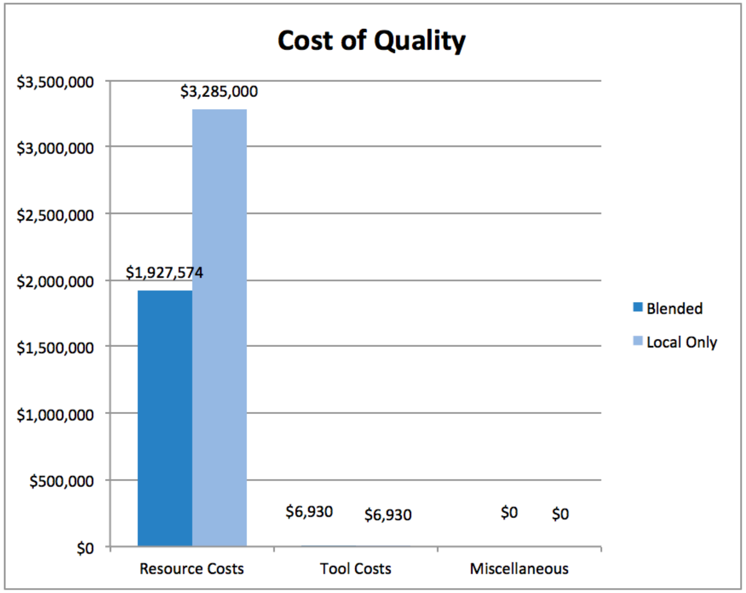


Costs for detecting 2,700 errors:		$314,040
Analysis:	1000 x 112.20 x 1 =	$112,200
Design:	1,700 x 112.20 x 4 =	$762,960
Total		**$1,189,200**

- **Heavy reliance on UAT is the most expensive and inefficient strategy for testing.**
- **Real cost is hidden when support costs are split from build costs and testing late in lifecycle is seen as "business as usual"**
- **Testing consistency is an accelerator for EED and automation is the key driver for consistency**

Measuring Success

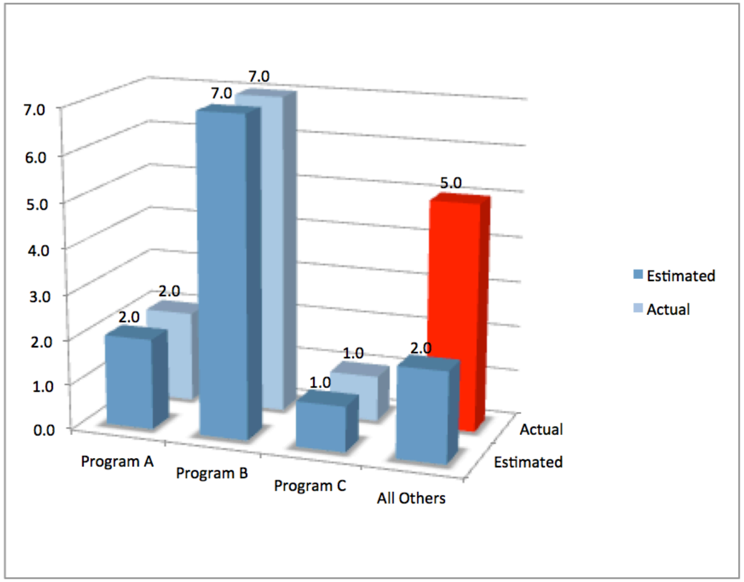
Cost of Quality



Type	Blended	Local Only
Resource Costs	$1,927,574	$3,285,000
Tool Costs	$6,930	$6,930
Miscellaneous	$0	$0
Total	**$1,934,504.00**	**$3,291,930.00**

