

Distance Matters

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Motivation

- 1898: Arthur Mee stated “If, as it is said to be not unlikely in the near future, the principle of sight is applied to the telephone as well as that of sound, earth will be in truth a paradise, and distance will lose its enchantment by being abolished altogether.”
- 1997: Frances Cairncross stated “Geography, borders, timezones - all are rapidly becoming irrelevant to the way we conduct our business and personal lives...” (in his book The Death of Distance)

Motivation

- Is distance death?
 - The authors do not share this view.
 - Even with all our emerging information and communications technologies, distance affects how humans interact with each other.
 - Some characteristics of face-to-face communication are pragmatically or logically incapable of replicating.
 - Cairncross was wrong....”Distance is not only alive and well, it is in several essential respects immortal.“

Motivation

- April 3, 2007: Google Tech Talks
- How to plan projects with distributed teams, especially when the project runs for months on end.
By Hubert Smits
- <http://www.youtube.com/watch?v=l87pzBYfqkg>
- "What are you doing in Google....What are your challenges? The two main things I could come up with were that we have a lot of distributed teams and we have more and more teams where we actually have to coordinate several teams and for my experience at Google these are two things we are not good at. We tried to do and we try to deal with but we do not have to much experience and we struggle with it..."

Outline

- ❑ Collocated Work Today
- ❑ Remote Work Today
 - ❑ Successes
 - ❑ Failures
- ❑ The Findings Integrated
 - ❑ Common Ground
 - ❑ Coupling in Work
 - ❑ Collaboration Readiness
 - ❑ Technology Readiness
- ❑ Distance Work in the New Millennium
 - ❑ Common Ground, Context, and Trust
 - ❑ Different Time Zones
 - ❑ Culture
 - ❑ Interactions among these factors and with Technology

Collocated Work Today

- They observed the work of people who are maximally collocated in nine corporate sites.
- Methods:
 - Interviews, surveys, diaries, observations.
- Location Characteristics:
 - People share office space (large rooms called 'project rooms' or 'warrooms')
 - People have no other office (in seven of the night sites)



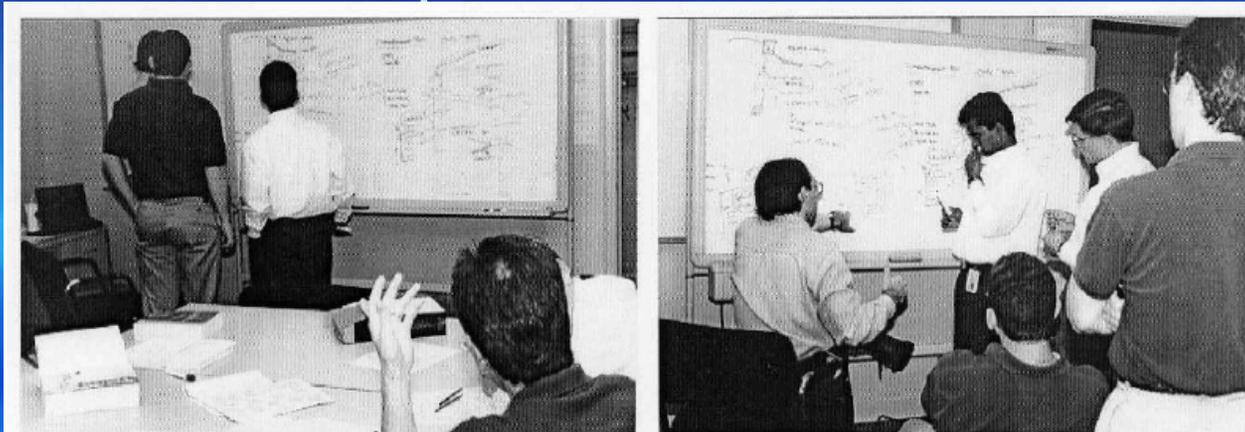
Collocated Work Today

■ Results

- One of the sites collected measures and they observed that the collocated group gained productivity (Double function points per unit of staff time and cut the total time to market by $2/3$). Being collocated assisted in the productivity gain.

Collocated Work Today

- What collocated teams have that distant teams do not?
 - Team members can move from working alone to work in subgroups or the whole group spontaneously. => High rate as a factor to complete work on time



What collocated teams have that distant teams do not?...

- Collocated teams benefit from the spatiality and stability of context in these rooms.
- Example: The use of project-planning wall (Whittaker and Schwarz)

The image shows a large project-planning wall (Gantt chart) with columns for iterations and rows for team members. The columns are labeled 'ITERATION' and contain dates and iteration numbers. The rows are labeled with team member names: HALO, HECTOR, NINA, PENELOPE, and PIU. Each cell in the grid contains 'PLANNED' and 'ACTUAL' columns with blue sticky notes representing tasks. Some cells have checkmarks, and some have asterisks.

