

Workflow Examples

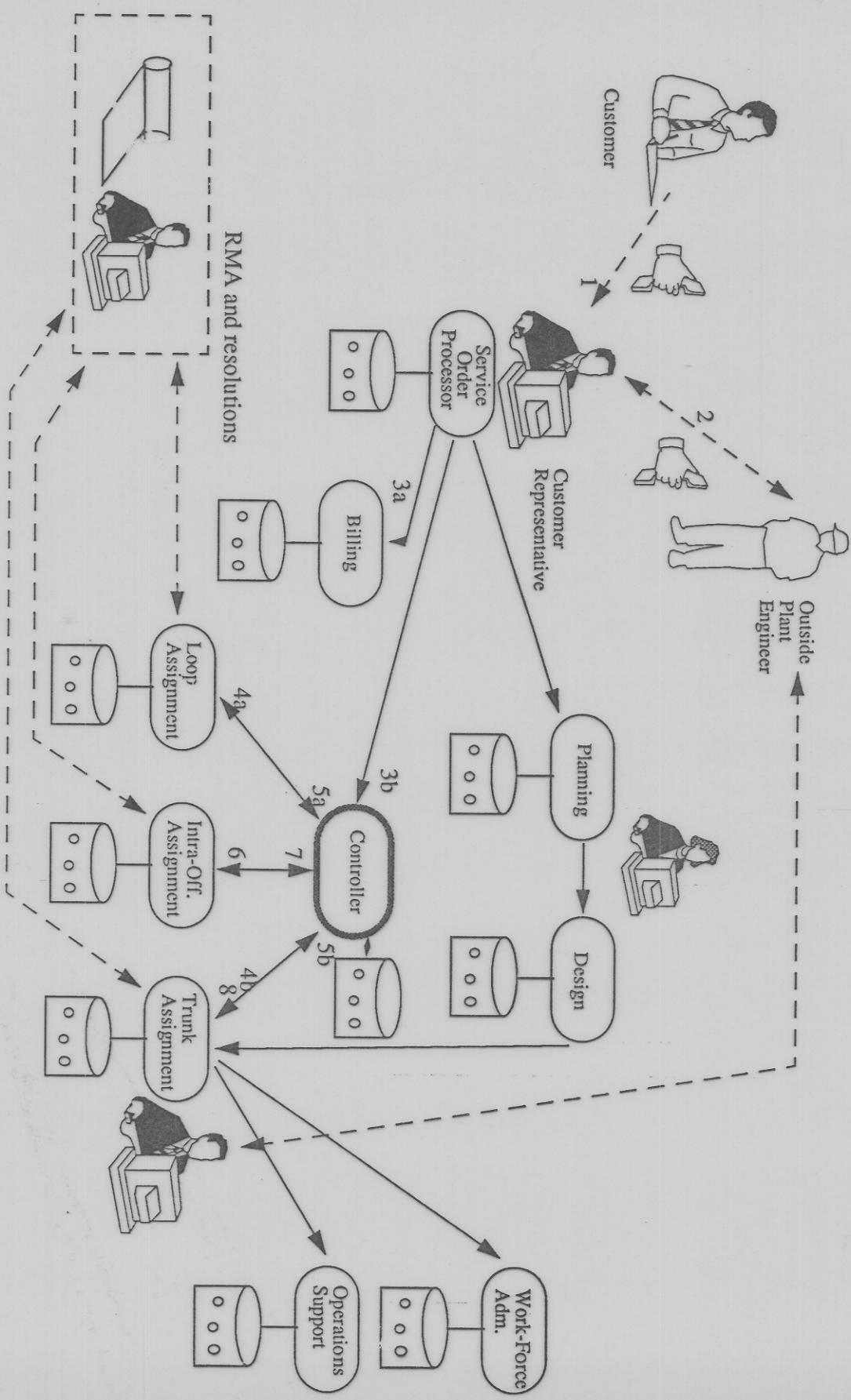
Environment	Application
office/enterprize computing/automation	mail routing loan processing meeting scheduling course organizing
data processing	processing a purchase order
manufacturing	product life-cycle
telecommunication	establishing or changing a service/circuit

