The Effect of Team Exploratory Testing – Experience Report from F-Secure

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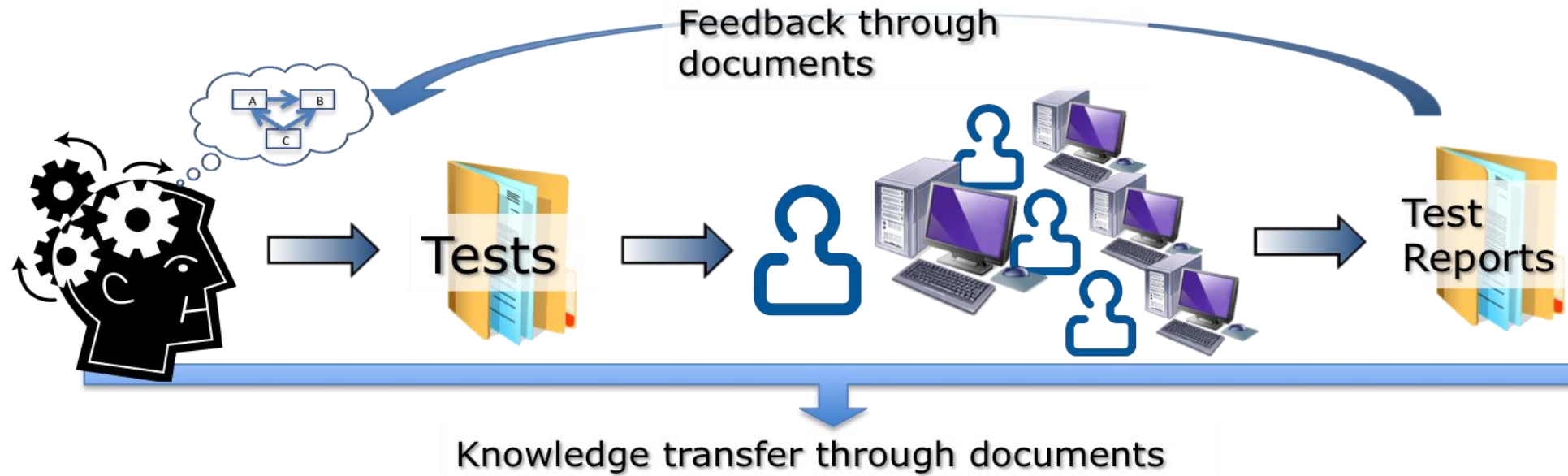
Mika Mäntylä, University of Oulu

What is Exploratory Testing?
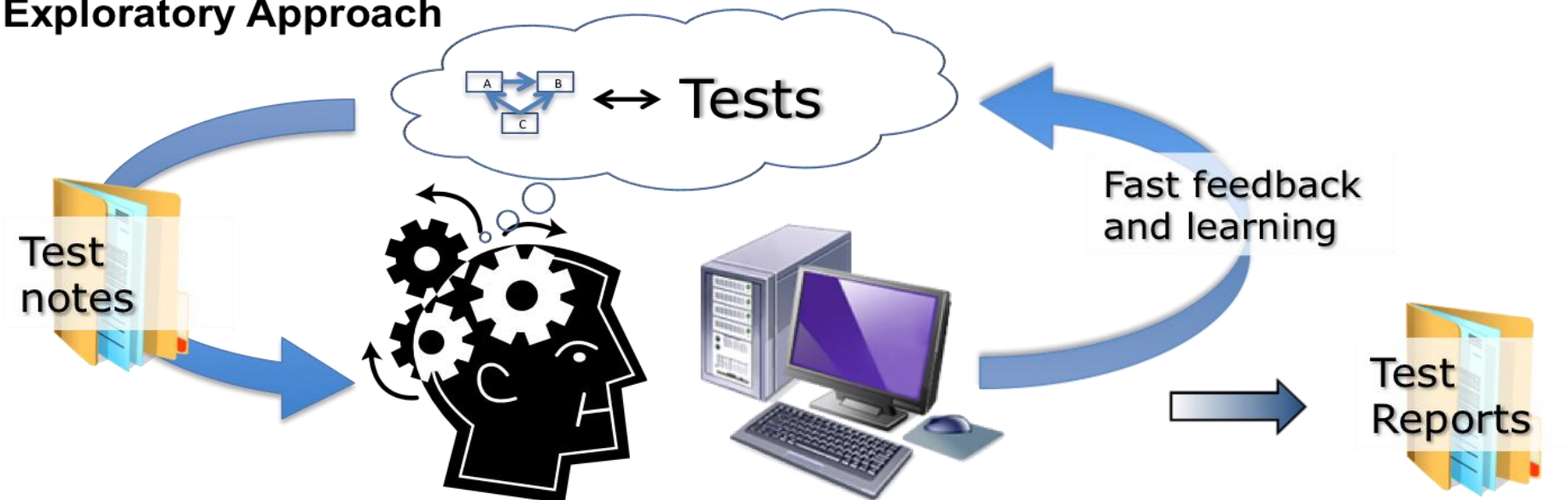Is it popular?
What about the future?

