ISO/IEC/IEEE 29119
The New International Software Testing Standards

Stuart Reid

Scope

The purpose of standards

Motivation for software testing standards

Development of standards

Overview of ISO 29119

Applicability

Timeline

Future involvement

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What are Standards?

"Guideline documentation that reflects agreements on products, practices, or operations by nationally or internationally recognized industrial, professional, trade associations or governmental bodies"

- ISO

- **Guidelines documents** as they are not compulsory unless mandated by an individual or an organization
- **Agreements** because they should reflect a certain level of consensus

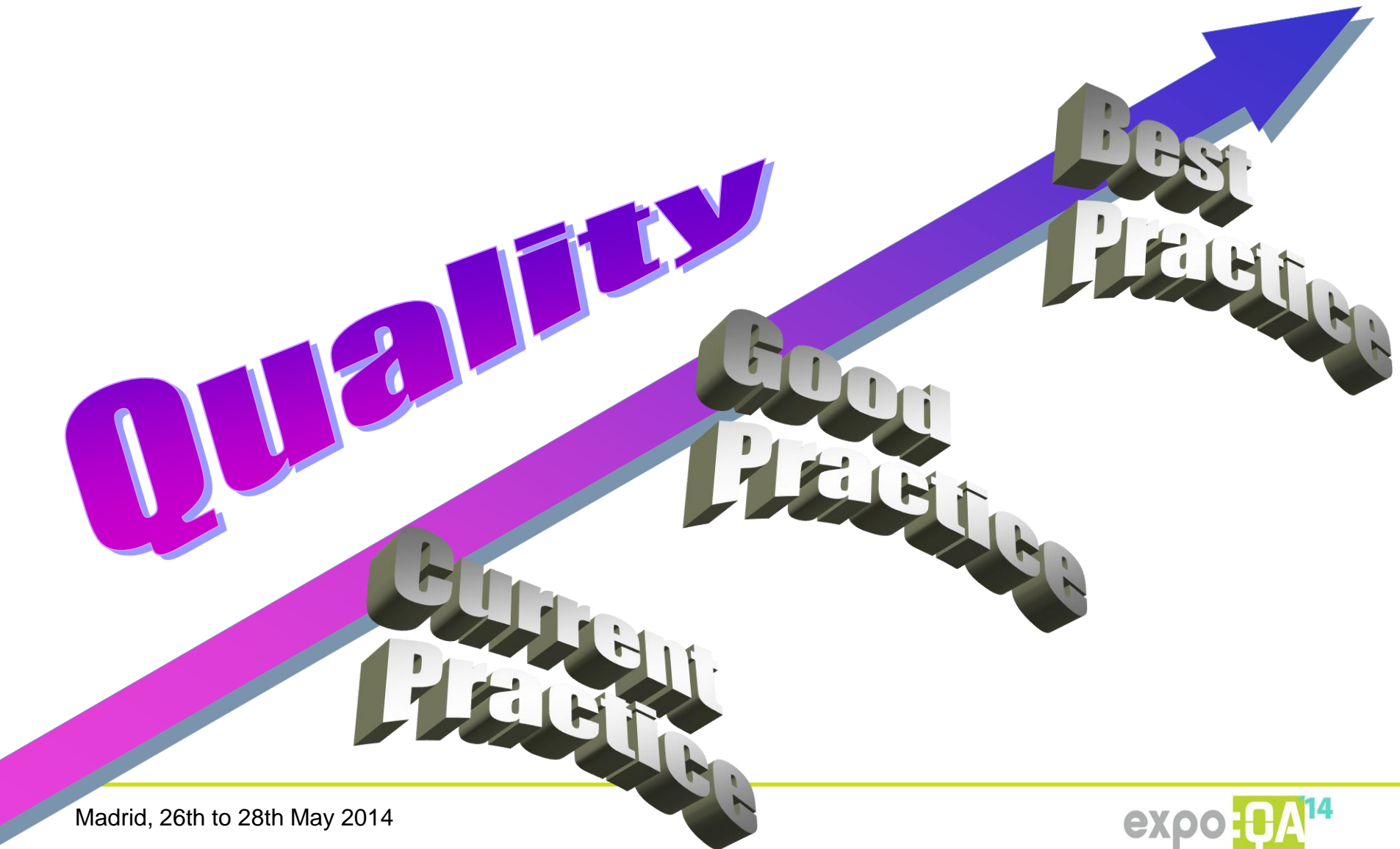expo:QA 14

Why use Standards?

Consumers

- – Confidence in compliant products

- – Authors provide expertise in standards

Manufacturers

- – Conformance and Marketing

- – 'Safety' from liability

- – Guidelines on production

But not 'Best Practice'…

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Quality and Standards

What use are Standards?

Standards describe a current 'body of knowledge' that provides the basis for a professional discipline

Basis for:

- Communication – common terminology
- Professional qualifications
- Certification/compliance schemes
- Benchmark of 'good industry practice'
- Contracts
- Interoperability and consistency……

