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The Use and Usefulness of Communication, Collaboration and Knowledge Management Tools in Virtual Organizations

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New types of work have emerged since 90's

- Teleworkers are still at about 5% of EU workers, and marked differences prevail among member states, and according to occupation and gender (Eurobarometer 2001)
- The annual (2002) 'Telework America' survey sponsored by AT&T showed a total of 28 million Americans that currently telework (up 17% from last year). That is about 20% of the workforce. Of the 28 million people who work away from the office:
 - 24.1% work on the road (= ca 4,8% of the total workforce)
 - 21.7% work from home (=ca 4,3 % of total workforce)
 - 7.5% work at telework centres (=1,5% of total workforce)
 - 4.2% (= ca 1% of total workforce) work at satellite offices
 - 42.4% work in more than one of these locations



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- *'Mobile teleworkers are those who work at least ten hours per week away from home and from main place of work, e.g. on business trips, in the field, travelling or on customers premises and use online computer connections when doing so.*
 - Almost 3 million home-based teleworkers can be found in the European Union. The vast majority of these practise alternating telework, i.e., divide their working week between time spent at a workplace in the home and time spent in the central office. 1.25 million employees can be classified as self-employed teleworkers in small office and home office (SOHO), and **2.3 million are mobile teleworkers,**



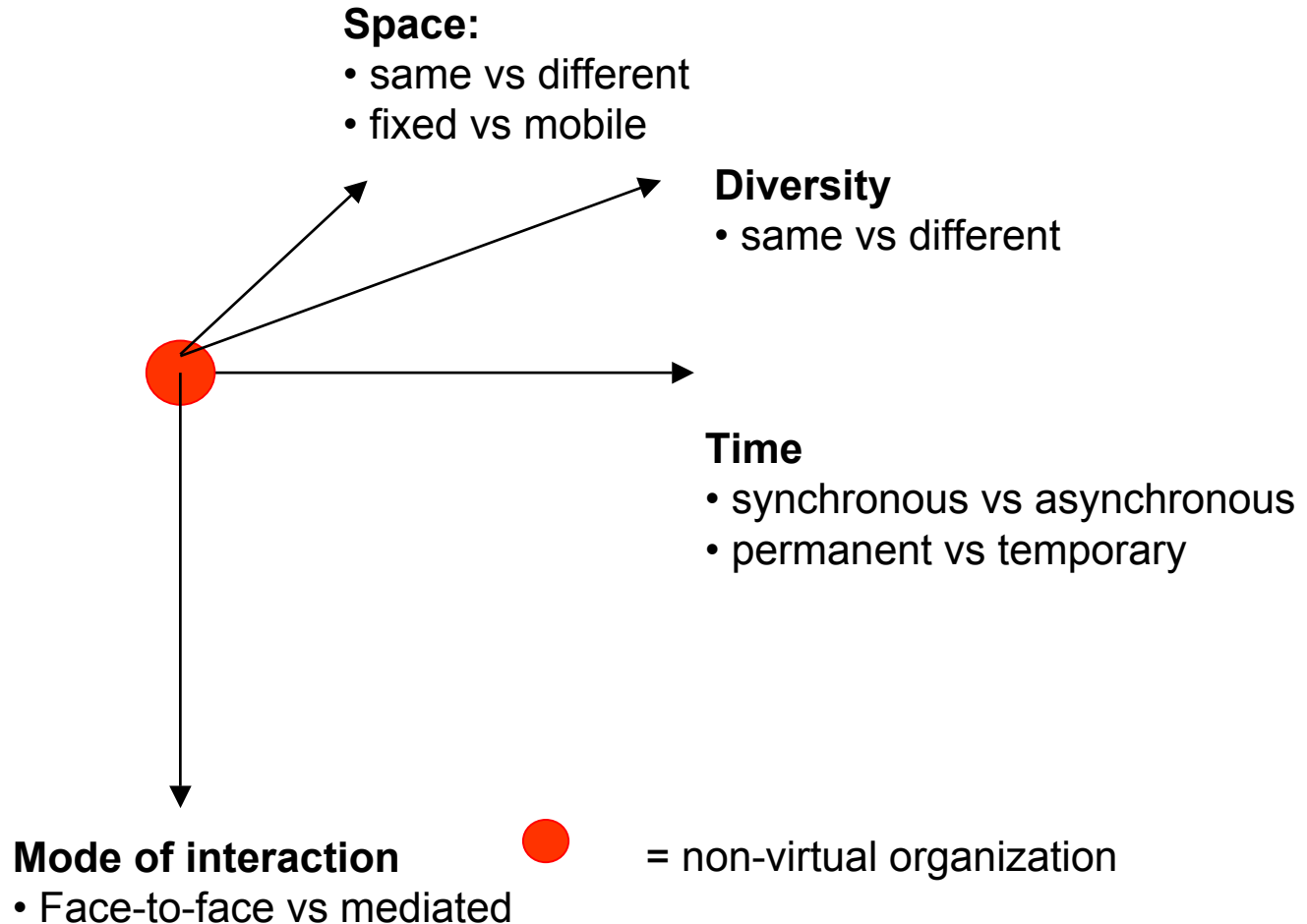
Why virtual organizations: arguments

- “The ideal virtual product or service is one that is produced instantaneously and customized in **response to customer demand**” ... “Building a virtual product will require a company to utterly revise itself, control ever more sophisticated types of information, and master new organizational and production skills.” (Davidow & Malone 1992)
- As companies expand globally, face increasing time compression in product development, and use more foreign based subcontracting labour, virtual teams promise the **flexibility, responsiveness, lower costs, and improved resource utilization** necessary to meet ever-changing task requirements in highly turbulent and dynamic global business environments. (Jarvenpaa & Leidner 1998)



