

Shaping Technology Across Social Worlds: Groupware Adoption in a Distributed Organization

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Background

Distributed organizations are prevalent

Yet adoption of collaborative technologies across geographic distance has not been a focus of study!

Much resistance in groupware adoption found: due to individual, group, and organizational factors

Adopting groupware across distance is a challenge: people must learn about technology, make collective decision, and coordinate in its implementation

Adoption in complex distributed organizations

Groupware adoption studies have used different loci of impact:

- Individual (e.g. Diffusion of Innovation, Technology Acceptance Model)

- Group (e.g. Cost/benefits)

- Organization (e.g. Structuration theory)

These loci of impact assume user roles and rigid boundaries for the technology diffusion

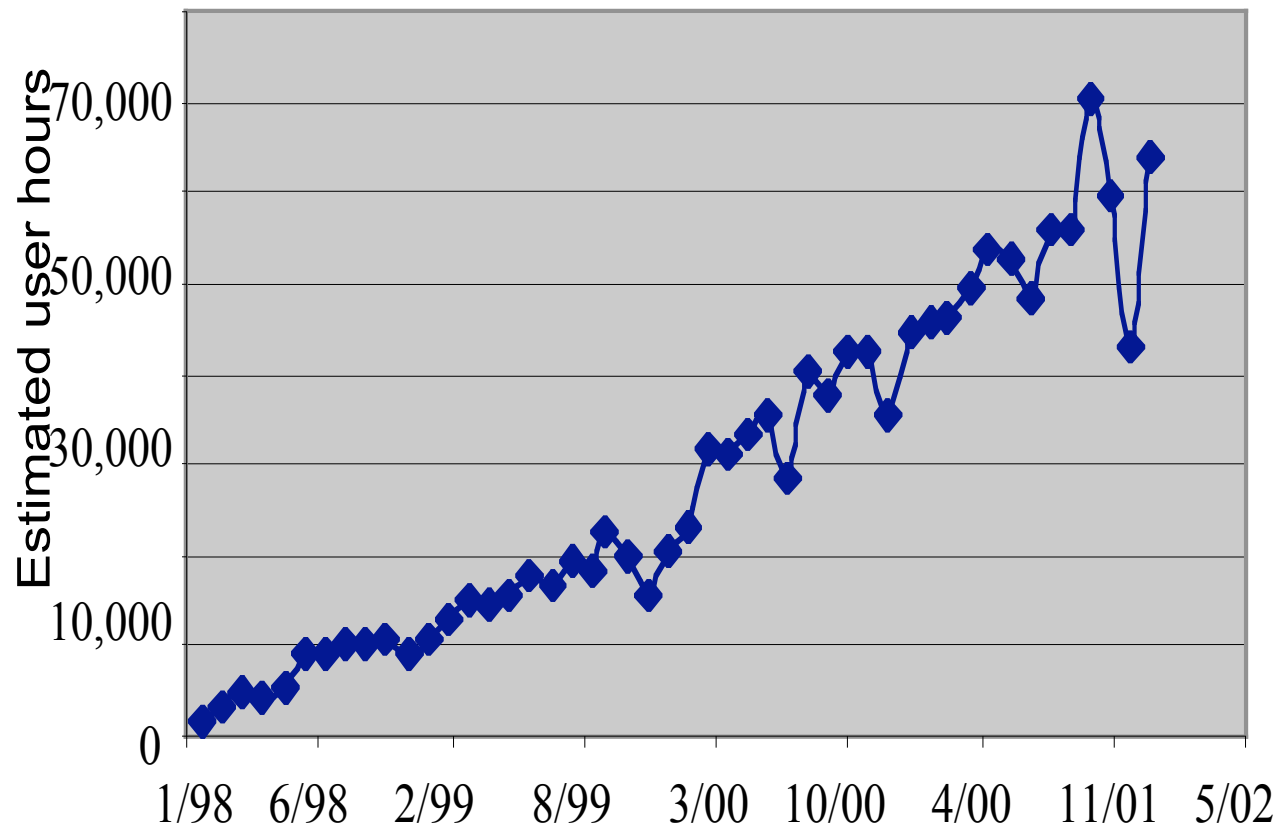
In fact, distributed organizations are complex

- Boundaries within which collaboration occurs are dynamic

- People are involved in multiple collaborations

- People assume multiple roles

Data conferencing diffusion curve



Research questions

Data conferencing diffused rapidly throughout a distributed organization

Diffusion occurred despite the fact *that there was no management mandate or top-down planning*

How did the diffusion occur so rapidly across geographic distance?

Did the technology become transformed as it spread across distance (e.g. Tuomi, 2002)?