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A Case in Point
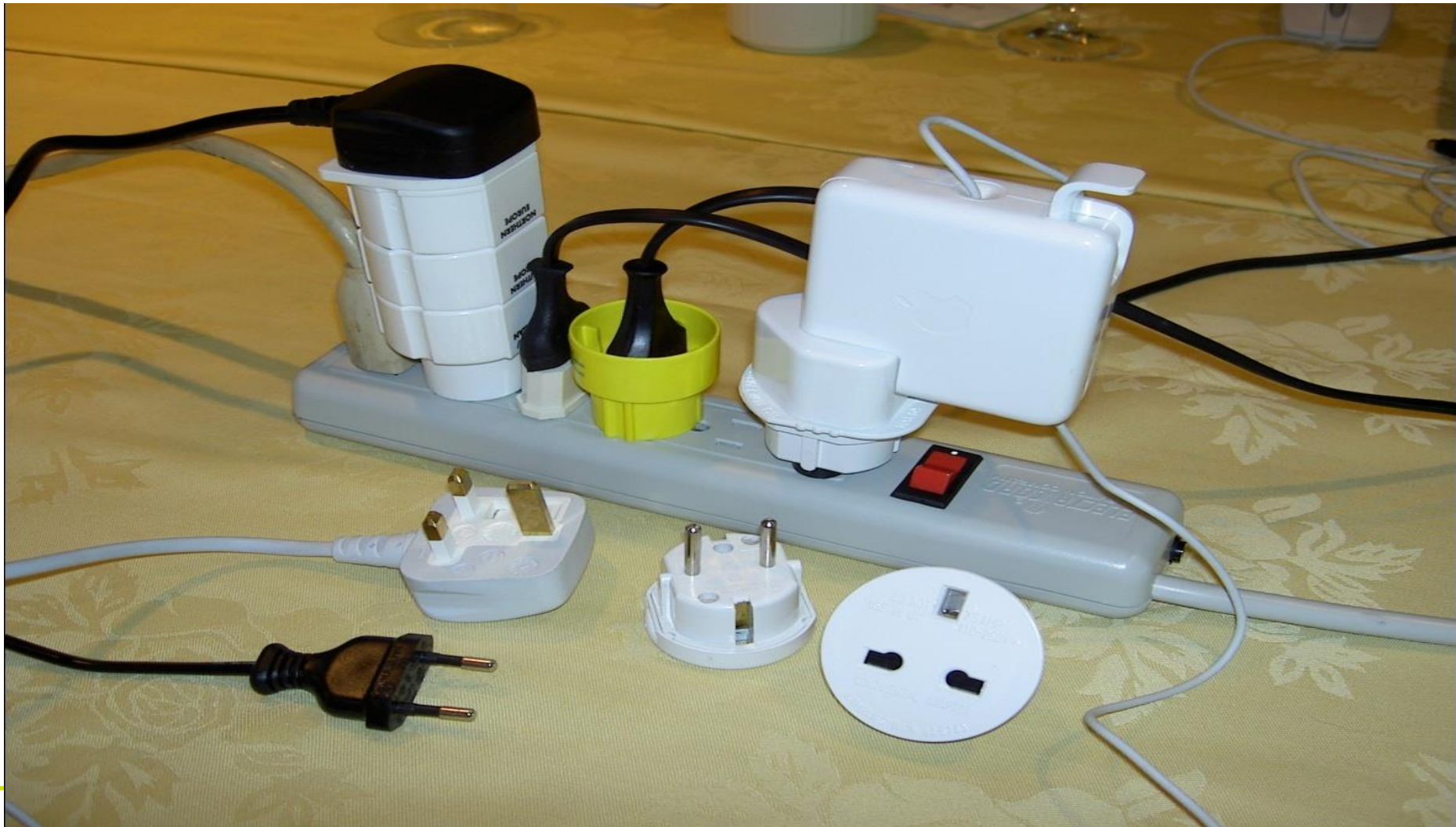
Motivation for ISO 29119

Demand for existing 'standards'
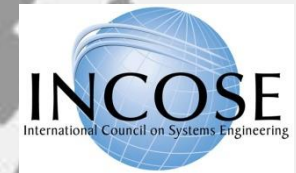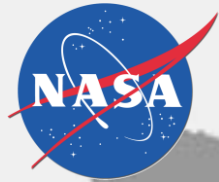
Gaps in the current standards provision

Conflicts in current definitions and processes

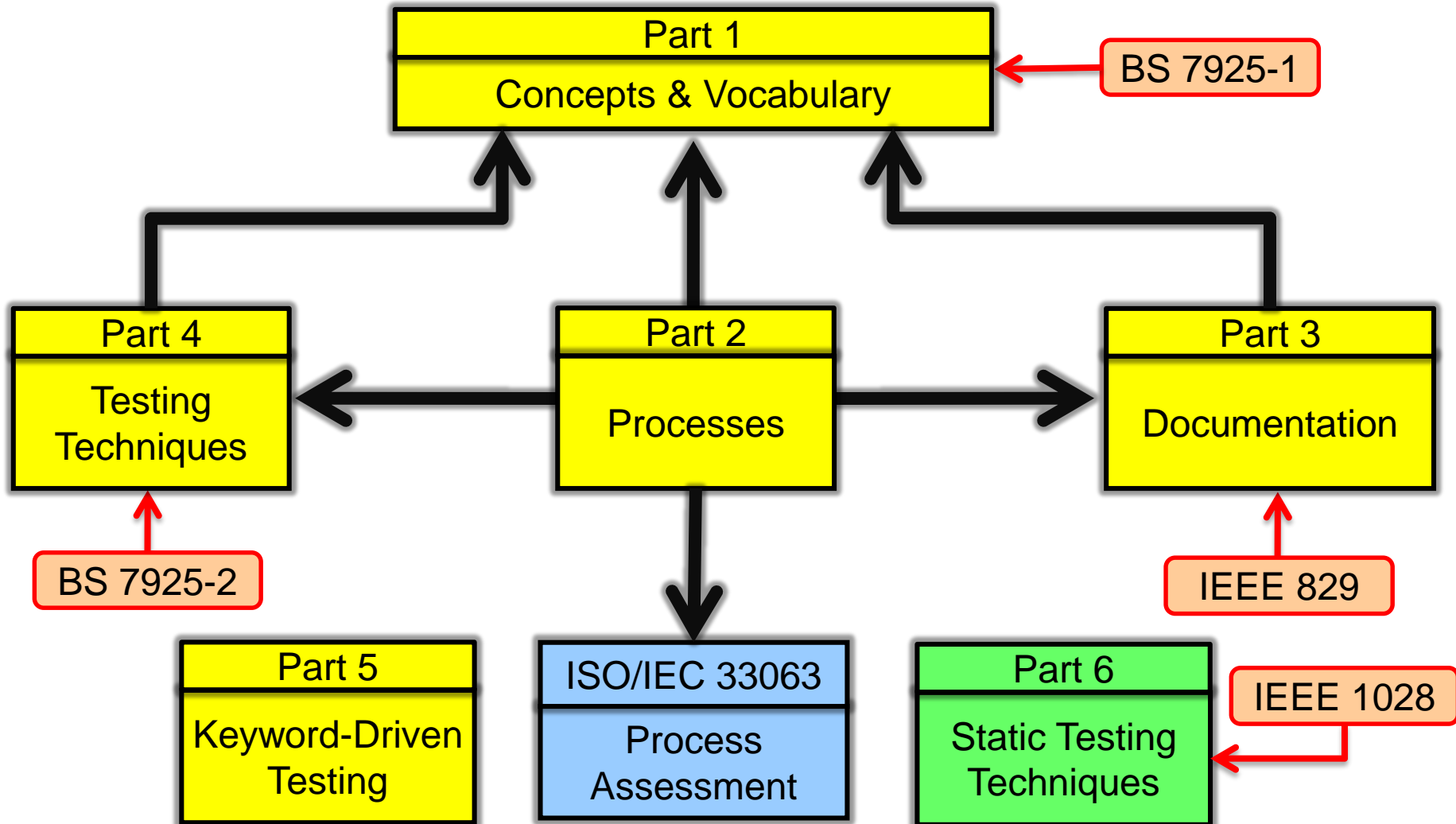A Baseline for the Testing Discipline

Current industry practice is lacking

Buyers unclear on what is 'good test practice'

