

# Difficulty Factors of Obtaining Access for Empirical Studies in Industry

**Lutz Prechelt**

prechelt@inf.fu-berlin.de

**Franz Zieris**

zieris@inf.fu-berlin.de

**Holger Schmeisky**

holger.s@fu-berlin.de

# Motivation

- **Empirical Studies in Industry:**
  - We have methodological knowledge about *study design, data collection and analysis*
  - But: *Getting access* to a suitable research context (e.g. permission to collect data) *is difficult.*
- **Idea:** Provide a “checklist”
  - of difficulties from *company’s perspective*
  - to help *choosing* a suitable study design

# Our Research Question

*“What factors influence the difficulty of obtaining access to a suitable industrial context?”*

## Research Design Phase



*Difficulty, rather than effort*

- High effort does not guarantee overcoming difficulty

# Structure of this talk

- 1. Overview:** The Difficulty Factors
- 2. Validation:**
  - Two cases from our own research
    - Pair Programming
    - Agile Offshoring

# The Difficulty Factors

Three categories:

## 1. Scope Factors



Number/diversity of participants, effort, time extent, loss of confidentiality, ...

## 2. Problematic Intervention Effects



Distraction/complication, need to learn, schedule/quality risk, ...

## 3. Helpful Intervention Effects



Insights, capability/tooling improvement, image benefits, ...

*see paper for details*

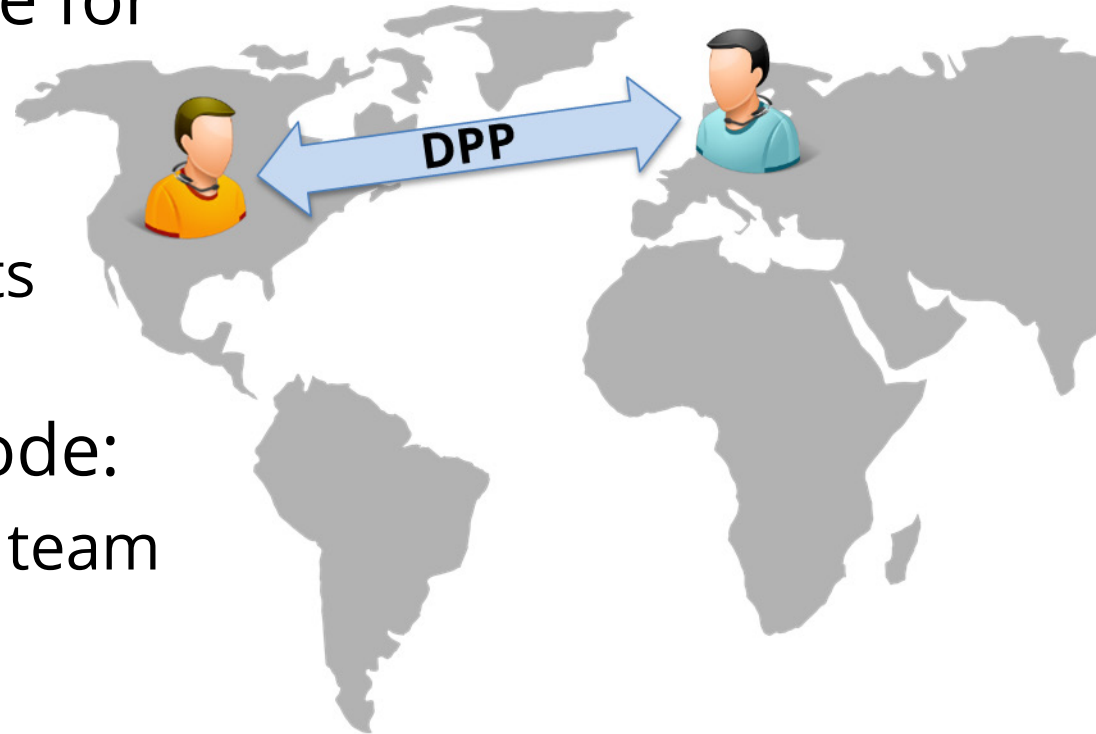
# Case 1: Pair Programming

- **Idea:** understand how pair programming works, describe behavioral (anti-)patterns
- GT-based qualitative analysis:
  - Voluntary in-vivo session recordings (screen, webcam, audio)
  - Reflective discussion the day after the recording
  - In-depth analysis during the following months