Document-Driven Approach

Feedback through documents

Tests

Test Reports

Knowledge transfer through documents

Exploratory Approach

Tests

Test notes

Fast feedback and learning

Test Reports

Exploration is not ON/OFF variable

Degree of Exploring

Pure
Automated
Testing

Confirmatory
Testing

Exploratory
Testing

Pure
Exploring
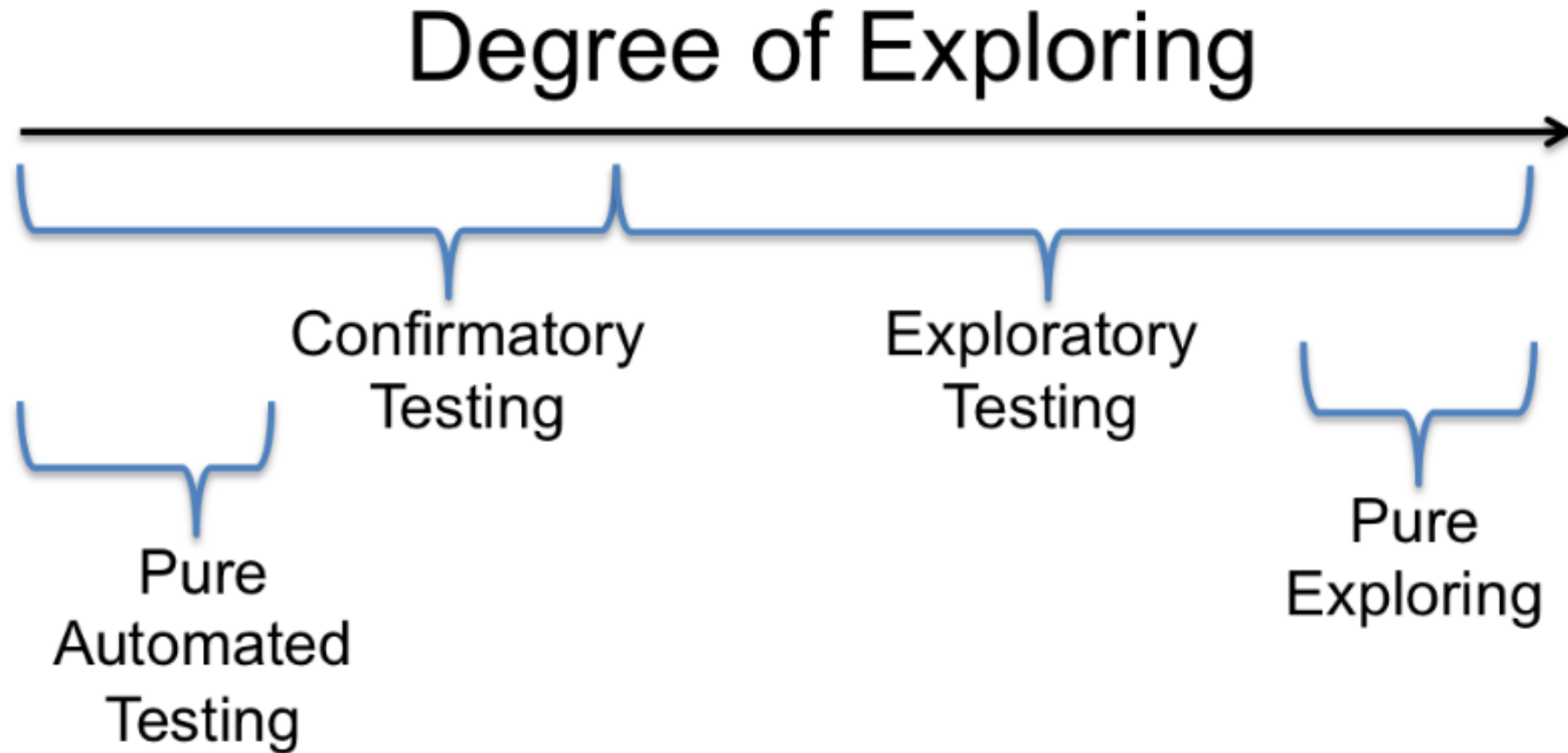
ISTQB survey shows exploratory testing is popular

