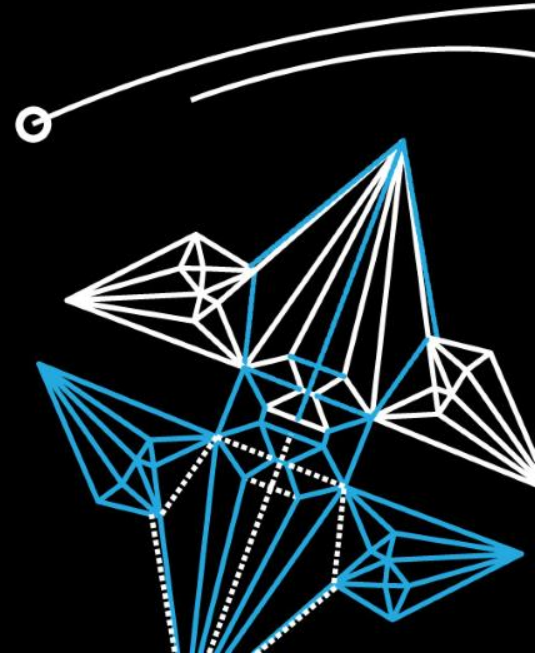
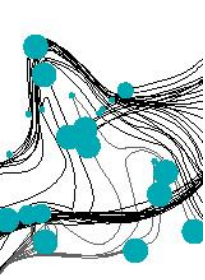


# Quality requirements challenges in the context of large-scale distributed Agile: An empirical study

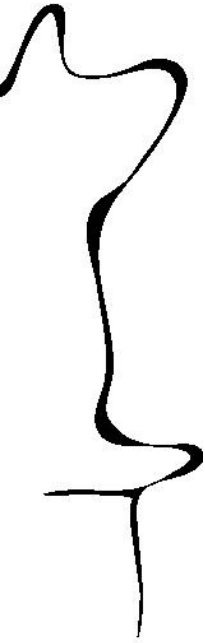
Wasim Alsaqaf, Maya Daneva and Roel Wieringa





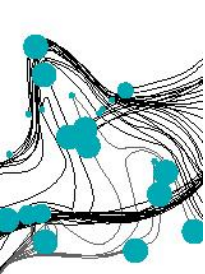
# TABLE OF CONTENTS

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- **Introduction**
- **Research Question**
- **Research Process**
- **Results**
- **Key Learning and implications**
- **Threats of validity**
- **Conclusions**





# INTRODUCTION

## AGILE & QUALITY REQUIREMENTS (NON-FUNCTIONAL REQUIREMENTS)

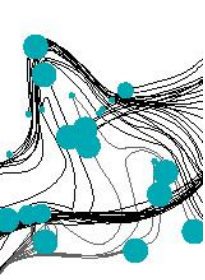
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- Agile methods became increasingly popular the last years
- A recent SLR\* on Agile found that Agile development methods neglect the Quality requirements in Agile methods\* during the development cycle
  - Undermine the profits of fast delivery by introducing high rework efforts later on
- Distributed agile projects could suffer more because of the neglect of QRs



\* I. Inayat, L. Moraes, M. Daneva, and S. S. Salim, "A Reflection on Agile Requirements Engineering: Solutions Brought and Challenges Posed," in XP Workshops, 2015.



# INTRODUCTION

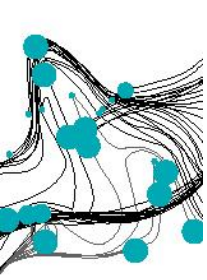
## OUR RESEARCH

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- In response to that problem, we initiated an empirical research project to develop best practices to help agile practitioners identifying, implementing and testing QRs in distributed agile projects.
- identify the challenges that agile practitioners face concerning QRs



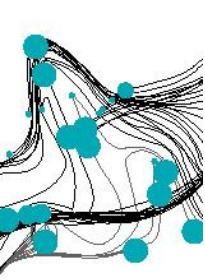


## RESEARCH QUESTION

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*What are the challenges Agile practitioners face when engineering the QRs in distributed large-scale settings?*



# RESEARCH PROCESS

## QUALITATIVE EXPLORATORY MULTI-CASE STUDY

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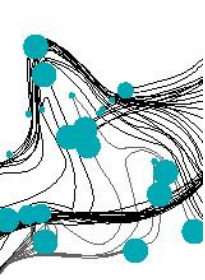


- We have followed the methodological guidelines described by R. Yin.\*
- Semi-structured open-ended in-depth interviews
- Interview protocol – developed by the first author and validated by the senior researchers (the other two authors).
- A pilot interview is conducted (interview was not included in the result)
- Finalizing the interview questions\*\*

\* R. K. Yin, Case Study Research Design and Methods, 5th Revise. Sage Publications Inc, 2013.

