Agent-based Process Management for SOA and WS Applications

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Agent-based approaches for SOA and WS, in print

- W3C Web Services Architecture

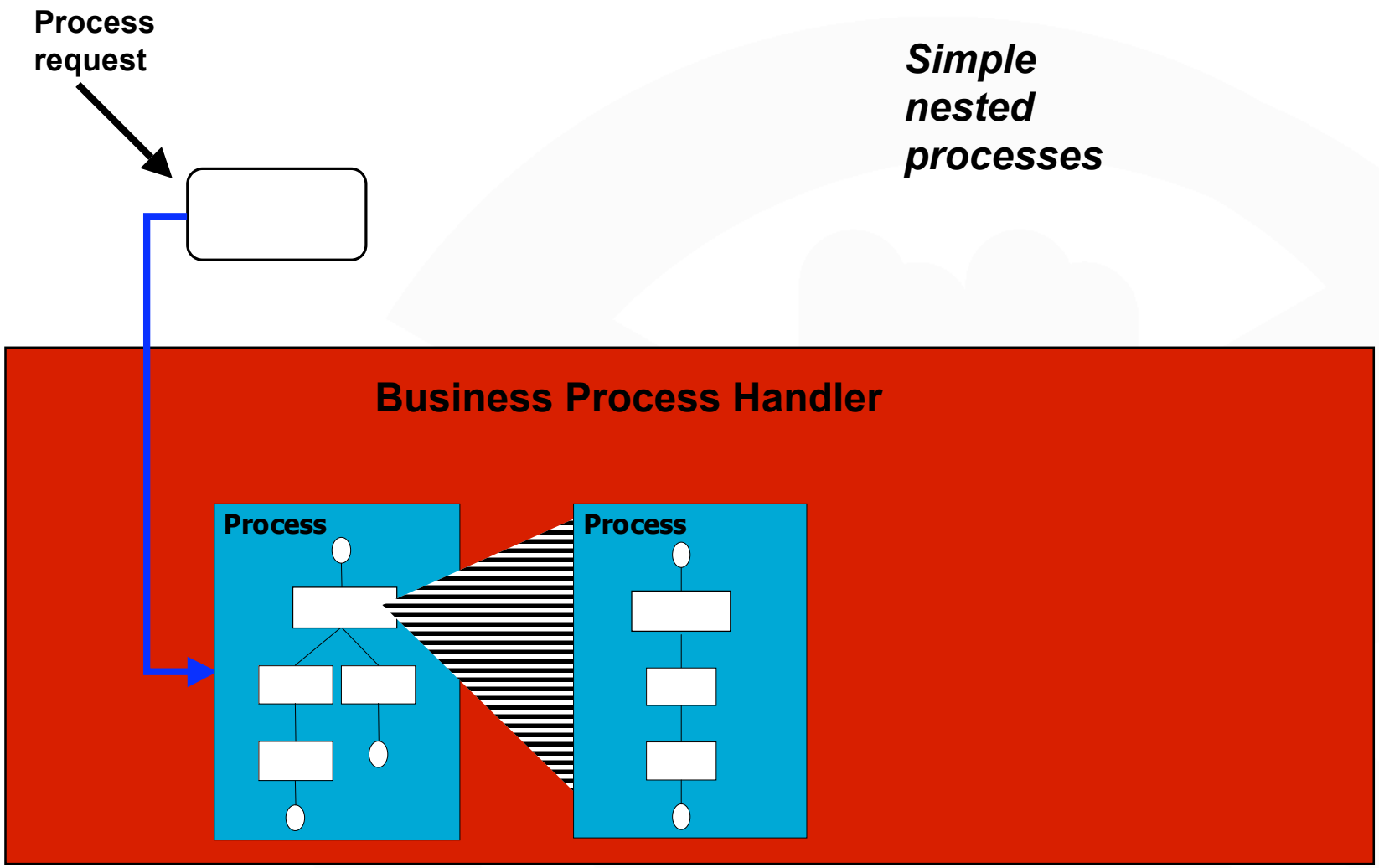
  http://www.w3.org/TR/ws-arch/

- *Service-Oriented Computing:*

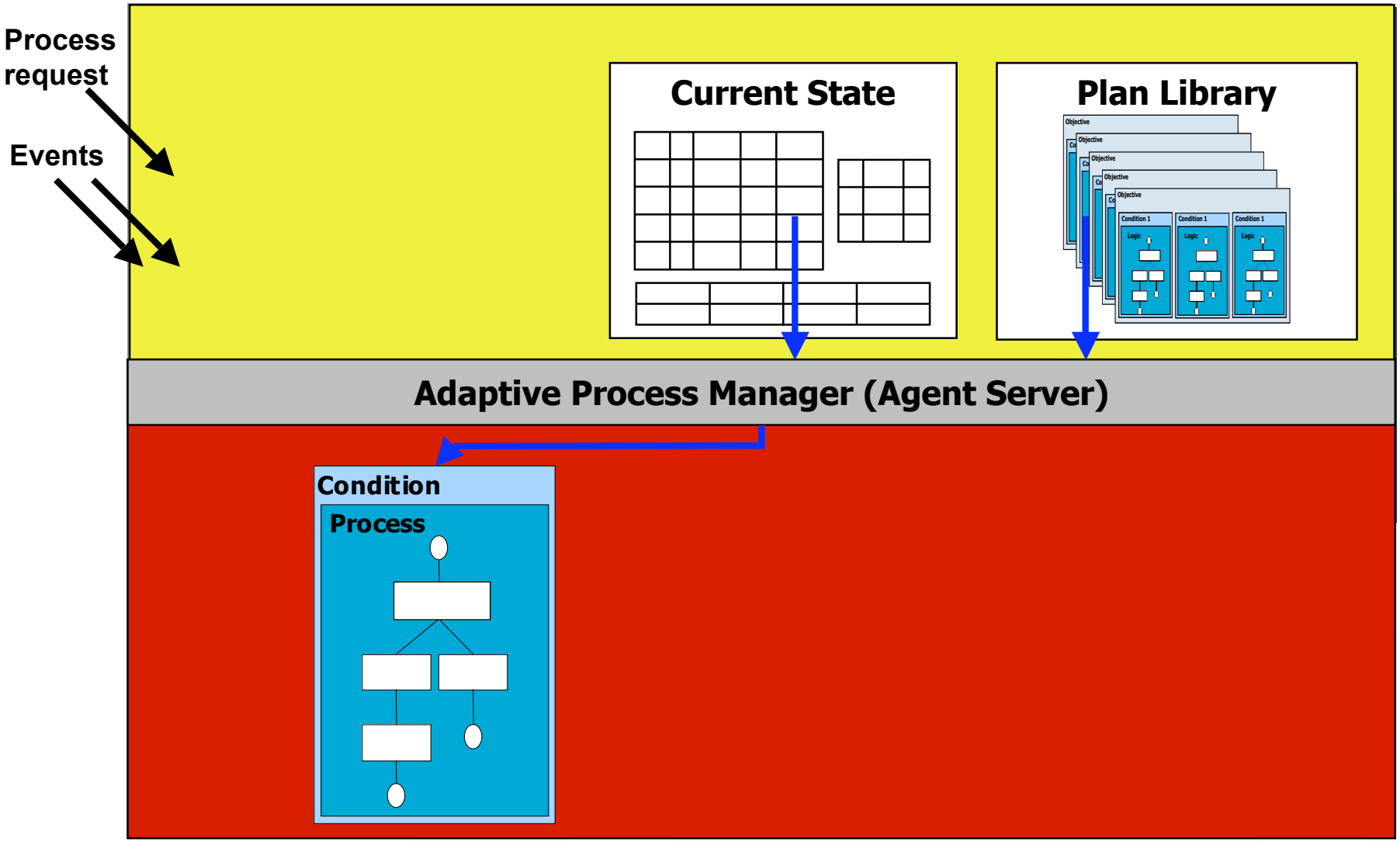
  Semantics, Processes, Agents

  by Munindar Singh and Michael Huhns

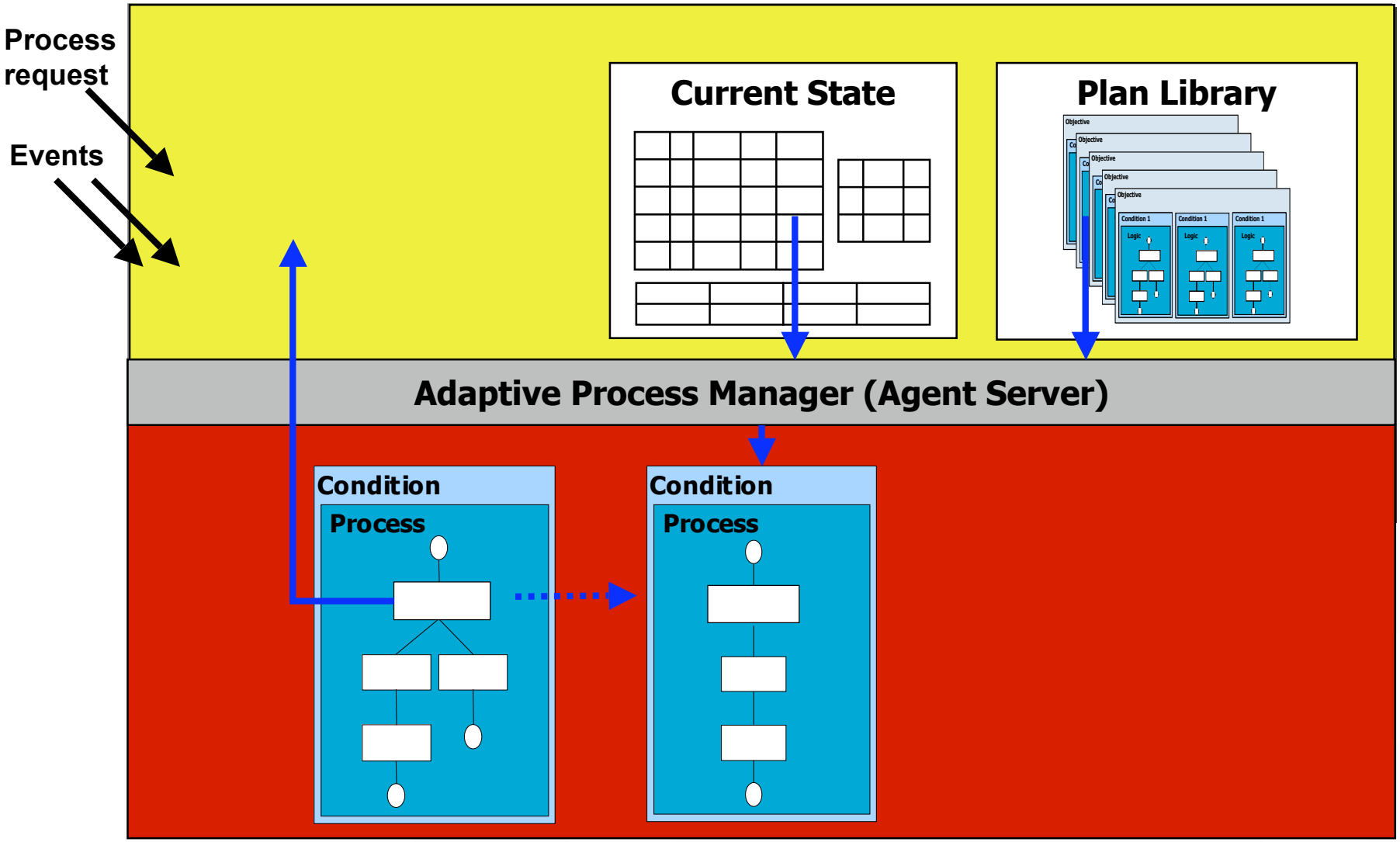
Traditional business process handling



