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ANSA Phase III

TC Presentation - 7th June 1994

Flexible Transaction Framework for Dependable Workflows

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Abstract

This document contains a slide presentation on APM.1217.00.03, "A Flexible Transaction Framework for Dependable Workflows. The work is in part fulfilment of deliverable D2 (Programming Model for Dependability).

APM.1217.00.03 scopes the applicability of dependable workflow management and the requirements of the supporting infrastructure. It provides a foundation for detailed design of specific workflow management systems. Accordingly, the document is targeted mostly at a technical designer audience. Moreover, it is assumed that this audience is familiar with the basic principles and techniques of atomic transactions.

APM.1250.00.04

Draft

25 April 1995

Request for Comments (confidential to ANSA consortium for 2 years)

Distribution:

Supersedes:

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Document APM.1217.00.03

(Deliverable in part fulfilment of task D2)

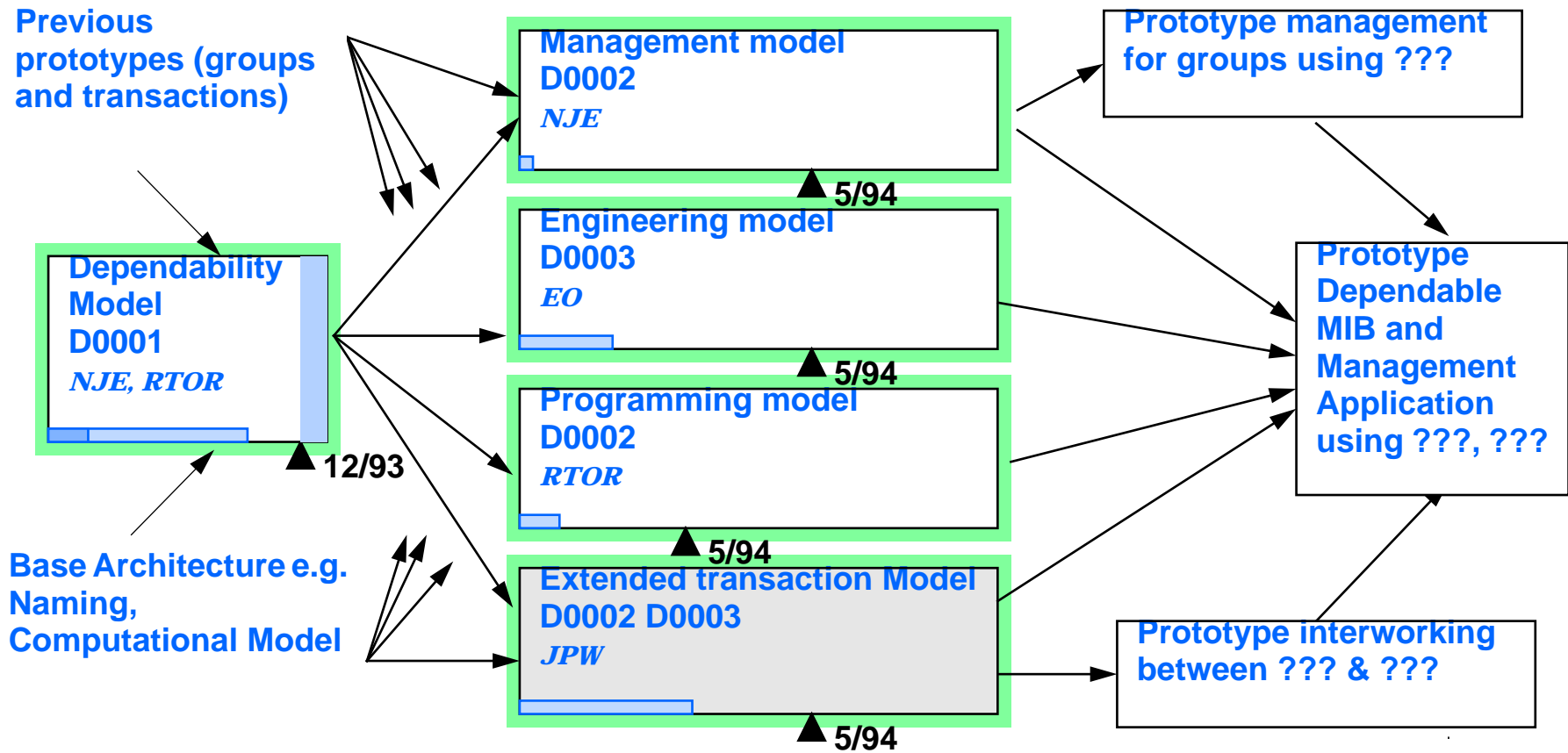
Flexible Transaction Framework for Dependable Workflows