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Standardization Bodies

ISO 29119 – Structure

```
                    ┌──────────────────────┐
                    │       Part 1         │ ◄─────  BS 7925-1
                    ├──────────────────────┤
                    │  Concepts & Vocabulary│
                    └──────────────────────┘
```

Part 4	Part 2	Part 3
Testing Techniques	Processes	Documentation

BS 7925-2

IEEE 829

Part 5	ISO/IEC 33063	Part 6
Keyword-Driven Testing	Process Assessment	Static Testing Techniques

IEEE 1028

Part 1: Concepts & Vocabulary

Scope, Conformance, Normative References

DEFINITIONS

SOFTWARE TESTING CONCEPTS

RBT

ANNEX - TESTING IN V & V

ANNEX – TEST METRICS & MEASURES

ANNEX - TESTING IN DIFFERENT LIFE CYCLES
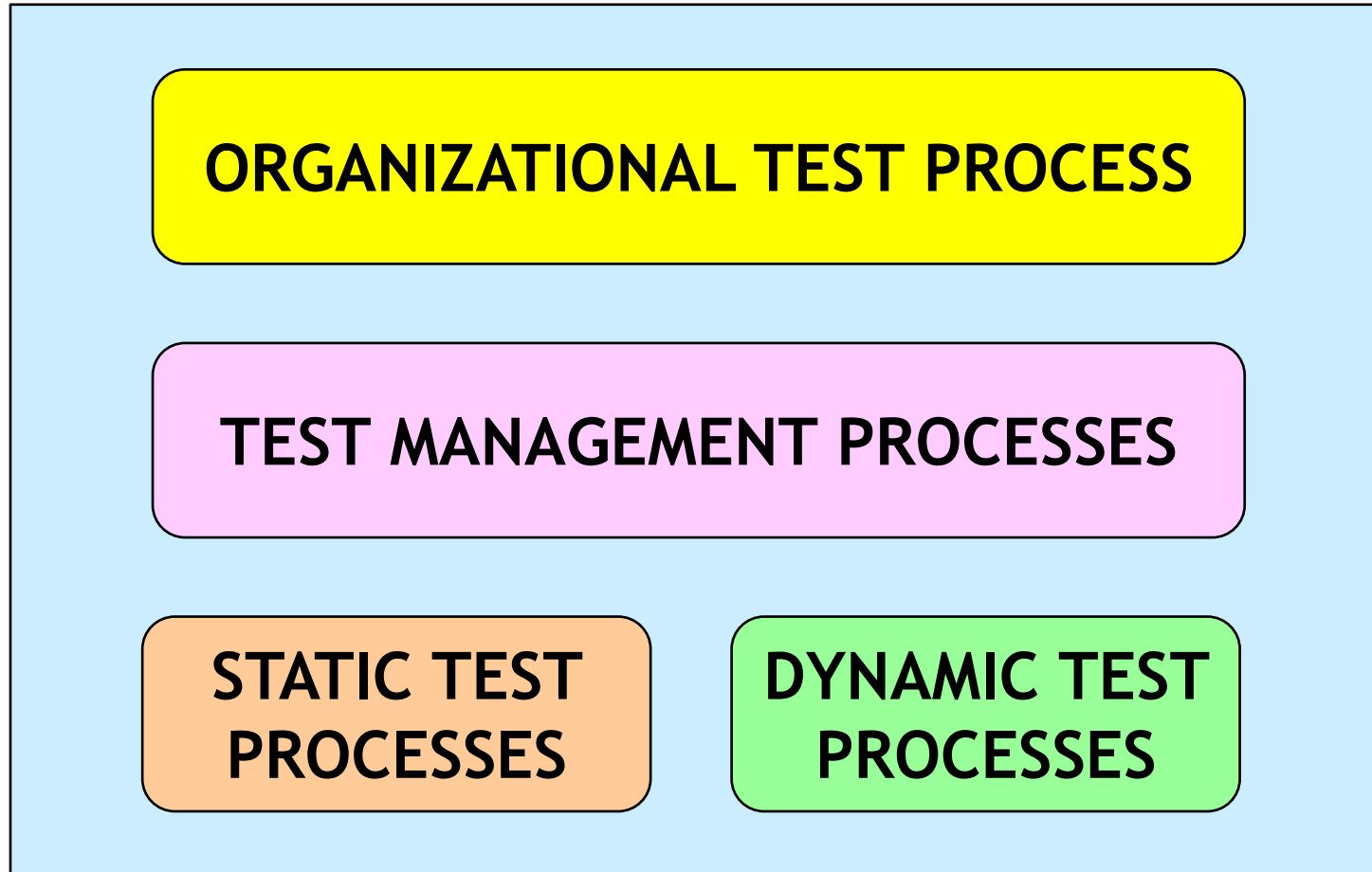
ANNEX - ROLES AND RESPONSIBILITIES

Bibliography

Part 2: Testing Processes
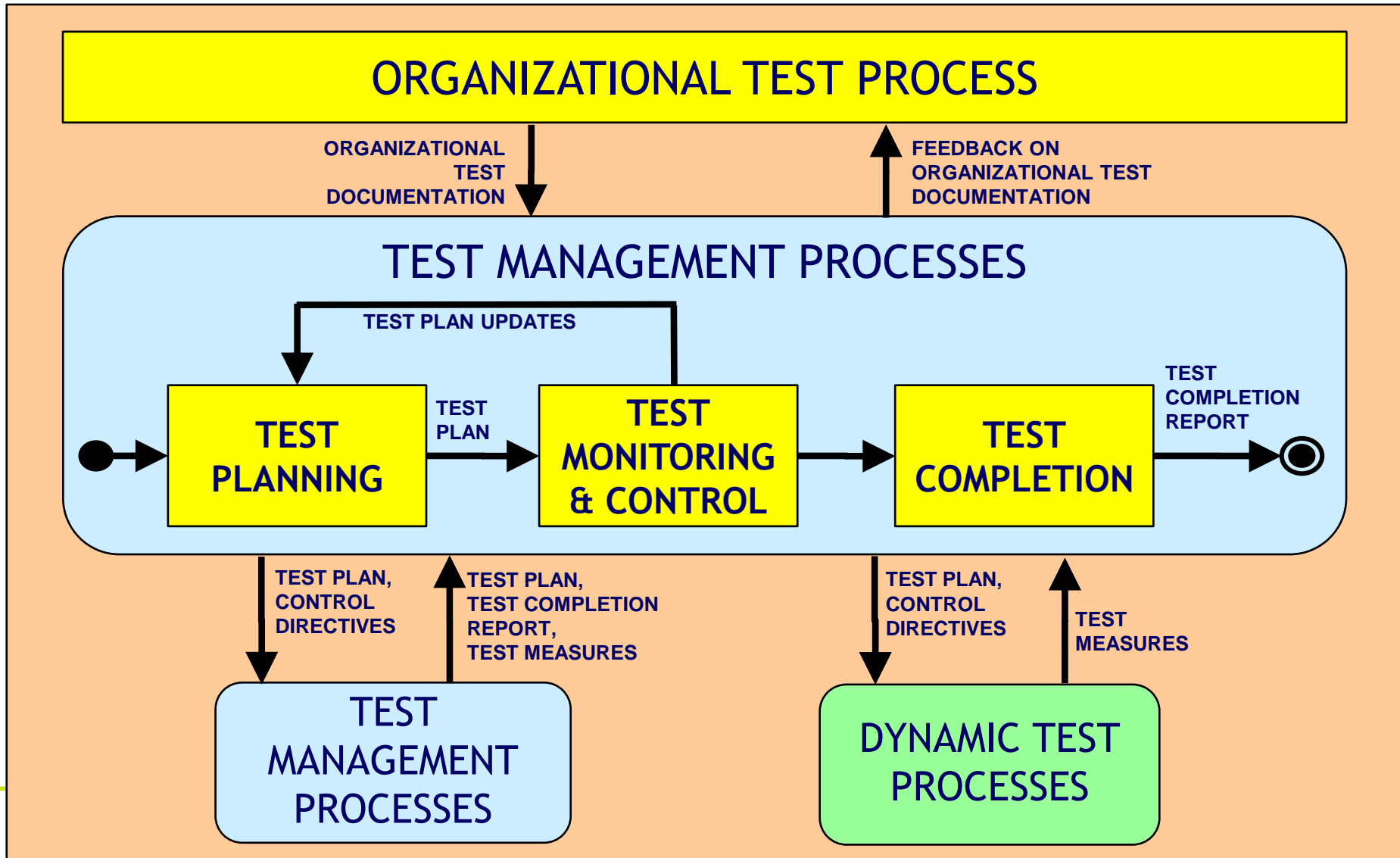
ORGANIZATIONAL TEST PROCESS

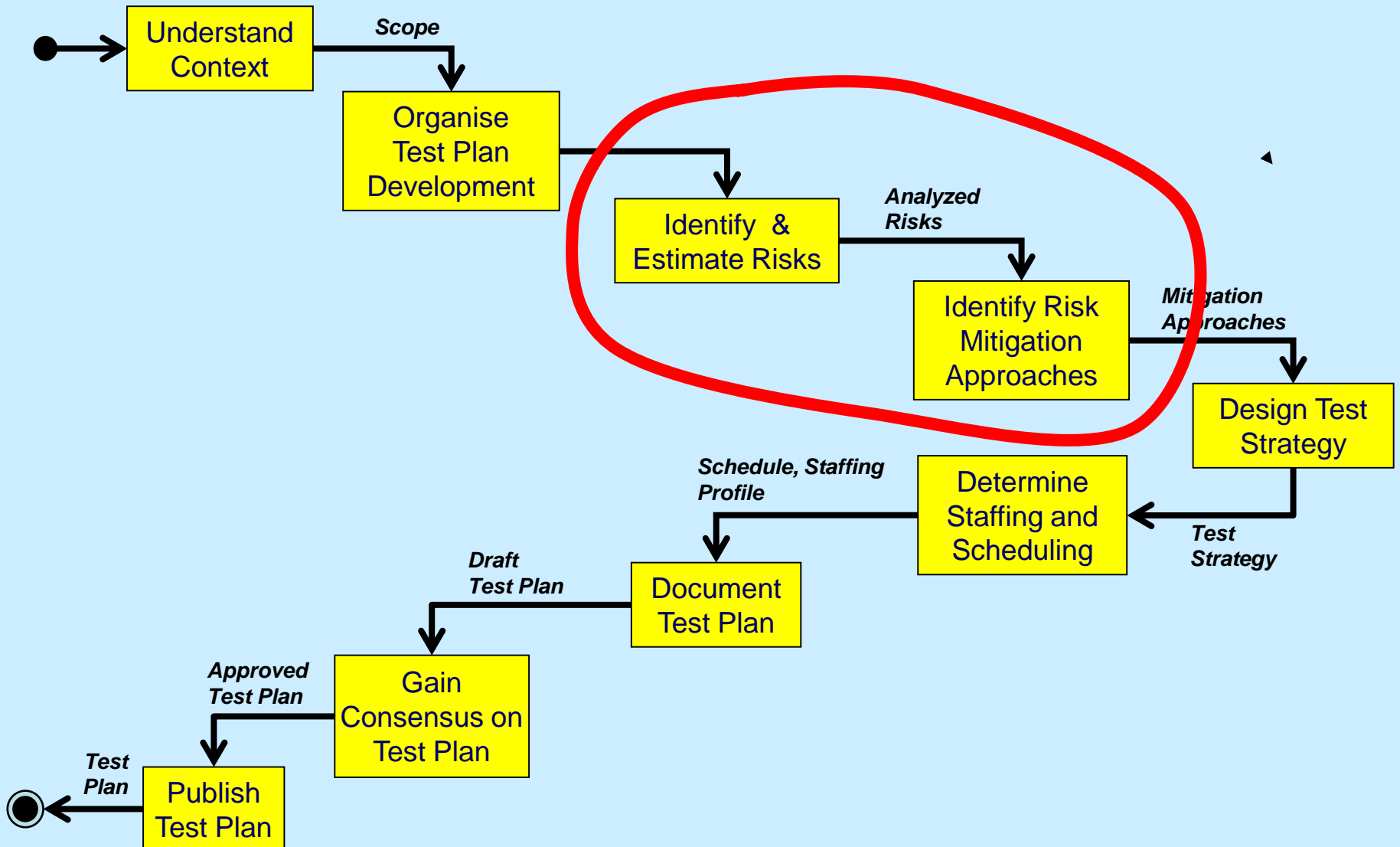**TEST MANAGEMENT PROCESSES**

DYNAMIC TEST PROCESSES

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Testing Processes – the future?

Test Management Processes

Test Planning Process

Perfect Requirements?