Closely related terms/issues:

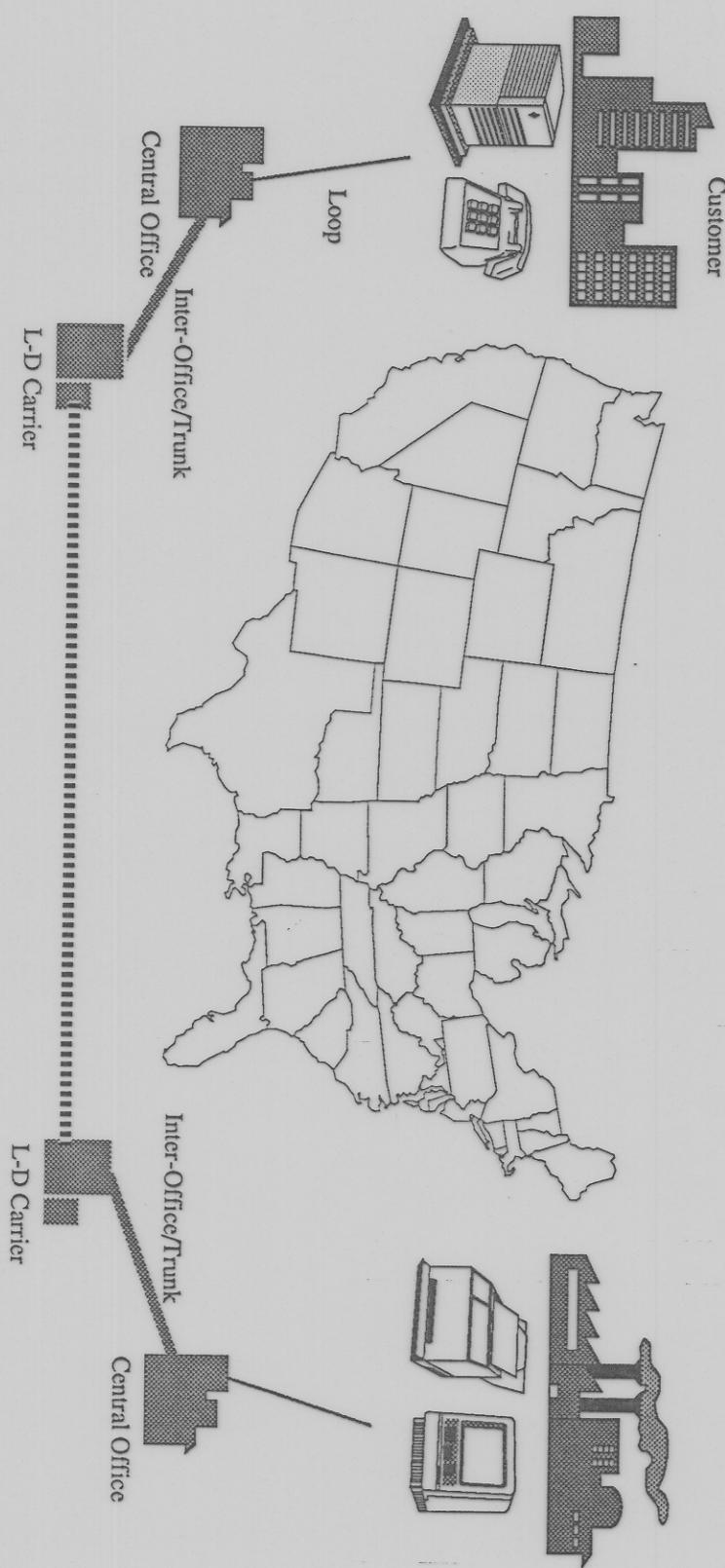
Multi-system applications [Bellcore/UofH], task flow [Dayal], long-running activities [DEC], application multi-activities [Kalnichenko], extended transaction models [Elmagarmid book, ACTA], third generation TP monitor [SIGMOD93]

Related research areas [different types of tasks, different types of entities]: cooperative activity [Bellcore,...], collaborative distributed problem solving [UFL,...], DAI [DAKE, MCC,...], learning, self-adapting software agents [CMU,...]

