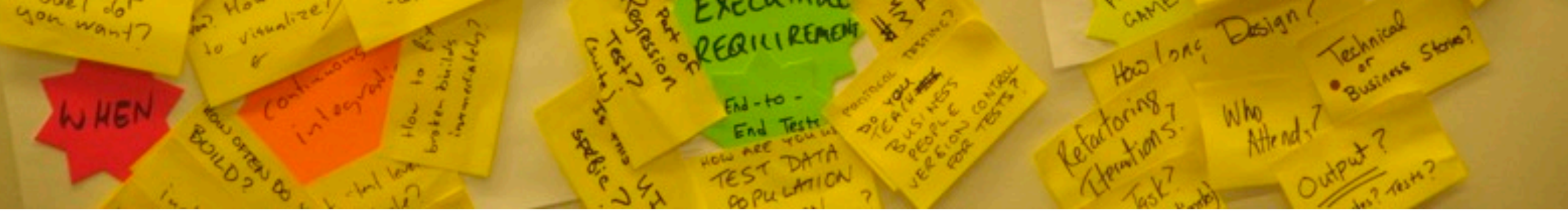

Case studies

IT3010 guest lecture

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Norwegian University of Science and Technology
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NTNU – Trondheim
Norwegian University of
Science and Technology

Agenda

- Your background
- Your prior knowledge of case studies
- The parental benefit programme

- Case studies: Key definitions and taxonomy
- Quality of case studies
- The parental benefit programme: Example research design
- Questions and answers

EXERCISE: Prior knowledge

1

- Individually: Write down answers to the following questions:
  1. What is a case study?
  2. When are case studies used?
  3. What types of case studies exist?
  4. How are case studies conducted?
  5. What would you like to know more about regarding case studies?

2

- If you would like, share on padlet

EXERCISE: Parental benefit programme

1

- Individually: Read text on the Parental benefit programme (3 minutes)
- Make individual notes (3 minutes) :
  How would you design a case study of this programme if you had a research question on *coordination?*

2

- In breakout groups (10 minutes):
  A. How would you design a case study on “coordination”?
  B. What data would you collect?
  C. How would you analyse the data?

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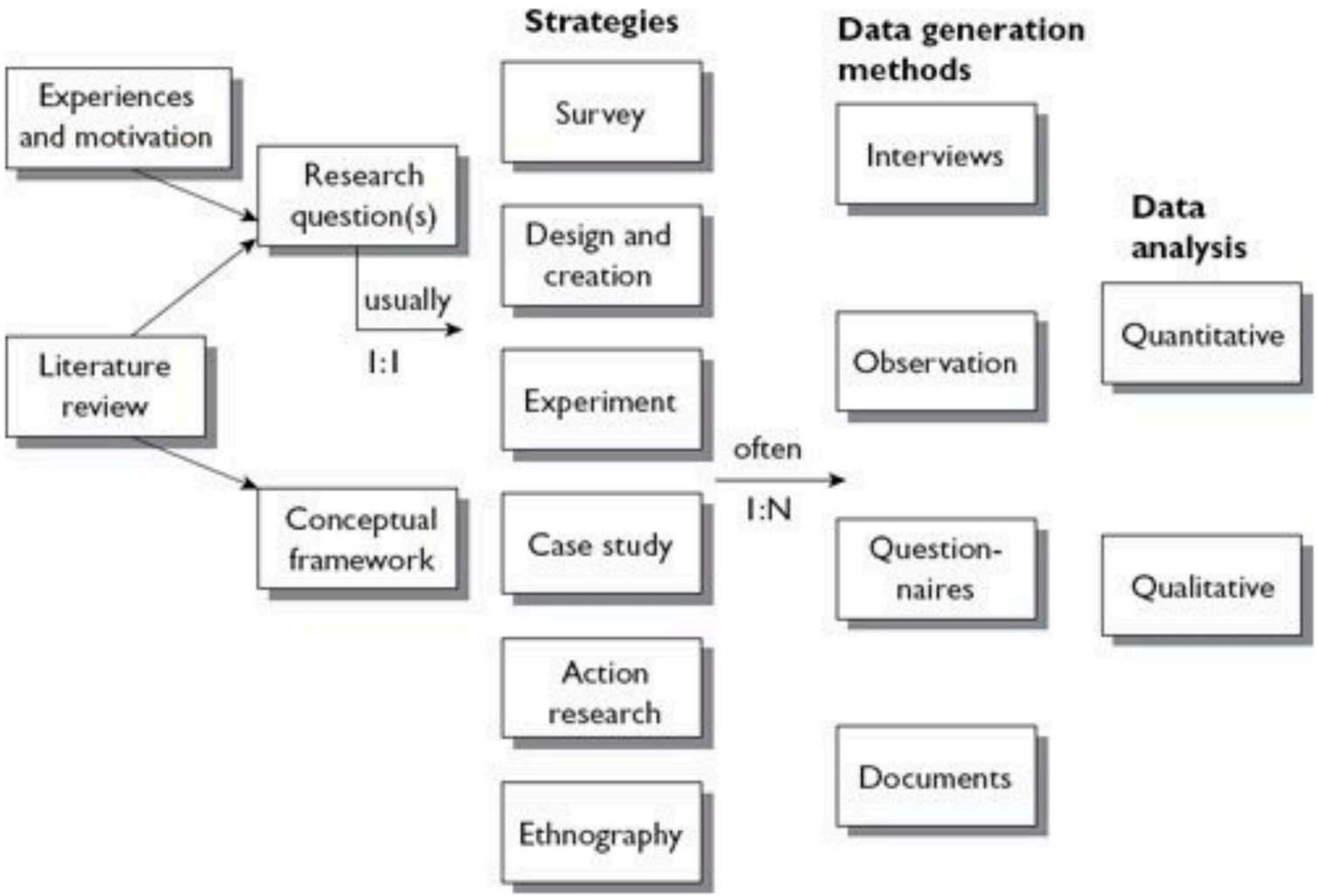
Research methods