Graphic reference: http://777-team.org/tmp/project.jpg

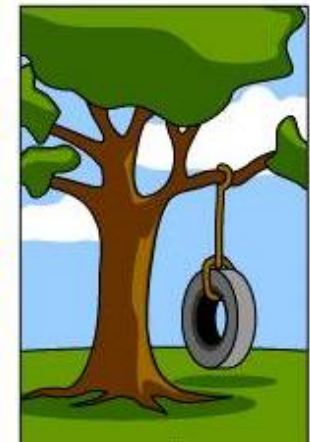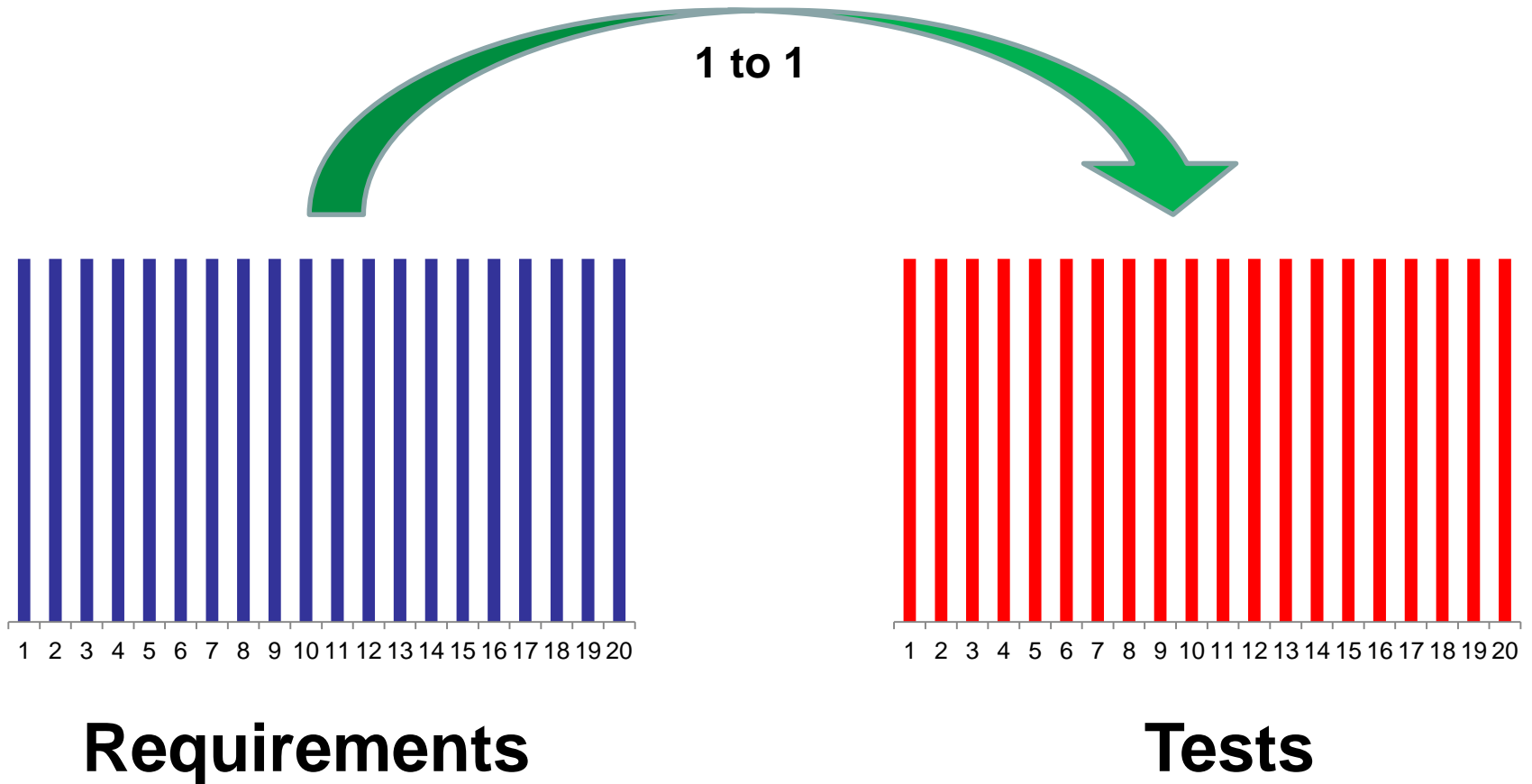| How the Customer explained it | How the Project Leader understood it | How the Analyst designed it | How the Programmer wrote it | How the Consultant described it | What the Customer actually needed |