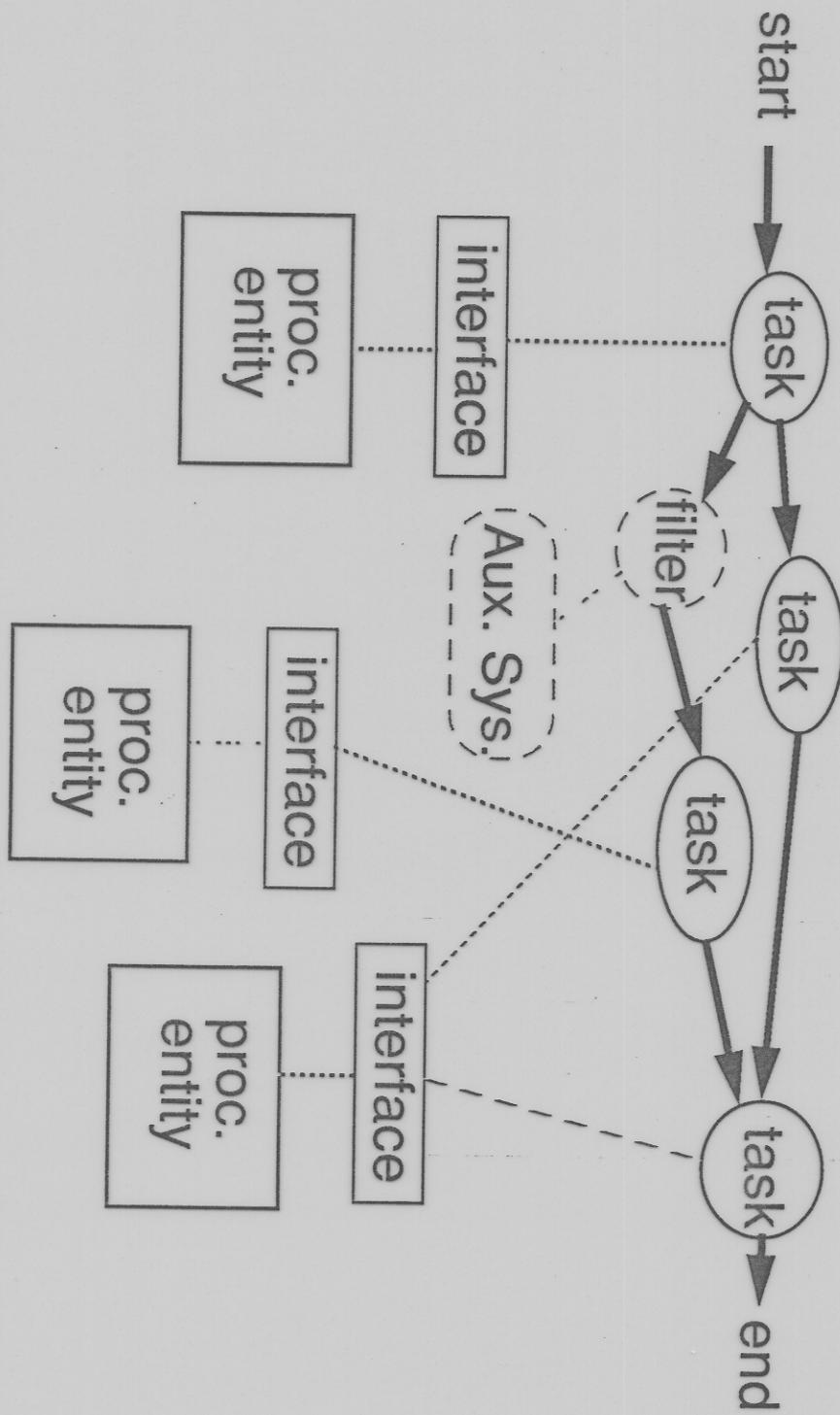
An Example Workflow in a Multisystem Application: Provisioning a Telecommunication Service [Continued]



