



# ***MALL2000* project**

## **Document exchange as a basis for business-to-business cooperation**

**Some ideas or „under consideration“  
or „what we are planning to do“**

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8. Januar 1999

IBM Labor Zürich

# MALL2000 project

EU INCO/Copernicus #977041

*Mall for online business beyond the year 2000*

## Partners:

- Sofia University (Project coordinator)
  - Darmstadt University of Technology (TUD, chairs PÜ & DVS1)
  - Technical University Brno
  - Digital Equipment Intl. BV, Galway
  - DirectNet Consulting Ltd., Brno
  - Object Technology Intl. GmbH, Zwingenberg
  - Stylo srl., Bologna
  - VirTech Ltd., Sofia
- Project started October 1998 (!),  
so don't expect too much**

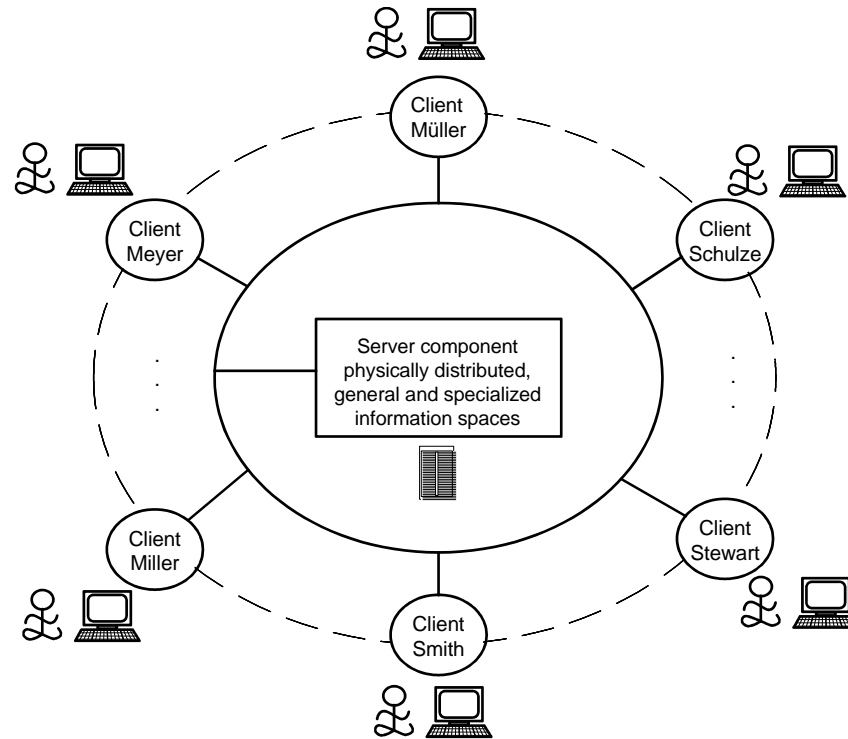
# Disposition of the talk in Zürich:

## „Some ideas“ !

- Scenarios of document exchange in Electronic Commerce, business-to-business cooperation
- *HotDoc*, document parts
- *HotSimple*
- *MALL2000* architecture
- Application of pattern technology
- Control of document workflow
- Visual support for workflow design and modification
- Summary

**TUD-PÜ is responsible  
for subscribers' interface**

# A typical *MALL2000*



# Preliminaries, definition of some terms

- *documents*  
*memos, specifications, code, manuals, queries, orders, bills etc.,*  
(in general) *business contracts*
- *framework*  
(application dependent) *cooperating classes* with „plug points“/“hot spots“  
*-- top-down --*
- *patterns*  
*used as building blocks for system design*  
(design documentation and/or specialisation of a framework)  
*-- bottom-up --*
- *workflow*  
*process to handle / to interact with a document*  
*by a group of business actors (businessmen “in persona” / “by agents”),*  
*statically/dynamically determined*

# Document exchange

- „*Since milleniums in written form*“, just everywhere
- Business contracts, trade conditions, offers, reports, bills, meeting agendas & minutes, filing, file access, statistics, ... (*you name it*)
- Exchange by messenger, by letter, by fax, by E-mail, Web/internet communicated, ... (*again, you name it*)
- Formal vs. informal; formatted vs. unformatted
- One-to-one, broadcasted, one-to-multiple, multiple-to-multiple, (a-)synchronous cooperating group
- In persona agreed vs. Routine work delegated to agent
- ... ?