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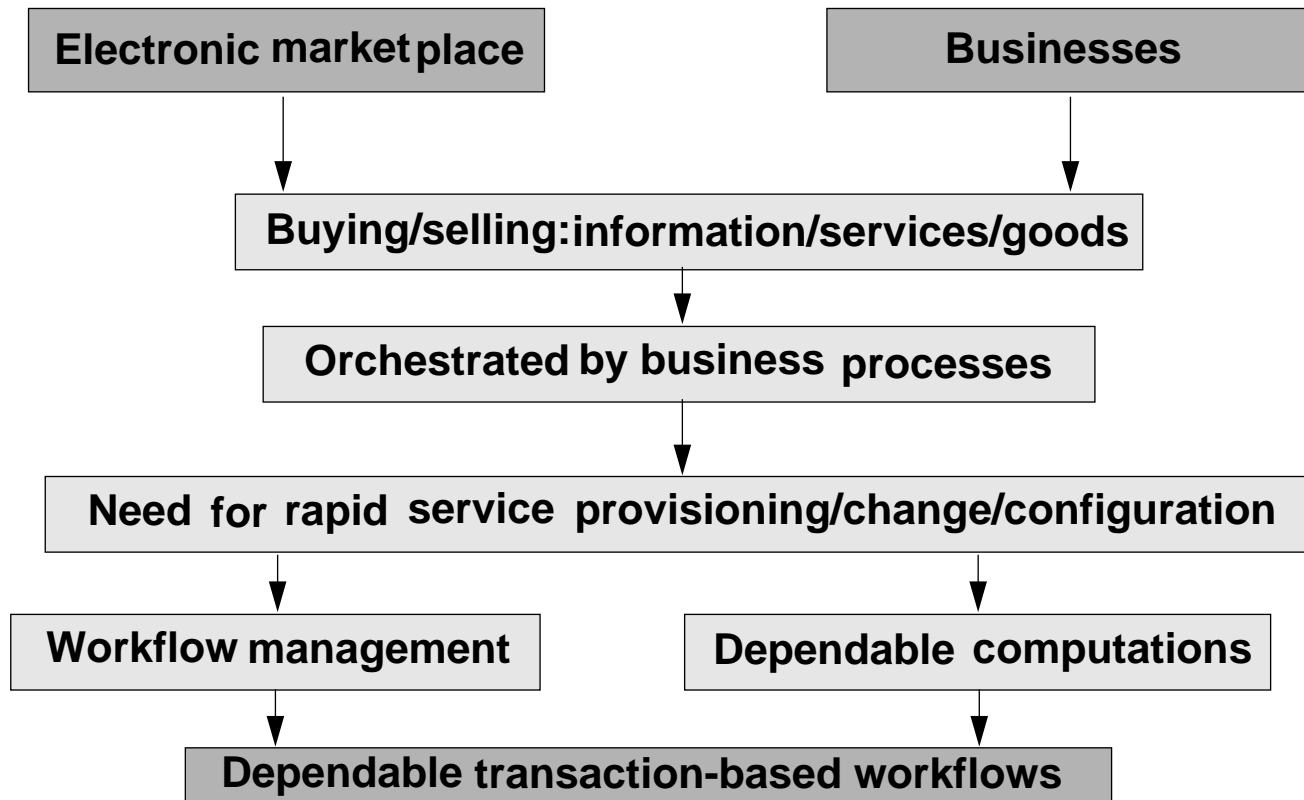
Dependability Task group