Case study

“an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.”

- Singlecase, multicase
- Exploratory, descriptive, explanatory
- Holistic, embedded
- Qualitative, quantitative
- Positivist, interpretative, critical

Yin, R.K., Case Study Research: design and methods. 3rd ed. Applied Social Research Methods. 2003: Sage Publications. 179.

Case study

- Term often misused
- Analysis: “Its is a case and it is a study, but is it a case study”

Table 1
Classification of 100 articles claimed to be case studies.

Case study	No real-life context	No real-life context and no contemporary phenomenon	Action research
53	33	13	1

Wohlin, C., "Case Study Research in Software Engineering—It is a Case, and it is a Study, but is it a Case Study?," Information and Software Technology, vol. 133, p. 106514, 2021/05/01/ 2021. https://doi.org/10.1016/j.infsof.2021.106514

EXERCISE: Quality of case studies

1

- Individually:
  - What do you think characterises a well-performed case study?
  - What do you think characterises a poorly performed case study?

2

- Rank your items and post 1-3 notes on each topic

EXERCISE: Parental benefit programme

1

- Individually: Read text on research method (5 minutes)
- Make individual notes (2 minutes) :
  What were main choices taken ragarding case study design, data collection and data analysis?

2

- In breakout groups (10 minutes):
  - Compare choices taken in this study with your choices on:

A. Case study design

B. Data collection?

C. Data analysis

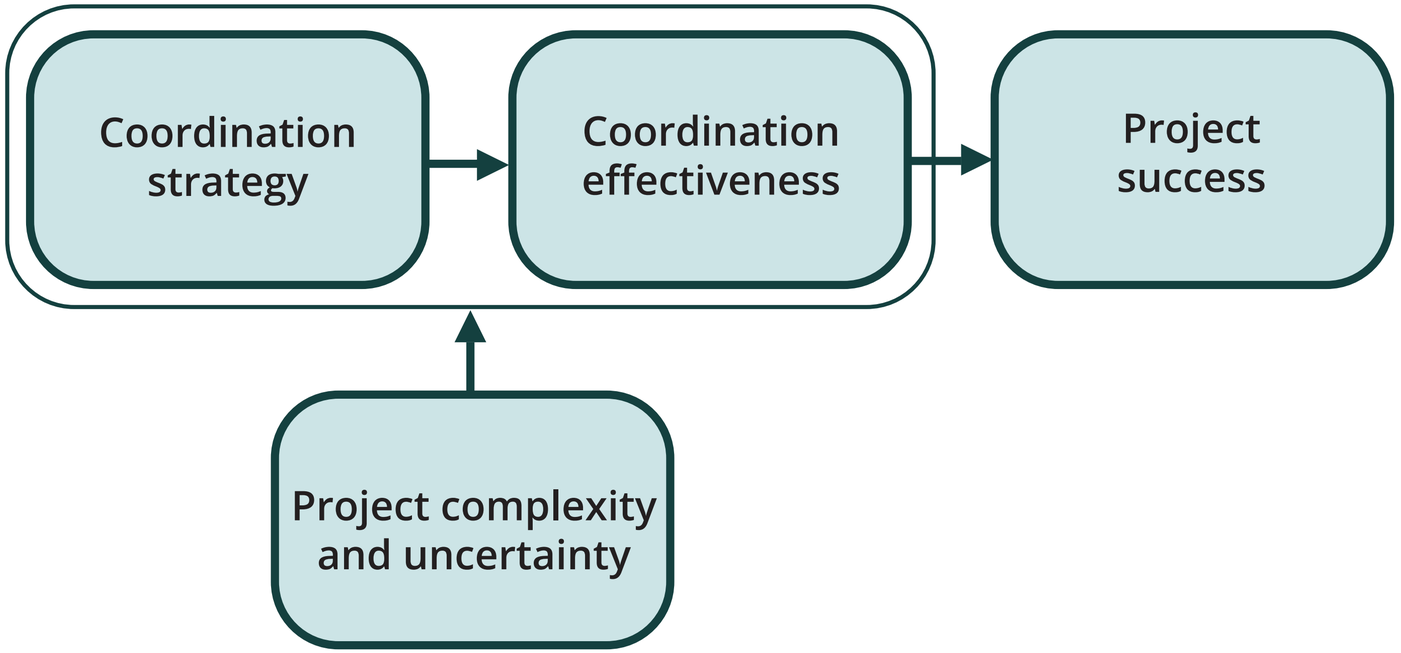
… and identify main deviations

Main choices in Case studies

- Type of case study?
- Selection of case(s)
  - Information-based sampling (typical/extreme/unique)
- Choice of data sources
  - Interviews
  - Observation
  - Documents
  - Metrics
- Choice of analysis method
  - Role of theory