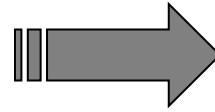
**A basis for business-to-business cooperation  
in an E-Commerce application, *MALL2000***

# Scenarios

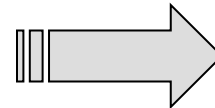
- „*Getting in touch*“
  - „*Negotiate*“
  - „*Preparing a contract*“
  - „*Simulation / Planning of alternatives*“
  - „*Cooperation preparation and execution between General Contractor and its subcontractors*“
  - „*Document handling with and in a consulting firm, administrative body / authority, hospital, project consortium*“
  - „*Simulation / Follow up of contract execution*“
  - „*Planning and controlling product distribution*“
  - „*Common Service Organisation of a mall*“
  - ... - you name it -
- All to be considered in an international (European) environment, Web-based**

# Required functionality for document exchange

- Availability of „*Parts*“  
(text, diagrams, graphs, audio, spreadsheets, ... - you name it -)
- **Partitioning** of document
- (Hierarchical) **placement** of parts („*Gestalter*“)
- Functionality to work on **structure** and/or **contents**
- (of course) **Editing / Planning**
- **Active** vs. **inactive** parts
- **(In-)visible** presentation;  
**access rights**
- **Links; constraints**
- ... Whatever good idea you have!



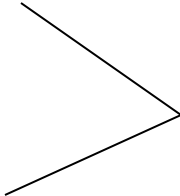
- Start with a “*framework*”
- **Specification tool** for parts
- Highly dynamic support for
  - parts’ **instantiation, structuring, and placement**
  - document **composition & communication**



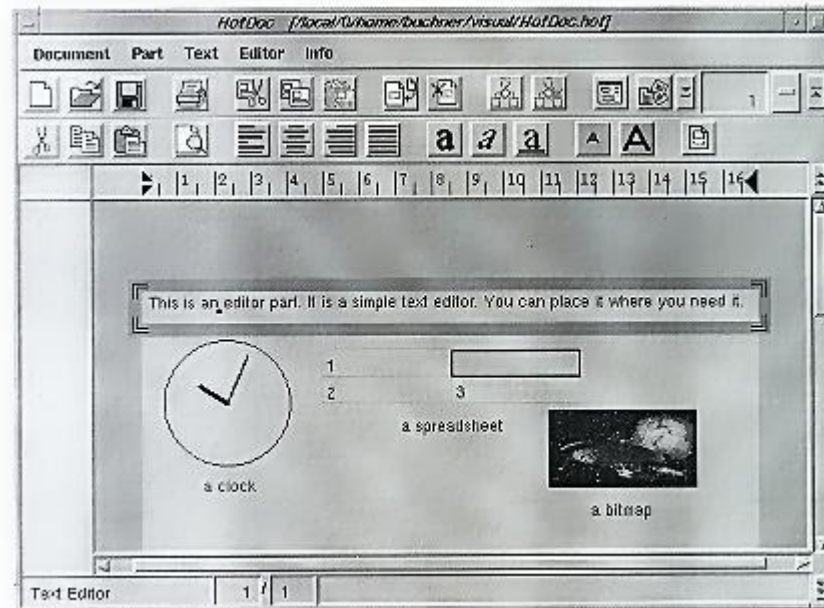
- **Smalltalk/Java (?)**
- Document **library** for initialisation (scenario depending)
- „*Workflow part*“ attached to document
- ... We are working on it!



