REVISITING GROUP-BASED TECHNOLOGY ADOPTION AS A DYNAMIC PROCESS: THE ROLE OF CHANGING ATTITUDE–RATIONALE CONFIGURATIONS

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Appendix A

Description of the Teams and Collected Data

Figure A1. Impressions of New Technologies Onshore (top) and Offshore (bottom)
[This picture was taken in a team not in our sample. However, the offshore setup was very similar across teams.]

Table A1. Description of the Three Production Teams			
	TEAM 1	**TEAM 2**	**TEAM 3**
Position in the change process	First pilot team	Last pilot team	No pilot (i.e., direct move into the standardized solution)
Team Composition			
Members directly impacted by the ICT change	6 onshore 6-8 offshore (per shift)	8 onshore 8 offshore (per shift)	7 onshore 7 offshore (per shift)
	Exchange of two onshore members with the move to the standard ICT solution	Exchange of one onshore member and of offshore management after the move to the standard ICT solution	One additional onshore member with the move to the standard ICT solution
Gender (% male)*	Onshore: 83-100% Offshore: 100%	Onshore: 75% Offshore: 100%	Onshore: 86-100% Offshore: 100%
Functions involved	Onshore: engineers for maintenance, well and production optimization, team leaders, field managers Offshore: control room technicians, line managers, operations engineers (managers), installation managers		
Team and subgroup tasks (identical for all three teams)			
Team task: Monitor and maximize production under safe conditions (safe for plant, personnel and environment) *Main tasks of the onshore subgroup:* • Optimization of well and production settings based on company targets and engineering support in case of disrupted production • Creating plans and organizing resources for the planned maintenance of equipment and platform as well as engineering support in case of unexpected breakdowns *Main tasks of the offshore subgroup:* • Execution of production and maintenance plans • First-line reaction to unexpected production failures or breakdowns • Input/feedback to plans and procedures devised by the onshore subgroup			
Hierarchical structure (identical in all three teams; levels directly impacted by the implementation are marked in bold)			
ONSHORE subgroup: **Onshore engineers** —— Team leaders ———————————————— Field manager OFFSHORE subgroup: **Technicians** —— **Line managers** —— **Operations managers** —— **Installation manager**			

*Range denotes changes in team composition over the study period.

Table A2. Type and Amount of Data Analyzed for this Study			
	TEAM 1	**TEAM 2**	**TEAM 3**
Interviews (excludes informal conversations)			
Within teams (73)	8 onshore (38%) 14 offshore (0%)	18 onshore (70%) 4 offshore (25%)	19 onshore (55%) 10 offshore (0%)
Decision makers, IT support and technology coaches (13)	4 managers deciding on the implementation in the teams 5 consultants guiding the implementation 2 IT support 2 technology coaches		
Observations (excludes informal observations)			
Within teams (work processes, meetings)	5 hours onshore 10 hours offshore	14.5 hours onshore	17 hours onshore 26 hours offshore
Feedback meetings	10 meetings with one or several teams		
Weekly meetings in the implementation group	30 meeting		
Archival documents **(191 total)**			
Minutes of weekly meetings, feedback and feedback reports		129 documents	
Strategic and technical documents detailing implementation decisions		38 documents	
Internal company communications		24 documents	

*Percentage of repeat interviews in the total number as follow-ups with the same members excluding informal conversations.

Appendix B

Interview Protocol ████████████████████

Team Members	
Personal information	• Job title • Years in job, years in team • Role in the team • Personal tasks and responsibilities in the subgroup • Type and frequency of contacts with the other subgroup and ICT used for contacts/work processes
ICT change project	Before implementation: • Information received on the technology change (what, how) • Involvement in the process • Expectations for changes to own role/subgroup/team with respect to communication/coordination/relationships/ performance • Positive expectations, potential misgivings • Evaluation of the engagement/implementation process so far After implementation: • Actual changes to own role/subgroup/team with respect to communication/coordination/relationships/performance • Evaluation of the technologies (positive/negative, examples) • Evaluation of the implementation process (positive/negative, examples)
Decision Makers	
Personal information	• Job title • Years in job, years in team • Personal tasks and responsibilities
ICT change project	• Role in the implementation process • Decisions taken on the technologies and process • Expectations for positive/negative changes for teams due to the technology change (before implementation) • Evaluation of the results (after implementation)
IT Support	
Personal information	• Job title • Years in job, years in team • Personal tasks and responsibilities
ICT change project	• Role in the implementation • Experiences during the deployment of the ICT • Evaluation of the ICTs and process (including examples)