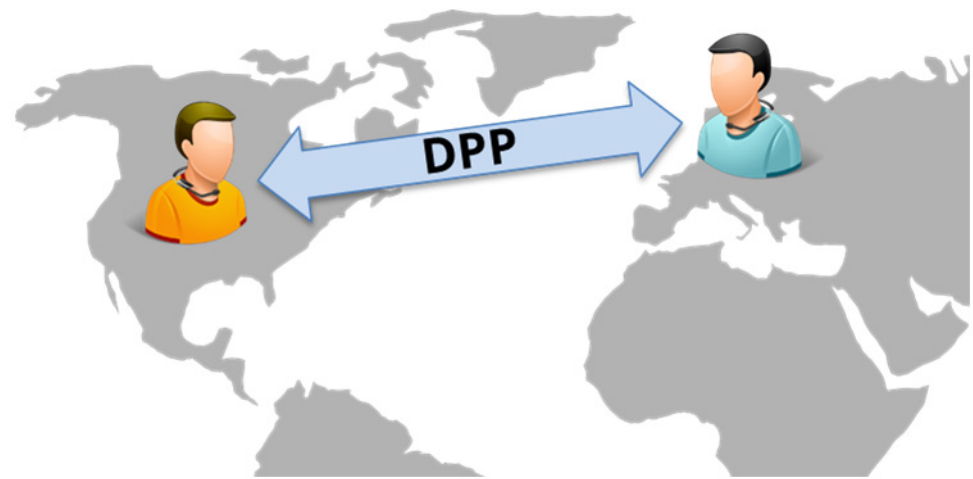


# Case 2: Agile Offshoring

- **Idea:** Employ distributed pair programming (DPP) as a regular practice for distributed teams
  - Feel as “one team”
  - Avoid requirements misunderstanding
- Action-research mode:
  - Accompany whole team for whole project duration, support decision-making



# The Scope Factors



## Numbers:

- + Only two participants

## Loss of confidentiality:

- Screen recordings
- + Voluntary sessions

## Numbers:

- Whole team

## Technology constraints:

- DPP tool support for team's IT ecosystem

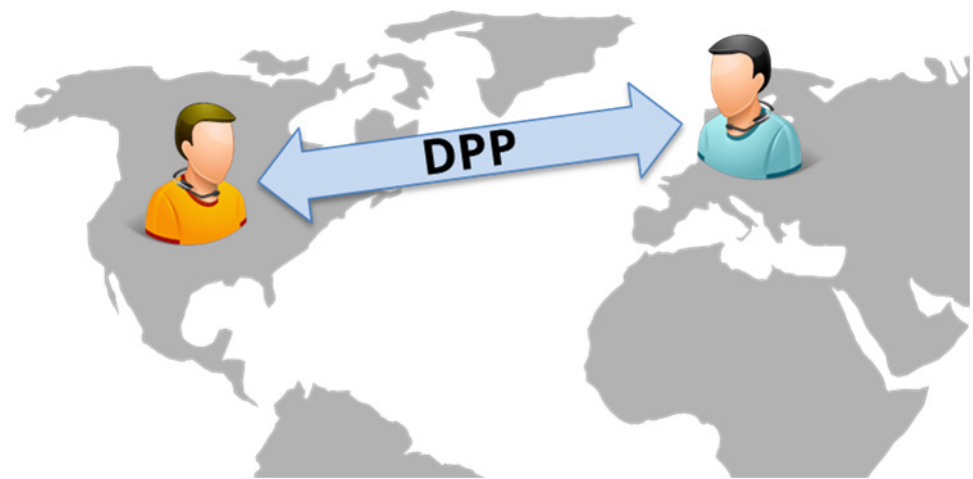


# Problematic Intervention Effects



**Schedule &  
Quality risk,  
Need to learn:**

+ little, work as usual



**Schedule &  
Quality risk,  
Need to learn:**

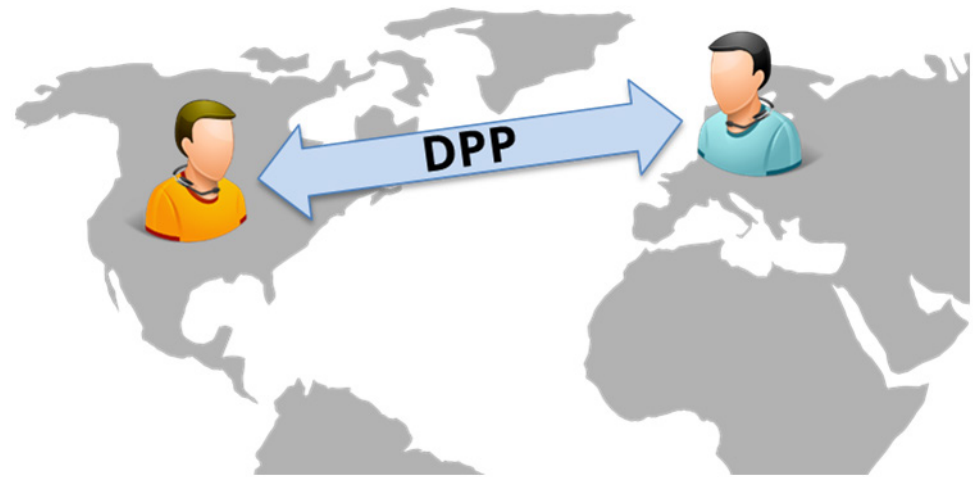
- Whole arrangement is new
- DPP tool and practice are new