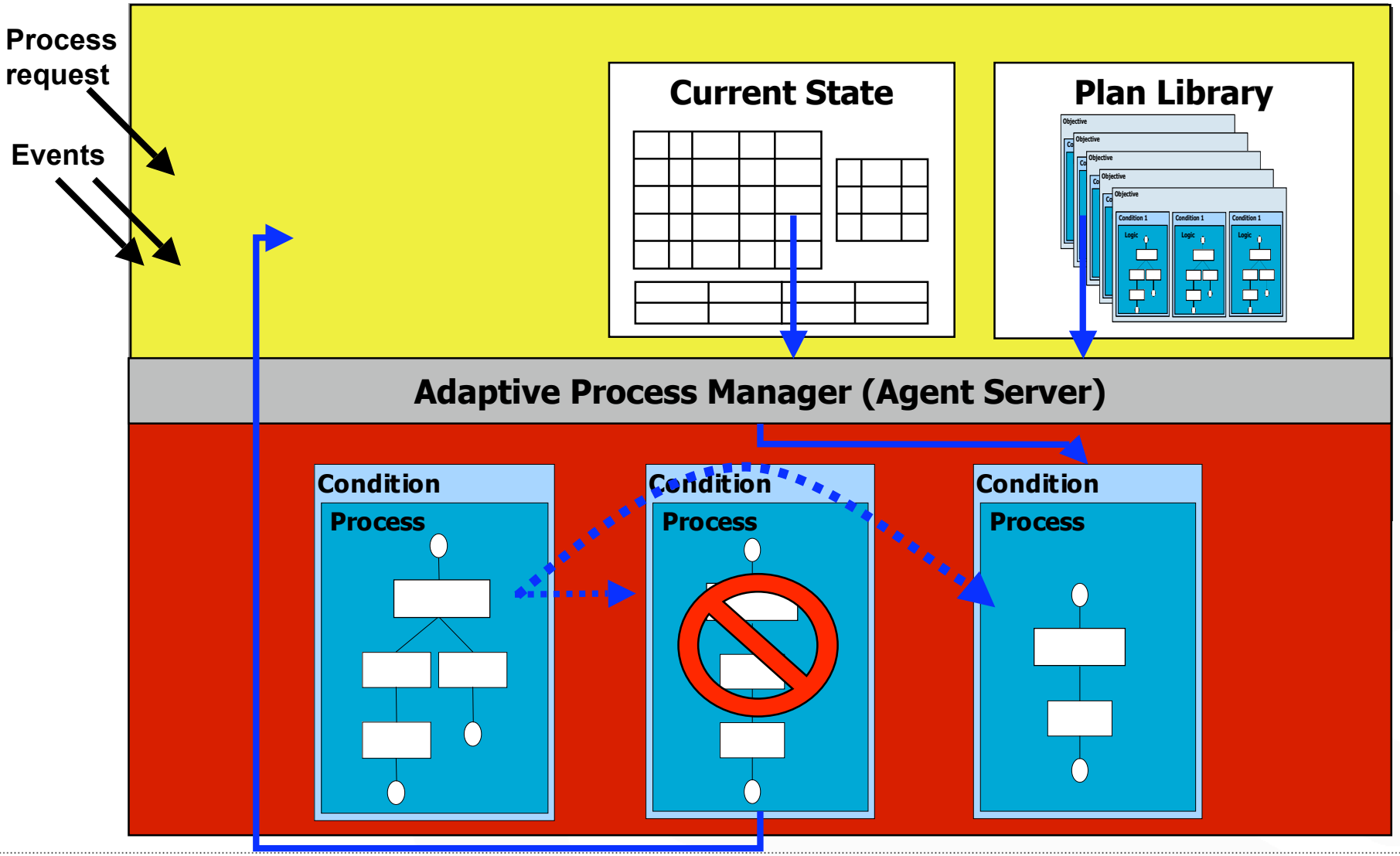
Service-oriented handling - 1



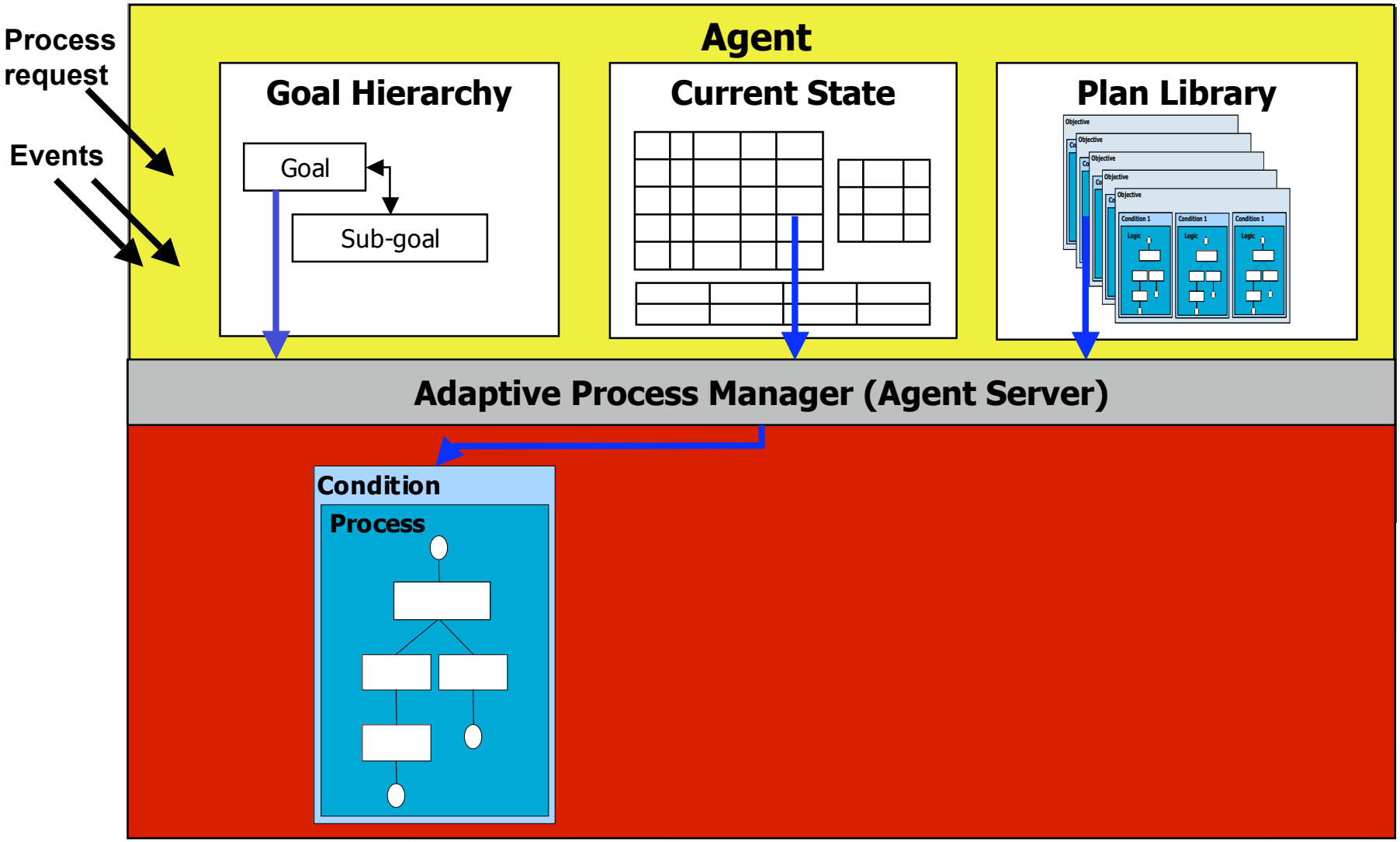
Service-oriented handling - 2



Service-oriented handling - 3



How goal-directed agents work in agents - 1



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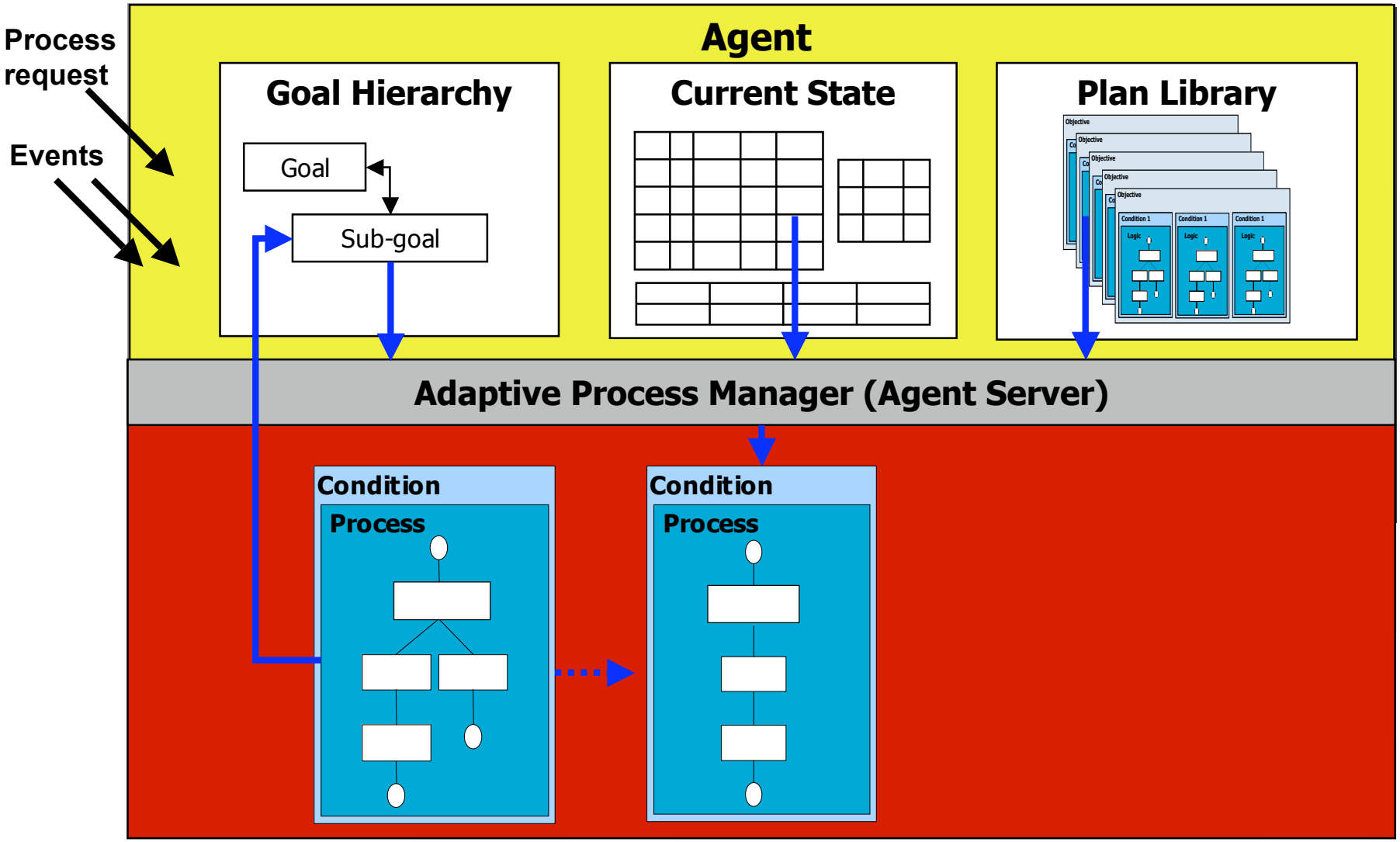

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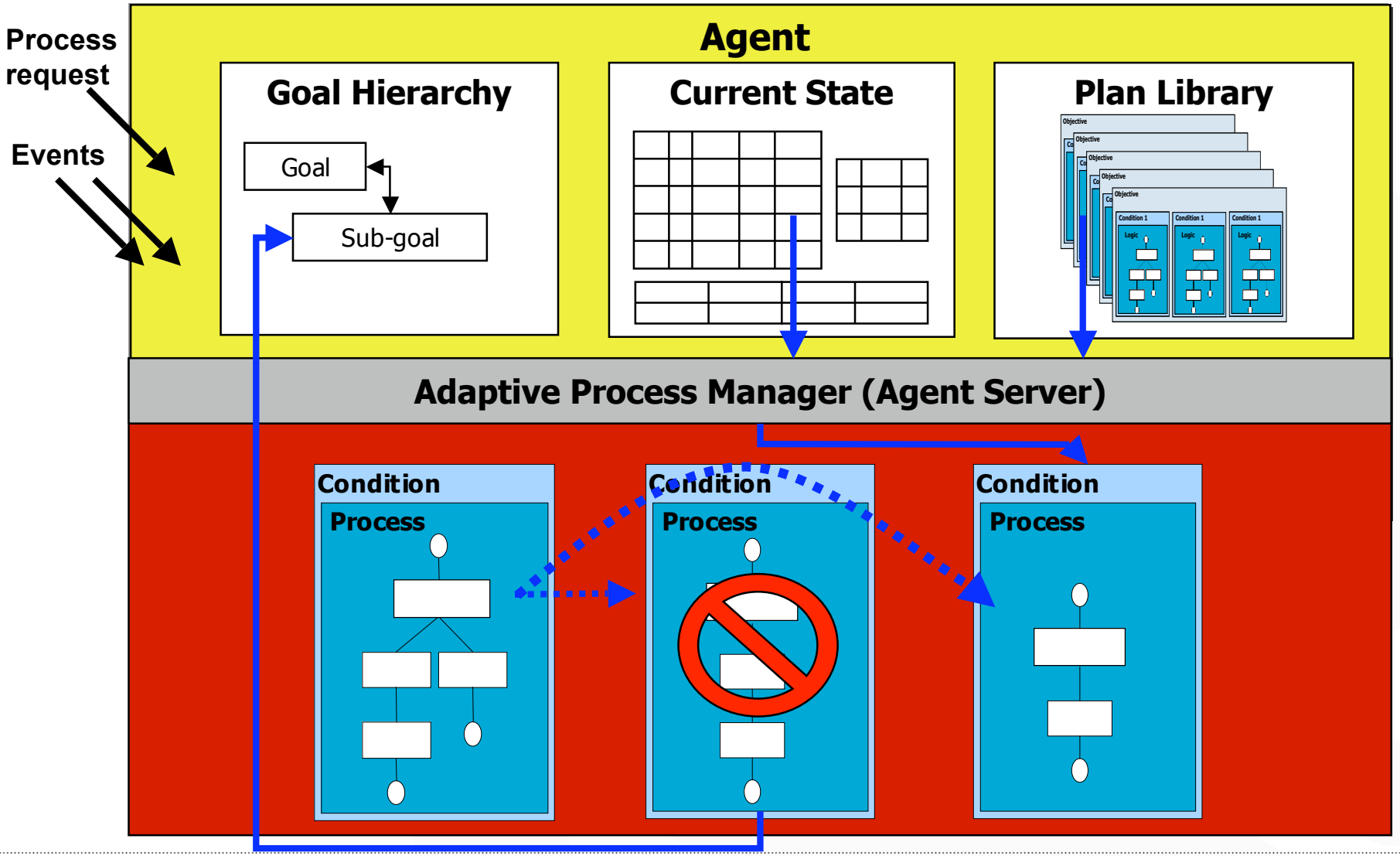
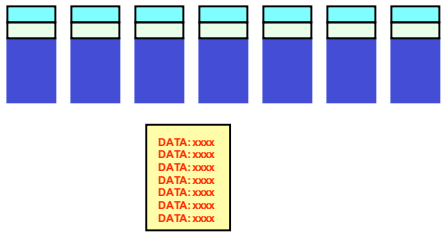
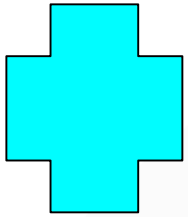