Note: The interviews were semi-structured. Often additional questions were asked to obtain more information on emerging topics or to follow-up on informal comments or observations made in the team. Also, in repeat interviews statements from former interviews were discussed and compared with the present situation to understand changes in attitudes. Further, later interviews and informal conversations were at times used to validate the researchers' interpretations of previous observations or statements.

Appendix C

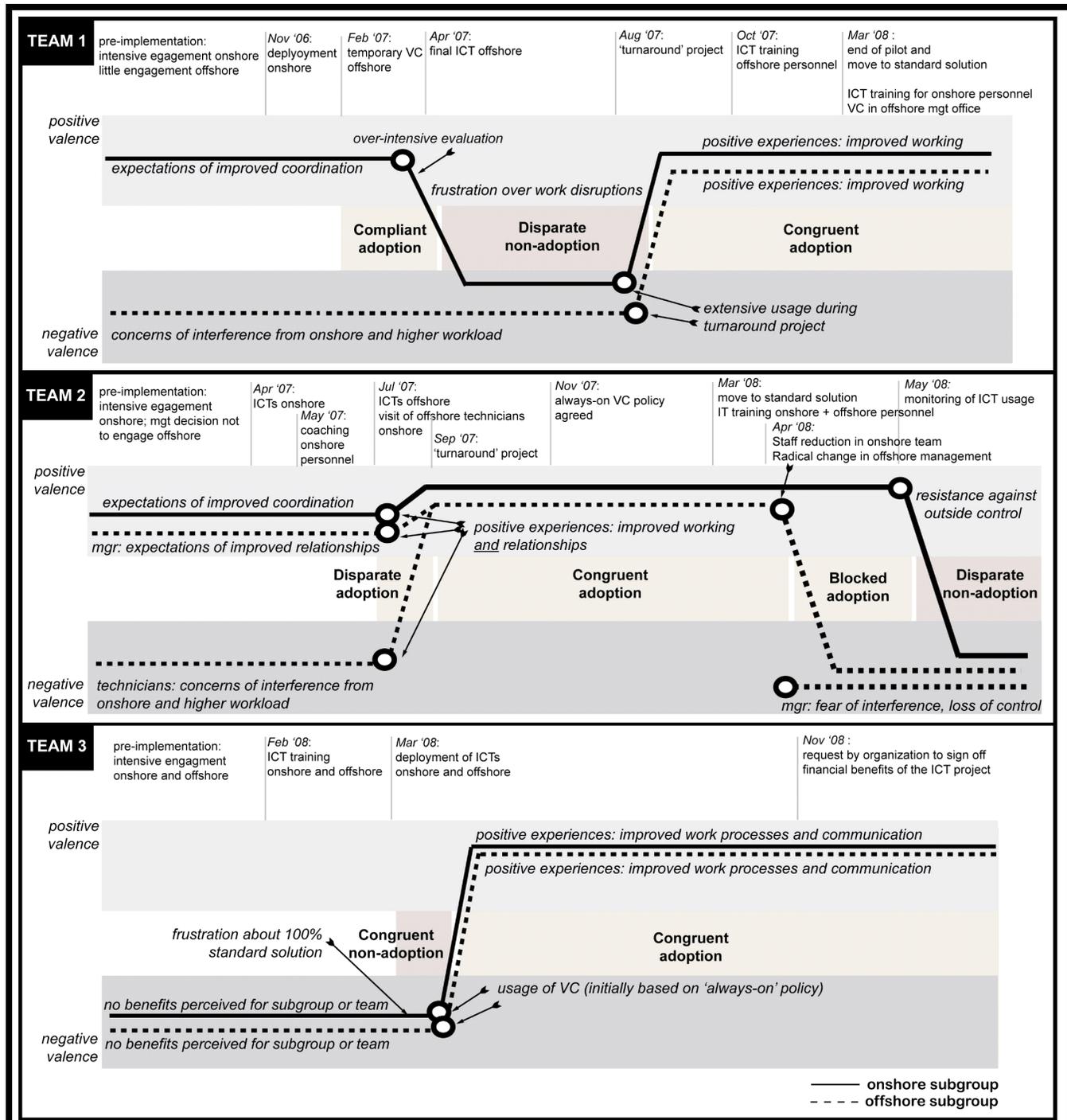## Changes in Adoption Decisions in the Three Teams Over Time