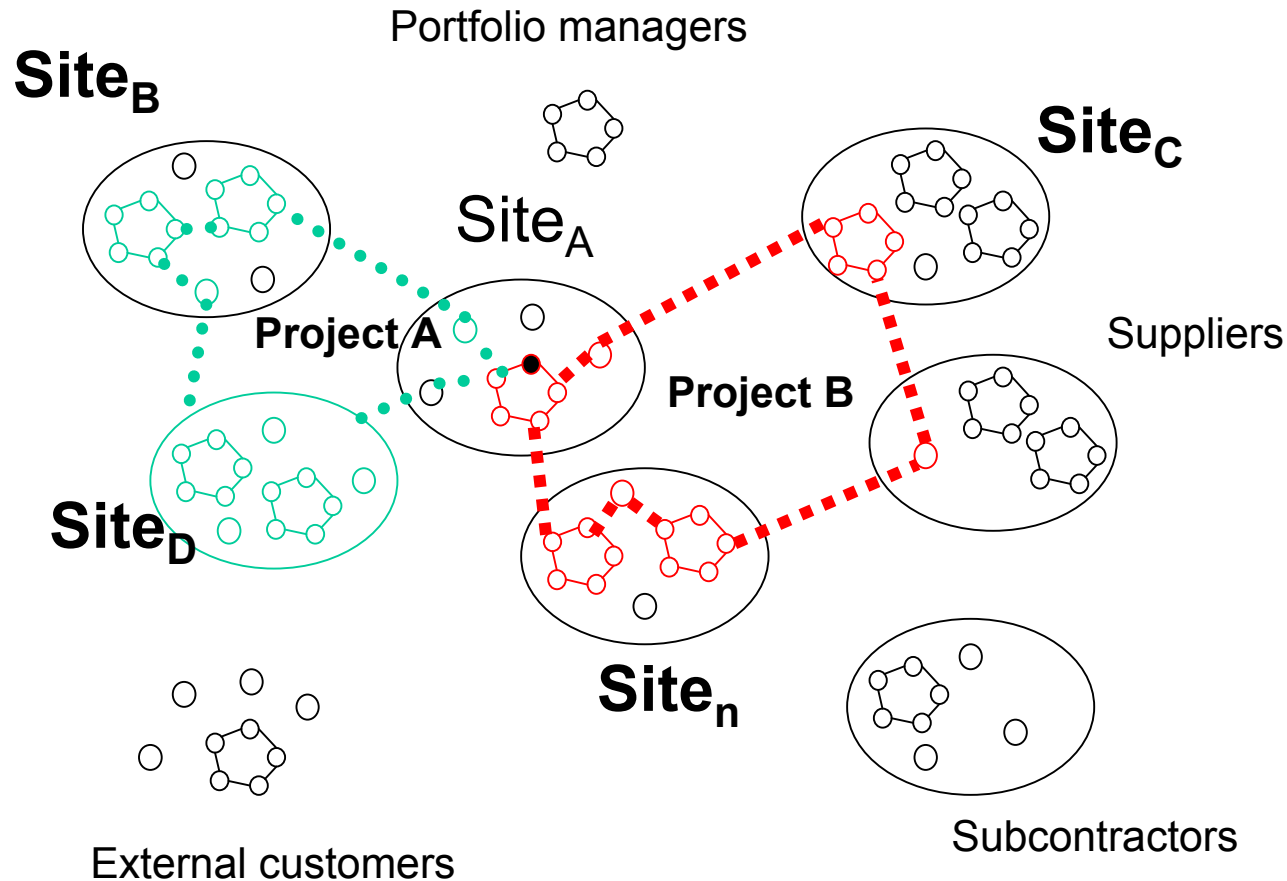
Dimensions of virtual organizations

• **Being virtual is a matter of degree!**





A company level virtual project organization





Collaboration technologies (Andriessen 2002)

- Standard 'off-the-shelf' tools:
 1. **Communication tools:** F-t-F meetings, videoconference, telephone (one-to-one), teleconference, special discussion lists, company intranet, chat, e-mail, text messages, fax, mail
 2. **Collaboration tools:** shared folders, shared databases, team's website, project management software, data conferencing, databases to find experts (e.g., 'Yellow pages'), group decision support system, group calendar



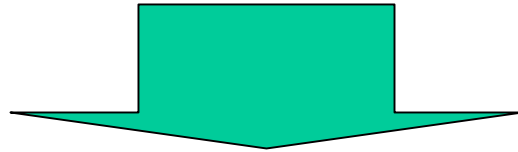
Purpose and research questions

- The purpose is to describe, evaluate and understand, how virtual teams and projects are functioning and using communication and collaboration tools to develop design specifications and operative practices
- The research questions of the study are:
 - How often members of virtual teams and projects communicate and collaborate, and what media they prefer?
→ **Virtual Team Questionnaire (VTQ)** (n=211)
 - To what degree communication tools support the production and social functions of teamwork?
→ **VTQ + Target unit interview** (n=51)



Functions and tools of groups to be effective and satisfying

- McGrath (1991): production function, member-support function, well-being functions



- Duarte and Snyder (2001):
 - **Task dynamics**, i.e., good teamwork performance → usefulness on ICT for a team's performance (production function)