Saved	**$1,357,426.00**	**41.2%**

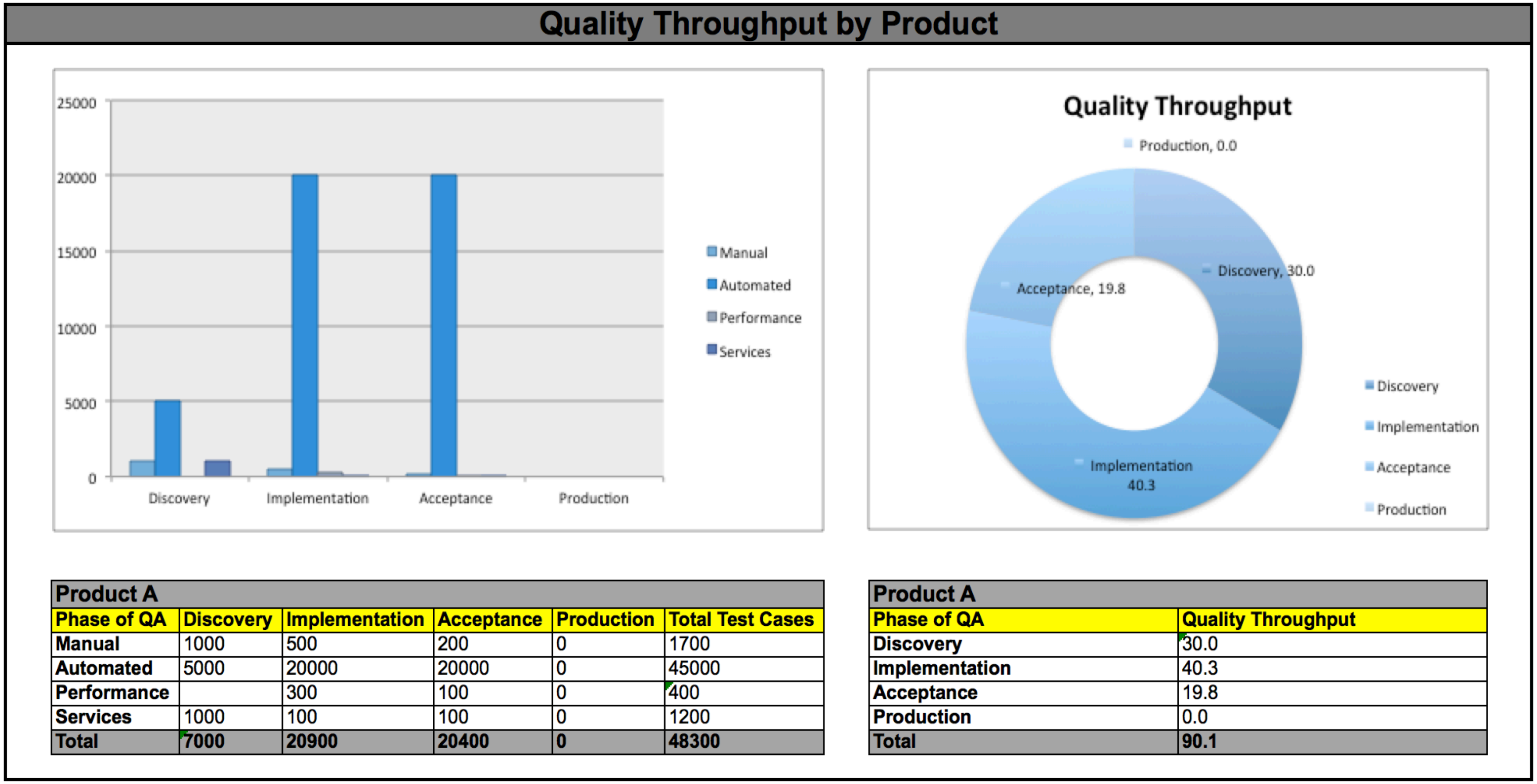
Adherence to Capital Resource Plan



Adherence to Resource Plan		
Programs	**Estimated**	**Actual**
Program A	2.0	2.0
Program B	7.0	7.0
Program C	1.0	1.0
All Others	2.0	**5.0**
Total	**12.0**	**15.0**

Cost of Quality is not just about the money saved, it is also about where it is saved and what it enabled by the savings