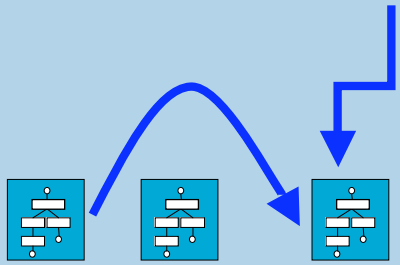
Agent-based processing for SOA and WS, thus far



Implicit Programming



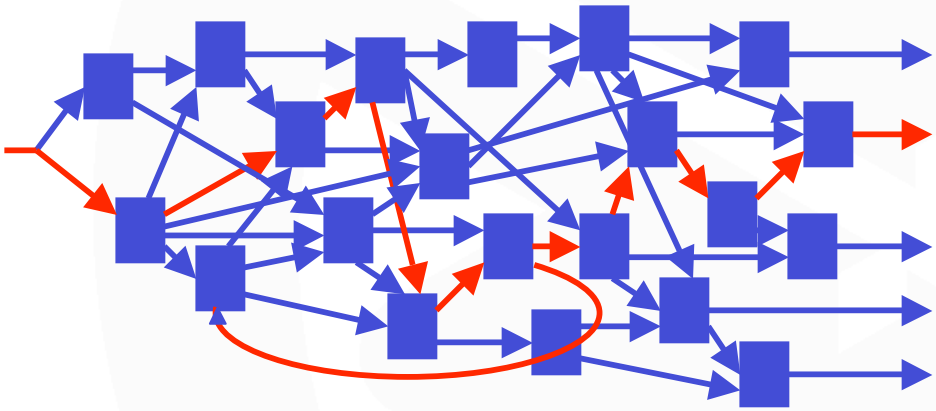
Adaptive Process Execution



Not

- Design only Plans and Agent Data
- Independent components easily added or modified
- Agent manages program flow control by dynamic process assembly
- Agent handles error and recovery path

- Program flow must be explicitly coded at design
- Complex and rigid
- Involves tedious programming
- Becomes unmanageable or limits possible variations



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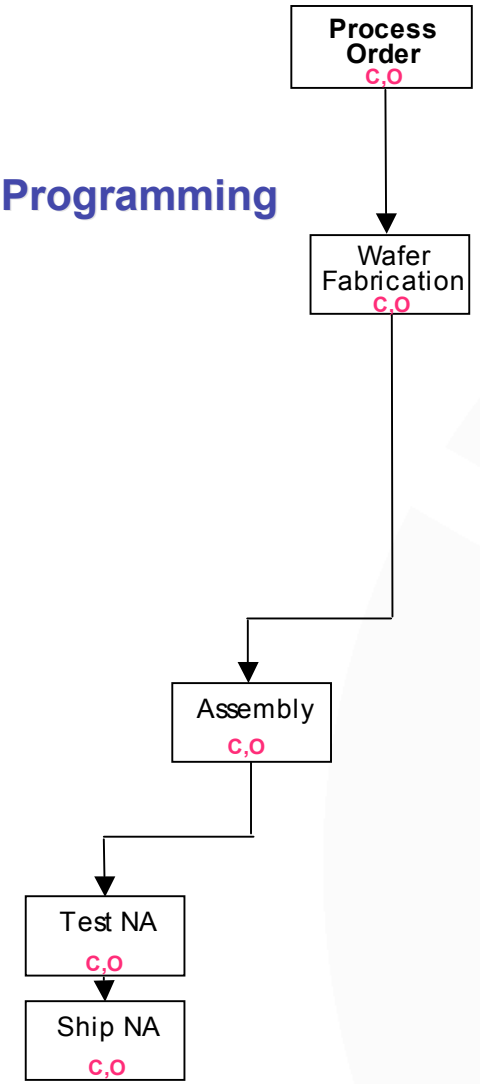


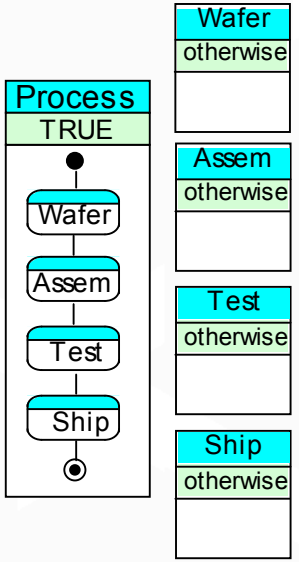
Process

Wafer Fabrication
Assembly
Test
Ship

Variables

C: Customer (RFID, MCU, RISC)
O: Order (RFID, MCU, RISC)

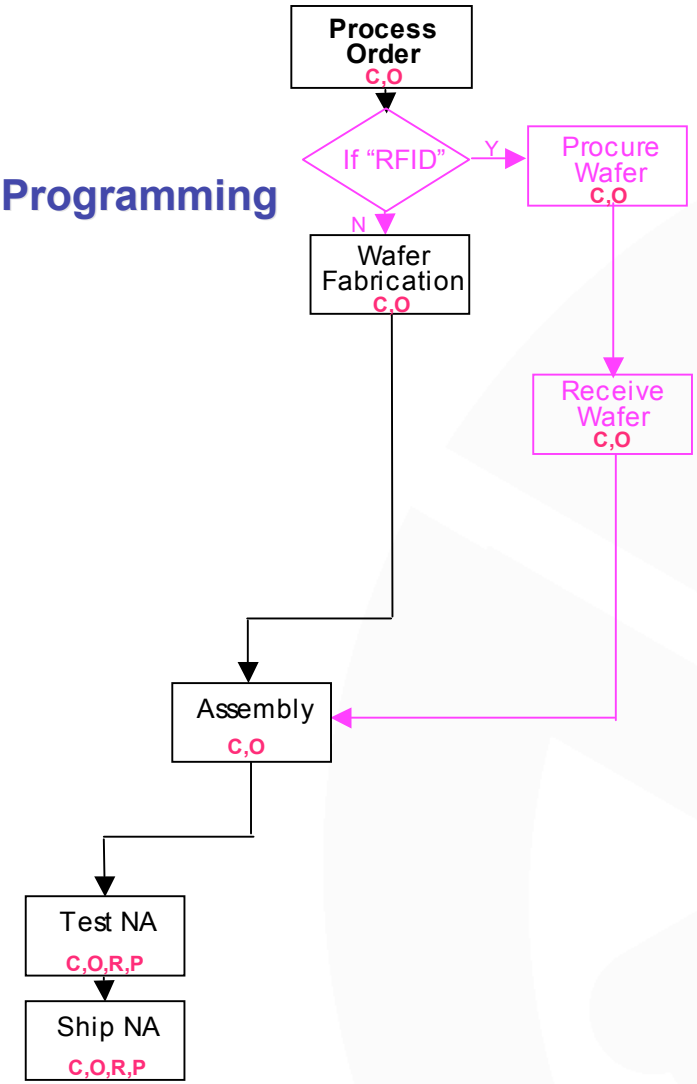
Agent Solution



A few simple plans made of few steps

Implicit Programming

Explicit Programming



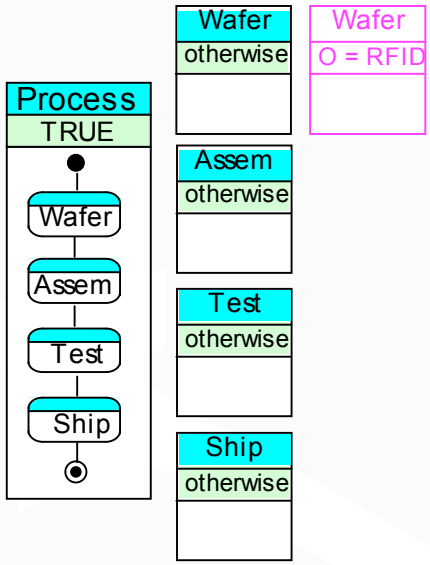
Process

Wafer Fabrication (In-house or Sub)
Assembly
Test
Ship

Variables

C: Customer
O: Order (RFID, MCU, RISC)

Agent Solution



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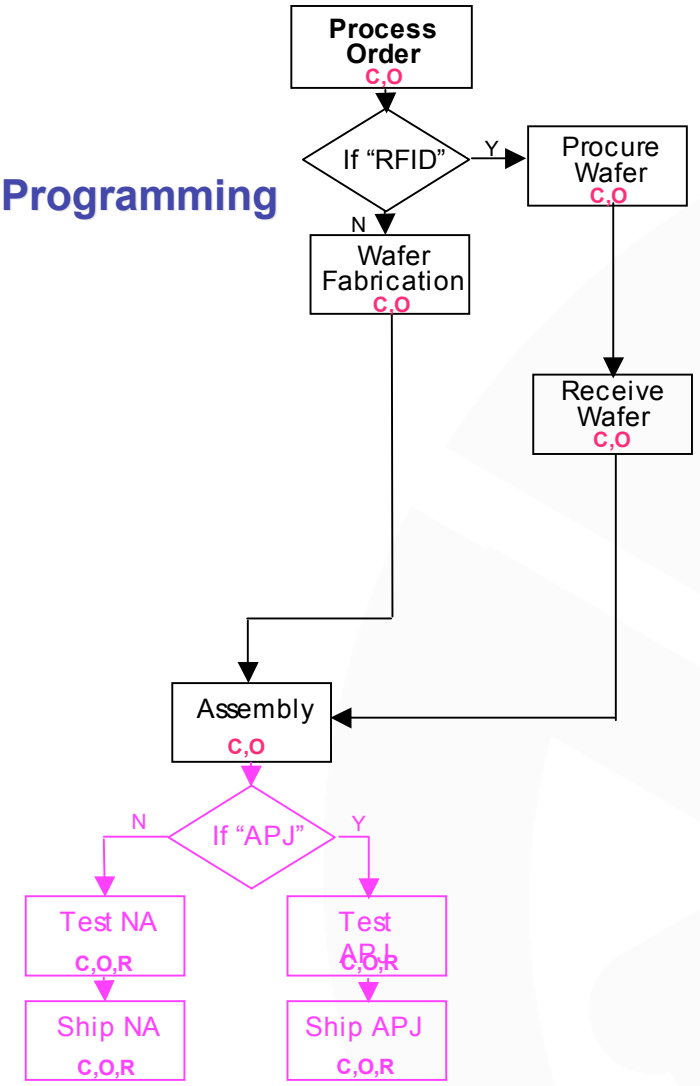

Process

Wafer Fabrication (In-house or Sub)
Assembly
Test
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C: Customer
O: Order (RFID, MCU, RISC)
R: Region (APJ or ROW)