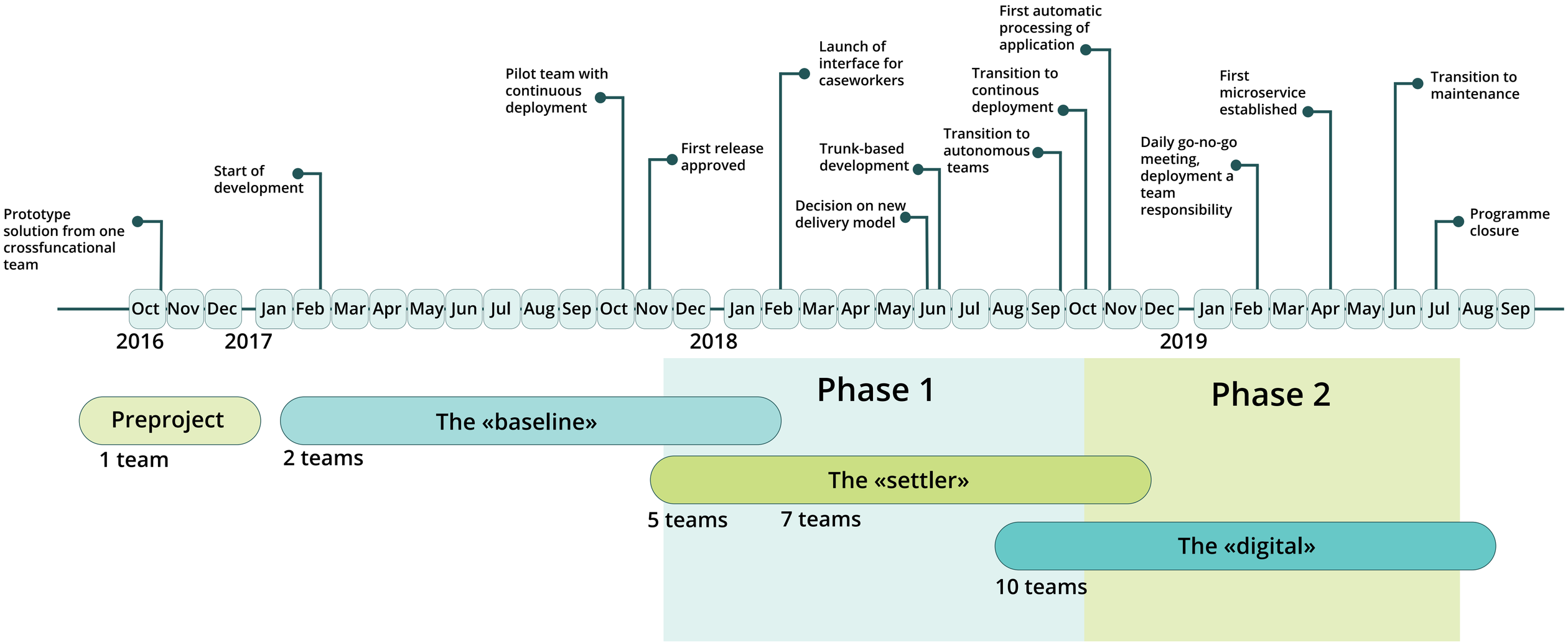
Research question and model

- Research question: *How is the inter-team coordination strategy impacted by a change from the first- to second-generation large-scale agile development methods*

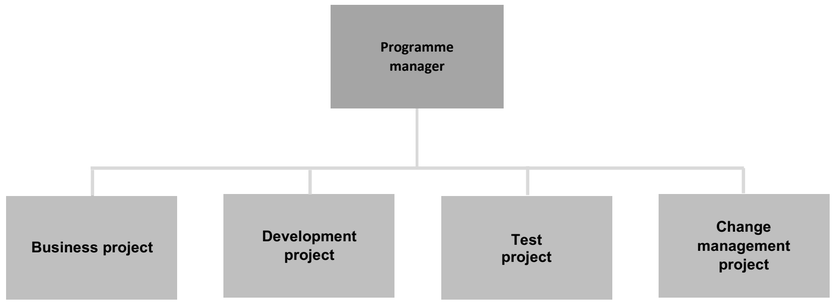


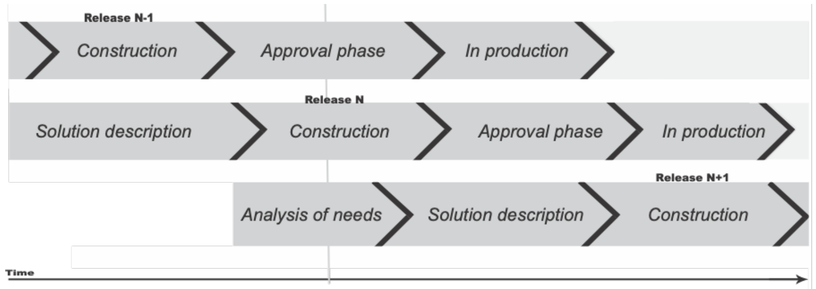
Dingsøyr, T., Bjørnson, F. O., Schrof, J., and Sporsem, T., "Transitioning from a first- to a second-generation large-scale agile development method: A longitudinal explanatory case study of coordination in a very large development programme," Work in progress, 2022.

