



# Internet technology and Workflow/CSCW on the Net

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# The advent of I'net technology

- Internet
  - Founded in the late 1960s for national security reasons in the US
  - Inclusion of academia in the 1980s through the National Science Foundation
  - “Takeover” by commercial interests in the 1990s
  - Explosion of Internet use since 1993
  - Billions of users?



# The WWW

- Developed by Tim Berners-Lee in 1989 at CERN
- The appeal of hypertext
  - You don't have to know where the information is, the computer does
  - Distributed storage, access and maintenance
- Multimedia capability
- Common interface
- Platform independence



# Intranets

- Internet technology used in the internal network
- Many names for the same phenomenon
  - Internal webs
  - Internet clones
  - Private webs
  - Corporate webs
- The boost came in 1995/96 (source: Computerworld)
  - 1994: 28 mentions
  - 1995: 554 mentions
  - 1996: 5.737 mentions (as of June)



## Use of intranets

- Email
- Directories
- Organization charts
- Newsletters
- Internal publications
- Manuals
- Training
- Job postings
- Memos
- Newsgroups
- Sales reports
- Lunch menu

The corporate billboard?  
What about value-added?



# Intranet advantages

- Relatively easy to set up
- Subsidiarity in application and data maintenance
- Cost-efficient, open standards
- Scalability, security, flexibility
- Ease-of-use
- Communication (collaboration/coordination)
- Multimedia
- Multiple access



# Intranet disadvantages

- Complexity and chaos
  - “Local” or “private” sites
  - Out-of-control communication
  - Information overload / communication overflow
- Security risks
- Cost estimation difficult
- Focus on internalities



# CSCW

- Support for cooperative/collaborative work
- Various “branches”
  - Groupware, Group Support Systems (GSS)
  - Workflow
- Different levels of process structure
  - Non-structured (Academic research)
  - Semi-structured (Company R&D)
  - Fully structured (Loan origination)



# CSCW advantages

- Structured approach
- Collaboration / Coordination / Communication  
in a wide range of processes
  - Primary/secondary activities
  - Product development / R&D
  - Marketing & Sales / Customer support
- Capturing and sharing of knowledge
- Organizational memory
- Automation of routine work



# CSCW disadvantages

- Most disadvantages have their origin in design
  - Communication rigidity
  - Inflexible process definitions
  - Focus on control
- Technological limitations
- Platform dependency
- Interoperability / Standards



