

Distributed Development (DD) in an Intra-national, Intra-organisational Context: An Experience Report

Edvin Lindqvist, Björn Lundell & Brian Lings
University of Skövde, Sweden

Presented by Björn Lundell



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Motivation and *Goal of the study*

- Available research on DD is largely focused on GSD.
- Intra-national DD may even be more common than GSD.
- *We report from a study of **DD** in an
intra-national
intra-organisational
company context.*

Dimensions of DD

- **Temporal distance**

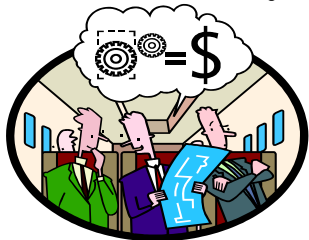


a **directional** measure of the dislocation in time experienced by two actors wishing to interact
Can be caused by time-zone differences or in time shifting work patterns.



- **Geographical distance**

a **directional** measure of the effort required for one actor to visit another at the latter's home site



- **Socio-cultural distance**

a **directional** measure on an actor's understanding of another actor's values and normative practices
Consequently, it is possible for actor A to be socio-culturally closer to actor B than B is to A.

Time zones – Sweden, GMT+1

- **Dublin**, -1h
- **Riga**, +1h
- **Moscow**, +2h

Travel, e.g. ...

Got/GSE (14:35) → **Dublin**
(15:55) **2:20h flight**

Dublin (10:50) → Got/GSE
(14:10) **2:20h flight**

Sto/NYO (15:30) → **Riga**
(17:35) **1:05h flight**

Riga (18:00) → Sto/NYO
(18:05) **1:05h flight**

Sto/ARN (13:30) → **Moscow**
(17:35) **3:05h flight**

Moscow (18.25) → Sto/ARN
(18:35) **3:10h flight**



Geographical distance (moderate) between sites

**Skövde – Gothenburg,
155 km**

1h (high speed train) + taxi,
Site-Site: ~**1.5-2h** (train + taxi),
cost ~**€100**



2006-05-22

Context for the study

- A development project at Ericsson Microwave Systems AB
 - is part of the Ericsson AB telecom company
 - The project totally involved 100+ developers (in Ericsson Microwave Systems AB)
- Two sites involved in the project
 - The Gothenburg site has ~1600 employees
 - The Skövde site has ~30 employees (of which 7 were involved in the project)
- A “typical” intra-national, intra-organisational DD project

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Research method – *Overview*

The **Case study**

- intra-organisational, intra-national DD project
- distributed over two sites in Ericsson Microwave Systems AB.

The **Interviews** were used for data collection

- included three different roles: a **developer**, a **team leader**, a **manager/sub-project leader**.

The **Interviewer**

- prior **employment** at Ericsson Microwave Systems AB
- worked **on the project** being investigated