 - **Social dynamics**, i.e., a feeling of team unity → usefulness of ICT tools in getting to know each other (social function)



Data and methods

FOUR TYPES OF VIRTUAL ORGANISATIONS (n=13):

1. **Global projects**

- **Elcoteq**: six global teams and projects (Finland, Croatia, Estonia, Japan, Hong Kong, etc)
- **CRF Box**: a design project (Boston, Helsinki, London, Stockholm)

2. **A network to design a kraft mill process**

- **Andritz**: three partners (Karhula, Savonlinna, Varkaus, Pietarsaari, Vantaa in Finland)

3. **A remote project to design construction of roads**

- **Tieliikelaitos**: consulting expert service unit (Helsinki, Kuopio, Oulu, Tampere, Turku in Finland)

4. **A permanent team for co-ordinating operations**

- **TietoEnator**: four units (Espoo, Oslo, Stockholm, Uppsala)



Virtual team questionnaire - themes

- Themes: goals and their attainment, trust, We-spirit, Fairness, Job demands, Stress and well-being, Leadership, Performance and effectiveness, **communication tools – use, communication tools – usefulness, collaboration tools –use, collaboration tools – usefulness**, effects of virtuality, background questions
- Web-questionnaire sent, n=343, returned, n = 211 (response rate 62%)

Age (average)	42,3
Women	27,1%
Number of locations	33
Number of nationalities	17
Number of temporary teams/projects	62,6%
Average working time in a team/a project (in months)	11,4
Average working time in company (years)	12,0
Travel days/year	20,6
Geographical locations due to team assignment	3,3
In supervisory position	29,9%
Experience about working in virtual teams (1=not at all; 4=a lot)	2,4