An Example Workflow in a Multisystem Application: Provisioning a Telecommunication Service

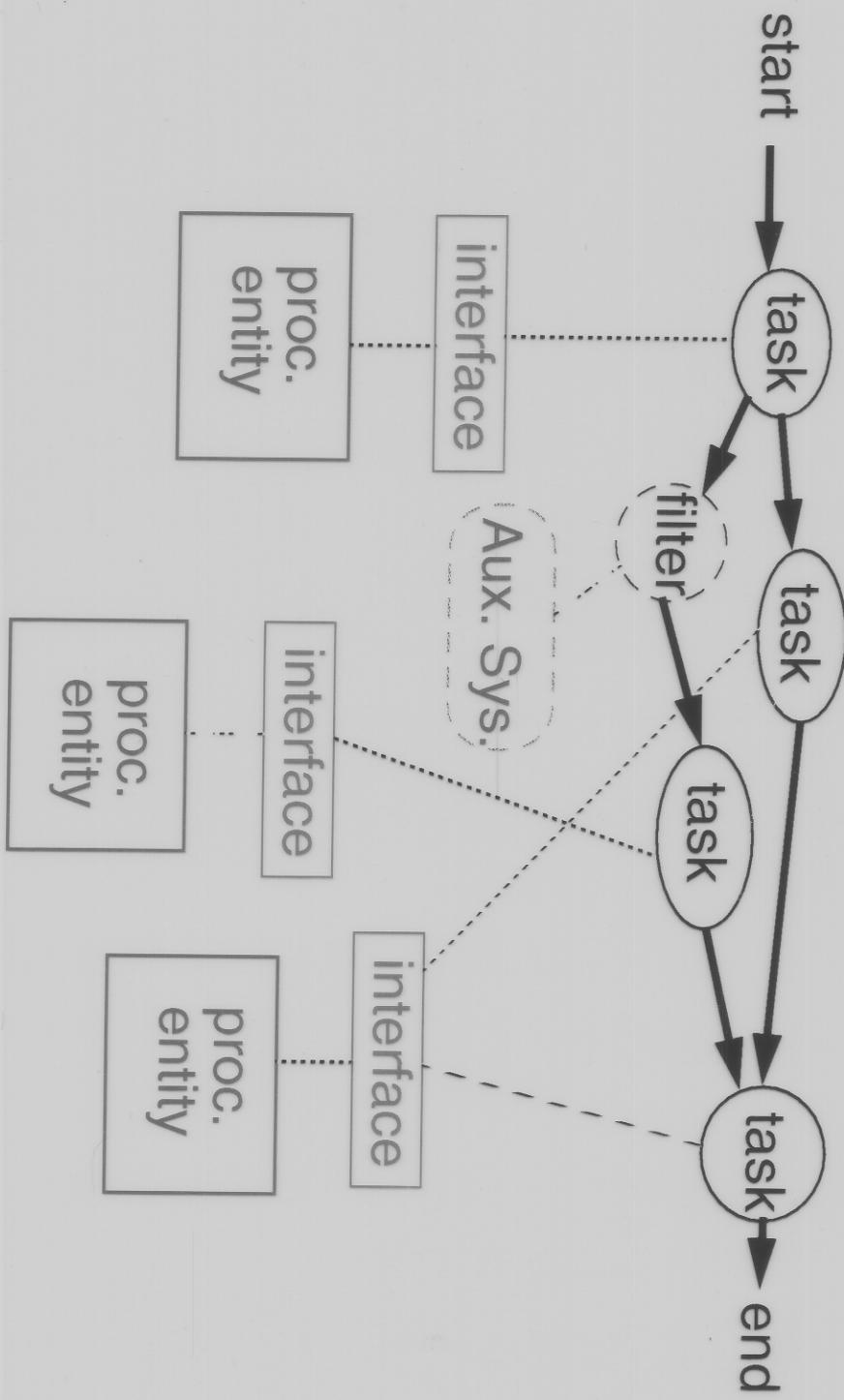


METEOR Model for (Transactional) Workflows



METEOR: Managing End-To-End Operations

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METEOR: Managing End-To-End Operations

Feb. 94

[Sheth and Krishnakumar 94]

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About the environment

Processing Entities

- humans (may appear as a GUI; may use document/image processing systems and applications)
- script interpreters and compilers (for processing scripts and application programs)
- (legacy) application systems (Operation Support Systems)
- servers in client-server and transaction processing systems
- DBMSs

About the environment

Additional Issues

- Inter-task dependencies
 - state-based
 - value-based: I/O objects and external variables
- Data Management
 - different data formats for input/output (e.g., FCIF)
 - use of auxiliary systems for complex data manipulation (e.g., TVO)

Workflow (WF) Automation Software VS Transactional Workflow (TWF)

(Typical Case)

Current workflow/workgroup software supports *office automation* functions (involving user tasks) (most products in PC and mainframe env.). Transactional workflows involves *application automation* (both user and application tasks with varied level of transactional properties).