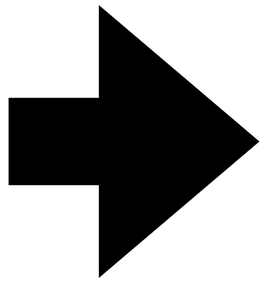
Parental benefit programme

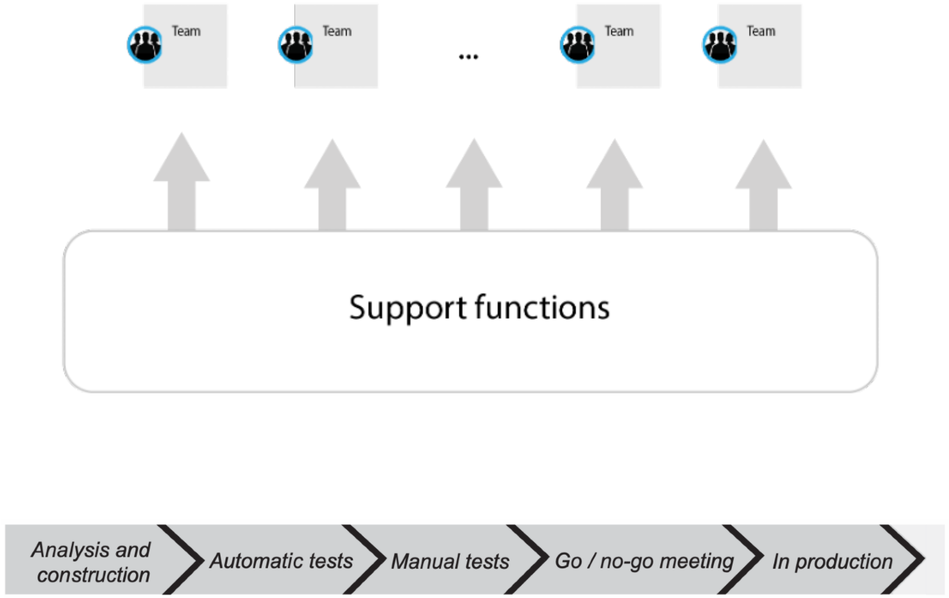


Change in case









Roles on programme-level	Roles in development teams
Construction manager (1), controller (1), customer manager (1), environmental manager (1), functional architects (7), functionality responsible (1), performance test manager (1), project manager (1), project support (1), PMO (1), quality assurance (1), solution manager (1), senior solution architect (1), test automation (1), test data responsible (1), test manager (1).	Scrum master (1), application architect (1-2), developers (5-6), testers (1-2)

Programme level	Development teams
Benefit management, business management, coordination with "external" teams, environmental coordination, holistic architecture, project management, PMO function (adapted to new model), restructuring and communication, value chain testing across teams, UX - holistic design.	Development competence, domain and business competence, functional competence, team-lead competence, technical architecture, test competence, competence, UX competence.

Common misunderstandings: Case studies

1. General, theoretical (context-independent) knowledge is more valuable than concrete, practical (context-dependent) knowledge
2. One cannot generalise on the basis of an individual case; therefore the case study cannot contribute to scientific development
3. The case study is most useful for generating hypotheses, that is, in the first stage of a total research process, whereas other methods are more suitable for hypothesis testing and theory building
4. The case study contains a bias towards verification, that is, a tendency to confirm the researhcers´s preconceived notions
5. It is often difficult to summarise and develop general propositions and theories on the basis of specific case studies

Flyvbjerg, B., "Five Misunderstandings about Case Study Research," *Qualitative Inquiry*, vol. 12, pp. 219-245, 2006.

Learn more about the case (in Norwegian)

- Nokios 2019 - Sesjon 3B: Fra store prosjekter til fleksibel og effektiv produktutvikling
- https://www.youtube.com/watch?v=yxqFxFDYKm8

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Questions and answers

Example Case Study

- Single-case holistic study of process guide usage
- Positivist, explanatory
- Longitudinal
- Mix: qualitative and quantitative

- Research question:

How does the participation in process workshops influence the use of electronic process guides over time?