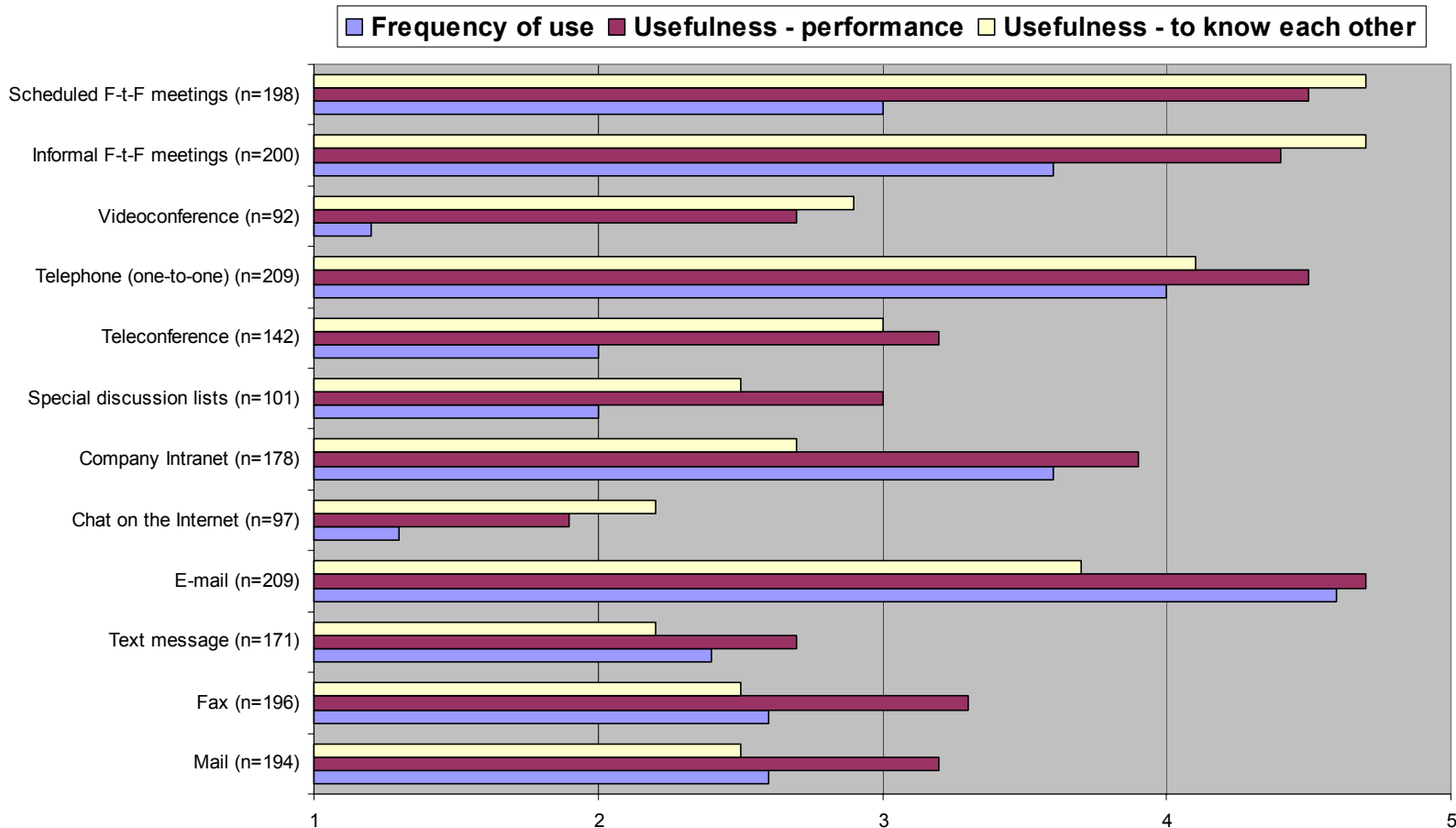


Target unit interview - themes

- **Themes: Background and Motivation**
- **Goals**
- **Organization**
- **Identification**
- **Competencies**
- **Intra- and Inter-Group Relations and Cooperation**
- **Communication**
 - How do you communicate with each other in your virtual team?
 - What kind of communication practices/rules have you agreed upon?
 - Which are the main challenges of communicating with people from different places/cultures? Give an example of misunderstanding from this project/team.
 - Compare the meaning, importance and differences of face-to-face meetings with e.g. e-mails and videoconferencing in this project?
 - How would you improve communication?
- **Usability**
- **Leadership**
- **Final Evaluation**