# The marriage 1

Cost efficiency

Functionality



Web-enabled CSCW



## The marriage 2

Chaos

Resistance



Web-enabled chaos

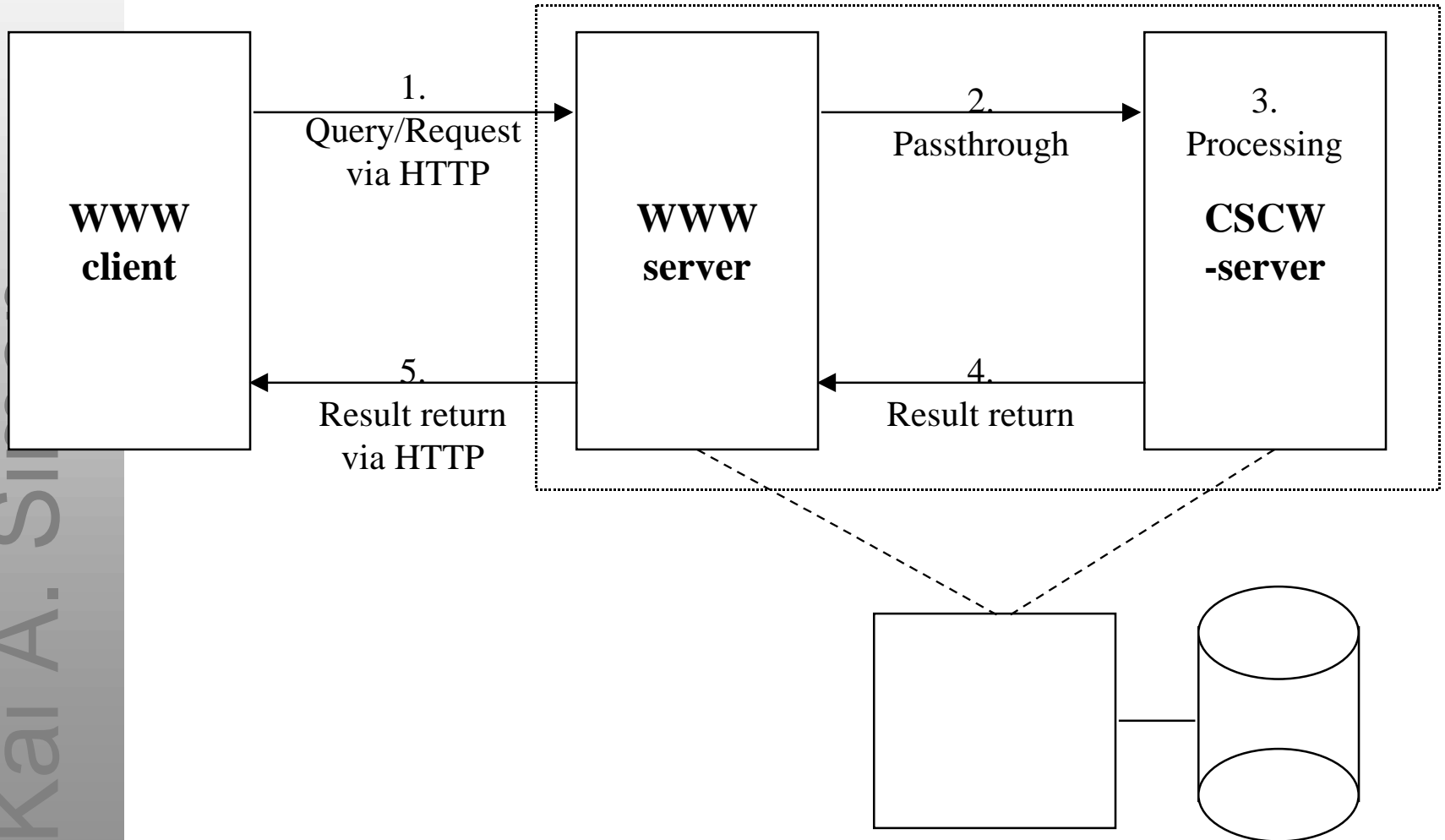


# What can happen?

- Role of technology in the organization
  - New roles and skills
- Business Processes
  - Support process information
  - Enable Inclusion of improvement and best-practice information
- Culture
  - Openness, information-sharing environment



