



Multisystem Applications and Transactional Workflows

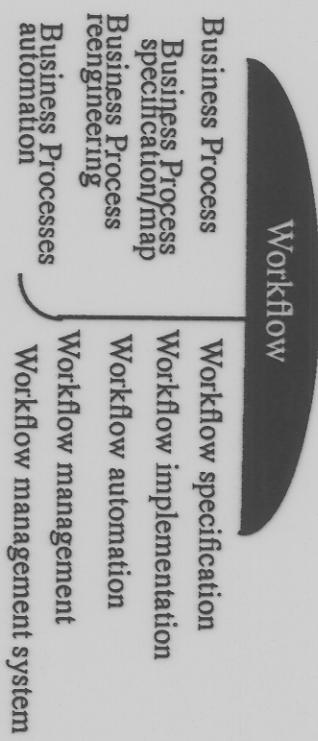
- Basic concepts and specification of workflows
- Related research and technologies
- Components of a Workflow Management Systems
- Prototypes and applications
- Work in progress

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Workflow Management

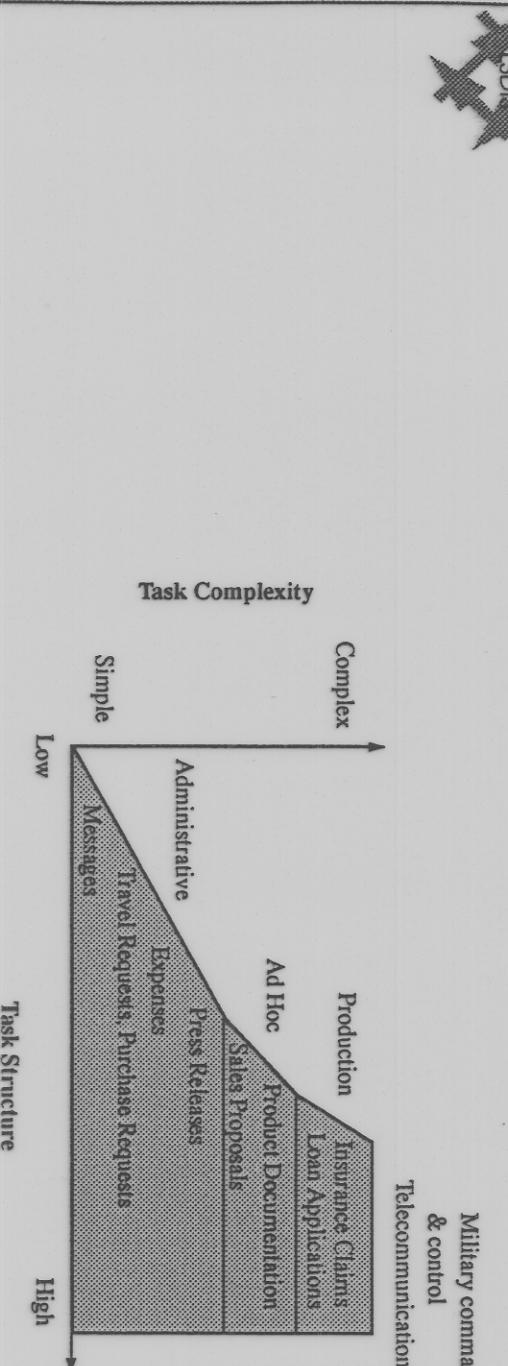
WFM involves:

- 1.defining *workflows*, i.e., describing those aspects of a process that are relevant to controlling and coordinating the execution of its tasks (and possibly the skills of individuals or information systems required to perform each task), and
- 2.providing for automation and re-engineering (fast (re)design and (re)implementation) of the processes as business needs and information systems change



The "Workflow" Umbrella

Trade Press Characterization of Workflows



Administrative workflows involve repetitive, predictable processes with simple task coordination rules, such as routing an expense report or travel request through an authorization process.

Ad-hoc workflows involve human coordination, collaboration, co-decision, and often appear in office processes such as product documentation or sales proposal.

Production workflows involve repetitive and predictable business processes, such as loan applications or insurance claims. Unlike administrative workflow, production workflow encompasses an information process involving access to one or more distributed/heterogeneous/autonomous information systems.

Other classifications:

Ad-hoc workgroup support, task automation, document flow, and process automation (see [Als94]).

Mail-centric, document-centric and process-centric (see [Fry94]).



Workflow (WF) Automation Software: Example Products

- WorkFlo (Filenet)
- InConcert (XSoft)
- WorkMan (Reach)
- FloMark (IBM Vienna)
- FloWare (Plexis)
- AWS (Action Tech)
- LinkWorks (DEC)
- ObjectFlow (DEC)
WORKMANAGER CHP
- Emphasis on office processes; reasonable support for administrative and ad-hoc workflows.
- Limited support for enterprise applications because of lack of support for transactional features and recovery (few exceptions, such as FloMark), Support for heterogeneous information systems, etc.