ANSA TC - 7 June 1994

Dependability outline plan



Motivation (Chapter 1)



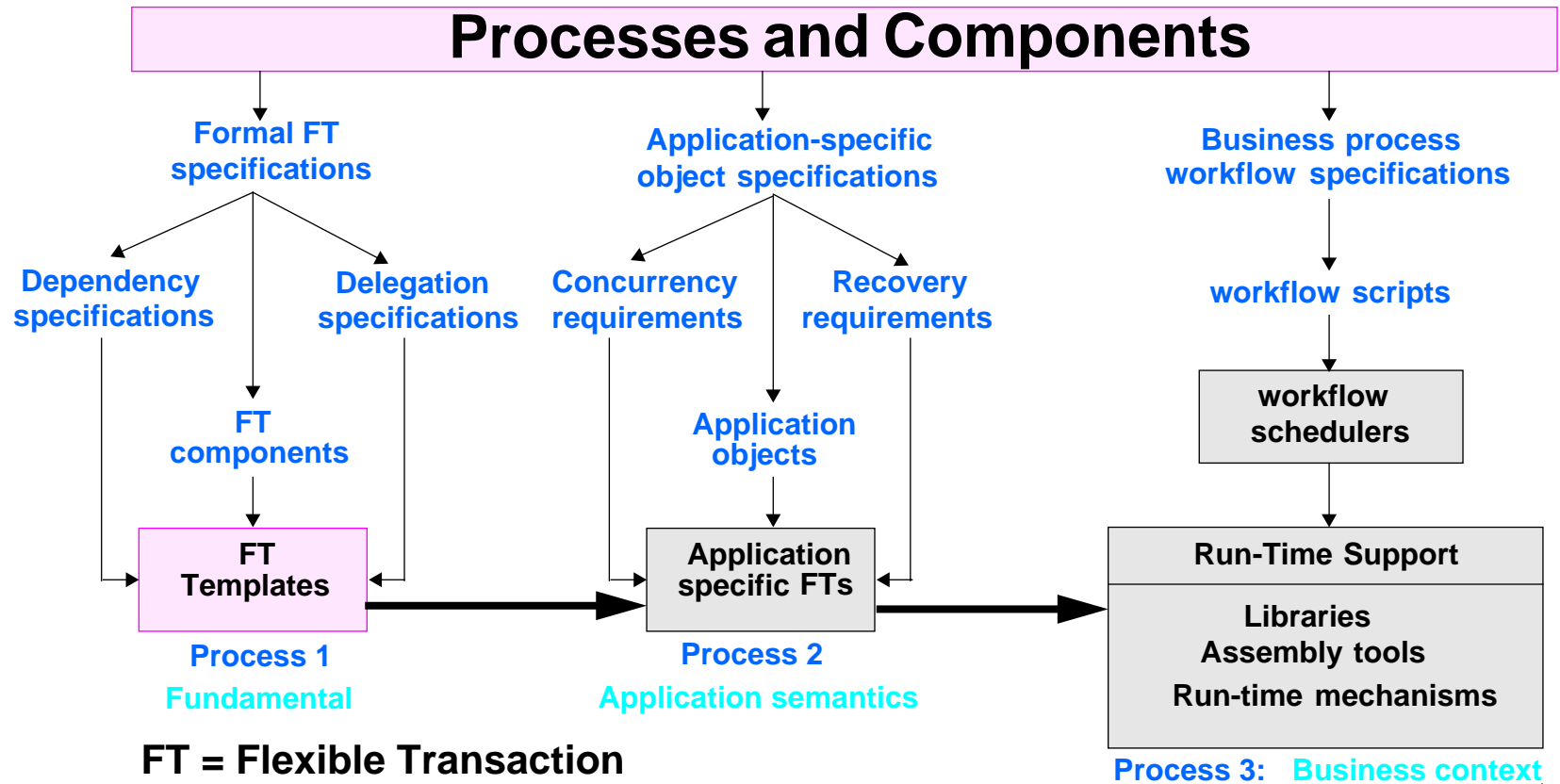


Need for Flexible Transactions (Chapter 2)