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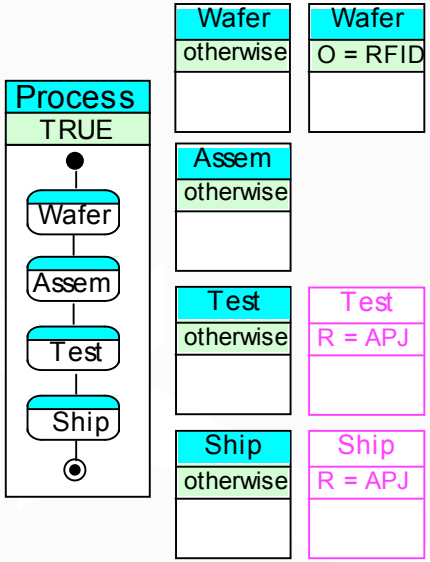

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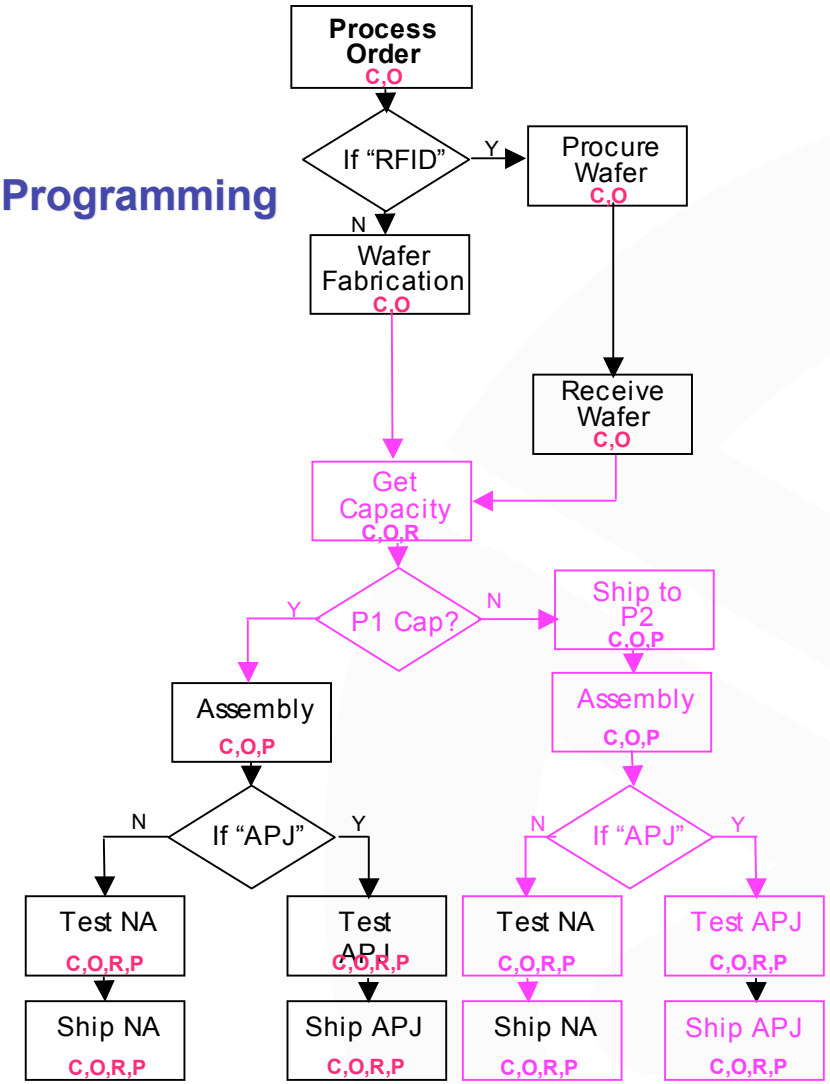

Process

Wafer Fabrication (In-house or Sub)
Assembly
Test
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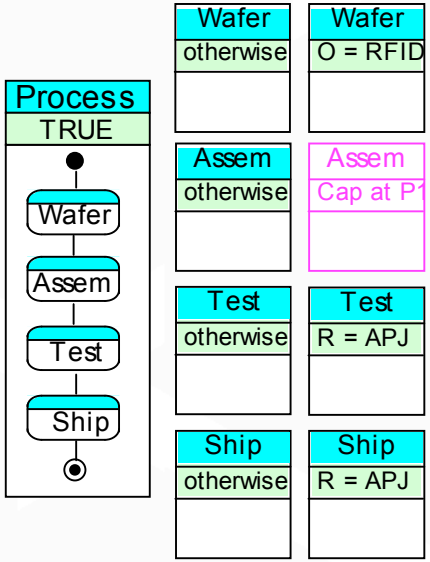
Variables

C: Customer
O: Order (RFID, MCU, RISC)
R: Region (APJ or ROW)
P: Plant (Capacity)

Agent Solution



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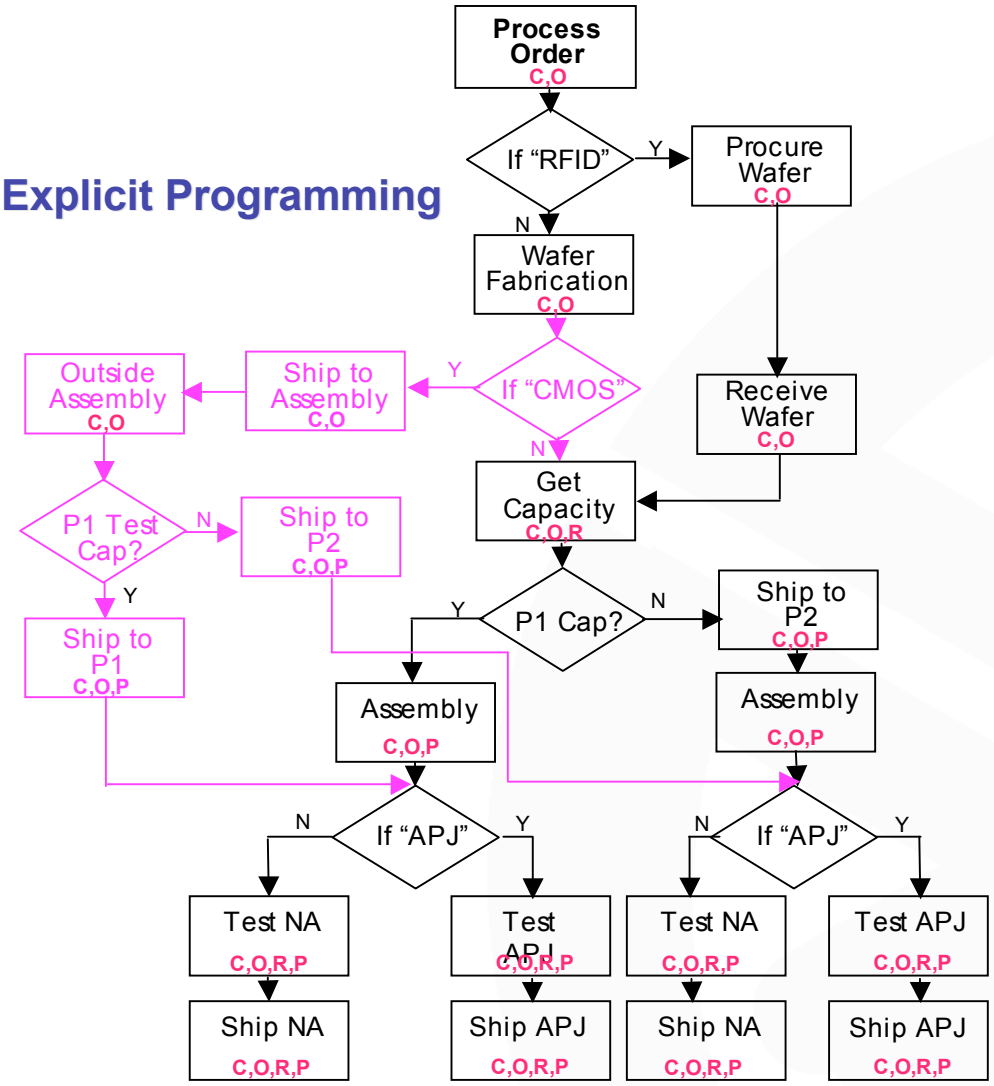

Process

Wafer Fabrication (In-house or Sub)
Assembly (In-house or Sub)
Test
Ship

Variables

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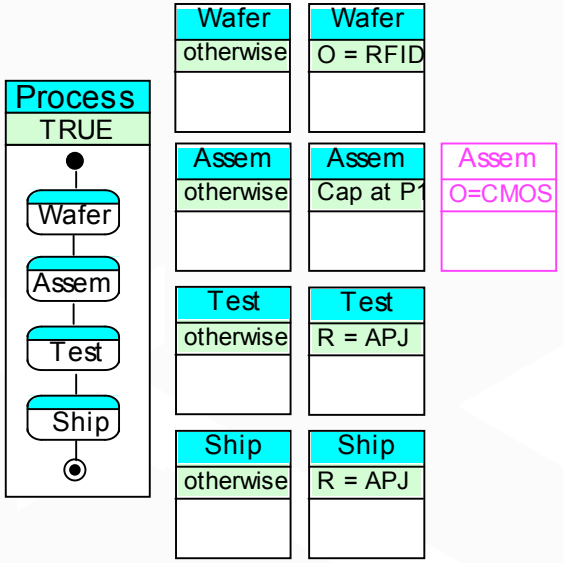

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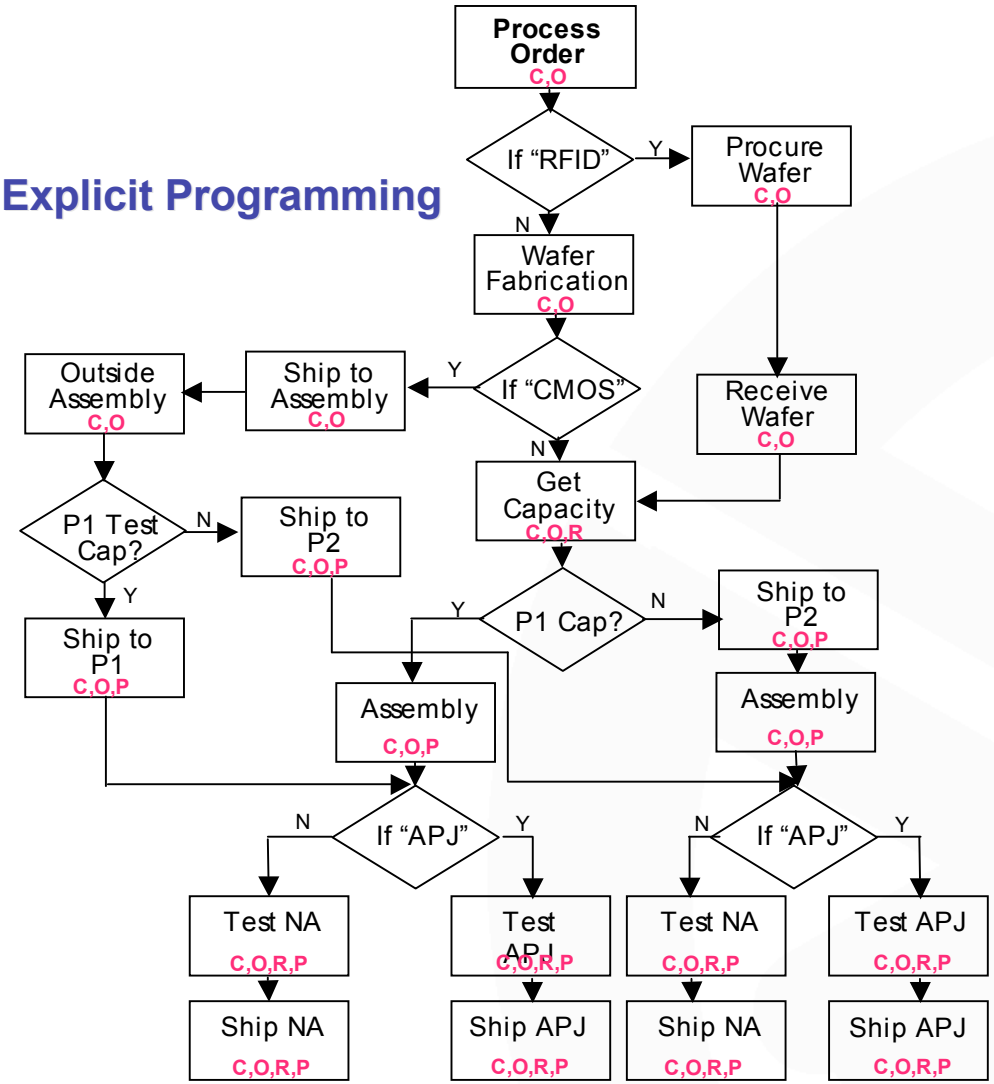

