

Preparing the Test and Evaluation Workforce for “The Speed of Need”

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Scope & Methodology



- Focus on managing organization's bundle of skills and competencies (S&C)
 - Not individual's qualifications and work performance
- Understand current S&C profile
 - Systems Testing Excellence Program (STEP) team completed an S&C analysis of Test and Evaluation (T&E) workforce professionals
 - 23 core knowledge areas for modern T&E
 - Areas were customized through site visits to focus on mission context combined with scientific foundations and industry best practices
 - Survey instrument was created and administered

Skills Analysis



Skills and Competencies Measures

| T&E Overview | Requirements & Developmental Testing | Operational Testing | Security Testing | Interoperability Testing | Agile Testing | Operations Research in Testing | Professionalism in Testing |
|--------------------------|--------------------------------------|--|--|--------------------------|----------------------------|---|--------------------------------------|
| Evolution of Systems T&E | Knowledge of Testing Frameworks | T&E Documentation | Factors Impacting Software Security | Interoperability Testing | Agile Principles | Test Automation and Tools | Contractor Management |
| Reasons for T&E | Test Cycle Activities | Evaluation Criteria for Interoperability | Differentiating Functional from Security T&E | Network Testing | Agile Methods | T&E Tool Integration | Project Management |
| T&E as a Science | Types of T&E | Configuration Management | Security Terminology for T&E | | Agile Techniques | Quality Methods for T&E | Professional Competencies |
| Scientific Basis of T&E | Defect Management | | Secure Development Life cycle | | Agile Management Practices | Test Process Models and Standards | Relationship Competencies in Testing |
| | Test Techniques | | OWASP or DoD IAVA Process | | | Statistical and Operational Methods for T&E | |
| | Test Coverage | | | | | | |