- **Benefits of traditional ACID transactions**
 - short computations/competitive environments
 - simplifies programming
 - acceptable efficiency for many applications
- **Limitations of traditional ACID transactions**
 - ineffective for collaborative, and/or long running applications
 - Lacking in functionality/flexibility/performance
 - isolation property too restrictive
- **Need to relax transaction isolation**
 - emergence of new extended transaction models
- **Need for a general architectural solution**



Architectural Summary (Chapter 3)

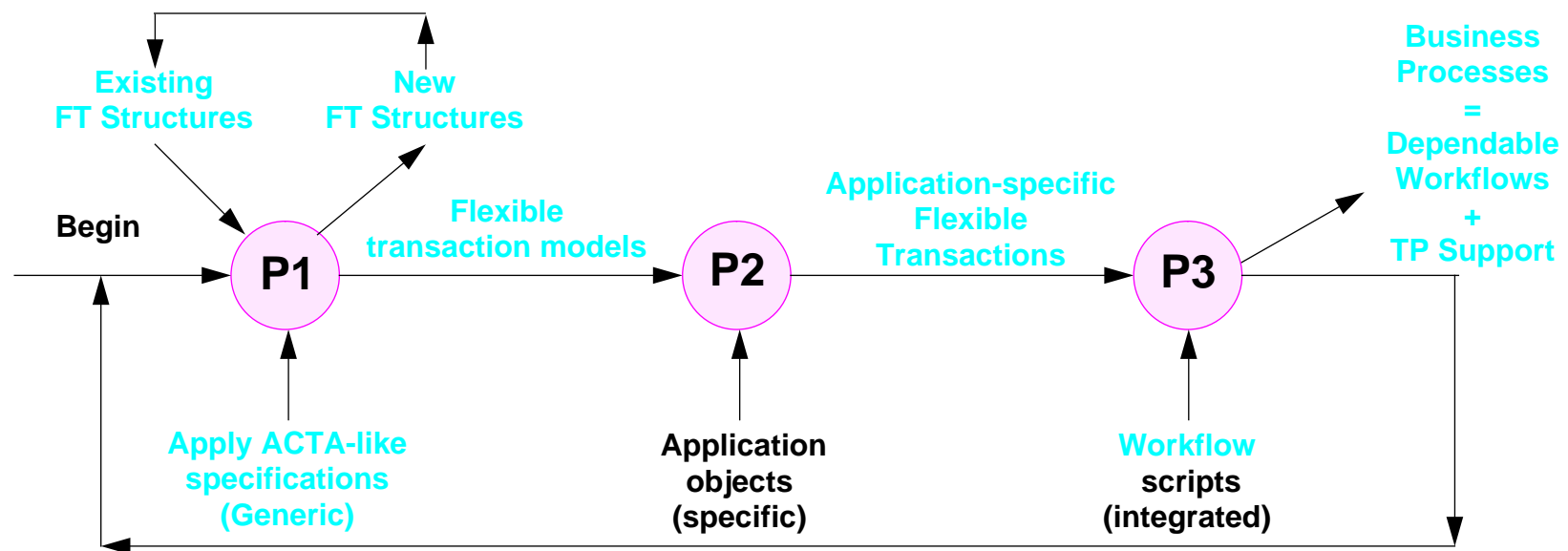




Concepts/Building blocks (Chapter 4)

- **use of ACTA model**
 - permits formal specification of transaction models
 - assists in reasoning about correctness of models
- **Simple concepts and mechanisms**
 - inter-transaction dependencies
 - object resource delegation
- **transaction management extensions**
 - dependency manager
 - delegation manager
- **Use of dependencies and delegation in nested transactions**

Construction Processes (Chapters 5,6,7)