What is your current job title?

Job Title	Count		Job Title	Count
Tester	1288		Development Manager	24
Test Leader	582		Academic / Professor	18
Test Manager	459		Operations Manager	10
Business Analyst	123		Enterprise Architect	8
Manager	106		R&D Manager	5
Project Manager	80		Database Admin	3
Developer	80		Other	305
System Analyst	61			
CEO / General Manager	40			
Business Unit Manager	33			
IT Architect	28			
CIO / IT Manager	26			

53% TECHNICAL   47% MANAGERS

"Respondents distribution according to functions"

Which are the most adopted test techniques?

(Multiple answers were allowed.)

Technique	Percentage
Use Case Testing	70,8%
Exploratory Testing	66,3%
Checklist Based	54,1%
Boundary Value Analysis	48,2%
Error Guessing	37%
Equivalence Partition	34%
Decision Tables	27,7%
Decision Coverage	21,5%
State Transition	21,4%
Statement Coverage	18,2%
Pair-Wise Testing	13,2%
Attacks	10,4%
Classification Tree	7,1%
Other	2,2%
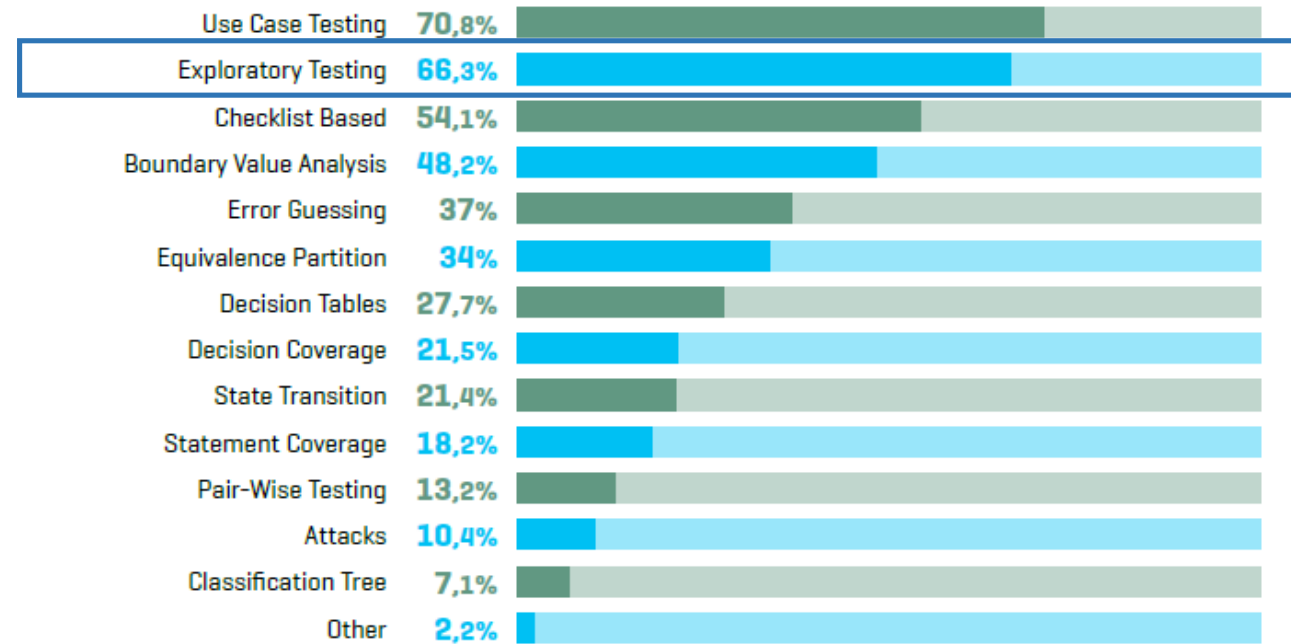
Different testing types [1] – What is the future

	Exploratory Testing	Confirmatory Testing	
	Performed by human testers		Automated
Testing philosophy	Testing is a knowledge intensive and creative activity requiring skills.	Testing is a mechanic and repetitive activity that can be described in explicit instructions.	Testing is automated and repeatable to provide fast feedback to development.