Research method – *The interviews*

Interview Guide

- **pre-phrased questions** and **open issues**

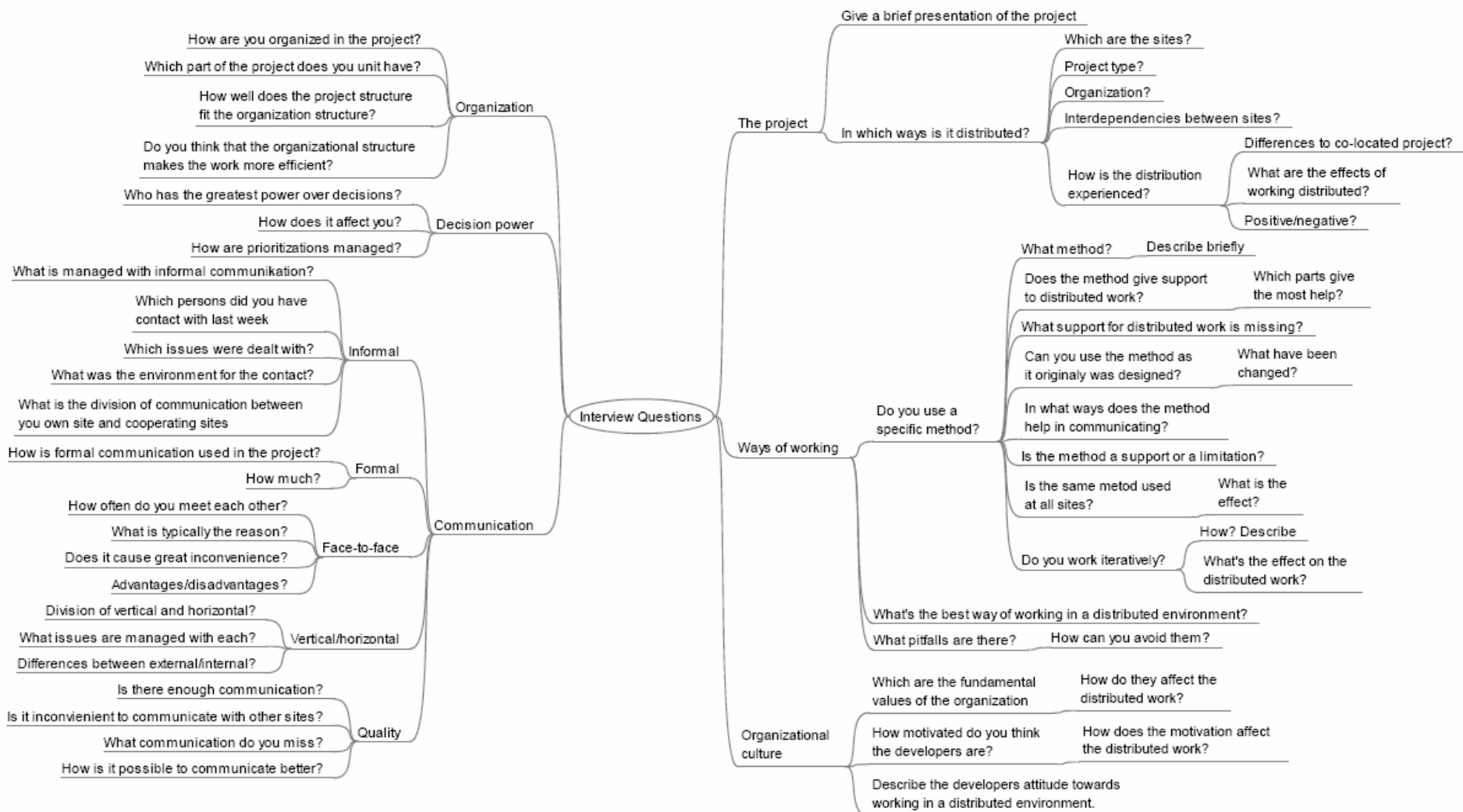
Interviews

- conducted in the **native language** of interviewer and interviewees (Swedish)
- recorded and **fully transcribed** (resulted in ~30 pages of transcriptions)
- went **beyond the guide**

Interviewees

- selected based on their (long) **experience** in the project

An interview guide informed the interview sessions (with both open and specific questions)

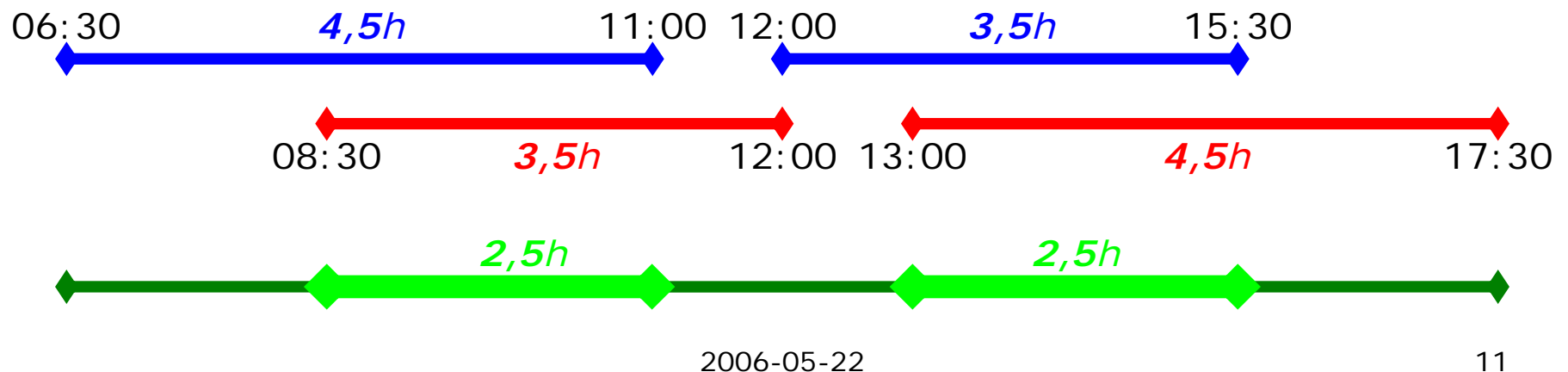


On Methods, tools and work practices used

- *Use of an **internal method**, MOOSE*
 - based on Objectory, the RUP predecessor
 - in use since 1993
- *Use of a **heterogeneous tool** environment*
 - Requirements management (Serena RTM)
 - Configuration management and distributed file system (Rational ClearCase)
 - Visual Modelling (Telelogic TAU UML Suite)
 - Issue/defect anagement (Rational Clear DDTs)
- *Work practices*
 - *Most projects at the Gothenburg site are non-DD*

Temporal distance (low) in the project

- No time-zone differences, but co-workers ...
 - have flexible work times (work 8h per day on avg.)
 - are recommended to be at office between 8:30 and 15:30
 - have lunch break between 11:00 and 13:00
- For example, two co-workers **P1** and **P2** can **overlap** 5h and **non-overlap** 6h during a day's 11h of work on the project.