Figure C1. Summary of Changes in Adoption Decisions in the Three Teams over Time

Appendix D

Coding Examples ▮▮▮▮▮▮▮▮▮

ATTITUDE

Positive attitudes: *"I think in terms of 'stay as you are' or 'move to [the new] type environment' I think is pretty much a no brainer" (onshore manager, Team 2). "The concept is very, very good. There's no doubt about that" (onshore engineer, Team 2).*

Negative attitudes: *"I just don't like it" (offshore technician, Team 2).*
Alignment of attitudes between subgroups: *"I don't see the value that it would bring to us, neither do they [offshore]" (onshore engineer, Team 1).*
Misalignment of attitudes between subgroups: *"I've still, personally, still to be convinced about the real time data sharing, the organizational impact of that and the benefit of that with that kind of structure." (offshore manager, Team 1). "Certainly it's worthwhile" (onshore manager, Team 1).*
Change in attitudes: *"Although offshore had this, we don't want cameras everywhere, you're not going to look at us, no, no, no, we don't want anything to do with it, I think they've seen the benefits of it now" (onshore manager, Team 2). "The [new ICTs] won't do anything. It's a room with better communication facilities. That's what is it" (onshore engineer, Team 3, pre-implementation). "To me, it has been a god-sent, this" (onshore engineer, Team 3, after implementation).*

RATIONALE

Rationales for adoption (selection)
Technology: *"The way it is in the control room now, we can just flip the button" (offshore technician, Team 2).*
Relationships: *"When you're meeting and you can see each other you start a bit of a small talk, which in a sense is good because it sets the scene and that relaxed environment, so it's much easier to talk about problems or issues" (offshore manager, Team 2).*
"When you are face to face talking to someone and you're talking through a job, then you build up a confidence and a trust type thing" (offshore manager, Team 1).
Benefits: *"So he was showing us slides and explaining the process…and it was absolute fantastic. Imagine, we would have to take off for one training day, but it had a two hour roll-out, you know, the money that that would cost us" (offshore technician, Team 1).*

Rationales for non-adoption (selection)
Benefits: *"Some people were thinking it was going to be this tool that would solve all the problems. It doesn't solve the problems, it's just a tool" (onshore engineer, Team 1).*
"I am struggling to see tangible benefits for us and what kind of tangible assistance it's going to give us. It's kind of 1% on your operating efficiency" (onshore manager, Team 3).
Relationships: *"If you have started in a company and you are put in the [new environment], it's the worst place you can be" (onshore engineer, Team 1).*
Privacy: *"Obviously there's a feeling of invasion of your privacy" (onshore engineer, Team 2).*
Process: *"We've done a lot of talking and delivered nothing" (project champion, Team 2).*
Work: *"The discussion about always on; it will be a distraction; there will be no bonus" (offshore technician, Team 2).*
Alignment of rationales between subgroups: *"Because they [onshore] have a camera on them all the time as well. I don't know if anybody would like that in a work environment constantly" (offshore technician, Team 2).*
"Before we had a camera installed they [offshore] would go and say, we don't want Big Brother looking over our shoulders. And we say, it works the other way around as well, you know" (onshore engineer, Team 2).
Misalignment of rationales between subgroups: *"Before we had that system, the only way we could find out if a piece of plant was online was to call the control room on the phone and ask them" (onshore engineer, Team 1). "This allows you to build a relationship with the guys on the beach, which normally you wouldn't see weeks at a time" (offshore manager, Team 1).*
Change in rationale: *"That will definitely help to improve the relationship, the working relationship between on- and offshore for most of the guys" (offshore manager, Team 2, pre-implementation). "In terms of management and using the video for management meetings or planning meetings the video is working fine"(offshore manager, Team 2, after implementation).*

ADOPTION AND NON-ADOPTION

Adoption:

Expected uses: *"With the management team, when we have planning meetings, where we have discussions on production between onshore and offshore, on the kind of management or supervisory level, we always use the [video]"* (offshore manager, Team 1).