incomplete

inconsistent

ambiguous

undocumented

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Requirements-Based Testing

1 to 1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Requirements

Tests

Limited Risk-Based Testing

importance

Requirements

Tests

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Risk-Based Testing

Risk Level/Testing

Likelihood/Complexity

×

Impact/Importance

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

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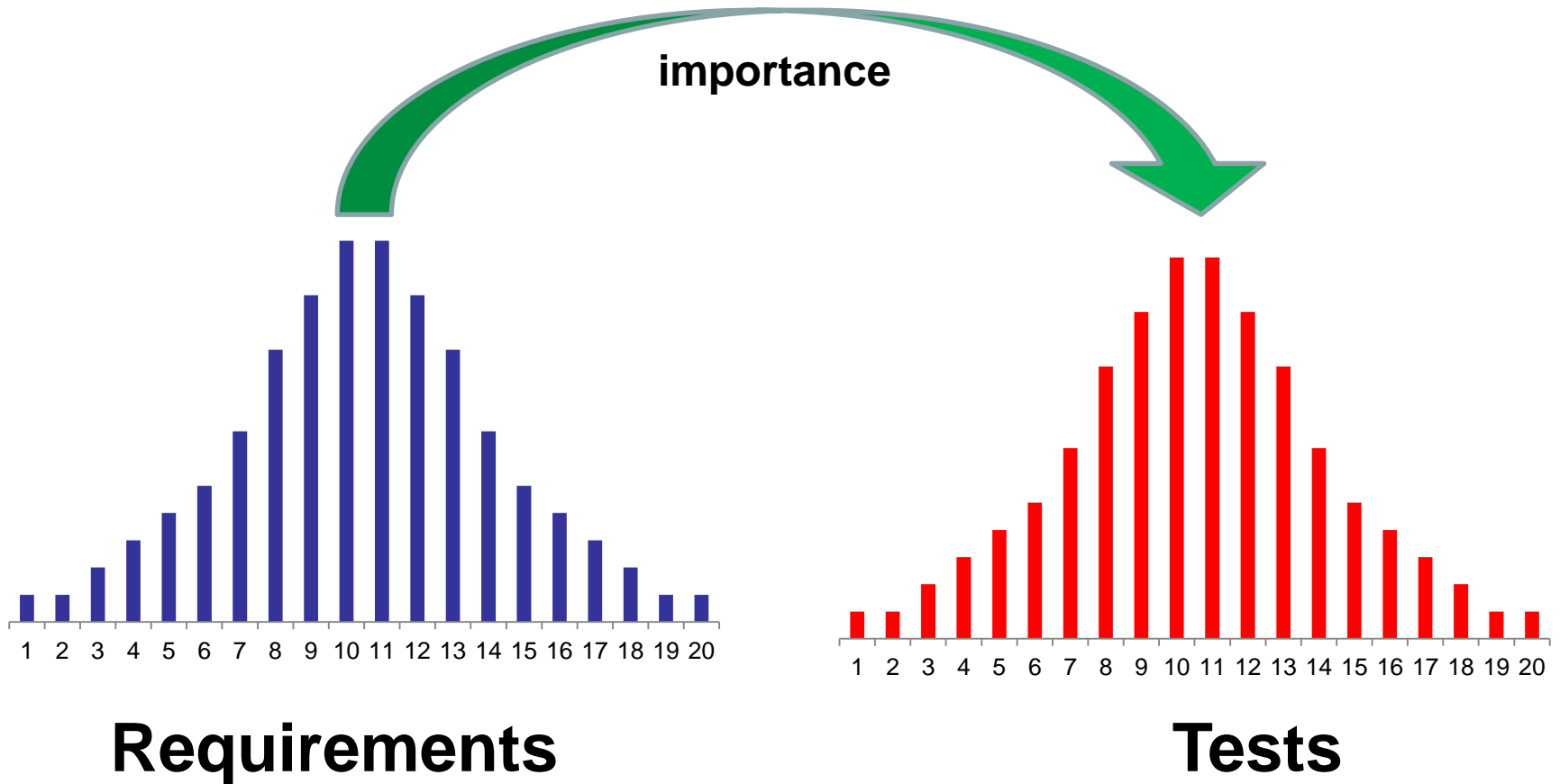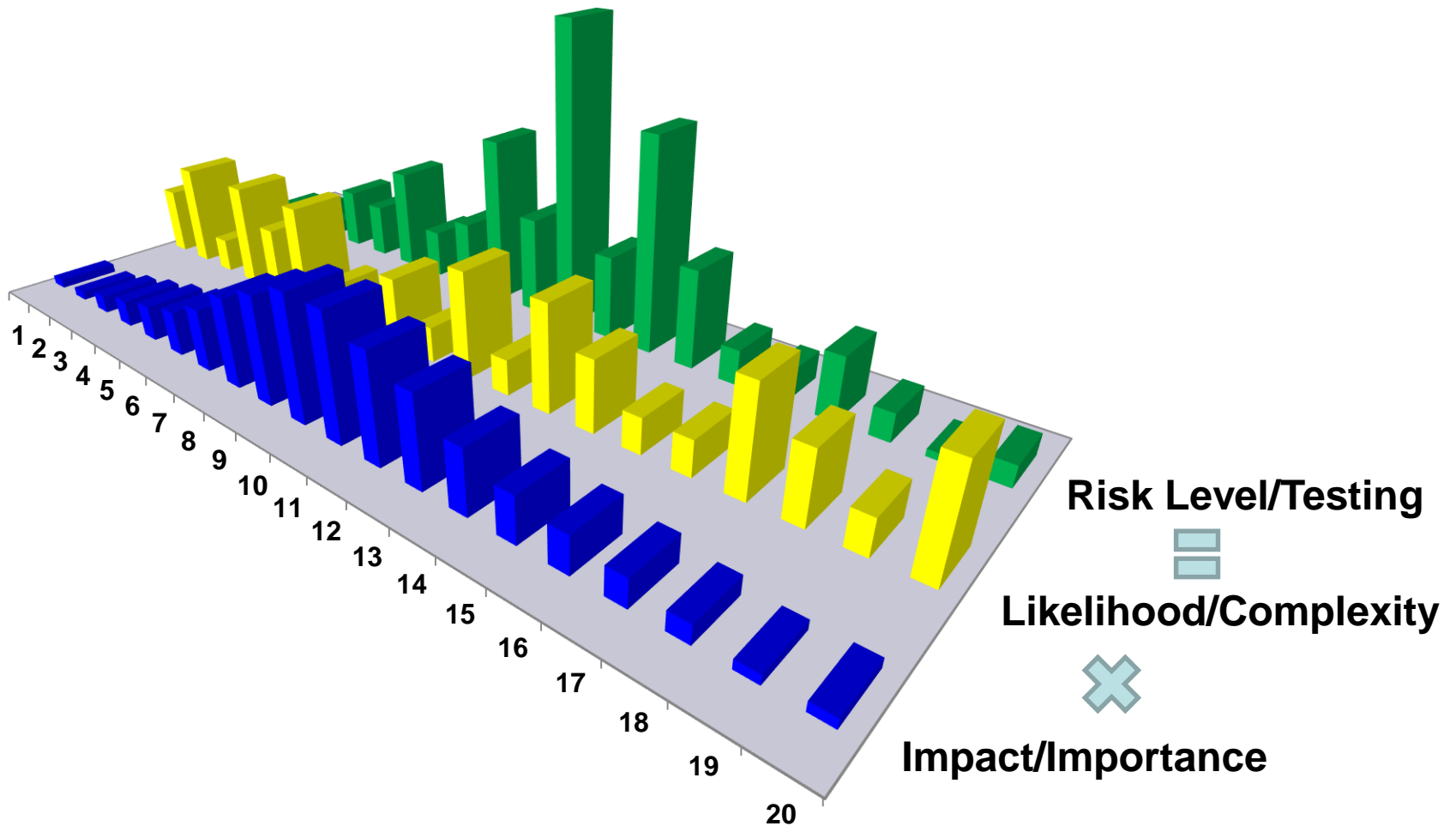
Risk-Based Panic
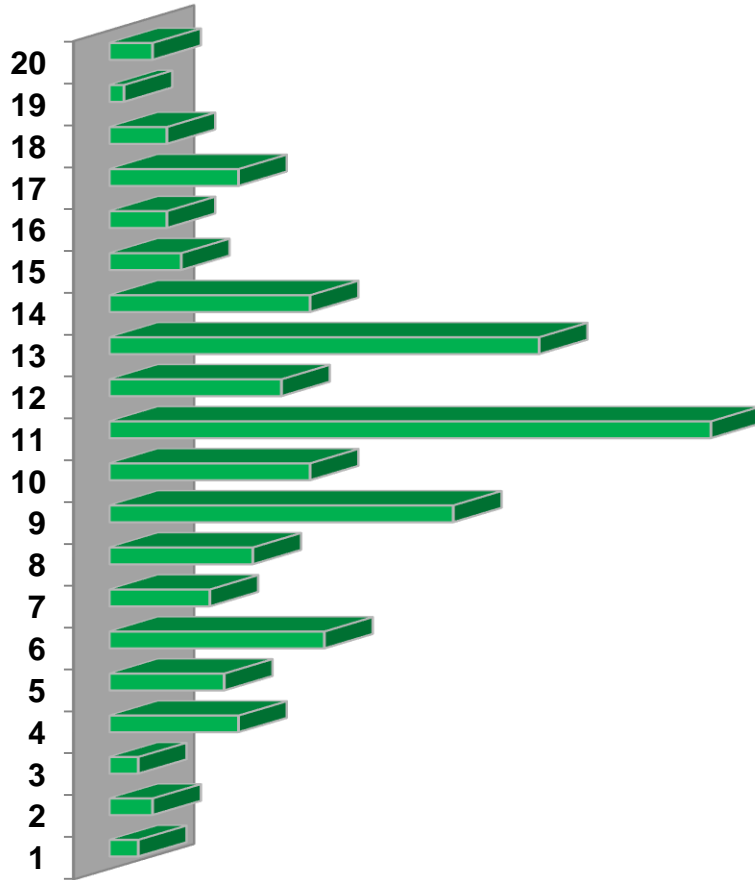
Risk Level / Testing
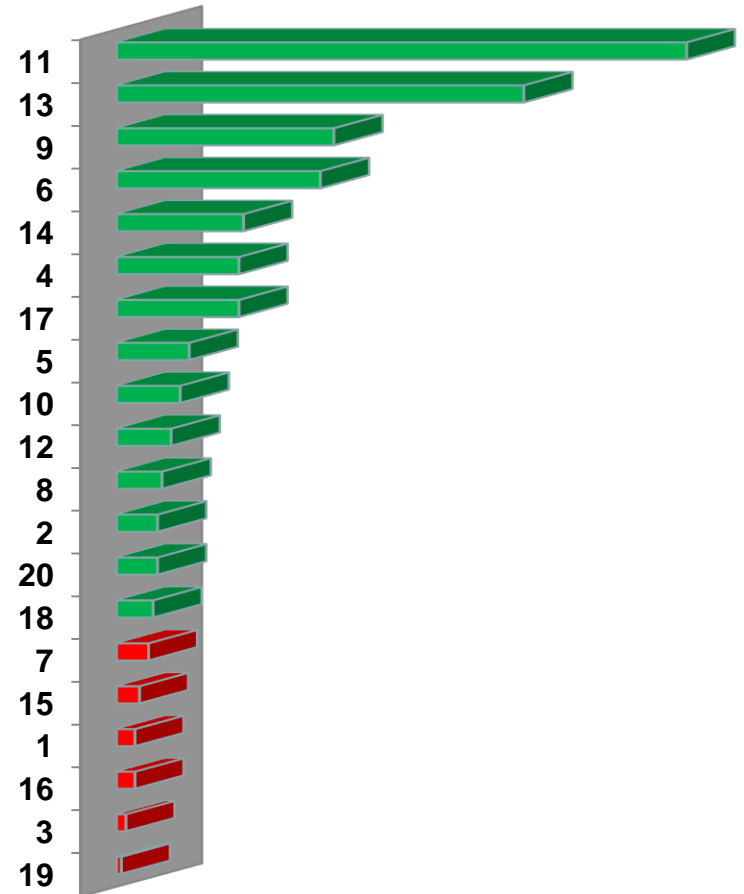
Prioritised Risks / Testing