How was adoption affected when collaborating partners were located in different organizational sites? How did (potentially) conflicting organization policies affect adoption?

Social worlds as focus of adoption in a distributed organization

A social world is a unit of collective action --Strauss

Social worlds are: *“Groups with shared commitments to certain activities, sharing resources of many kinds to achieve their goals, and building shared ideologies about how to go about their business”* --Clarke



Why social worlds?

Social worlds are appropriate for explaining distributed adoption:

- Social worlds have fluid boundaries

- Social worlds are diverse

- People belong to multiple social worlds

- Communication channels vary across social worlds

- Rate of adoption is different across social worlds

People reference the relevant social world for an adoption decision

Social worlds are in contrast to Diffusion of Innovation theory:

- DOI locus of impact is the individual

- DOI does not account for networked technologies, interdependent decisions, heterogeneity

- Assumes bounds within a “social system”

- Assumes fixed user roles

Research setting and technology

In late 1990's, Boeing underwent mergers that led to more geographical distribution across U.S. and world

Employees needed a way to participate in newly formed distributed teams

Data conferencing technology (Netmeeting) made available

Netmeeting (NM) defined as a company standard

Methodology

Case study approach

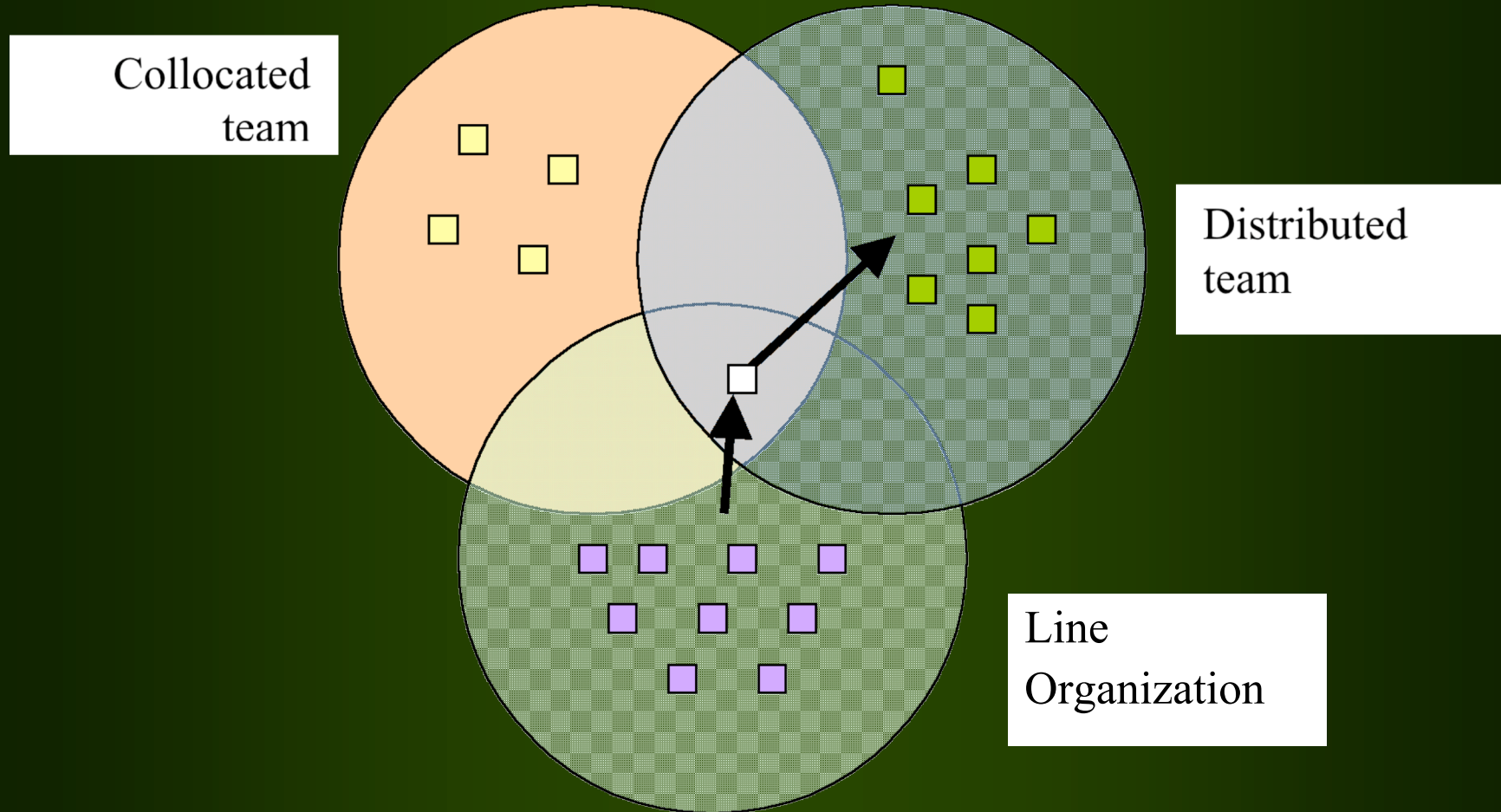
Examined archive of 354 email messages over 2 1/2 years:
a log of all requests to use NM at one organizational site
Each message is a thread of correspondence