Dingsøyr, T. and N.B. Moe, The Impact of Involvement on the Use of an Electronic Process Guide: A Longitudinal Case Study. I*EEE Transactions on Software Engineering,*

Data Sources and Data Analysis

- Data sources:
  - Interviews
  - Usage logs
  - Survey (Technology Acceptance Model)

- Data analysis:
  - Coding of interview transcripts (3285 lines of text)
    - Two independent coders
    - ”Preform” and ”postform” coding, 63 categories
    - Computed coder reliability (0,6)
  - Plots of usage logs

Description of Process Guide Users

Characteristics of the two groups	-WS	**WS**
Number of people	22	9
Percentage of project managers	55	56
Average number of years working with software development	8,1	12,9
Average number of years in the company	6,3	10,2
Percentage of people with BSc degrees	23	44
Percentage of people with MSc and PhD degrees	77	56
Percentage of female employees	14	22

Dingsøyr, T. and N.B. Moe, The Impact of Involvement on the Use of an Electronic Process Guide: A Longitudinal Case Study. I*EEE Transactions on Software Engineering,*

Description of Interviewees

Interviewee	Interview rounds 1	2	3	Workshops #	Company role
A		Y	Y	1	Project manager
B	Y	Y	Y	1	Developer
C	Y	Y	Y	2	Project manager
D	Y	Y	Y	2	Developer
E	Y			2	Developer
F	Y	Y			Project manager
G	Y	Y	Y		Project manager
H	Y	Y	Y		Developer
I	Y	Y	Y		Developer
J			Y		Developer

Dingsøyr, T. and N.B. Moe, The Impact of Involvement on the Use of an Electronic Process Guide: A Longitudinal Case Study. I*EEE Transactions on Software Engineering,*

What Functionality is Used?

Functionality	January 2004 WS	-WS	August 2004 WS	-WS	January 2005 WS	-WS	Total WS	-WS	*Total All*
Checklists	4	2	4	3	3	3	11	8	*19*
Action list	4	0	3	1	4	3	11	4	*15*
Process descriptions	3	0	2	4	3	2	8	6	*14*
Project status	2	3	3	1	2	1	7	5	*12*
Project reports	2	1	2	0	2	1	6	2	*8*
Work packages	2	0	1	1	2	1	5	2	*7*
Project notes	0	0	1	0	2	1	3	1	*4*
Milestones	0	2	0	0	0	1	0	3	*3*
Requirements database	0	0	1	1	1	0	2	1	*3*
Risks	0	0	2	0	1	0	3	0	*3*
Templates	0	1	0	2	0	0	0	3	*3*
Generate documentation	0	0	1	1	0	0	1	1	*2*
Use case	0	0	1	0	0	0	1	0	*1*
SUM	*17*	*9*	*21*	*14*	*20*	*13*	*58*	*36*	*94*
COUNT	*6*	*5*	*11*	*8*	*9*	*8*	*11*	*11*	-

Dingsøyr, T. and N.B. Moe, The Impact of Involvement on the Use of an Electronic Process Guide: A Longitudinal Case Study. I*EEE Transactions on Software Engineering,*

Advantages

Advantages	January 2004 WS	- WS	August 2004 WS	- WS	January 2005 WS	- WS	Total WS	- WS	*Total All*
Better overview	3	2	3	3	3	1	9	6	*15*
Everything in one place	3	2	2	0	3	1	8	3	*11*
Better control	1	1	3	2	2	0	6	3	*9*
Better reports	0	0	2	1	3	1	5	2	*7*
Easier to organize the work	1	0	1	1	2	1	4	2	*6*
Easier to remember steps in the process	1	0	1	1	1	1	3	2	*5*
Better project execution	1	0	0	2	2	0	3	2	*5*
Uniform way of working	1	1	2	0	0	0	3	1	*4*
Easier to tailor processes	1	0	1	0	2	0	4	0	*4*
Everyone insight in status	0	0	1	1	1	0	2	1	*3*
Better project information	0	0	1	1	0	1	1	2	*3*
More conscious on the process	0	1	0	1	1	0	1	2	*3*
SUM	*12*	*7*	*17*	*13*	*20*	*6*	*49*	*26*	*75*
COUNT	*8*	*5*	*10*	*9*	*10*	*6*	*12*	*11*	-

Dingsøyr, T. and N.B. Moe, The Impact of Involvement on the Use of an Electronic Process Guide: A Longitudinal Case Study. I*EEE Transactions on Software Engineering,*