	ITERATION 42	43	44	45	46
	28 SEP - 11 OCT	12 OCT - 26 OCT	26 OCT - 9 OCT	10 OCT - 23 OCT	24 OCT - 6 NOV
HALO	PLANNED 9 ACTUAL 10	PLANNED 10 ACTUAL 11	PLANNED 11 ACTUAL 12	PLANNED 12 ACTUAL 13	PLANNED 13 ACTUAL 14
HECTOR	PLANNED 9 ACTUAL 10	PLANNED 10 ACTUAL 11	PLANNED 11 ACTUAL 12	PLANNED 12 ACTUAL 13	PLANNED 13 ACTUAL 14
NINA	PLANNED 10 ACTUAL 11 (22.5 hrs)	PLANNED 11 ACTUAL 12	PLANNED 12 ACTUAL 13	PLANNED 13 ACTUAL 14	PLANNED 14 ACTUAL 15
PENELOPE	PLANNED 10 ACTUAL 11	PLANNED 11 ACTUAL 12	PLANNED 12 ACTUAL 13	PLANNED 13 ACTUAL 14	PLANNED 14 ACTUAL 15
PIU	PLANNED 10 ACTUAL 11	PLANNED 11 ACTUAL 12	PLANNED 12 ACTUAL 13	PLANNED 13 ACTUAL 14	PLANNED 14 ACTUAL 15



What collocated teams have that distant teams do not?...

- Groups came into their projects with established working habits within a corporate culture.
- All the survey teams stated that they thought that sharing a room will cause too much interruption. Their attitudes change for the better.

Key Characteristics of face-to-face interaction

Characteristic	Description	Implications
Rapid feedback	As interactions flow, feedback is as rapid as it can be	Quick corrections possible when there are noticed misunderstandings or disagreements
Multiple channels	Information among participants flows in many channels—voice, facial expressions, gesture, body posture, and so on	There are many ways to convey a subtle or complex message; also provides redundancy
Personal information	The identity of contributors to conversation is usually known	The characteristics of the source can be taken into account
Nuanced information	The kind of information that flows is often analog or continuous, with many subtle dimensions (e.g., gestures)	Very small differences in meaning can be conveyed; information can easily be modulated
Shared local context	Participants have a similar situation (time of day, local events)	A shared frame on the activities; allows for easy socializing as well as mutual understanding about what is on each others' minds

Key Characteristics of face-to-face interaction...

Characteristic	Description	Implications
Informal “hall” time before and after	Impromptu interactions take place among subsets of participants on arrival and departure	Opportunistic information exchanges take place, and important social bonding occurs
Coreference	Ease of establishing joint reference to objects	Gaze and gesture can easily identify the referent of deictic terms
Individual control	Each participant can freely choose what to attend to and change the focus of attention easily	Rich, flexible monitoring of how all of the participants are reacting to whatever is going on
Implicit cues	A variety of cues as to what is going on are available in the periphery	Natural operations of human attention provide access to important contextual information
Spatiality of reference	People and work objects are located in space	Both people and ideas can be referred to spatially; “air boards”

Remote Work Today

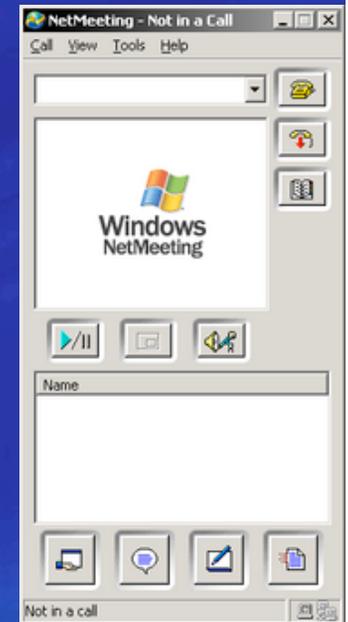
- They conducted observational studies of five corporate sites and two scientific laboratories.
- They also report findings from a comparative laboratory studies:
 - Standard face-to-face using whiteboard, paper, pencil
 - Shared editor while working face to face
 - Editor while working remotely using audio and videos connections

Remote Work Today - Sucesses

- The Space Physics and Aronomy Research Collaboratory (SPARC)
 - They focuses on simultaneous access to real-time data from instruments around the world.
 - Scientist are able to participate in specific research campaigns that could be saved and replayed.
 - They started with a simple single-stream chat and now they have 'rooms' and 'clubs' online.