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Dynamic Test Processes

(LEVEL) TEST MANAGEMENT PROCESS

(LEVEL) TEST PLAN

CONTROL DIRECTIVES

TEST MEASURES

DYNAMIC TEST PROCESSES

TEST DESIGN & IMPLEMENTATION

TEST SPECIFICATION

TEST EXECUTION

TEST RESULTS

[NO ISSUES NOTICED]

[ISSUE NOTICED or RETEST RESULT]

TEST ENV'T REQUIREMENTS

TEST ENVIRONMENT SET-UP

TEST ENVIRONMENT READINESS REPORT

TEST INCIDENT REPORTING

INCIDENT REPORT
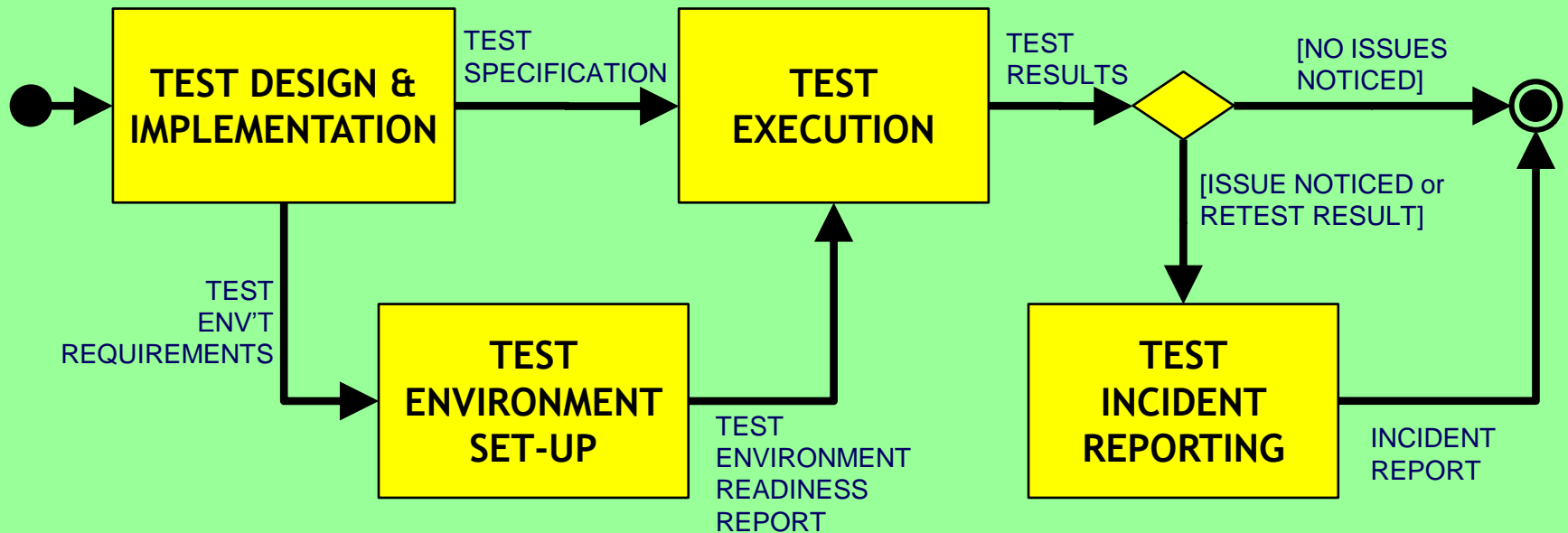
Part 3 – Test Documentation