# *HotDoc*

- Framework for document composition (Doctoral thesis Buchner, „*HotDoc, Ein flexibles System für den kooperativen Aufbau zusammengesetzter Dokumentenstrukturen*“, TUD 1998)
  - Presently available **active „parts“**, **hierarchically structured**:
    - *Plain text*; (some) *multimedia features* (e.g., running clock)
    - *HotCalc / HotSimple* (Doct. thesis Kunstmann, TUD 1999, watch later)
    - *HotVector / HotChart*
    - *HotGroup / HotWeb*
    - *HotScript*
  - Parts to be made available in the **MALL2000 project**
    - (re-designed) *HotGroup / HotWeb*
    - (*HotScript*) / *HotLink / HotStruct / HotMerge*
    - *HotFlow / HotRight*
    - *Hotdata*
  - *VisualWorks*, to be re-implemented in *VisualAge for Smalltalk/Java, Web-based*
- 
- „under consideration“**

# *HotDoc*: The End-user's Point of View



# Multimedia features in *MALL2000* subscribers' interface

- What is „*multimedia*“ ?
- (Structured/formatted) text, diagrams, graphs, pictures, acoustic signals, animated information presentations, videos, ... (you name it)
- Information with standardized communication formats / protocols (?)
- Information capable to be presented by Web browsers (?)
- ... **We are glad to have a project partner looking into business application requirements for MALL2000**
- Attached functionality: active/inactive, visible/invisible, spreadsheet, access rights, workflow, ... (**any dynamics we may think of and which we like to be realized under MALL2000**)

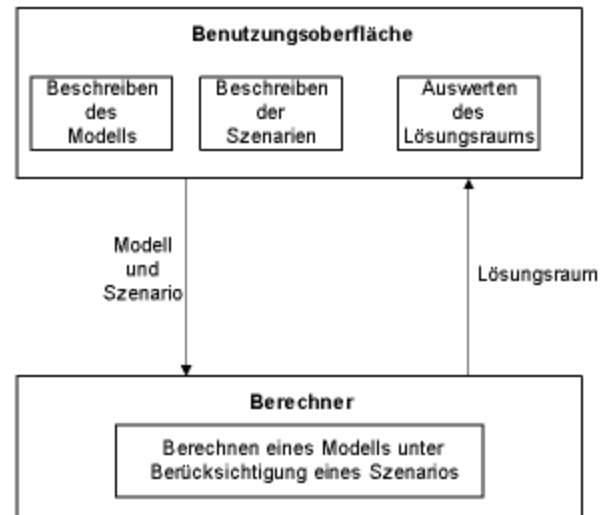
# *HotSimple* (I.)

- Business cooperation means *joint planning and simulating* of possibilities for contracting and/or acting;  
„*solution space*“
- **Spreadsheets** (!), in common use by businessmen
- Some characteristics thereof:
  - uni-directional constraints,
  - no visualisation of solution space and of the mutual dependencies in it,
  - error-proneness.
- Doctoral thesis Kunstmann, „*Rechnergestützte Simulation und Planung auf der Grundlage von Tabellenkalkulation*“, TUD to be completed 1999,  
*Simple*



# *HotSimple* (II.)

- *Simple*
- A „*language*“ to describe a planning/simulation domain
- Bi-directional constraints, „*numerical intervalls*“
- To decrease error-proneness with „*units*“ (e.g., Meter, Euro, Monat, LOC), „*scales*“ (e.g., Centi, Kilo), „*derived units*“ (e.g., EuroproYear, kg), „*enumerations*“ (e.g., [\$, DM, Sfrs], [Mo, Tu, We, Th, Fr]), „*types*“/„*sets*“/„*arrays*“ (structured cell data, e.g., „VisitDays={Mo, We, Fr}“), „*constraints*“ (too complicated to be explained here, example follows), ...
- Interactive tool for visualizing/exploring the solution space + for navigating in the solution space
- User interface, *HotSimple*, is an integrated part of *HotDoc* framework

# Architecture of *Simple*



Legende:

-  Komponente mit Subkomponente
-  Datenfluß

# *HotSimple* User Interface



## *HotSimple* (III.)

- Example:

TYPE

„Preis“ Preis =

RECORD

„Nettopreis“ Netto = [0 || 1000] [DM];