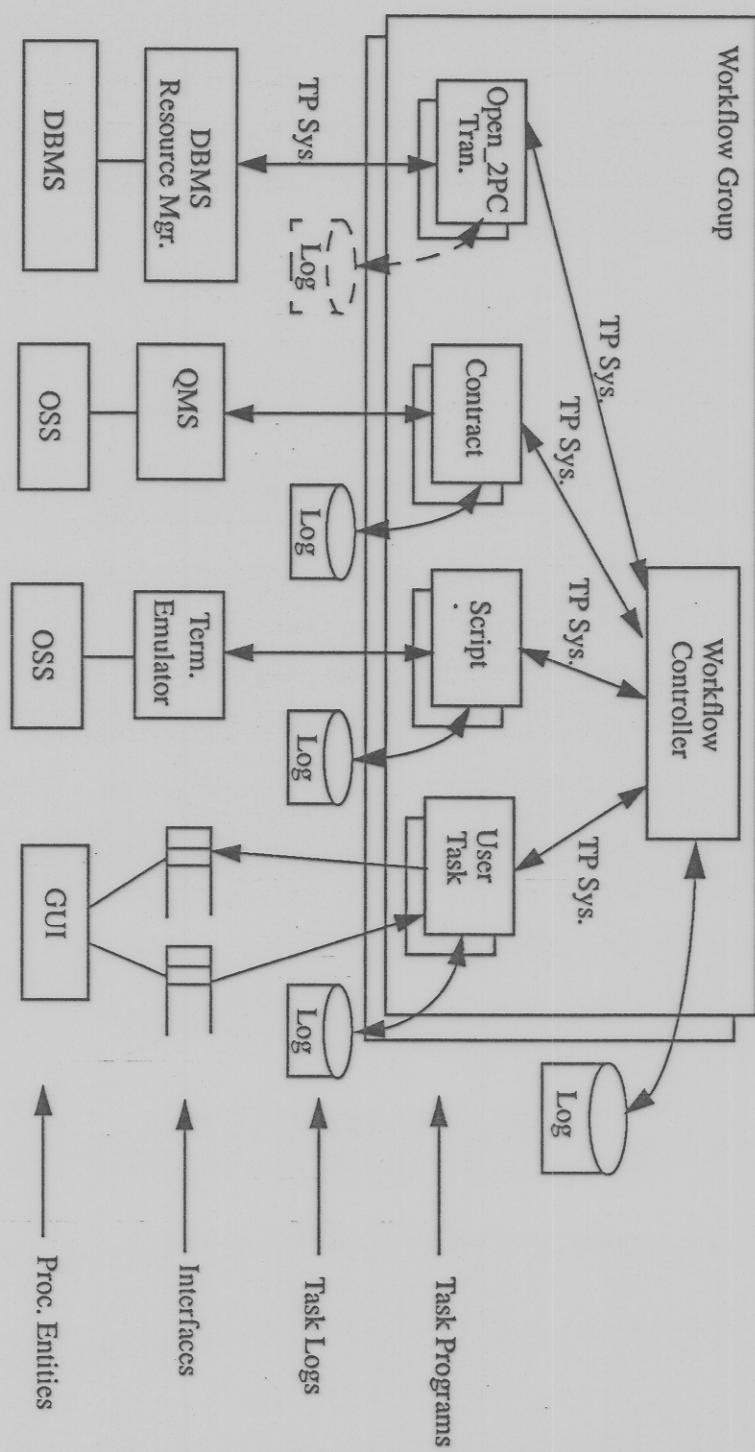
In WF Admin

In TWF syst.

Technical Challenges

- Tasks => homogeneous modeling; modeling
- able (hence formal) specifications and execution (including recovery)
- cessing environments and systems => actions and processing entities, their impact
- n and performance
- / more messages/tasks in "application/
on" as compared to "office/user task"

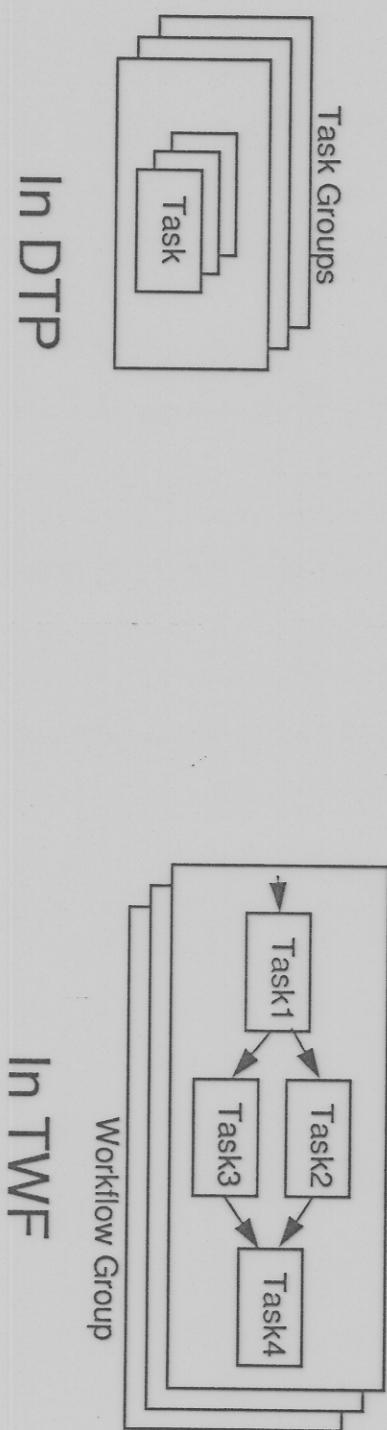
Runtime Architecture (One Approach)



(Distributed) Transaction Processing (DTP) vs Transaction Workflow (TWF)

(Typical Case)

DTP/D-OLTP is focused on efficient execution of relatively simple tasks with no coordination across heterogeneous tasks (in different task groups). Transactional workflows require coordinated execution of heterogeneous tasks, with varied levels of transactional properties, on a variety of systems.



- Earlier queued message systems and "chaining of transactions".
- Problems: insufficient control over transaction properties, one type of task, interactions among concurrent activities difficult.

Challenge to Researchers