# Helpful Intervention Effects



## Insights & Capability Improvement:

- + Reflective discussion the day after the recording



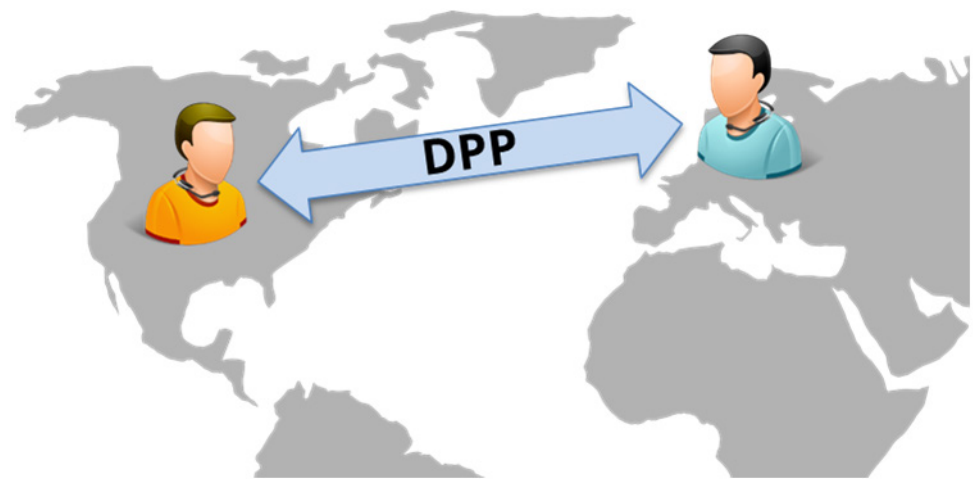
## Insights & Capability Improvement:

- + Action Research mode

## Additionally:

- + Having must-pay-for formats (workshops, consulting)

# Case Comparison: *Actual* Difficulties



## Sometimes:

-  Distraction
-  Loss of confidentiality





## Regularly:

-  Insights expected

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**So far:** 10 comp., 45+ rec.

## Although:

-  Improved capability
-  Little quality risk/distraction
-  Paid tool development,
-  would pay for workshop




## Still:

-  Schedule risk, #participants

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**So far:** None worked out yet 11

# Conclusion

- “Difficulty Factors”: **Taxonomy** of
  - 6 **scope factors** 
  - 5 **problematic intervention effects** 
  - 7 **helpful intervention (side-) effects** 
- Initial **validation** for two of our own research strands
- **No quantification**
  - The anti-difficulties need to outweigh the difficulties from the industry’s partner point of view
- **Further work**
  - Systematic application of the Factors during the design phase
  - Include Factors (i.e. their *strength*) in research articles?
  - Catalog of procedures for coping with each factor

**Thank you!**

# Used Images



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<http://www.iconarchive.com/show/oxygen-icons-by-oxygen-icons.org/Devices-camera-web-icon.html>

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# Backup slides

# Scope Factors

- Factors having to do with the size of the study



## **Practitioner Effort**

- The lesser the better



## **Loss of Confidentiality**

- No planned exposition
- Mechanisms to minimize unplanned exposition



## **Required Technology**

- Two or more choices for each factor (e.g. IDE, programming language)



## **Number of Participants**

- Fewer people for longer time frames
- Exception: five minute surveys



## **Diversity of Roles**

- Different roles might call for different ways of convincing them



## **Time Extent**

- Shorter time frames → fewer unexpected events to wreck schedule



# Problematic Intervention Effects

- Factors influencing the company's work in a problematic way (even if unplanned)



## Schedule Risk

- Allow company to withdraw from study quickly without losing work



## Quality Risk

- Any negative impact should be obvious early on and easy to fix



## Distraction

- Non-invasive data collection
- High degrees of voluntariness and informedness about research procedures



## Complication

- Being flexible to work-around steps that are perceived as complications



## Need to Learn

- Bring evidence for actual learning effort/possible enjoyment

# Helpful Intervention Effects

- Factors influencing the company's work in a good way



## Action Research Mode

- Joint problem solving → company has more control
- Lower required level of competence (i.e. need to understand issues in advance)



## Must-pay-for Activities

- Offer training/consulting → *having* a price as service quality proxy



## Capability Improvement Expected

- Quantitative measurements of benefits
- Special case for technology-oriented partners:  
Tooling Improvement Expected



## Insights Expected

- Emphasize various kinds of possible insights from study execution or study results



## Image Benefits

- Being named as research partner, e.g. for hiring young talent



## Altruistic Benefits