Difficult to automate or outsource due to knowledge and skill needs, see [2]

To be automated or performed by low wage workers

Rapid releases -> increased regression testing [3]

[1] Itkonen, J., Mäntylä, M. V., Lassenius, C., "Test Better by Exploring: Harnessing Human Skills and Knowledge", IEEE Software, (accepted May/2015)
[2] Itkonen, J., Mantyla, M. V., Lassenius, C. (2013). The role of the tester's knowledge in exploratory software testing. *Software Engineering, IEEE Transactions on*, *39*(5), 707-724.
[3] Mäntylä M. V., Adams B., Khomh F., Engström, E. and Petersen K., "On Rapid Releases and Software Testing: A Case Study and a Semi-Systematic Literature Review", Empirical Software Engineering, vol. 20, issue 5, Oct 2015, pp. 1384-1425
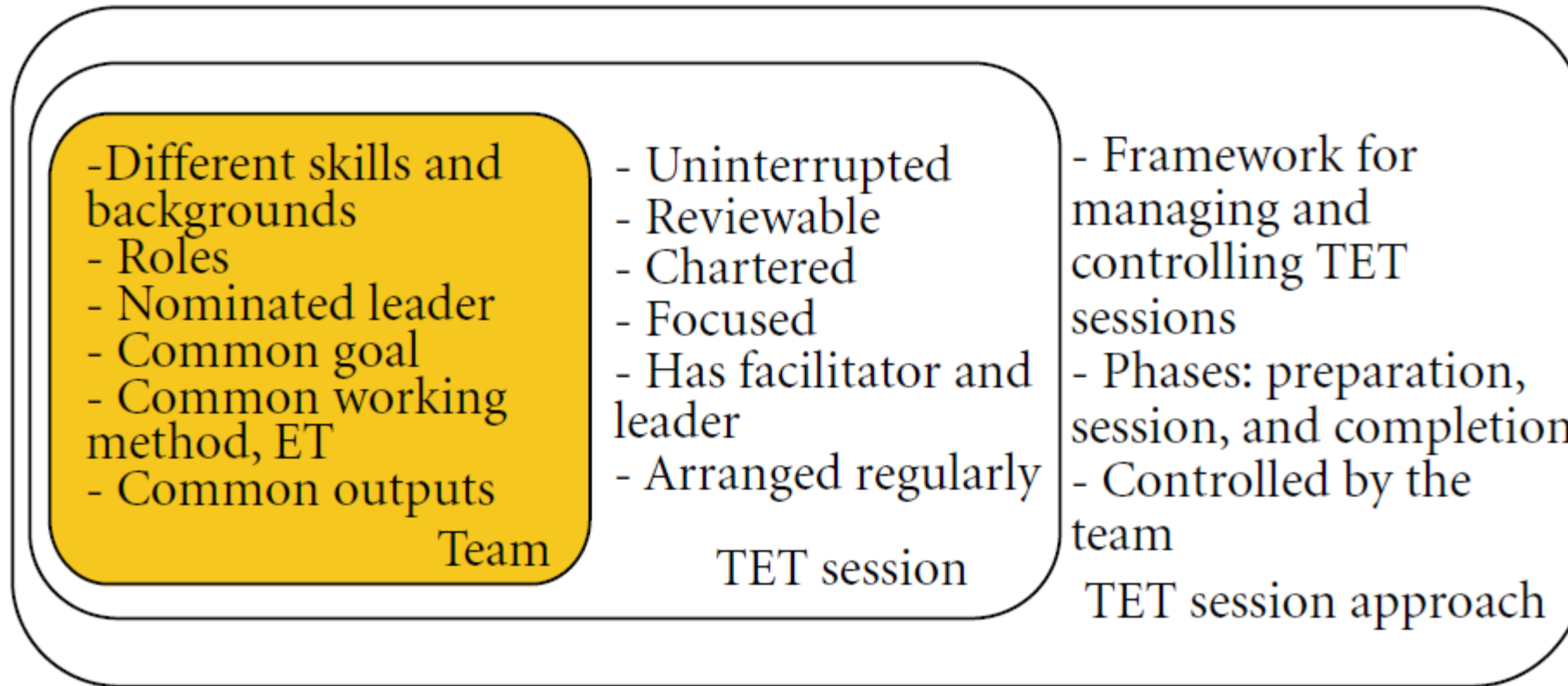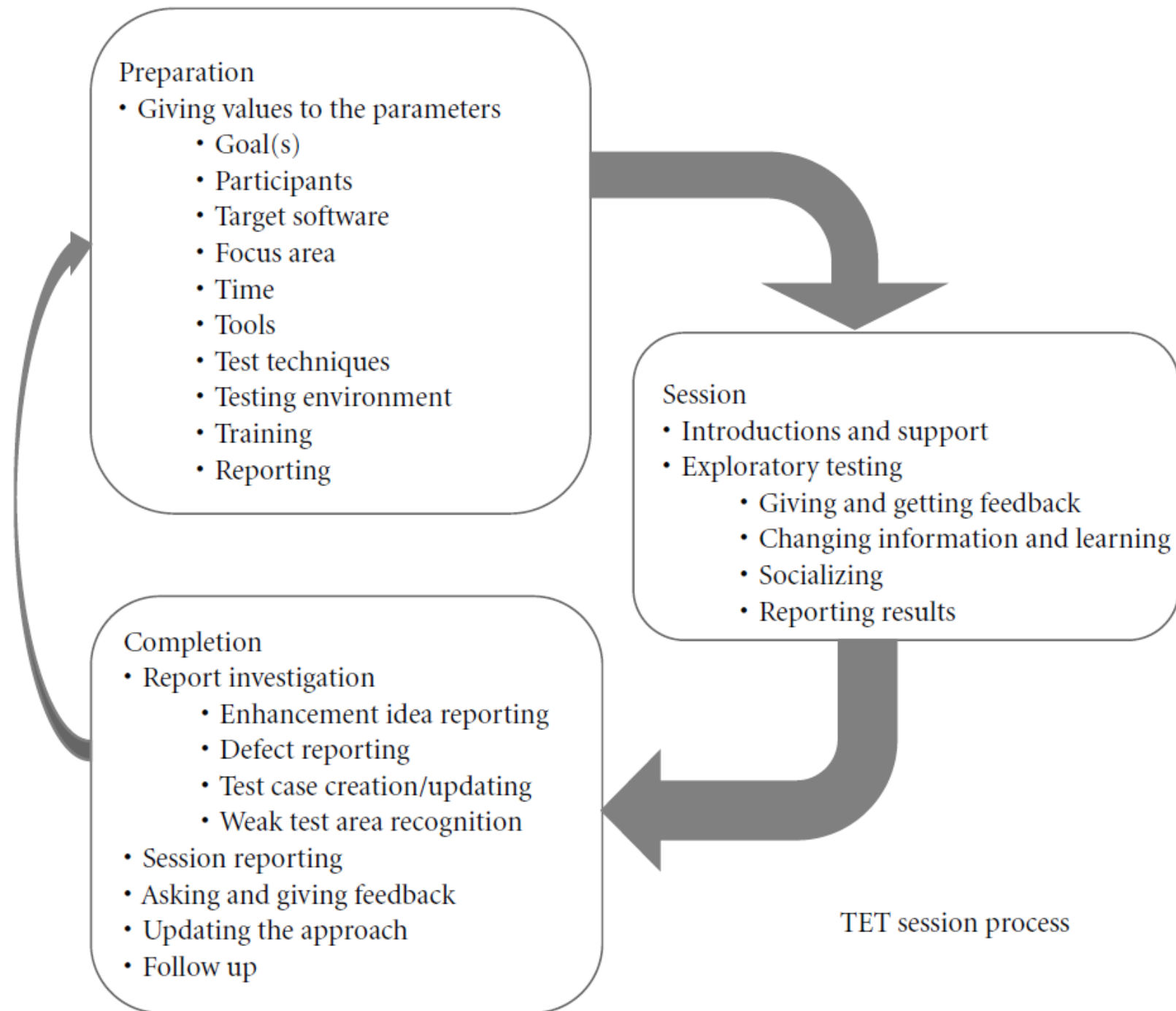
Study

RQs

- *RQ1: How does using the team exploratory testing approach affect the testing results?*

- *RQ2: How are TET-sessions experienced by the participants?*

What is Team Exploratory Testing?