Disadvantages

Disadvantages	January 2004 WS	-WS	August 2004 WS	-WS	January 2005 WS	-WS	Total WS	-WS	*Total All*
Poor layout	2	3	1	1	1	2	4	6	*10*
Technical problems	2	0	4	0	3	0	9	0	*9*
Cumbersome to use	1	2	1	1	1	1	3	4	*7*
The process does not fit	1	0	1	1	2	2	4	3	*7*
Does not show genuine progress	0	0	2	0	3	1	5	1	*6*
Not tailored to small projects	1	0	1	1	1	1	3	2	*5*
More bureaucracy	1	2	0	0	1	0	2	2	*4*
The process does not support iterations	0	1	0	1	1	1	1	3	*4*
Double book-keeping	0	0	1	0	0	2	1	2	*3*
Too large	1	0	1	0	0	1	2	1	*3*
Unknown terms	0	1	0	0	0	1	0	2	*2*
Only available online	0	0	1	0	1	0	2	0	*2*
SUM	*9*	*9*	*13*	*5*	*14*	*12*	*36*	*26*	*62*
COUNT	*7*	*5*	*9*	*5*	*9*	*9*	*11*	*10*	-

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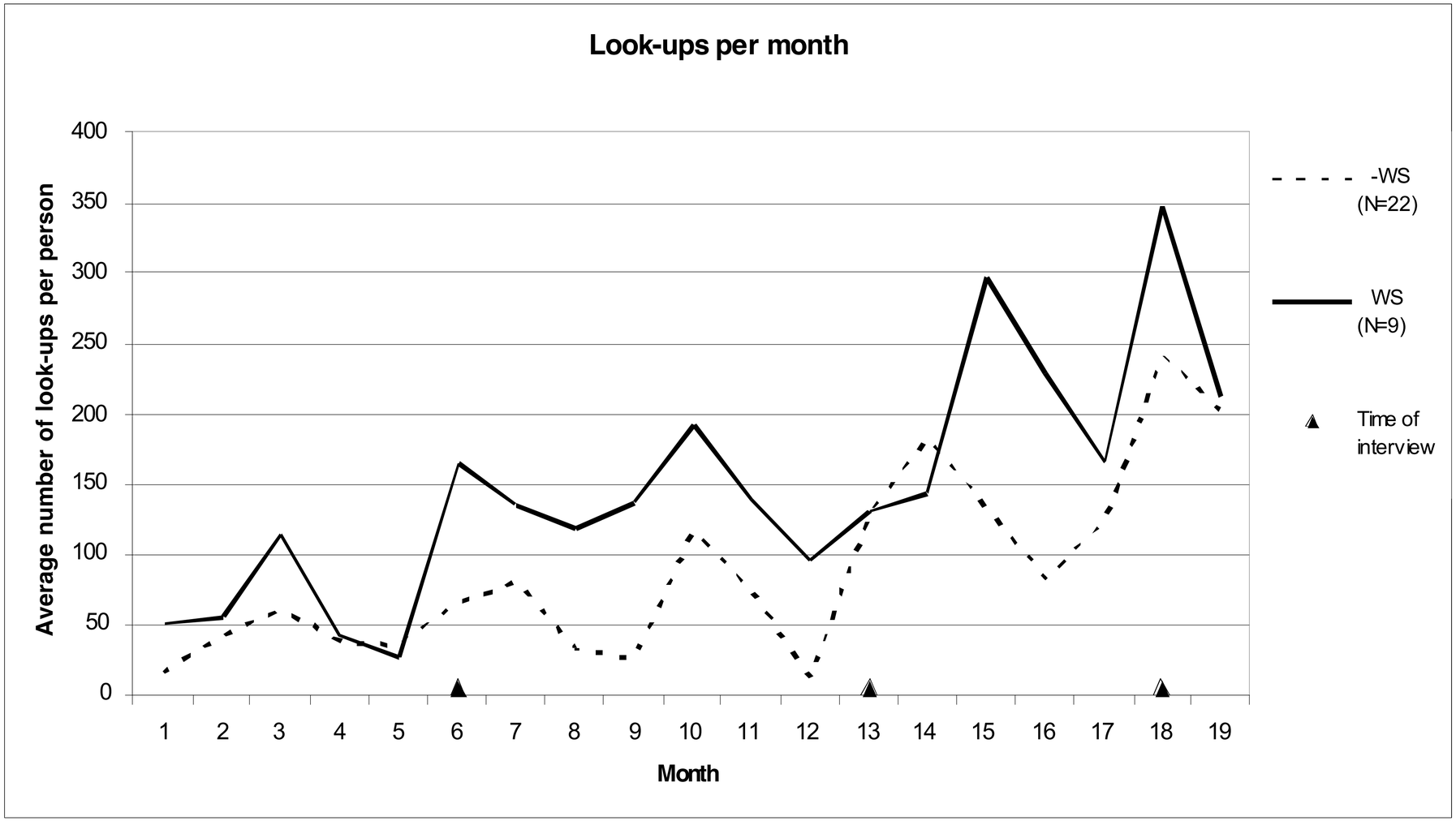
Process Guide Usage over Time