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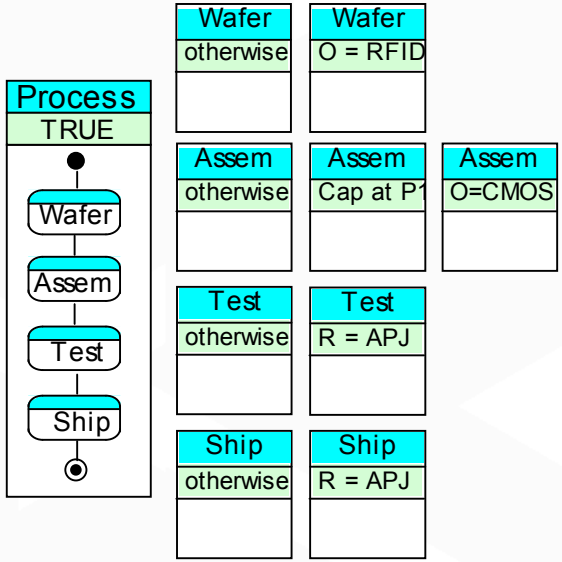

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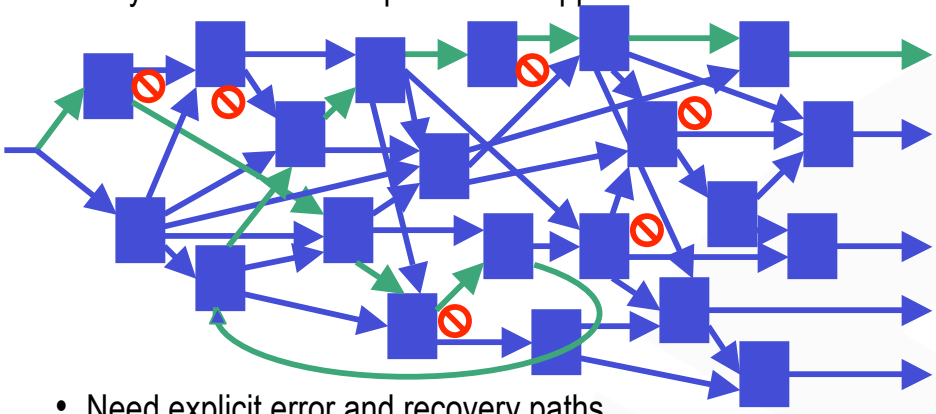
Adaptive Process Execution

Coded at design execution

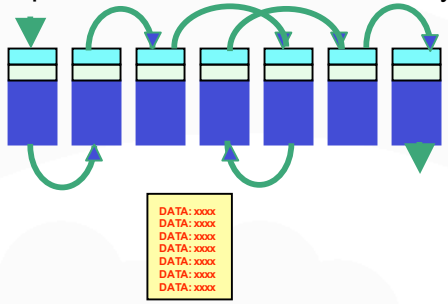
Only coded execution paths can happen



- Need explicit error and recovery paths
- Complexity limited to “manageable” size
- Failure result in manual intervention

Adaptive Process Execution

Execution path built as needed “on-the-fly”

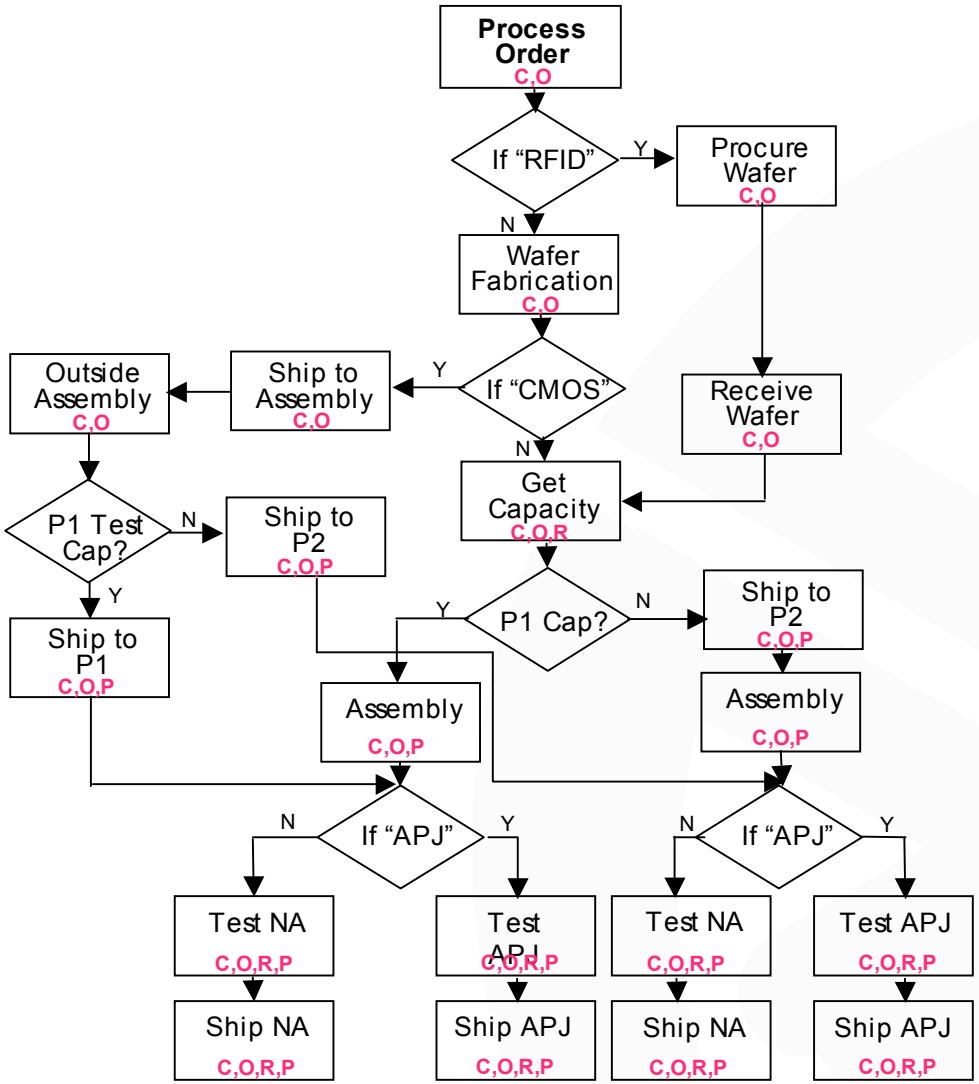


- Focused on achieving goals (end-result)
- Automatic recovery in case of failure
- Great number of combinations with few plans
- Significantly reduced manual intervention

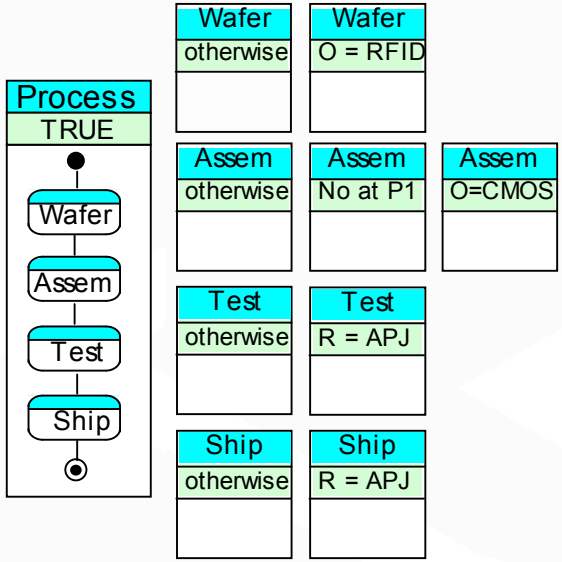
Reduces Time To Market and Total Costs of Ownership

- Increases application robustness, especially for unplanned situations
- Reduces design requirements ➔ faster and cheaper delivery
- Lowers cost of operations through reduced manual interventions

Adaptive Process Execution



Case 1:
MCU for APJ customer, no capacity available at plant P1



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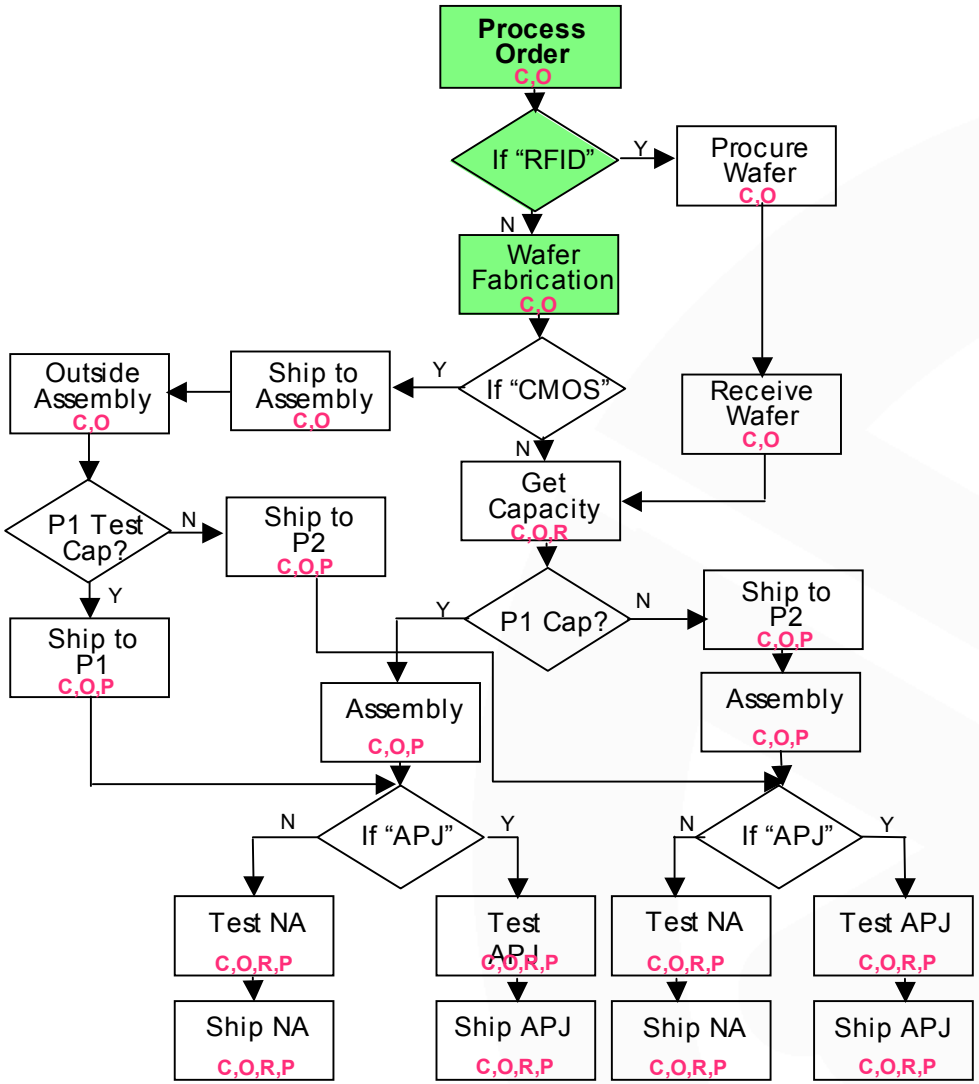

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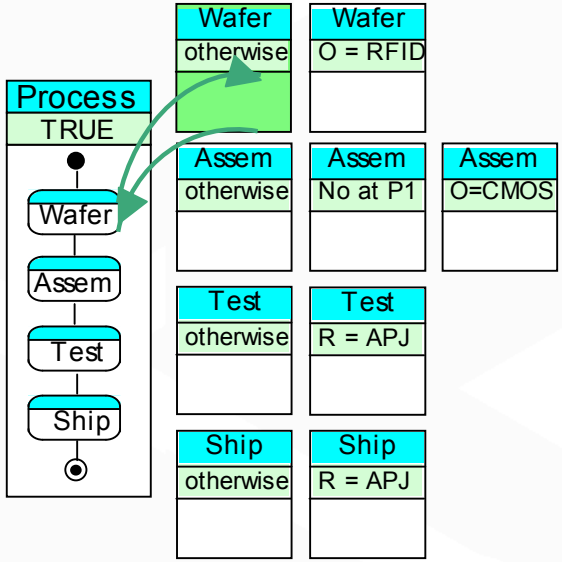