# HTML based architecture



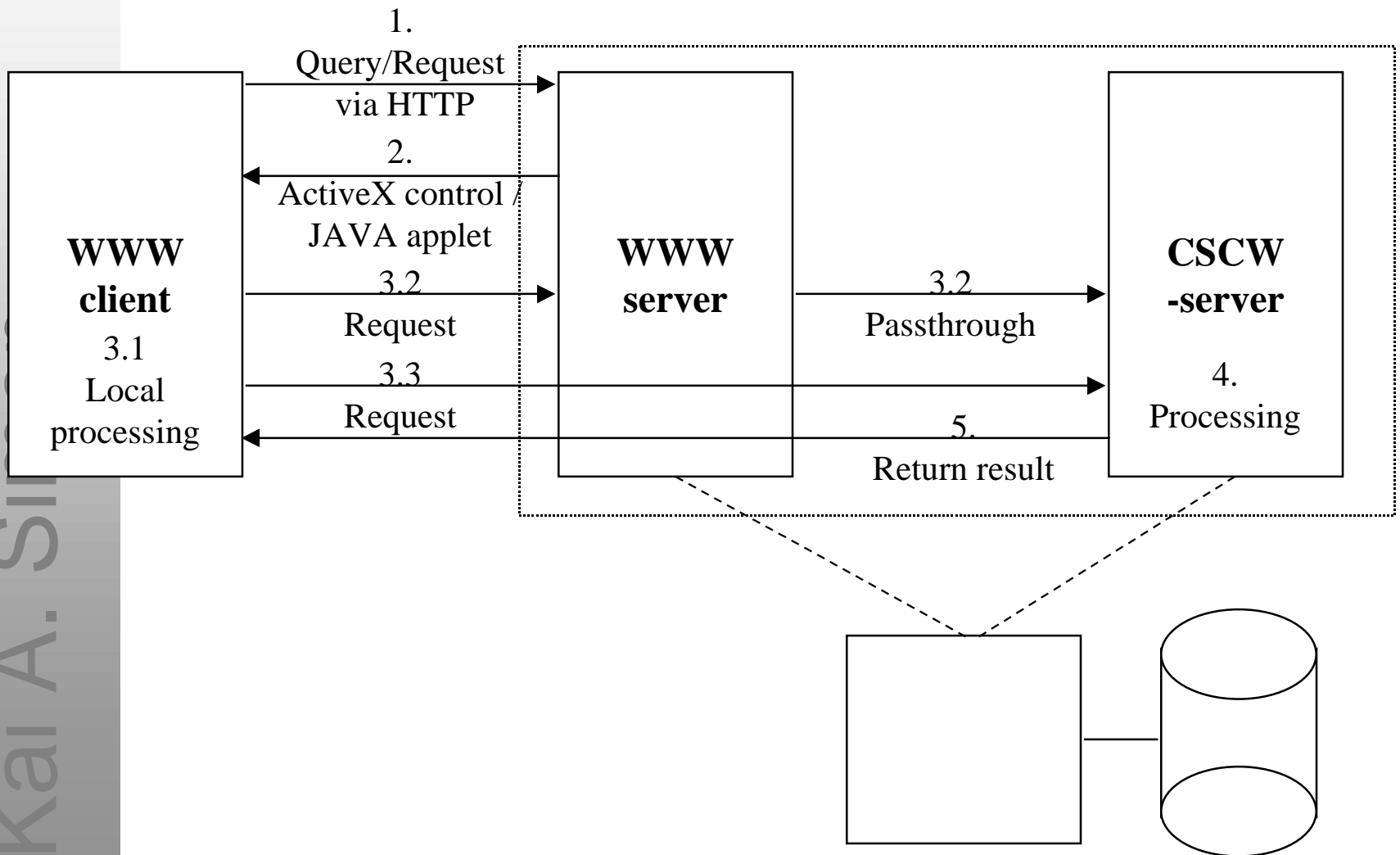


# HTML based architecture

- Advantages
  - Platform independence
  - Highly customizable
  - Publish-oriented applications
- Disadvantages
  - All processing on server
  - Multi-tier client/server
  - WWW-server used as high-volume transaction server



# ActiveX/JAVA based architecture





# ActiveX based architecture

- Advantages
  - Look and feel as Windows/OCX
  - Development similar to 4 GL client/server
  - No manual code-updates for local apps
  - Distributed processing
  - Improved transfer through WWW-server bypass
- Disadvantages
  - Currently only in 32-bit Windows
  - Only supported by MS-Explorer
    - Add-on software required



# JAVA based architecture

- Advantages
  - Look and feel as client/server apps
  - No manual code-updates for local apps
  - Distributed processing
  - Improved transfer through WWW-server bypass
  - Download only when needed
  - Code removed after use
  - Platform independence
  - Double-byte architecture (+ for Kanji)



# So, you made up your mind?!

- Product selection criteria
- Advantages and Disadvantages
- Implementation issues
- Critical Success Factors
- Outlook



# Product selection

- **Server platform**
  - Number of supported platforms
  - Versions on different platforms / internal interoperability
  - Which are your current platforms
- **Architecture / openness**
  - Standards supported
  - Open standards / proprietary systems / “wrapped-in” proprietary systems



# Product selection

- Capabilities, features and functions
  - Calendars, schedules
  - Meetings, conferences, video, mail
  - Organizational memory, repositories
- Workflow I
  - Web-/proprietary interface
  - Forms, templates
  - Easy-to-use interface
  - Development support



# Product selection

- Workflow II
  - Groups/Teams as organizational unit
  - Routing through CMI or databases
  - Integration with third party products
    - Pipelines, gateways, CMI, EDI
  - Web development
    - CGI scripting, Perl
    - Java scripts, Java, scriptlets, ActiveX



# Product selection

- High-end or low-end
  - Everything-in-one-box
  - Niche solutions
  - Which features do you need vs pay for
- Usability
  - Required user skills
  - Training and education
  - Time-to-use - days, weeks, months



# Product selection

- Development and maintenance
  - Staff requirements
  - Highly skilled programmers and Web-kids
- Cost
  - Price per seat
  - Installation, maintenance
  - Hardware, server, client, network, ...
  - Deployment



# Advantages of Web-CSCW

- Low set-up cost
- Cost saving through deployment
- Improved communication -> Productivity +
- Organizational memory
- “Ubiquitous” workflow and document management
- Platform independent clients



# Disadvantages

- Integration can be costly
- Information currency, validity and actuality
  - Set-up, maintenance and retention of information
- Productivity – due to information overload
- On-line is necessary
- Authentication
- The simplicity of HTML (XML on the way)



# Implementation

- Structured approach vs organic growth
- “Do we need it?” vs “Just do it!”
- Project management vs grassroots activities
- Structure vs chaos
- Approval and funding
- Critical mass in development and use
- Fun of use



# Two implementation models

## Structured

- Requirements analysis
- Status mapping
- Project development plan
  - ROI, cost justification
  - Future process
  - Time plan
- Implementation
- Roll-out
- Feedback

## Organic

- Requirements analysis
- Set up infrastructure
- Create audience
- Promotion
  - Content delivery
  - Use
- Large scale demonstration
- Enable easy embarking
- Further development



# Critical Success Factors

- Dejà vu
  - It's still the people issue
  - Change is difficult
- If there is no communication before, there will be no communication afterwards
- Disseminate results
  - Prototypes, intermediate versions for review
  - Users' ideas are easy to include



# Outlook

- If a product isn't Web-enabled yet, it soon will be
- Multi-vendor systems
- Integration with business systems
- Supply chain management
- Integration of customers/consumers
- Multi-lingual WF-systems
- Re-union of CSCW and WF