\*\* <https://wasimalsaqaf.files.wordpress.com/2017/07/interviewquestions.docx>





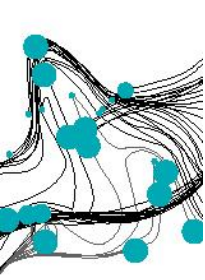
# RESEARCH PROCESS

## INVOLVED ORGANIZATIONS

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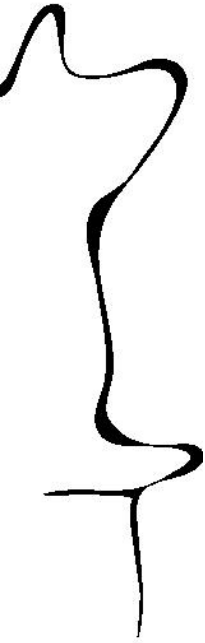
Organization	Size in employee's number	# of projects	# of participants
O1	Middle (51 – 200)	2	4
O2	Middle (51 – 200)	1	2
O3	Big (200 – 500)	1	1
O4	Big (300 – 700)	3	3
O5	Big (10000 – 30000)	3	3
O6	Big (50.000 – 100.000 )	4	4



# RESEARCH PROCESS

## INVOLVED PARTICIPANTS

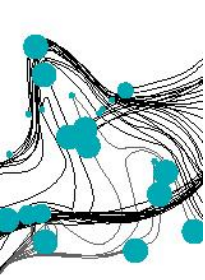
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- Between 4 – 36 years of experience
- Different roles & background (developer, architect, tester, scrum master, etc.)
- Different domains (Public sector, government, banking, commercial etc.)







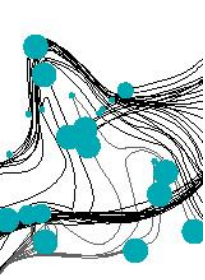
# RESULTS

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- Teams coordination and communication challenges
  - Late detection of QRs infeasibility
  - Assumptions in inter-team collaboration
  - Uneven teams maturity
  - Suboptimal inter-team organization
- Quality Assurance challenges
  - Inadequate QRs test specification
  - Simulated integration tests
  - End user acceptance of QRs





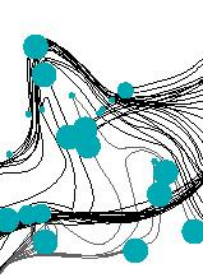
# RESULTS

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- QRs elicitation challenges
  - Overlooking sources of QRs
  - Lack of QRs visibility
- Conceptual challenges of QRs
  - Conceptual definition of QRs
  - Mixed specification approaches to QRs
- Architecture challenges
  - Unmanaged architecture changes
  - Misunderstanding the architecture drivers





# DISCUSSION

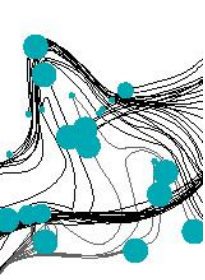
## COMPARISON WITH PREVIOUS EMPIRICAL STUDIES

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- What challenges did we find, that were not mentioned before?
  - Insufficient inter-team collaboration,
  - Organizing distributed teams around the product backlog in a sufficient way
  - Lack of visibility of QRs early in the project and
  - Knowledge and skills discrepancy within a single team / teams





# DISCUSSION

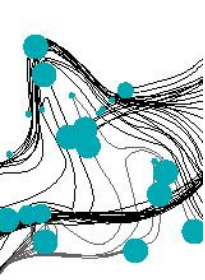
## COMPARISON WITH PREVIOUS EMPIRICAL STUDIES