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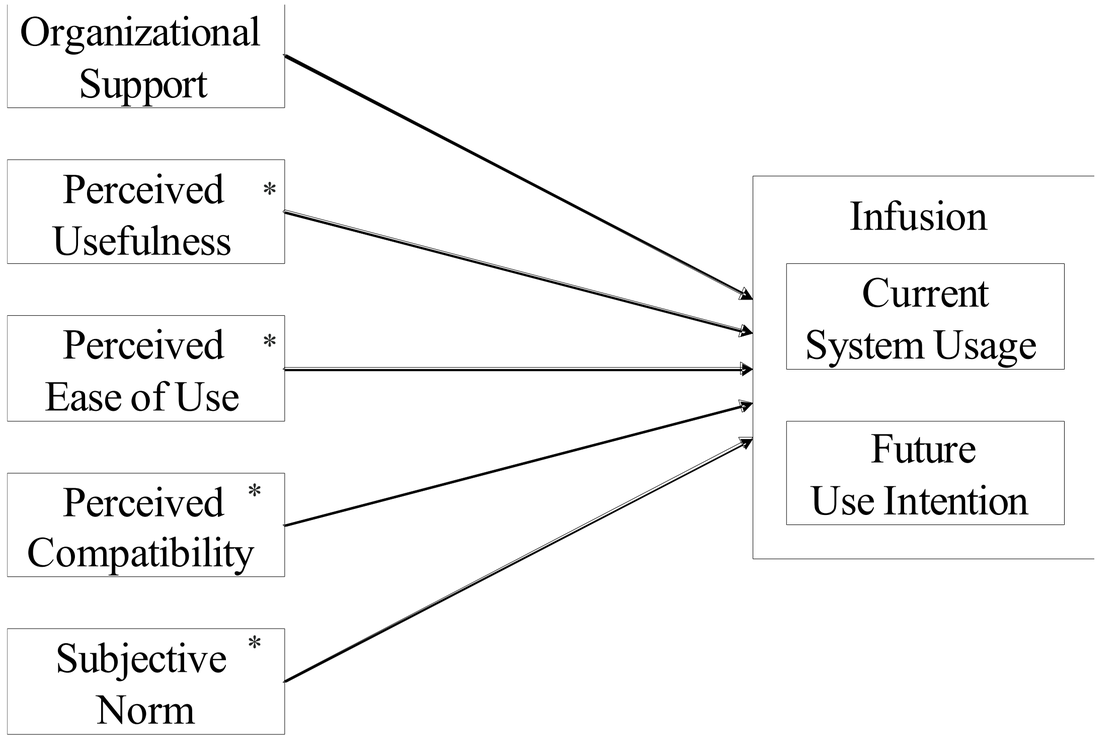
Threats to Validity

- Measuring use
- Internal validity:
  - A potential bias with respect to selecting the participants in the process workshops
  - The selection of the interviewees amongst the workshop participants and non-participants
- External validity
- Reliability

Dingsøyr, T. and N.B. Moe, The Impact of Involvement on the Use of an Electronic Process Guide: A Longitudinal Case Study. I*EEE Transactions on Software Engineering,*

TAM Conceptual model



*Based on prior research on the Technology Acceptance Model (TAM, TAM2), the Perceived Characteristics of Innovating (PCI), the Theory of Planned Behavior (TPB), and the Model of Personal Computer Utilization (MPCU).