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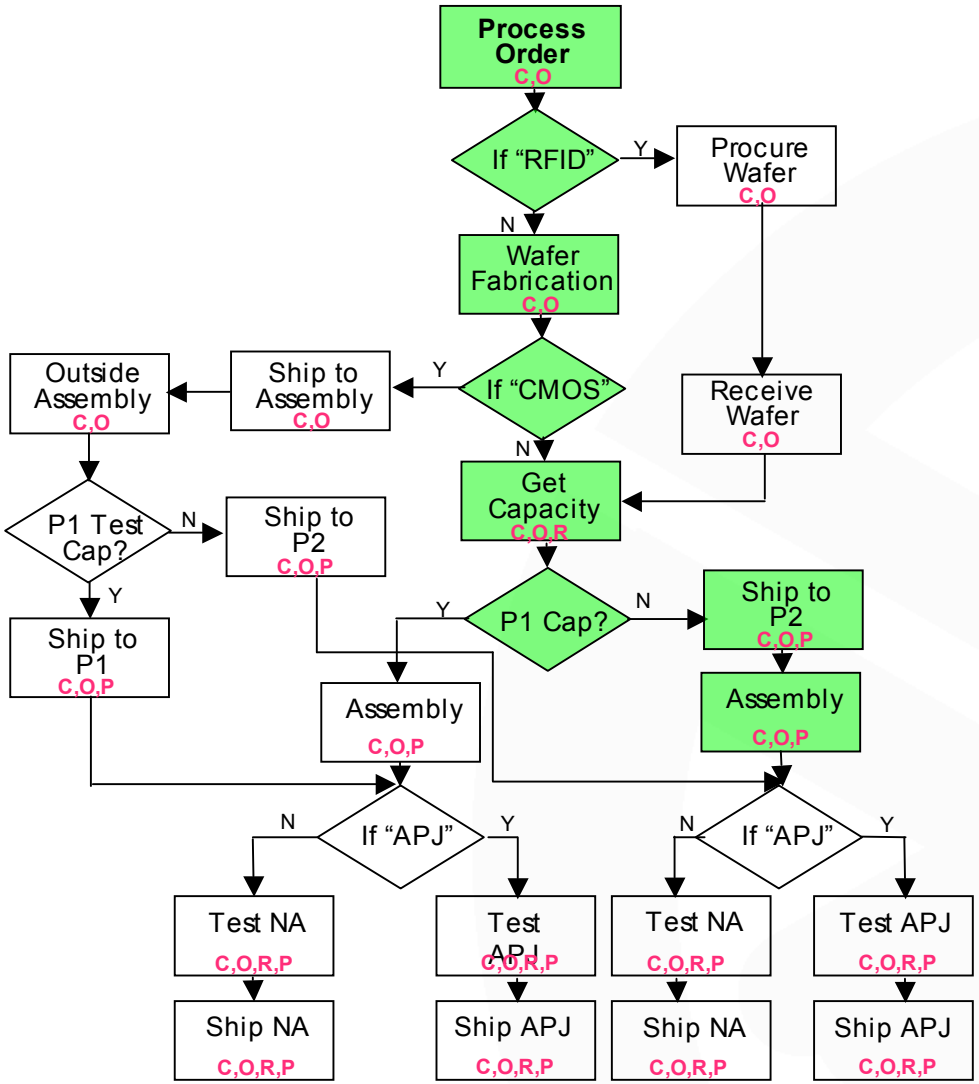

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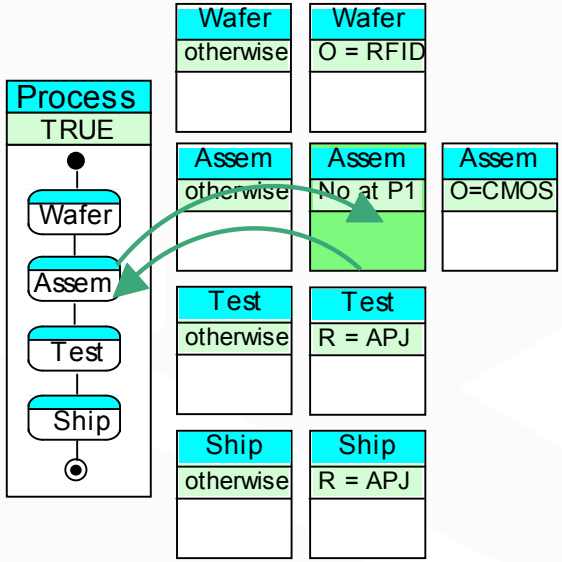

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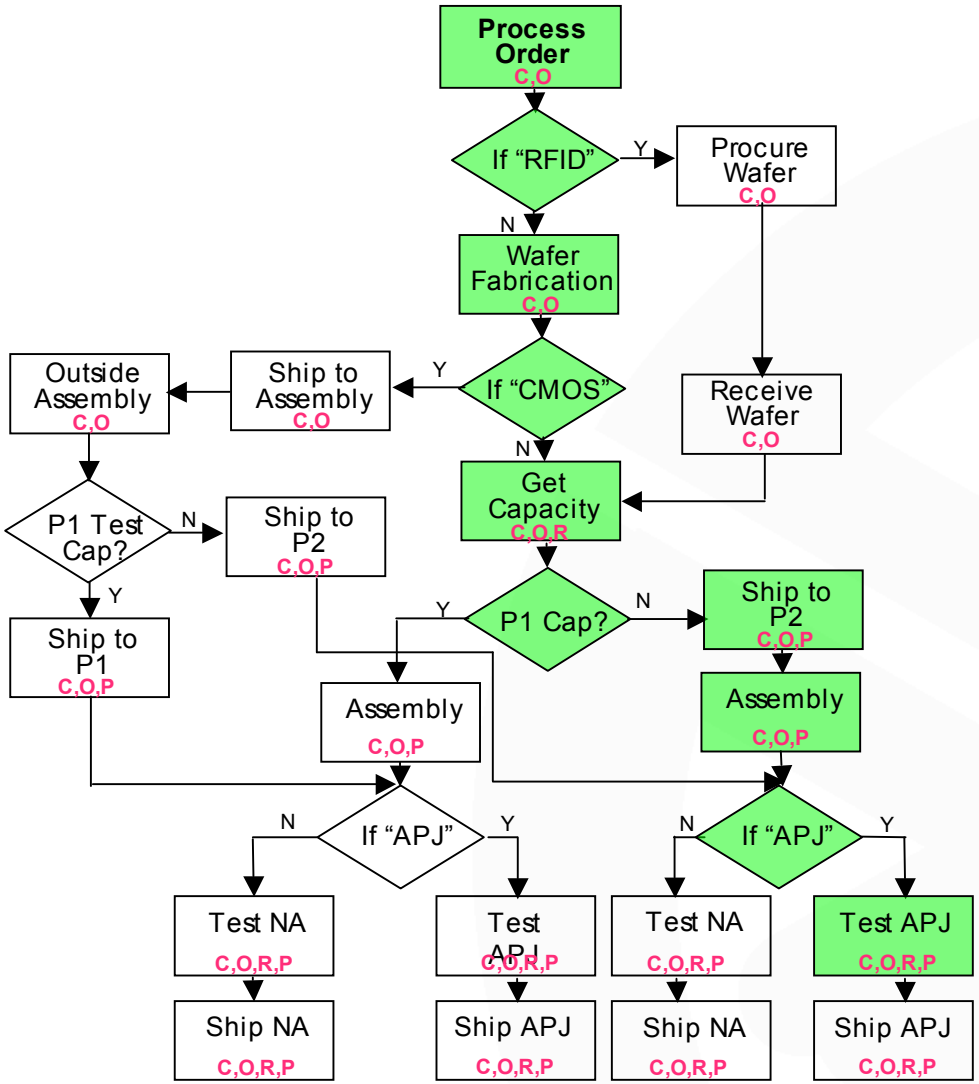

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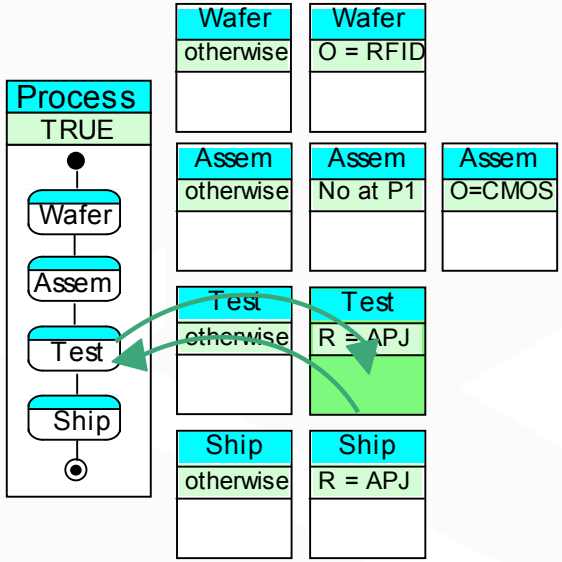

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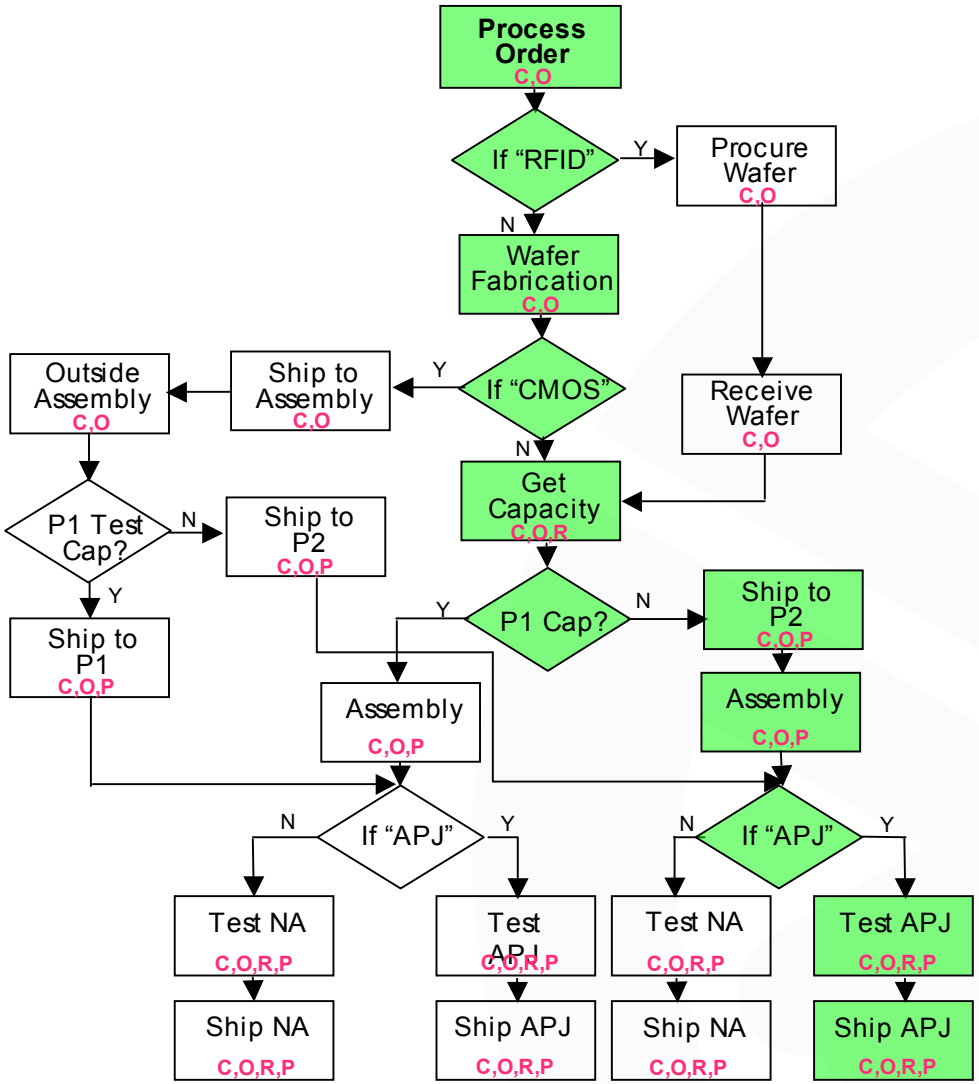

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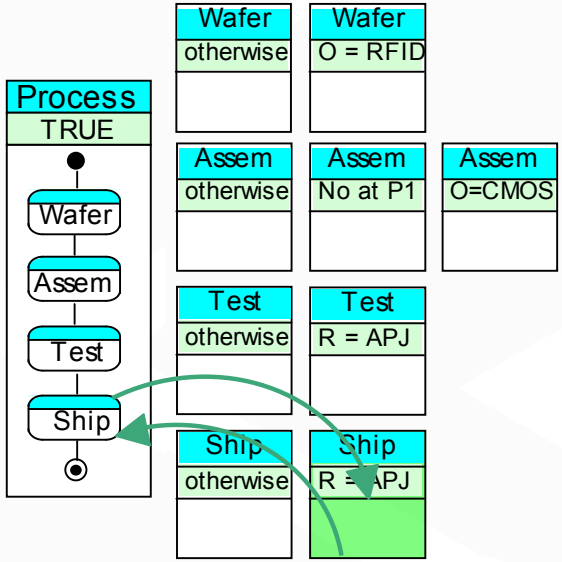