Remote Work Today - Sucesses

- ❑ Boeing
 - ❑ They use NetMeeting. They prefer having meetings that are structured using NetMeeting.
- ❑ Telecommunication Company
 - ❑ They use a mix of e-mail, video and audioconferencing, transferred files, and fax
 - ❑ The structure of the projects remains the same
 - ❑ There is a detailed process shared across all sites and they share a common language. It would take 2 years to a novice to learn the structure and process.



Remote Work Today - Failures

- ❑ The laboratory data show that remote teams change how they work. They need more clarifications and management overhead
- ❑ In the field, it has been observed also the effects of extra effort.
- ❑ Teams complained about the quality of communication over audio and video.
- ❑ A new role is needed for the “virtual meeting facilitator”
- ❑ Video has showed to add nothing to the outcome performance of people in a variety of tasks

Remote Work Today - Failures

- ❑ Video is better than audio => people from different countries speaking English as their second language
- ❑ Motivation: Some scientist have fear to lose control over the data and miss a discovery

Findings Integrated: Common Ground

- A characteristic of the players.
- Common ground refers to that knowledge that participants have in common and they are aware of that.
- It is easy when teams are fully collocated. They share cultural and local context.
- Remote Teams complain about the difficulty of establishing common ground.
 - Example: state of coworkers

Findings Integrated: Common Ground

■ Prescription:

- The more common ground people can establish, the easier the communication, the greater the productivity. In case of distant teams, they could travel to get to know each other or having video.

Findings Integrated: Coupling in Work

- Coupling refer to the extent and kind of communication required by the work.
 - Tightly couple work: depend on talent of workers and is nonroutine. => requires complex communication. Very difficult to do it remotely -> collocate this work
 - Loosely coupled work: fewer dependencies or is more routine. There is common ground. These were the success cases
- Couple based on nature of the task and common ground of participants.

Findings Integrated: Coupling in Work

■ Prescription

- Design the work so that ambiguous, tightly work is collocated. Long-distance dependencies have to be straightforward and unambiguous to succeed.

Findings Integrated: Collaboration Readiness

- People should value sharing to be ready to use shared technology
 - Example: People did not want to learn TeamRoom because it was unclear the output.
- Prescription
 - One should not attempt to introduce groupware and remote technologies in organizations and communities that do not have a culture of sharing.

Findings Integrated: Technology Readiness

- ❑ Organizations should have habits and the infrastructure to adopt appropriate technologies for distance work.
- ❑ Example: Physicist used email first, then web-based technologies. Boeing, video conferencing -> NetMeeting
- ❑ Prescription
 - ❑ Advance technologies should be introduced in small steps.

Distance Work in the New Millennium

- There is room for improvement over today's technology
- There will always be things about the remote situation that make it different than collocation => time zones, cultural differences

Distance Work in the New Millennium

- How well Today's and Future Technologies can support key face-to-face characteristics

Characteristic	Today	Future
Rapid feedback		●
Multiple channels	o	●
Personal information	o	●
Nuanced information	o	●
Shared local context		
Informal "hall" time before and after	o	o
Coreference		o
Individual control		o
Implicit cues		o
Spatiality of reference		o

Note. ● = well supported; o = poorly supported.

Common Ground, Context, and Trust

- People in different countries have different common ground
 - Example: London-Chicago conference delayed for 45 minutes due to snowstorm
 - India-US: medical care software
- People will trust others who make a sincere effort to fulfill commitments, are honest and do not take advantage.
 - Trust is very fragile in electronic communication.
“trust needs touch”

Different Time Zones

- ❑ The more time zones you cross, the fewer the number of hours when people are at work at the same time.
 - ❑ Examples:
 - ❑ Looking for overlaps: France is still awake, When the US woke up
- ❑ If properly managed work can proceed 24 hours a day.
- ❑ Participants in different times of the day
 - ❑ Ex: US sleepy morning member and France members ready to go home

Culture

- ❑ People misunderstand each other because of cultural differences.
 - ❑ Ex: Code dress: US jeans and T-shirt, Big Five consultant in their formal wear
- ❑ Difference in process
 - ❑ Ex: American task oriented. Asian value personal relationships. Also different times for socializing.

Culture

- Power distance: relationship between manager and direct reports
 - Europe and Asia: respect to authority
 - US: review plans and actions with direct reports

Interaction among Factors and Technology

- Culture, time zones, and technology interact.
 - Video conference meeting (US, France) Friday 7:30. France 35 hours work. Behavior intolerant, short responses.
 - American, France, Germany. Somebody in France will retire. Americans no comments and France and Germany spent 15 minutes taking about this.

Conclusion

- “Although we will be able to bridge some of the distance and make communication richer for remote work than it is today, distance still matters.”