Unexpected uses: *"There are conversations going on between the teams, not only just work conversations, but talking about they're eating biscuits and things. They may cut out pictures of people who used to work on the platform and having them dancing in front of the screen"* (consultant about adoption in Team 2).

Non-adoption: *Interviewer: And do you ever use [the new video]? – Onshore engineer, Team 1: Never, never. – Interviewer: Why not? Onshore engineer, Team 1: One, I wouldn't be sure how to use it. Two, nobody's called me. And three, I don't like the idea of folk can call you and see you before you are aware of it.*

Active resistance/blocking: *"[The camera] is on silent and next thing you know, you turn around and somebody [onshore] switched it on. So that's why we put things like mugs in the way and the crazy frog [offshore mascot]"* (offshore technician, Team 2).

TRIGGERS FOR CHANGES

Team–internal:

Team composition: *"The problem we're having at the moment…is a change in personnel, which then brings lack of experience"* (offshore manager, Team 2).

Unexpected benefits: *"To be honest with you, using the [new ICTs] has been very good. It's enhanced communications; it's enhanced relationships with the guys offshore. Meetings are easier....I mean during the [turnaround] that helped us quite a lot to show bits of things broken on the screen"* (onshore engineer, Team 3).

Team–external:

Process mismanagement: *"You [interviewer] had a rejection back from requesting interviews, but a couple of guys are getting quite pissed off with the amount of outside interfacing"* (onshore engineer, Team 1).

Appendix E

Golden-Biddle and Locke (1993) Criteria for Interpretive Research ▐████████

Criteria	Explanation in GBL	Realization in Our Paper
1. Authenticity	Has the author been "there" in the field?	
Particularizing everyday life	The ability of the text to provide enough detail of the specific organization and its members to assure the readers that the author was indeed "there" (p. 601)	Use of quotes from interviews and documents in the methods and findings to present the thoughts and perspectives of onshore and offshore team members, managers and consultants throughout the process; also inclusion of photos of the onshore and offshore environment in Appendix A to give readers an impression of the working spaces of both subgroups and how the new technologies were integrated in these spaces
Delineating the relationship in the field	Delineating the relationship which the author developed with organization members while conducting the field research…the text invites readers to visualize how the author navigated while in the field, including how close the author got to the members as they experienced everyday life (p. 603)	Description in the method section of the role of the first author as independent researchers located in the organization for 2 years as non-participating observer and the various steps taken to collect data from formal interviews and observations in the onshore office and on offshore platforms to informal conversations
Depicting the disciplined pursuit and analysis of data	Ways in which the authors collected and analyzed the field data…adopting a disciplined approach and paying careful attention to the data…depicting their systematic and persistent efforts over time to collect and analyze data (p. 604)	Detailed information of the multiple ways and sources from which we collected data over time, including a table in Appendix A for an overview and description of the data that was analyzed for the study; motivation of the choice of the three teams and detailed description of the analysis steps in the method section including Appendix D with coding examples; presentation of intermediate results of the within case-analyses in Figure C1 which shows the changes in adoption decisions in the three teams over the analysis period and which also served as starting point for the cross-case analysis
Qualifying personal biases	Did the authors allow the data to inform their personal and theoretical perspectives, or did they impose their own perspectives onto the data? (p. 605)	Our understanding of collective adoption was primarily shaped by observations from the data (for instance, as indicated in the method section, our realization that alignment of attitudes and rationales plays such an important role in shaping adoption dynamics came through reading and re-reading interviews, documents and notes, and aiming to make sense of the disparate adoption decisions in the three teams); also explicit testing of our own interpretations of the data in subsequent interviews or conversations with the same or different participants or members of another subgroup (see note, Appendix B)