63 interviews, 8 with key people

Collected usage data from conference servers, over ~ 4 years

Examined adoption-related artifacts from 1997-2003
e.g. documents, company announcements

Transporting technology across social worlds



Transforming technology across social worlds

As the technology moved across social worlds, the uses of the technology changed

Different social worlds afford the opportunity to *shape* the technology to fit the work practices of the world

Examples:

User learns about Netmeeting from a colleague in the line organization; user adapts Netmeeting to do remote software testing

User learns about Netmeeting as a presentation tool in a distributed salary review team; user introduces it to a distributed team for sharing spreadsheets

User learns about Netmeeting from support staff colleague; user adapts Netmeeting to perform computer support for remote users

Social worlds can work for and against adoption

Social worlds have unique conditions affecting adoption:
collective experience of members, resources, task, etc.

Two sites in the organization had conflicting views about NM

One site had gatekeepers that controlled adoption

Other site enabled easy adoption

Many people were on distributed teams with members from both sites

Adoption in Central City

Harry, the IT director at Central City, controlled adoption

Reasons: operating costs, impact on computer network, new uses of NM would lead to more support costs

Central City policy for controlling NM use:

- NM use was considered an “exception”

- Potential users needed to formally apply to use it: each situation was reviewed by IT staff before approval could be granted

- Could not be used to support collaboration at local Central City site

- Audio, video features could not be used

- Potential users not allowed to assist each other to install NM

- IT staff not allowed to present or “sell” NM to potential users

- Harry: NM should not be available for “general use”

Users followed policy to avoid repercussions

- Some users who already downloaded it “confessed” and requested permission

Adoption in Seattle

Seattle IT staff believed requirement for NM already existed

“Self-service” strategy

All information for deploying it was on a company web page

Users needing further assistance could consult technical support

Social worlds in conflict

Central City and Seattle had different views of the value of synchronous collaboration

Central City (high-level IT manager): *“Somewhere, someone, would need to place a value on collaboration. What’s the payback? What are you gonna get out of it to offset the costs?”*

Seattle: viewed technology as an investment, paid back by saving travel costs

Seattle followed NM as company standard; Central City declined NM as a company standard

Central City user point of view

Despite gatekeepers at Central City, their relevant social worlds for the adoption decision were their distributed teams

Potential users not concerned with costs or network traffic at Central City; they needed NM to participate in their distributed teams

Technology promoters at the intersection of social worlds

Social worlds can influence the power that technology promoters have

Mary, a dedicated promoter of NM, was a member in two (conflicting) social worlds: the IT staff at Central City and the distributed NM IT group

Mary was not allowed to promote NM at Central City

She compiled a web page of FAQs, wrote users' guide, ran training sessions

Her efforts were successful: *"I'd hate to have to ask them to take it off their PC's--we aren't the NM Police, although Harry might prefer we do ask them to remove it, it's hard to say...."*

Critical mass and diffusion across social worlds

Critical mass from can exert pressure on those social worlds with overlapping membership

Critical mass in the organization served to weaken resistance by Central City policy:

Central City requests grew into several 100's

By 1999, IT approval policy becoming more lenient for local NM use

A Central City manager wrote a business case to make NM a standard

Language of NM requests changed from asking for "exceptions" to asking for "approval"

In August 2000, NM became a standard in Central City

Social worlds and diffusion

Social worlds can explain diffusion in a distributed, complex organization

Adoption should be viewed via boundaries of working spheres which can span boundaries of single work units or even organizations

People are members of multiple working spheres; adoption decision is viewed according to the relevant social world

Social worlds can benefit and also hinder adoption, depending on the conditions of that social world

Adoption rate can vary across social worlds

Technology use is socially constructed; it is influenced by the contexts of the unique social worlds

The technology

Data conferencing is a malleable technology

It provides a “medium” to collaborate, not just a mechanism

Its functionality could be adapted to existing work practices

Emerging work practices occurred:

remote software testing, remote technical support

The tension for distributed teams

Distributed teams face tension: all must adopt to collaborate effectively

Each team member may experience constraints or benefits towards adoption from membership in their other social worlds

Positive message: shared views of adoption were developed within distributed teams, these views served to overcome resistance at Central City