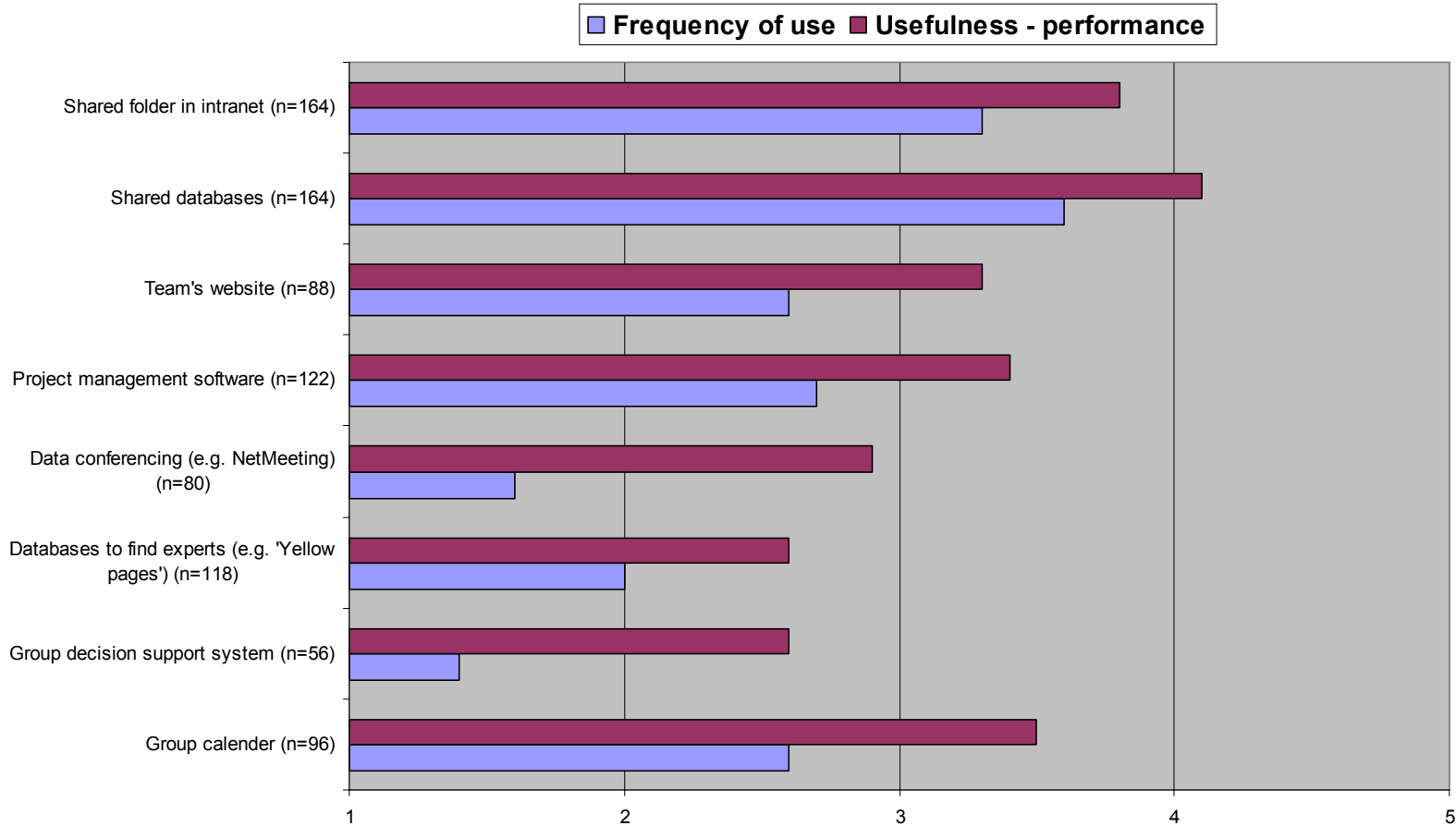
Use and usefulness of communication tools: production and social functions



(1 = never/not at all, 3 = monthly/somewhat, 5 = daily/very much)



Use and usefulness of collaboration tools: production function



(1 = never/not at all, 3 = monthly/somewhat, 5 = daily/very much)