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- What was already discussed in prior studies?
  - QRs identification and documentation difficulties
  - Focusing on delivering functionality at the cost of architecture flexibility
  - Ignoring predictable architecture requirements,
  - Insufficient requirements analysis,
  - Validating QRs occurs too late in the process and
  - Product Owner's lack of knowledge





# DISCUSSION

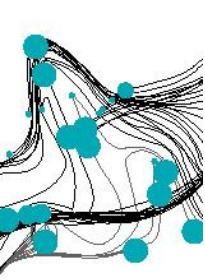
## COMPARISON WITH PREVIOUS EMPIRICAL STUDIES

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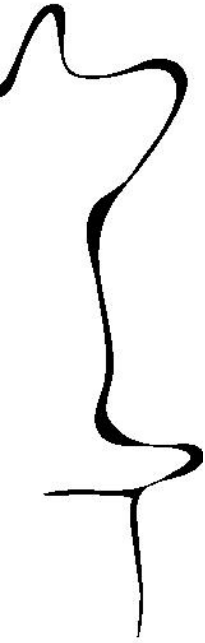
- What was already discussed in prior studies but not found in this study?
  - Product Owner's heavy workload and
  - Insufficient availability of the Product Owner





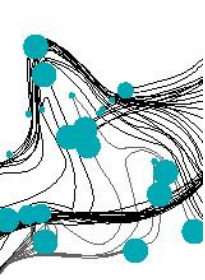
## KEY LEARNING AND IMPLICATIONS (1/2)

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- Practitioners struggle with the nature of QRs
  - Are user stories equivalent to traditional requirements or not?
  - 3C = Card (written user story), Conversation (user story discussion) and Confirmation (user story acceptance criteria)





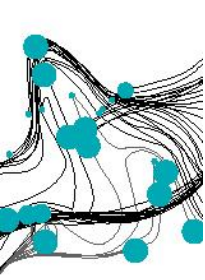
## KEY LEARNING AND IMPLICATIONS (1/2)

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- Our suggestions:
  - Practitioners should think carefully at the beginning of a project about how to treat the QRs
  - Organizing distributed teams should happen in a way that ensure the streaming of tacit knowledge from the more knowledgeable to the novices





# THREATS OF VALIDITY

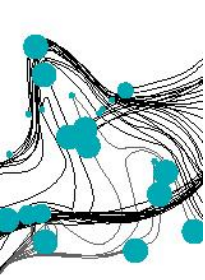
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- The first author is an agile practitioner, so occupational bias is possible.
- Involved practitioners may not answer the question honestly.
- The interviewer may ask leading questions

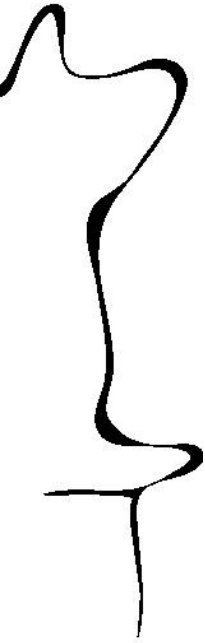






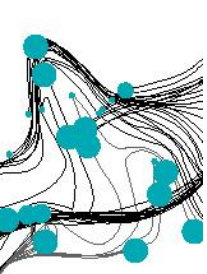
# CONCLUSION

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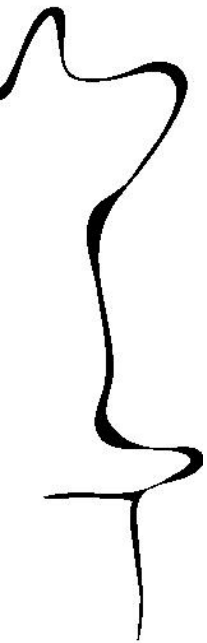
- Thirteen main challenges were identified regarding QRs based on a qualitative exploratory case study.
- There is actually a conceptual problem when it comes to the identification of QRs.
- We think that the challenges are not caused by Agile methods but by the way practitioners implement those methods





# THANK YOU

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- For additional questions/information → [w.h.a.alsaqaf@utwente.nl](mailto:w.h.a.alsaqaf@utwente.nl)