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Three dimensions: data, constraints, operations

To achieve high degree of interoperability, we need to address issues along all three information management dimensions:

- information modeling issues of semantics and structure of data,
- interdatabase constraints among data, and
- work-flow control involving operations on data in different databases (or application systems).

We need to go beyond data (model) sharing and interoperability, to transaction (model) interoperability, and multidatabase constraints.



Information Management Issues: Technology and Evolving Synergy

Information Manipulation

Relaxed
Multidatabase
Transactions,
Work-flows

MDB
Languages

transaction
augmentation,
nonserializable
schedules

semantic
query augmentation,
approximate answers

Schemata
Dictionary/
Repository/
Ontology
Information
modeling

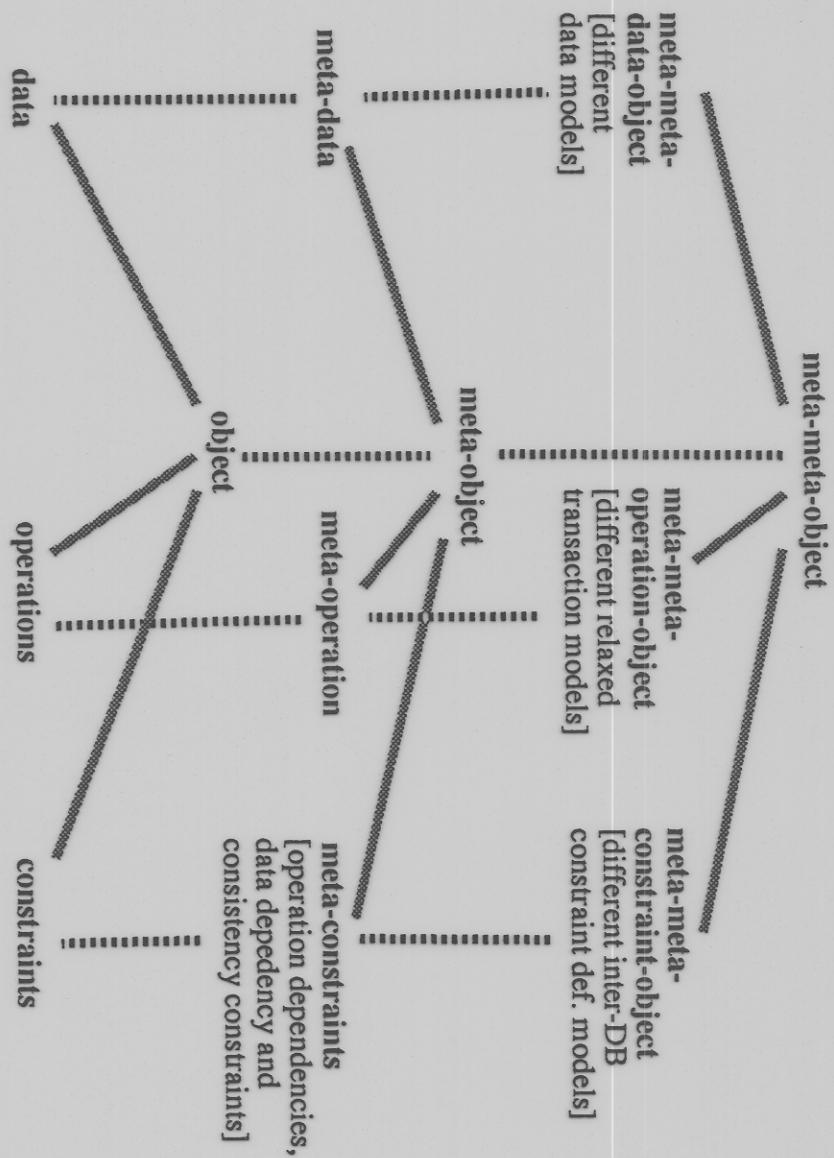
D³s, triggers, rules

Application Semantics
Eventual/Weak Consistency
Information integrity/consistency

[Sheth92a]



Another view -- Organizing Multidatabase System Information Repository



[Sheth, Kalinichenko 92]

A Quick, Biased & Personal Judgement

Extensively researched areas:

- multidatabase query languages
- classical schema integration
- most heterogeneous distributed database prototypes of 1980s
- distributed DBMS products
- ACID properties, immediate consistency
- distributed transaction management, replica control
- distributed query optimization

Emerging areas:

- remote database access
- incremental & flexible schema integration
- semantic issues
- flexible atomicity and isolation, consistency by exploiting application semantics
- relaxed transaction models
 - to support work-flow control/long-running activities
 - interdependency with eventual consistency
- data quality management