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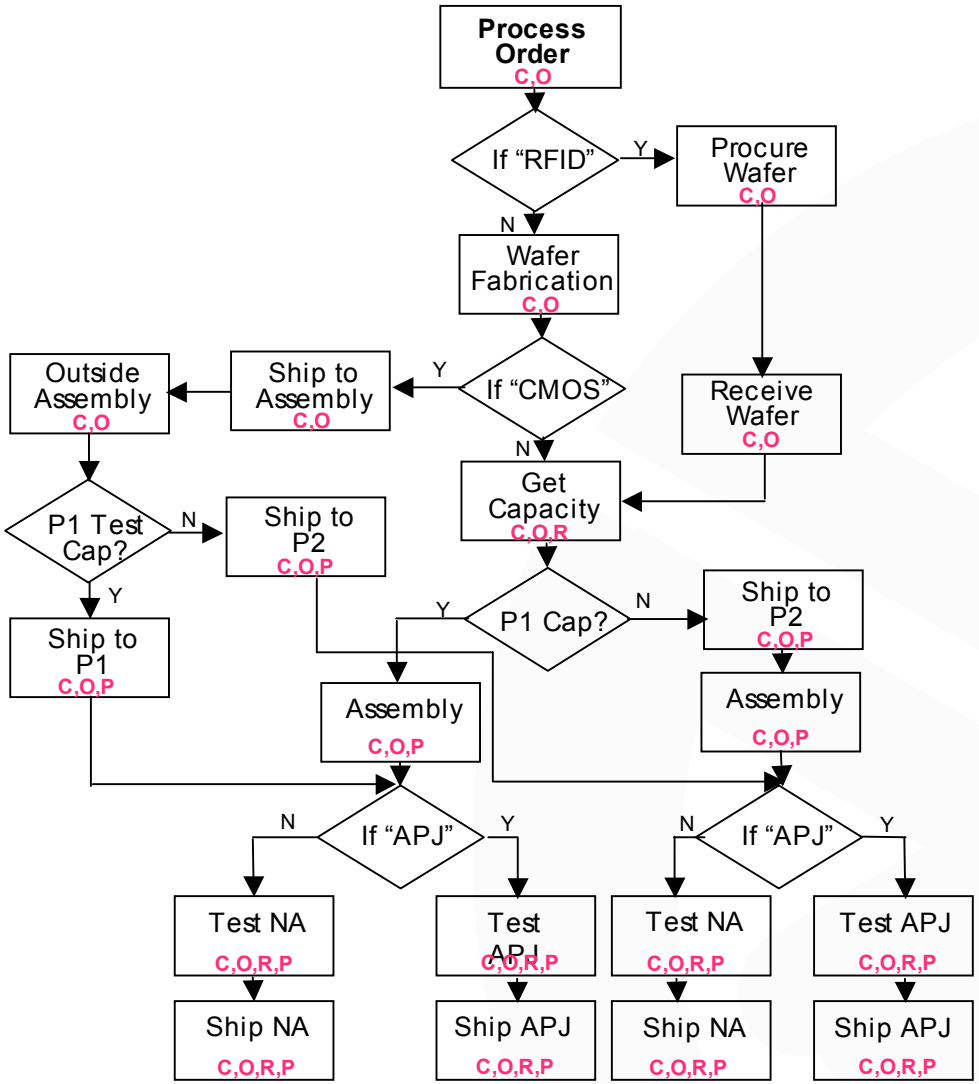

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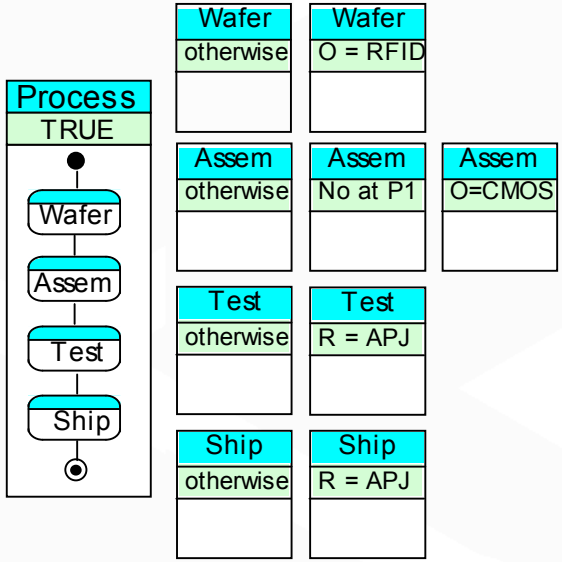

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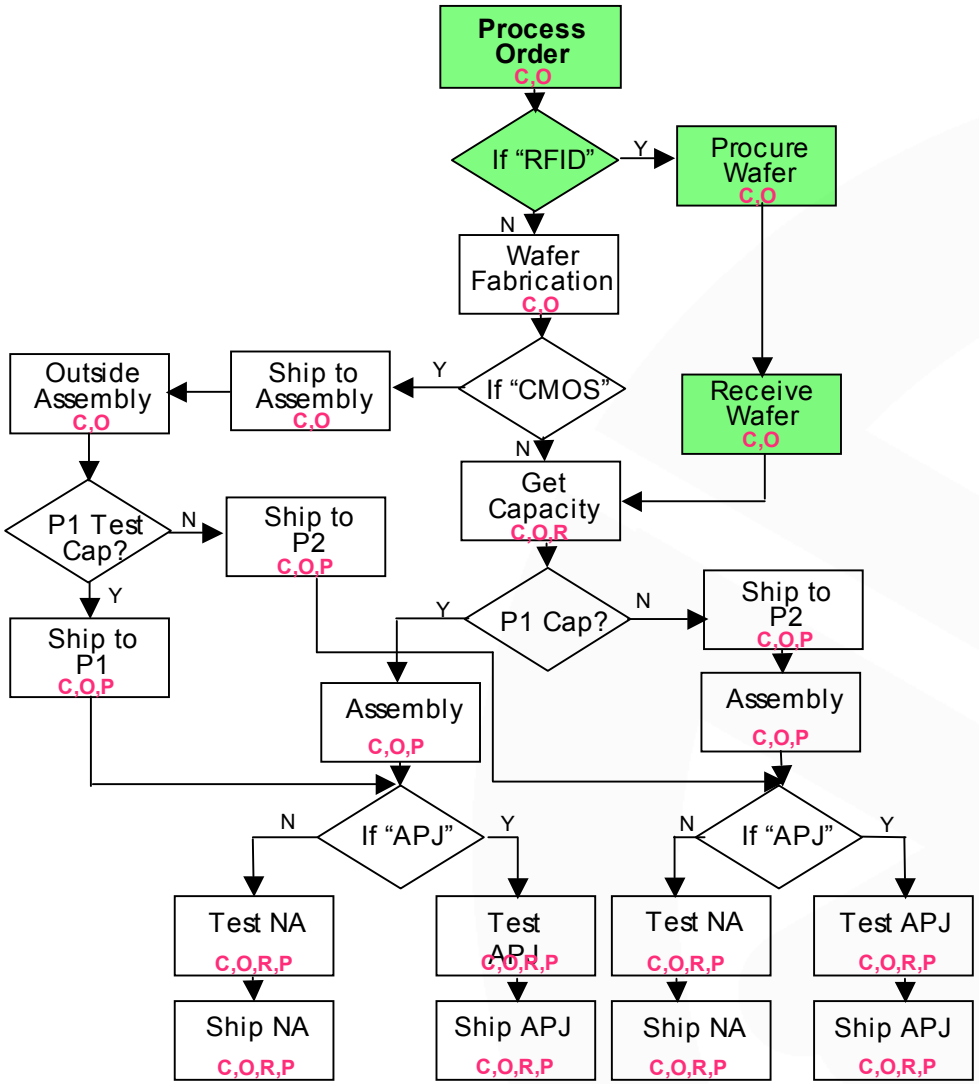

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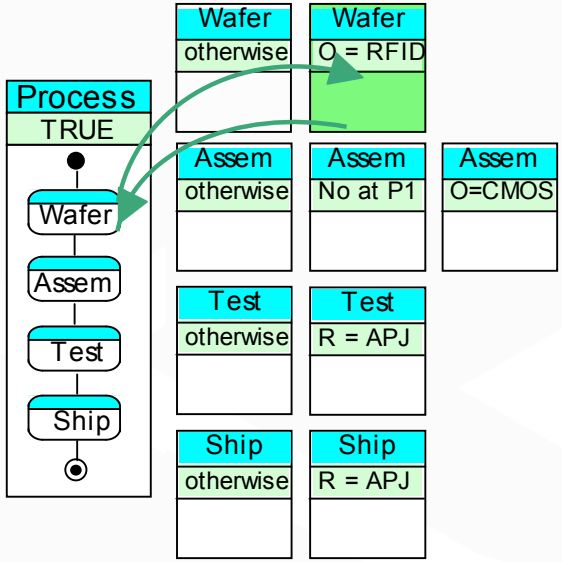

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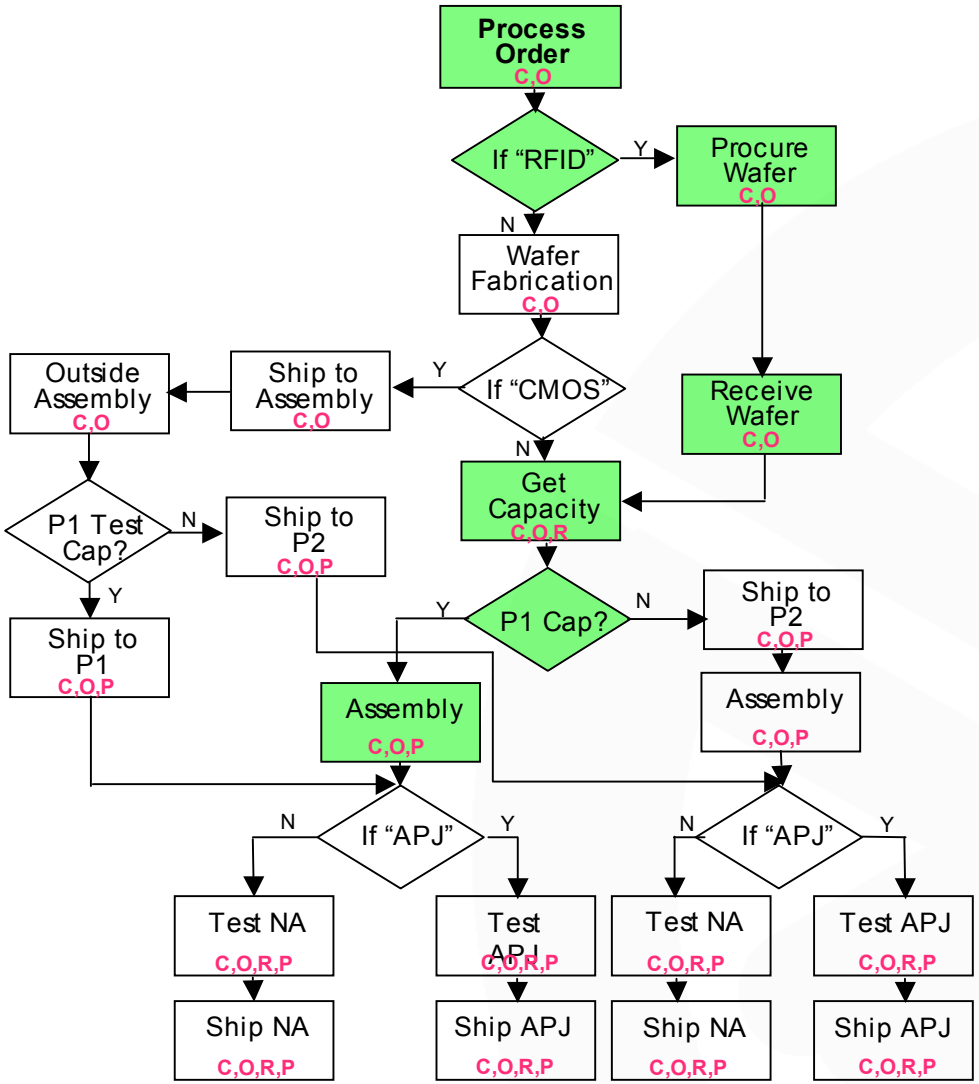

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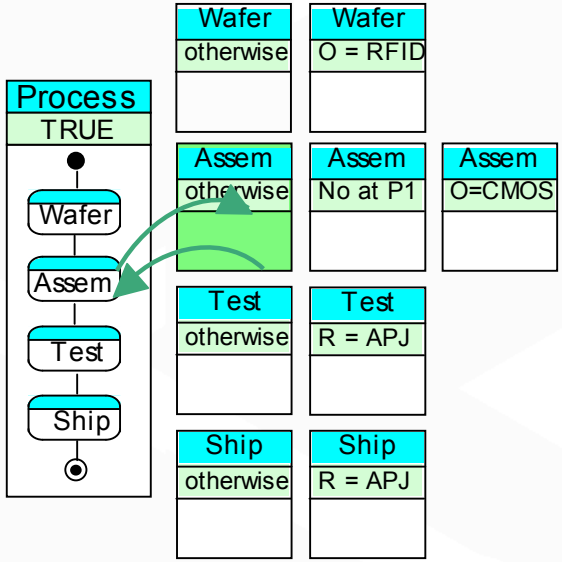