„Mehrwertsteuer“ Mwst = [0 || 160] [DM];

„Bruttopreis“ Brutto = [0 || 1160] [DM];

TYPECONSTRAINT

„Berechnung der Mehrwertsteuer“

MwstFormel : Mwst = Netto \* 16/100;

„Berechnung des Bruttopreises“

BruttoFormel: Brutto = Netto + Mwst;

TYP CONCATENATION

Beide : MwstFormel & BruttoFormel;

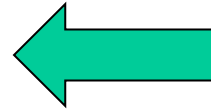
END;



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# *MALL2000*, architecture (I.)

- Peer-to-peer, Internet-based network for business-to-business applications of Electronic Commerce
- Architectural details presently „*under consideration*“ in the consortium
- WP 2: Representative *MALL2000* business services
- WP 3: Data/information universe (Design and development of *MALL2000* Data Base)
- **WP 4: Design and Development of the *Mall2000* Subscriber Service Interface** - *mainly covered in this talk* -
- WP 5: Common Service Organisation
- + WP 1 (management) + WP 6 (usability) + WP 7 (demos)

## ***MALL2000***, architecture (II.)

- **WP 4: Design and Development of the *Mall2000* Subscriber Service Interface** - *mainly covered in this talk* -
- Document-based cooperation of businessmen (*subscribers*) as the architectural paradigm (in persona and by delegation for routine activities)
- Based on *HotDoc* framework with additional parts (as mentioned earlier) + *HotSimple*
- From an architectural „*development*“ viewpoint providing additional and enhanced/modified *HotDoc* parts (as also mentioned earlier)
- From an architectural „*research*“ viewpoint emphasis on applying **pattern technology** and attachment of **workflow capabilities** to documents (with visual support for dynamic design and modification)
- (There will be a second, more traditional approach for a *MALL2000* Subscriber Service Interface **not** covered in this talk)

# Redesign of *HotDoc* to become subscribers' interface of *MALL2000*

- Redesign required due to transition from *VisualWorks* to *VisualAge* (for Smalltalk/Java ?)
- *HotDoc* and all its parts grew without much systematics; „*framework*“
- To do it better the second time!
- Application of **pattern technology**

„*under consideration*“

# Document workflow under pattern control

- „*Horizontal*“ steps (subscriber to subscriber)  
probably more or less pre-planned (application dependent, initialisation);  
*dynamisation* may occur
- „*Vertical*“ steps (e.g., General Contractor to subcontractor)  
will be developing according to contract circumstances
- Facility for dynamic modification, visually supported;  
tool required for visualisation and specification / modification
- „*Events*“
- „*Time-controlled*“, synchronisation points, *self-active*  
time line, relative and/or absolute schedule (?)
- „*HotFlow part*“ in the *HotDoc* framework  
workflow becoming associated part of a document;  
full functionality of *HotDoc* usable

***„under consideration“***

# Visual tool for design and modification of a workflow

- There are some proposals known from the literature about Visual Languages:
  - Data flow programming,
  - Specification of control flow in parallel applications' programming,
  - etc.
- Challenge of appropriate visualisation:
  - Icons for workflow structure and steps,
  - Representaion of structural relations in workflows.
- And: Provisions for dynamic modification (by laymen!)

*„under consideration“*

## Summary

### **Document exchange as a basis for business-to-business cooperation**

- Document exchange as a basic scenario in Electronic Commerce
- The *HotDoc* / *HotSimple* approach
- Multimedia features in the subscribers' interface
- Integrated in *MALL2000* project
- Pattern technology
- Document workflow under pattern control
- Workflow design and modification tool (*HotFlow*)
- Time frame 1998 - 2001



***MALL2000* project**  
**Document exchange as a basis for  
business-to-business cooperation**

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# To remember

- Security measures
- Configurability, adaptability to individual business area
- Compatibility with presently used platforms in businesses
- Conformity with usual EC user interfaces on the Web
- Integration  
with *IBM E-Business Solutions*,  
with *MS Office*  
(or whatever)
- ... What else?