Scope, Conformance, Normative References

TEST DOCUMENTATION

ANNEXES - EXAMPLES

AGILE & TRADITIONAL

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Test Documentation Types

Organizational test documentation
  – Test policy
  – Test strategy

Project test documentation
  – Project test plan
  – Test project completion report

Test level documentation
  – Test plan
  – Test specification
  – Test results
  – Anomaly reports
  – Level test status report
  – Test environment report
  – Test level completion report

Part 4 – Test Techniques

Scope, Conformance, Normative References

TEST DESIGN TECHNIQUES

BLACK BOX | **WHITE BOX** | **EXPERIENCE**

TEST COVERAGE MEASUREMENT

ANNEXE – TESTING OF QUALITY CHARACTERISTICS

ANNEXE – EXAMPLE USE OF TECHNIQUES/MEASURES

ANNEXE – TEST TECHNIQUE EFFECTIVENESS

ISO 29119 – Test case design techniques

specification-based testing techniques

- boundary value analysis
- cause-effect graphing
- classification tree method
- combinatorial test techniques
- decision table testing
- equivalence partitioning
- random testing
- scenario testing
- state transition testing
- syntax testing

structure-based testing techniques

- branch / decision testing
- branch condition testing
- branch condition combination testing
- data flow testing
- modified condition decision coverage (MCDC) testing
- statement testing

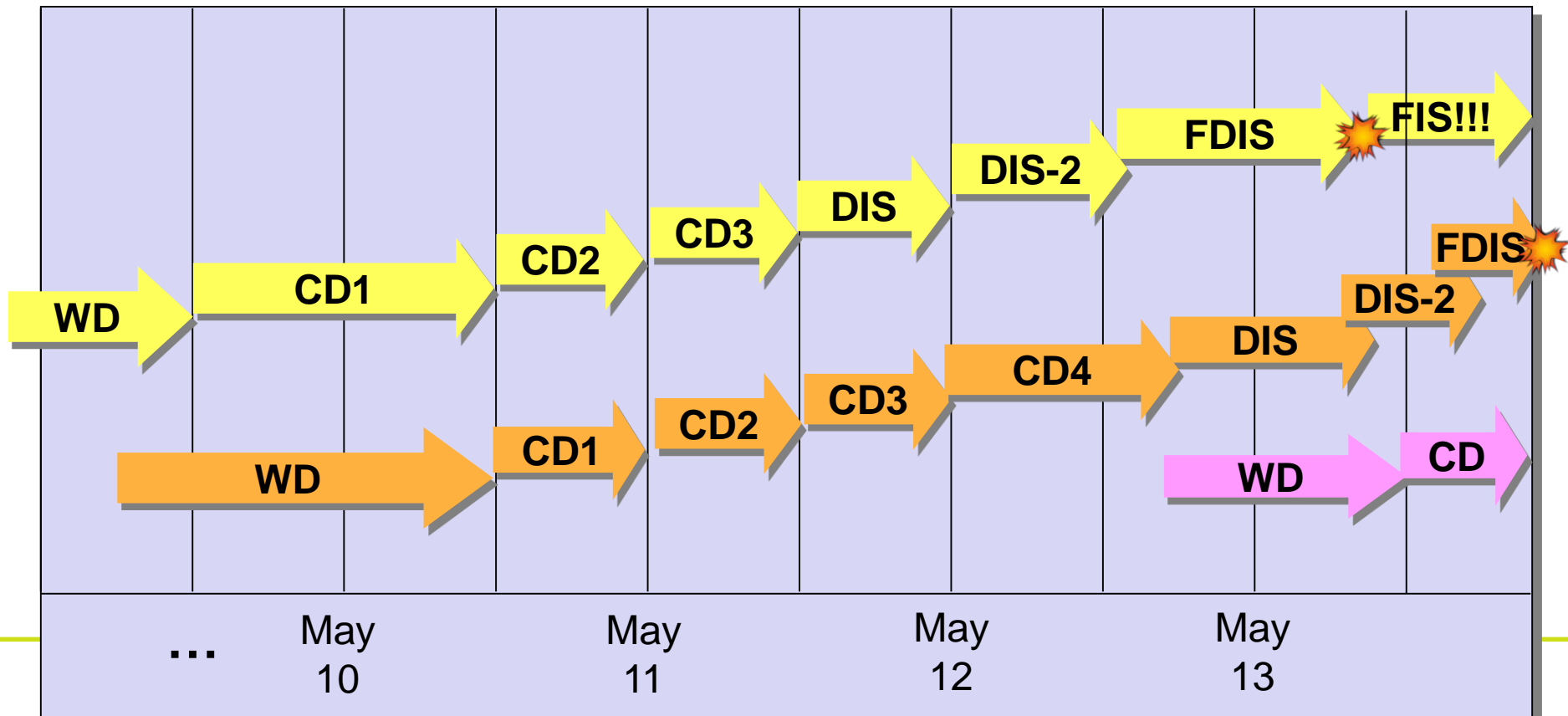**experience-based testing technique**

- error guessing

Current Status

What is most likely to stop ISO 29119?

Fear of change

'Not invented here' syndrome

Perceived as competition

Lack of required use

Anti-standardization – craftsmen

No evidence of efficacy

Cost of use

Complexity

Lack of responsiveness

Lack of inclusiveness…

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Are they applicable to you?

Intended to be a generic standards

– allow tailored conformance

For small and large organizations

Agile and Traditional

Exploratory testing

Financial, Safety-Critical, Games...

Following Regulatory Standards?

Can you afford not to?

Conclusions

Parts 1, 2 & 3 were published September 2013

– My thanks to the editors and reviewers ☺

International standards will provide practitioners with guidelines for testing that cover all aspects of the life cycle

– Provide a consistent set of definitions, processes, procedures & techniques for software testing

– and accelerate take-up of risk-based testing

Will be adopted by IEEE, BSI, ISO and other national standards bodies

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Do you want to be involved?

Join ISO Working Group 26

- – representing your national standards body

- – 6 day meetings, every 6 months

- – contribute between meetings

Join a WG26 mirror group

- – for your national standards body

Contribute materials

Review drafts

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Any Questions?

Any Volunteers?

Finally…

stureid.test@gmail.com

- – if you have any questions on the standards
- – if you are interested in trialling the standard on a project, reviewing drafts or writing examples

http://softwaretestingstandard.org/

- – WG26 website

http://www.jtc1-sc7.org/

- – access to official documents released by WG 26

Acknowledgement

- – ISO 29119 process diagrams based on those of ISO/IEC/IEEE 29119-2, 2013

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