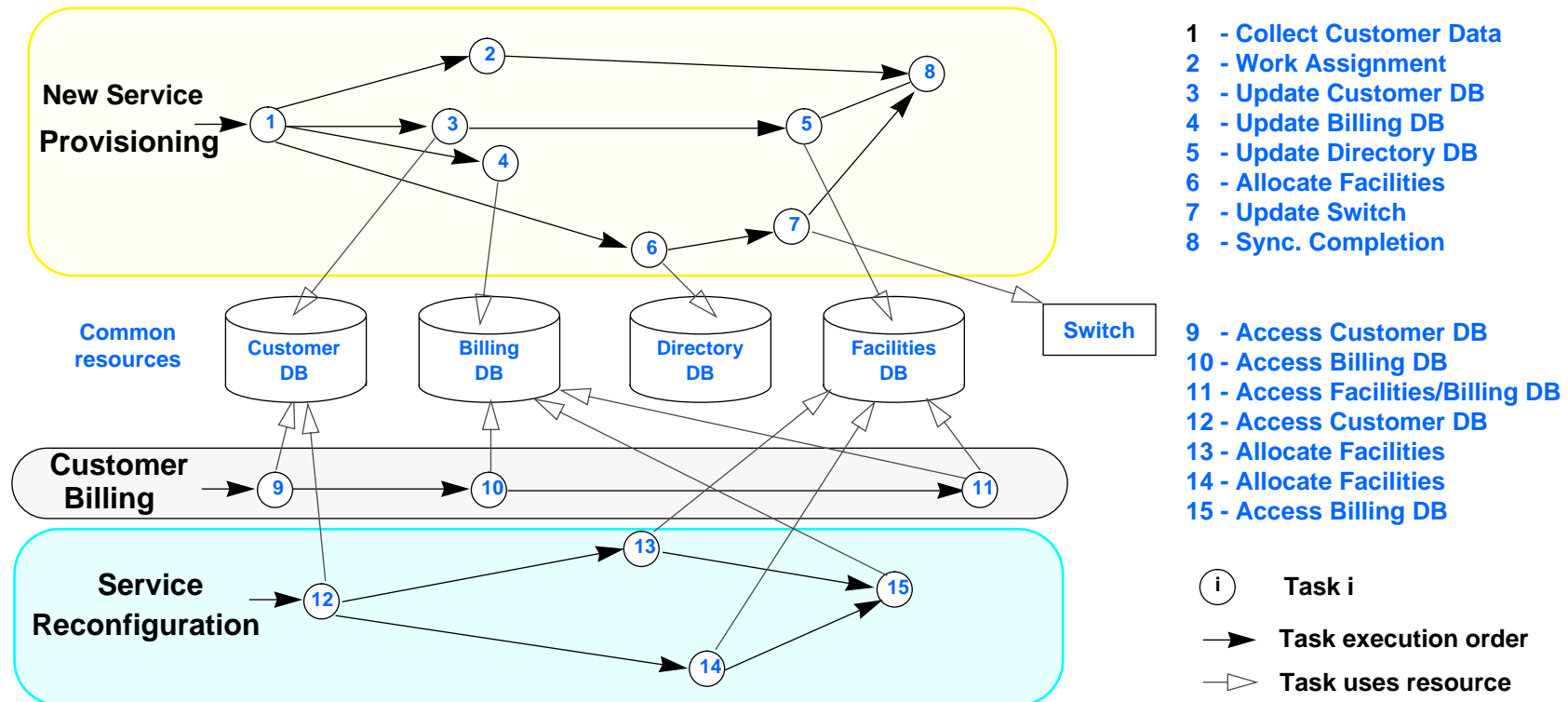


P1: Construct new flexible transaction models applying ACTA concepts

P2: Construct application-specific flexible transactions using application objects

P3: Combine application-specific flexible transactions to construct dependable workflow

Workflow Example (Chapter 8)



Workflow Scripts + Workflow Tools -> Flexible Efficient Dependable Business Processes



Directions for Future Work (Chapter 9)

- **Detailed design specification for FTF run-time support, including**
 - **libraries of applicable dependency rules**
 - **event-based trigger mechanisms**
 - **run-time dependency manager**
 - **run-time delegation manager**
 - **integration with basic transaction management platform**
- **Detailed design of FTFSE**
 - **graphics/workflow scripts/tools**
 - **transformer tools to ease construction processes**
 - **libraries of control mechanisms (e.g. multi-transaction commit coordinators)**