Team:
- Different skills and backgrounds
- Roles
- Nominated leader
- Common goal
- Common working method, ET
- Common outputs

TET session:
- Uninterrupted
- Reviewable
- Chartered
- Focused
- Has facilitator and leader
- Arranged regularly

TET session approach:
- Framework for managing and controlling TET sessions
- Phases: preparation, session, and completion
- Controlled by the team

Saukkoriipi, Soili, and Ilkka Tervonen. "Team exploratory testing sessions." *ISRN Software Engineering* 2012 (2012).

What is Team Exploratory Testing?

Preparation
- Giving values to the parameters
  - Goal(s)
  - Participants
  - Target software
  - Focus area
  - Time
  - Tools
  - Test techniques
  - Testing environment
  - Training
  - Reporting

Session
- Introductions and support
- Exploratory testing
  - Giving and getting feedback
  - Changing information and learning
  - Socializing
  - Reporting results

Completion
- Report investigation
  - Enhancement idea reporting
  - Defect reporting
  - Test case creation/updating
  - Weak test area recognition
- Session reporting
- Asking and giving feedback
- Updating the approach
- Follow up

TET session process

Saukkoriipi, Soili, and Ilkka Tervonen. "Team exploratory testing sessions." *ISRN Software Engineering* 2012 (2012).

RQ1: ...testing results? Defects found & Efficiency

Source	F-Secure - TET sessions	F-Secure Other testing	ET test sessions Case A/B [14]	Sub-system and System testing in Testing phase T1/T2/T3/T4 [28]
Defects found	115	427	169 / 34	20/12/24/0
Effective testing hours	116.5	1761.5	36 / 4	32/570/3150/160
Efficiency (defects per hour)	0.99	0.24	4.8 / 8.7	0.63/0.021/0.0076/0.0

RQ1: ...testing results? Defect severity

Defect type	TET session	Other testing
Show stopper	0.9%	1.6%
Urgent	2.6%	4.4%
High	20.9%	31.9%
Medium	53.9%	42.9%
Low	20.9%	18.3%
Enhancement	0.0%	0.5%
Undefined	0.9%	0.5%

RQ1: …testing results? Defect type

Defect categories	TET	non-TET
Enhancement	4%	1%
Inconsistency	9%	2%
Localization	4%	7%
Documentation and guidance	5%	5%
Usability	24%	14%
UI	28%	18%
Functionality	22%	40%
Performance and reliability	3%	8%
Technical	1%	6%

RQ2 ... *participant experiences? Benefits Drawbacks*

Benefits

- *"immediate discussions", "instant feedback", "I can ask",*

- *"colleagues collaborating in the same room" and "communality"*

- *"insight from non-testers on how applications are used" "broader look at the application"*

Drawbacks

- vague defect descriptions: *"Home view does not look good, it should look better".*

- Test-sessions require arranging and after work

RQ2 ... *participant experiences?*

Suitable for testing

- For full features

- Regression related defects

- *The exploratory testing flow is more random in the nature so it is not uncommon to make a discovery that would not have been made in actual structured regression testing.*

Non-suitable for testing

- functions that require a lot of steps

- long running functions or

- testing that requires backend, device side or remote service configurations

Paper Summary

- Quantitative data of TET
  - High efficiency
  - More usage and usability related problems
- Qualitative findings pros
  - Feedback & Discussions
  - Many defects found
  - Insight from non-testers & Broader view
  - For testing full features
- Qualitative findings cons
  - Requires effort in set-up and after-work
  - Vague defect descriptions
  - Not for tests that take long time to execute

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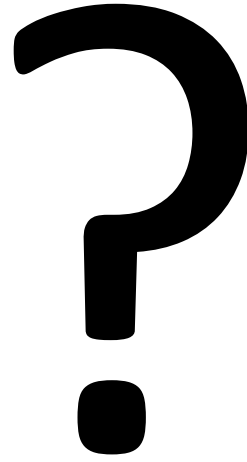
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