2. Plausibility	Does this make sense to me?	
Normalizing unorthodox methodologies	Claims on the readers to see the ethnographic approach to research as sensible in terms of more orthodox research standards by adopting the latter's form and devices (p. 605)	Adherence to the traditional structure of research articles; use of tables and figures in the text and appendices to show the type of data collected (including samples of the data and the coding in the form of quotes in the text and as table in Appendix D); explanation of how the data was collected and the steps taken for analysis including the presentation of intermediate steps in Appendix C (summary of events and changes in adoption decisions in the three teams as result of the within-case analyses) and in Appendix D (showing coding examples); summary of findings in a theoretical model in Figure 1
Drafting the reader	Inviting readers to see themselves in solidarity with the text's assertions....One way is the use of the first person plural pronoun (p. 606)	Use of first person plural pronoun to emphasize the interpretative nature of our statements; choice to move in our argumentation from the concrete case examples to the more abstract theoretical assertions to allow the reader to follow our assumptions and interpretations step by step by first creating detailed stories in the within-case analyses with quotes from interviews, documents and observations and then developing the theoretical arguments based on the subsequence analysis across cases
Legitimating the atypical	How does the text help to mitigate against the possibility of being dismissed as irrelevant to organization studies because its subject matter is overly peculiar and therefore too distant from the readers? (p. 606)	Discussion in the sections on theoretical and practical implications of other contexts for which our findings are applicable such as demographi-cally or culturally diverse teams and teams with different forms of distribution, which can be found in a wide range of other industries and contexts (e.g., R&D or crisis response teams); illustration of how our study can support managers and organi-zations to identify, forestall and rectify problematic adoption states in teams
Smoothing the contestable	A text attempts to manage its plausibility…what it does when it makes assertions that are potentially problematic (p. 608)	Ample use of quotes and materials from the field in the methods, findings and appendices to demonstrate the grounding of our assertions in the data (e.g., extracts from documents, photos, interviews quotes)
Differentiating findings, a singular contribution	Systematically creates lacunae or gaps in the existing literature on the topic of concern (p. 609)	Clear statements in the introduction and discus-sion sections explaining the gaps our study addresses (i.e., providing a process perspective on collective technology adoption) and clear statements of its added value to an under-represented research area (i.e., the role of sub-groups for the stability of collective technology adoption)
Building dramatic anticipation	Build a sense of dramatic anticipation into the text; this conditions readers to expect something new from the study's results (p. 610)	Foreshadowing of the main theoretical contribu-tions in the introduction and use of explicit research questions that target the gaps in our knowledge about collective technology adoption; context and case descriptions in the methods and findings that illustrate the complexity of the adoption process across subgroups over time in

		rich details and which form the basis for the development of the new theoretical concept of technology adoption states in the subsequent sections of the findings and discussion
3. Criticality	**Does the text activate readers to reexamine assumptions underlying their work?**	
Carving out room to reflect	Ability of the text to provide opportunities for readers to take time out in order to reflect on the ideas and thoughts disclosed in reading the text (p. 610)	The research questions in the introduction can provoke readers to take time for own reflections (e.g., why should diversity have an impact on collective adoption?); also the numerous quotes from interviews, excerpts from documents and the photos from the field in the methods, findings and appendices invite users to think about own interpretations of our data
Provoking the recognition and examination of differences	Provoke readers into examining the differences between prevailing views on a particular subject (which they may hold) and the ones articulated in the text (p. 611)	Claim that distribution and diversity impact collective adoption dynamics in the introduction and more explicitly in the research questions; in the discussion comparison of prevalent (primarily quantitatively defined) conceptualizations of adoption as binary choice or adoption strength with our new concept of (qualitatively defined) malleable technology adoption states
Imagining new possibilities	Enable readers to imagine different possibilities than they had previously for the way they frame and conduct their work... opening up of unknown possibilities to readers (p. 611)	We suggest a different way of conceptualizing adoption by emphasizing qualitative aspects in terms of attitudes and adoption rationales and by introducing attitude-rationale alignments for explaining changes over time; inclusion of examples how this new conceptualization can support managerial practice