Geographical distance (moderate) between sites

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cost ~**€100**

- *Skövde – Luleå, 1134 km*

~6h (train to Sto. + flight)
~19h (direct train, sleeping-place)

- *Gothenburg – Luleå, 1271 km*

~3h or 5:30h flight (via. Sto.),
cost ~**€550**

~20h (direct train, sleeping-place),
cost ~**€250** (or €550 for a 18h trip)

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Experiences – *Communication*

Mail or **phone**? *The likelihood of using mail instead of phoning is greater if the person on the other side is unknown*
“Most people mail me. I prefer to call. I believe it is easier to call. **When someone mails me I pick up the phone.**”

Informal communication *is very important ...*

“I’ve seen communication fail several times when people haven’t communicated when needed. It’s enough to call once a week, send a mail with the current status, or anything and it will work out alright. The means are simple, but still people don’t bother or don’t believe it’s important.”

“To take a short meeting, or take a seat in someone’s room when you have a problem is something you do all the time. But the problem needs to be at least ten times worse to order a train ticket. ... **A train ticket is nothing compared to a delay in the project.** It’s not even in the same galaxy of costs.”

Experiences – *Coordination*

*Much is said in **connection to a meeting** ...*

“The first five to ten minutes **when people are gathering** and the last five to ten **when they are leaving**, if they aren’t in a hurry for the next meeting, **there is as much communication as during the meeting.**”

*Despite a long-term working relationship **regular meetings** are seen as **necessary** ...*

“If I had only spoken with someone over the phone for ten weeks I wouldn’t have understood the person as well as if I had **looked him in the eyes once every two weeks** and could see and understand what was really important and what was only done because of informal rules. ... You speak a little nonsense and he remembers ‘It was this thing also ...’ This part is **really important.**”

Experiences – *Control*

Managers and project leaders often do not work in the same way with remote sites as their local site ...

“I try to keep updated of what’s going on. When I notice that something isn’t as I want it to be I make a phone call immediately and speak with them (the developers) in person. I never send email or such things. ... Preferably, I walk up and speak with them. But you can’t just walk up to Skövde on a Tuesday afternoon: then you have to call them. Contact with the individual is really important.”

The use of iterations in the development process will enforce communication ...

“You take smaller development steps one at a time and check that you’ve done it right at the end of each iteration. It’s good to work in this way, since the risk is smaller compared to working with different tasks for a long time.”

Some experiences of *Strategies for Successful DD*

- Travel on a regular basis (not only when problems and important issues arise)
- Use same management style for both sides.
- Give clear motivation or reasons of temporary co-location to co-worker of site-reallocation.
- Use the same method.
- Use synchronous communication (when possible)

Conclusions

- The most important factor for success or failure in DD is how well communication works. Effective communication can create:
 - High **motivation of developers**, *and*
 - **Utilization** of combined **experience** from all sites.
- The **leader** has an **important role** for creating a culture of good communication
- **Issues** in intra-organisational, intra-national DD are **similar** to inter-national DD (GSD), whereas **strategies** may be **different**.

Processes	<i>Dimension in a framework for Considering Opportunities and Threats in Distributed Software Development (Ågerfalk et al., 2005)</i>		
	Temporal Distance	Geographical Distance	Socio-Cultural Distance
Communication	Reduced opportunities for synchronous communication, introducing delayed feedback. Improved record of communications.	Potential for closer proximity to market, and utilisation of remote skilled workforces. Increased cost and logistics of holding face to face meetings	Potential for stimulating innovation and sharing best practice, but also for misunderstandings.
Coordination	With appropriate division of work, coordination needs can be minimised. However, coordination costs typically increase with distance.	Increase in size and skills of labour pool can offer more flexible coordination planning. Reduced informal contact can lead to reduced trust and a lack of critical task awareness.	Potential for learning and access to richer skill set. Inconsistency in work practices can impinge on effective coordination, as can reduced cooperation through misunderstandings.
Control	Time zone effectiveness can be utilised for gaining efficient 24x7 working. Management of project artefacts may be subject to delays.	Difficult to convey vision and strategy. Communication channels often leave an audit trail, but can be threatened at key times. 2006-05-22	Perceived threat from training low-cost 'rivals'. Different perceptions of authority/hierarchy can undermine morale. Managers must adapt to local regulations. 18