Functionalities of communication tools

Tools	Function	Advantages	Disadvantages
E-mail (n=33)	- Asking questions, comments, and feedback	- Quick to transfer knowledge to many, can be archived	- Too many, too slow responses to urgent questions, easy to misunderstand
Telephone (one-to-one) (n=19)	- Urgent reasons requiring quick answers and decisions, negotiation	- Quick and immediate, easy to correct if misunderstood	- Not good for getting to know each other
Face-to-face (n=42)	- Getting to know each other, planning and problem solving, exchanging opinions and ideas	- Seeing body language, simultaneous working, quick feedback	- High costs, difficult to arrange when in hurry
Video-conference (n=24)	- Well-prepared decisions, exchanging information and ideas, handling routines	- Saves time and travel costs	- Unstable technology, the more people the more difficult, lacking metacommunication



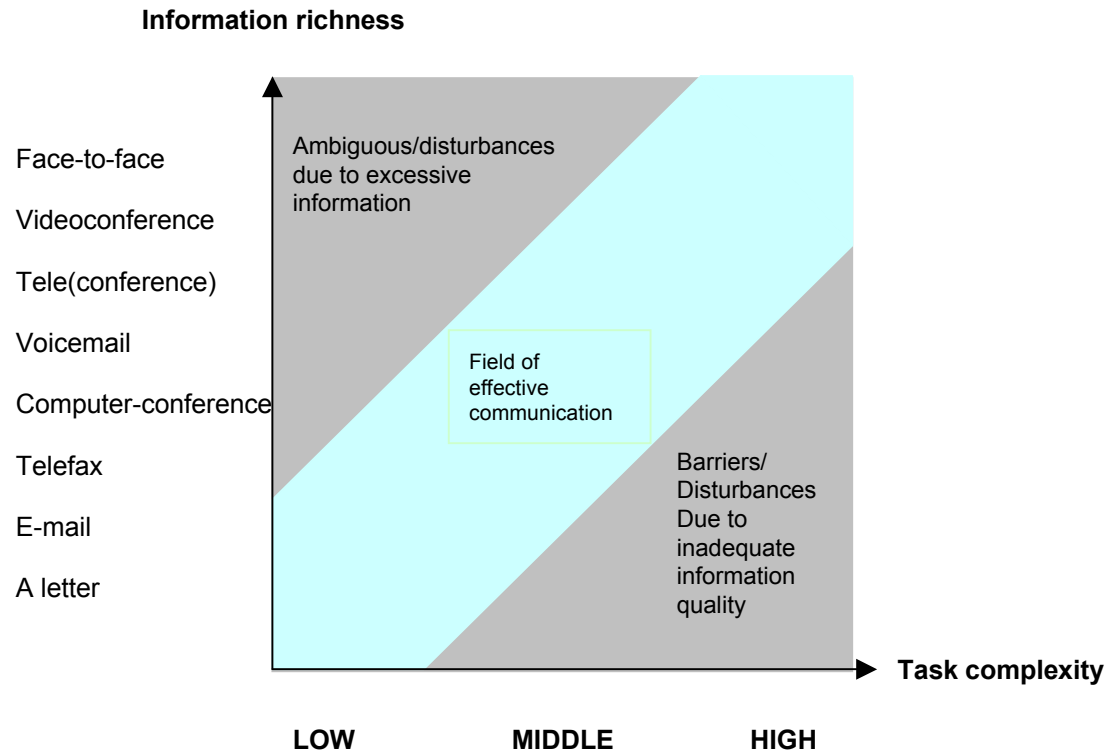
Conclusions

- The toolbox of a virtual employee consists of:
 - E-mails, one-to-one calls, scheduled and informal F-t-F meetings, shared folders and databases in company intranet are **used much and frequently**. Other tools were used less than monthly.
- Usefulness of tools for work performance (**production function**):
 - See: above + project management softwares
- Usefulness of tools for getting to know each other (**social function**):
 - Scheduled and informal F-T-F meetings, one-to-one calls, e-mails



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- Tools for task and social dynamics are a bit different from each other
 - Different tools seem to offer different functionalities → their combination is necessary!
 - The Media Richness Model was confirmed to some extent: F-t-F collaboration is needed for creativity, visioning, problems solving and complex decision making

The media richness model and selection of support technology (Daft & Lengel 1984)





Questions?
PLEASE!