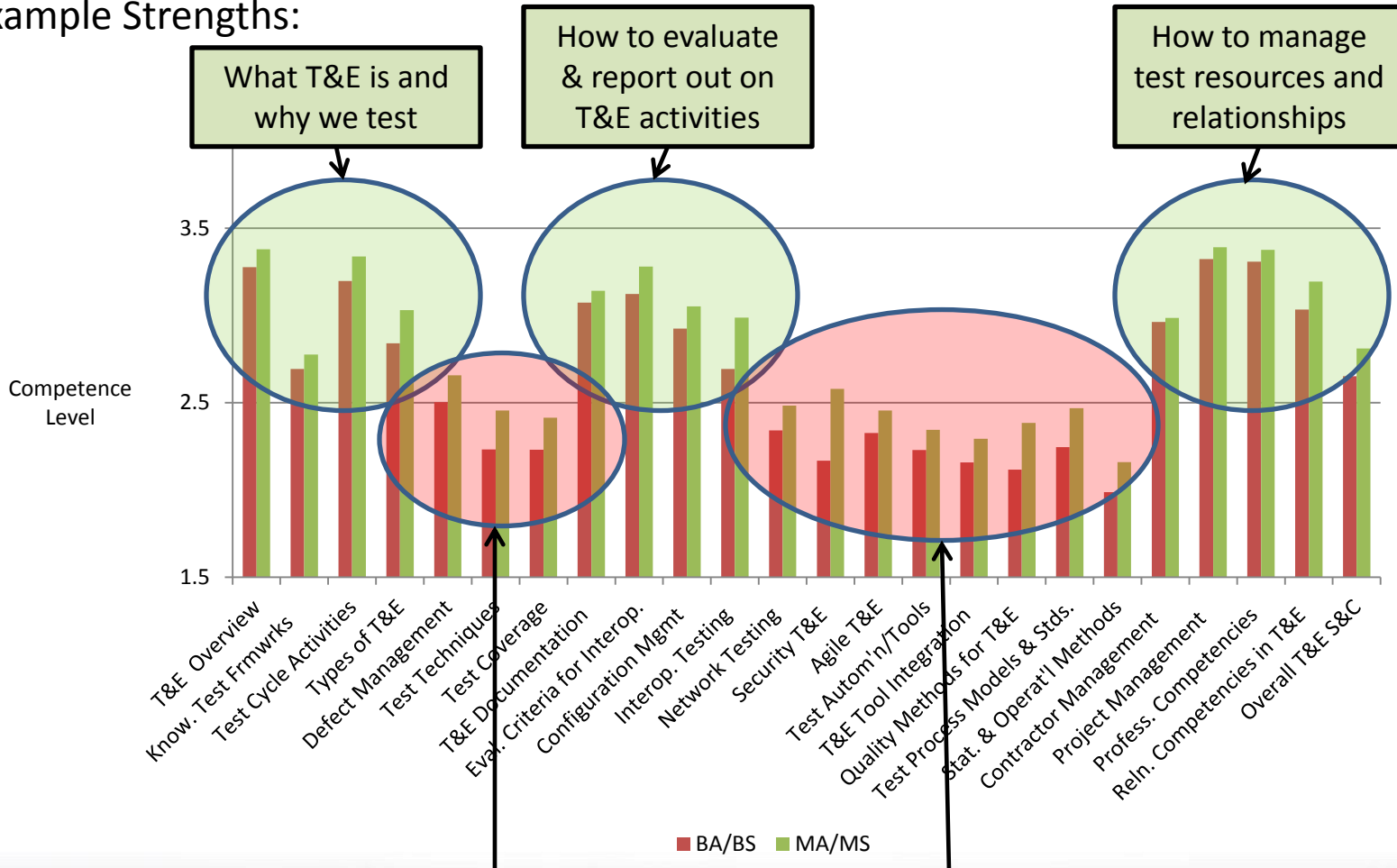
Goal



- Goal is to move the organization's workforce up on the scale of overall T&E S&C measures
- Achieved through:
 - Training programs targeted to raise the overall S&C
 - Hiring of a skilled workforce in critical areas
 - Skills-based work re-balancing
- Equips the organization's T&E element with the S&C required to succeed in its role – whether supporting the Warfighter, Acquisition Community, or Commercial Sector

Skills Analysis

Example Strengths:



What T&E is and why we test

How to evaluate & report out on T&E activities

How to manage test resources and relationships

The best techniques to use or how much to test

How to improve efficiency through automation & statistical methods

Areas for Targeted Improvement:

*Notional Data Only

Strengths



- Managing test resources and relationships—project management and other professional competencies
- Big picture of T&E including test cycle activities
- T&E documentation
- Evaluation criteria
- Configuration management

Areas for Improvement



- Core testing techniques
- Test coverage factors
- Test automation processes
- Operational Analysis

Unexpected Findings



- Defense Acquisition Workforce Improvement Act (DAWIA) T&E certification (in its current form), while adding some marginal value, is not addressing the S&C gaps for T&E of Information Technology (IT) systems
- Having a degree makes a difference in T&E S&C – regardless of the degree focus area.
- Those with engineering qualifications possess a skills profile similar to those with information technology, information systems, information assurance qualifications (suggests similar duty assignments)
- Workforce with > 15 years of experience may be stagnating regarding S&C

Expected Findings



- The more senior the employee, the higher the S&C level
- Security-related skills are lacking in all but Information Assurance employees
- T&E Management employees possess a more rounded S&C profile
- All groups share the same knowledge gaps

Recommendations



- Use profile as basis for customized training and certification for T&E personnel and to discuss appropriate target profile over next 3-5 years
- Use data to clarify
 - The skills breakdown of each T&E employee
 - Identification of in-house experts in each S&C
 - Specific testing tools each employee is skilled in using
- Use data as basis for assigning testers to agile projects and other work assignments
- Use knowledge items as basis of a customized curriculum plan for a foundational level training and certification

Next Steps



- Findings provided a basis for foundational training for all T&E workforce
- Along with skills gaps, the training program:
 - Provided base T&E knowledge from an IT perspective
 - Provided base agile testing knowledge from an IT perspective
 - Provided base T&E IT knowledge informed by best practices drawn from the business software industry
 - Provided base T&E IT knowledge that is informed by research
 - Provided base T&E IT knowledge emphasizing 'big picture' perspective that facilitates innovation absorption

Projected Future Profile