Measuring Success



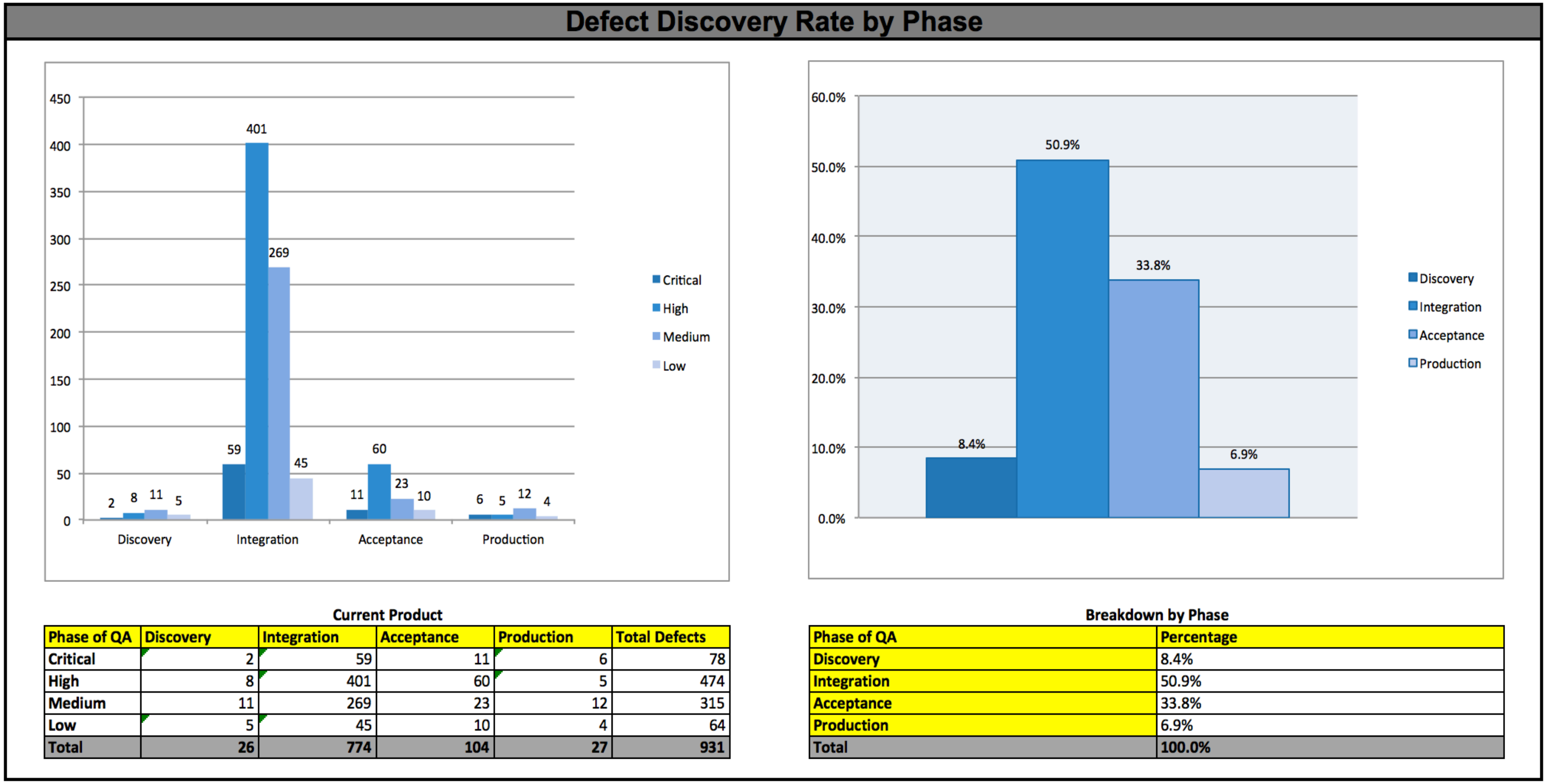
Quality Throughput by Product

Product A					
Phase of QA	**Discovery**	**Implementation**	**Acceptance**	**Production**	**Total Test Cases**
Manual	1000	500	200	0	1700
Automated	5000	20000	20000	0	45000
Performance		300	100	0	400
Services	1000	100	100	0	1200
Total	**7000**	**20900**	**20400**	**0**	**48300**

Product A	
Phase of QA	**Quality Throughput**
Discovery	30.0
Implementation	40.3
Acceptance	19.8
Production	0.0
Total	**90.1**

Quality throughput is just as important as Cost of Quality because if your enterprise automation framework doesn’t enable you to increase throughput then you haven’t been successful.

Measuring Success



Defect Discovery Rate by Phase

Current Product

Phase of QA	Discovery	Integration	Acceptance	Production	Total Defects
Critical	2	59	11	6	78
High	8	401	60	5	474
Medium	11	269	23	12	315
Low	5	45	10	4	64
Total	26	774	104	27	931

Breakdown by Phase

Phase of QA	Percentage
Discovery	8.4%
Integration	50.9%
Acceptance	33.8%
Production	6.9%
Total	100.0%

Making sure your enterprise automation framework enables “shift left” by your QA teams is also important to track. Keeping an eye on where defects are discovered is a great indicator of shift left.

continual improvement is critical.
how you go about it is trissential

trissential

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Thank you for your attention