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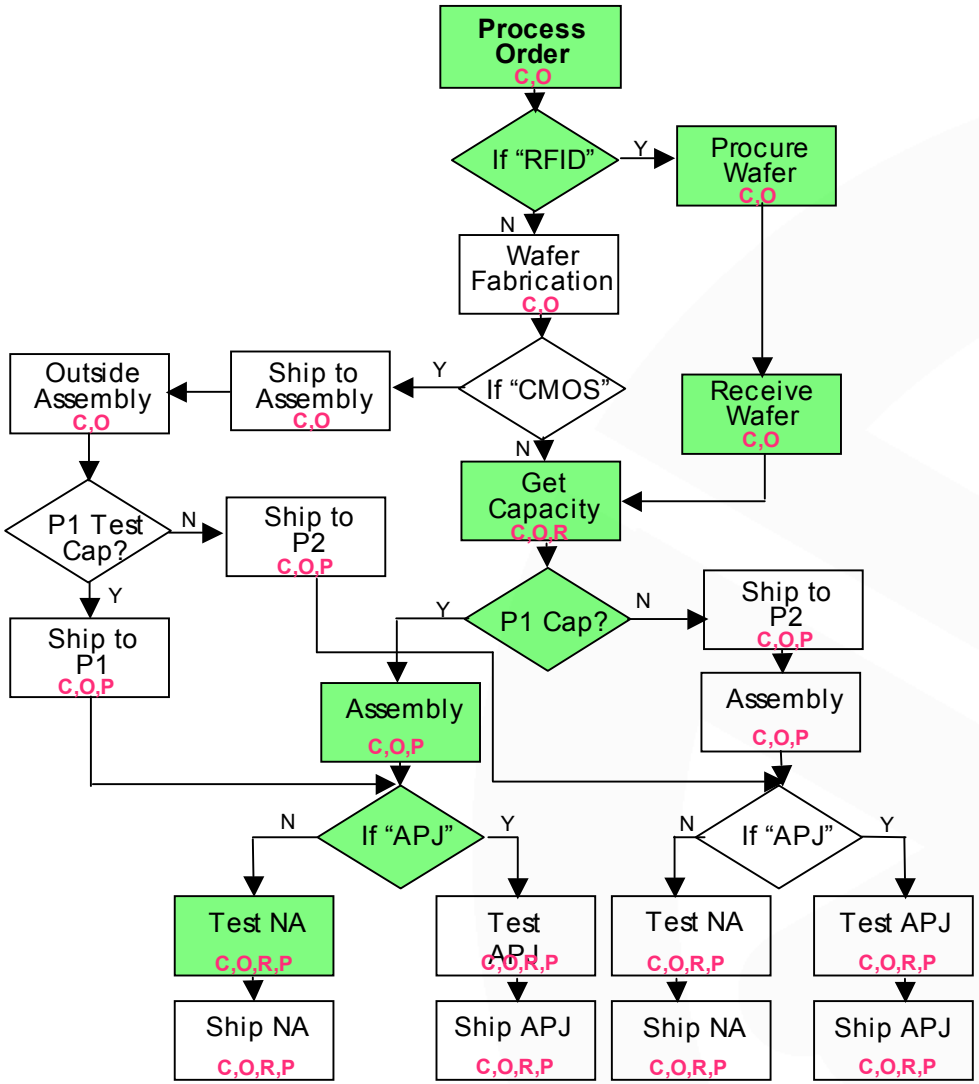

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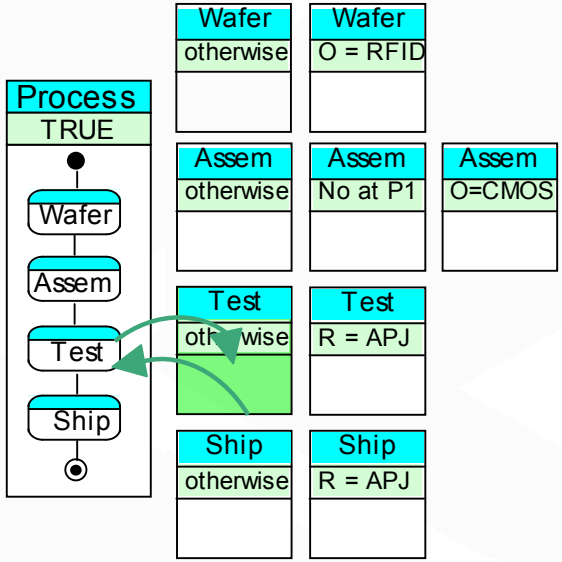

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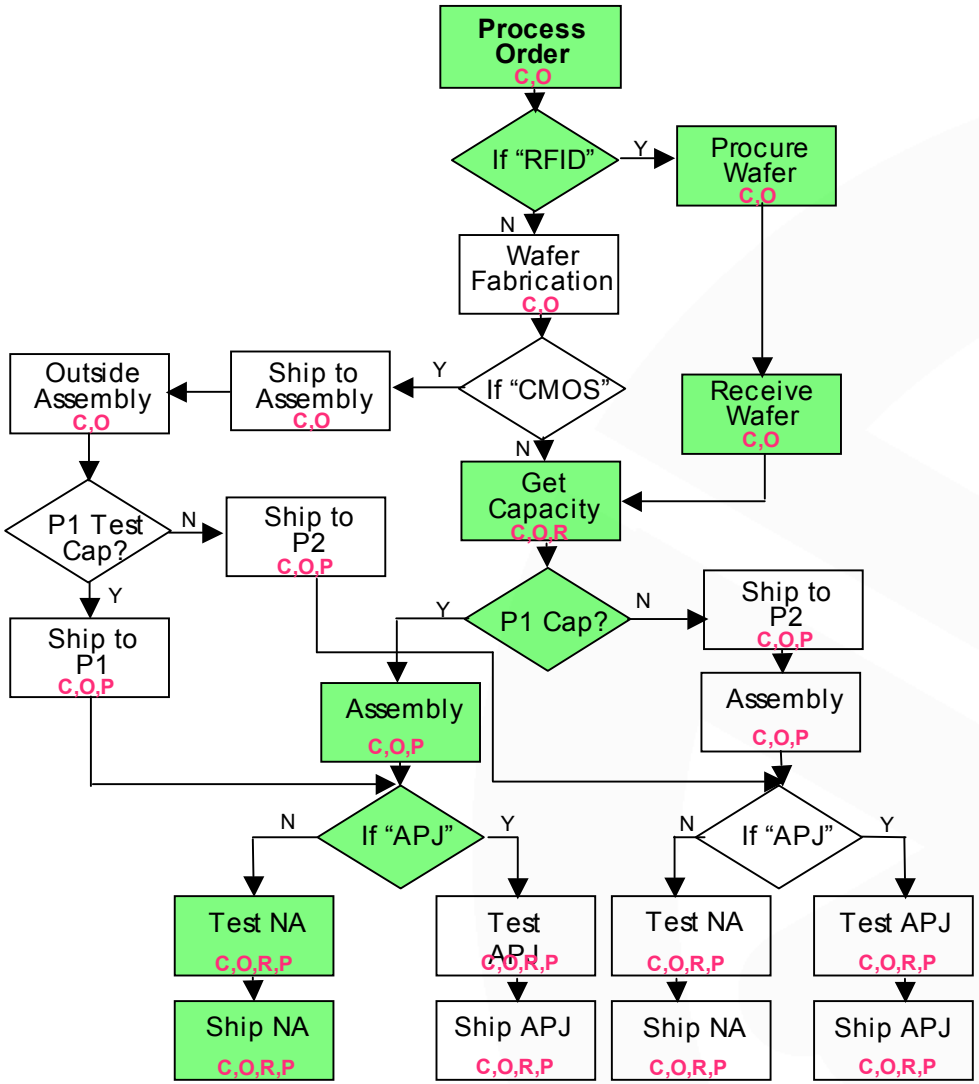

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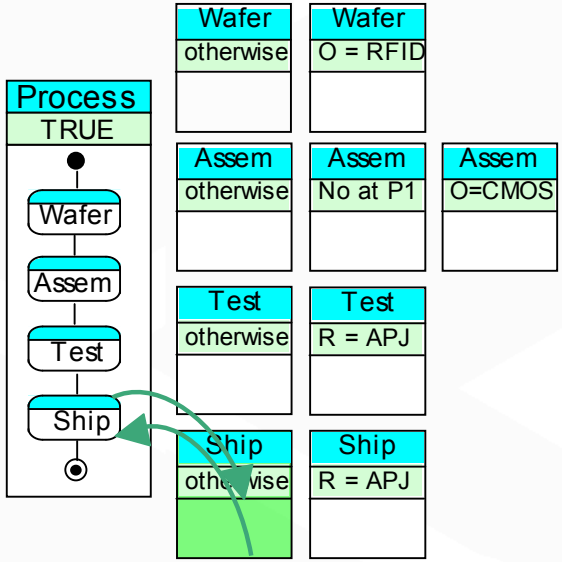

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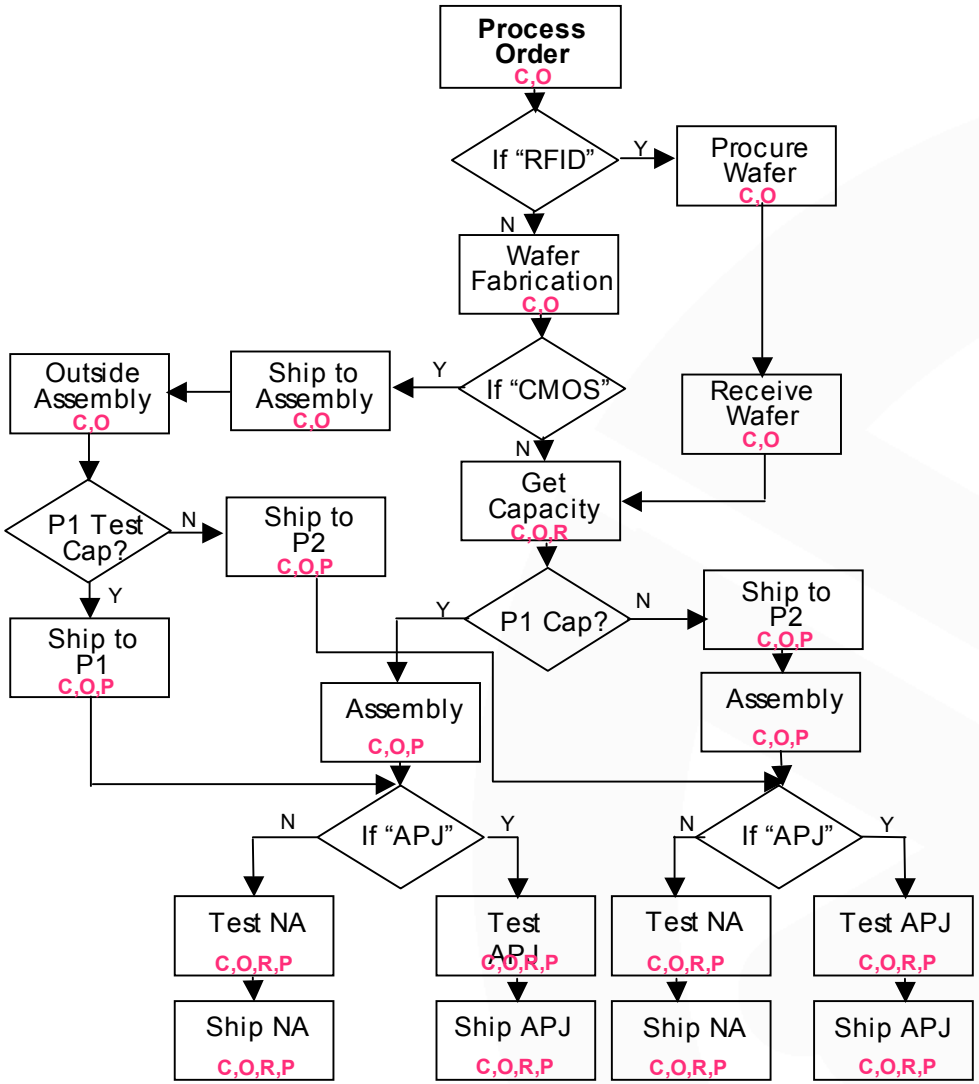

Case 1:
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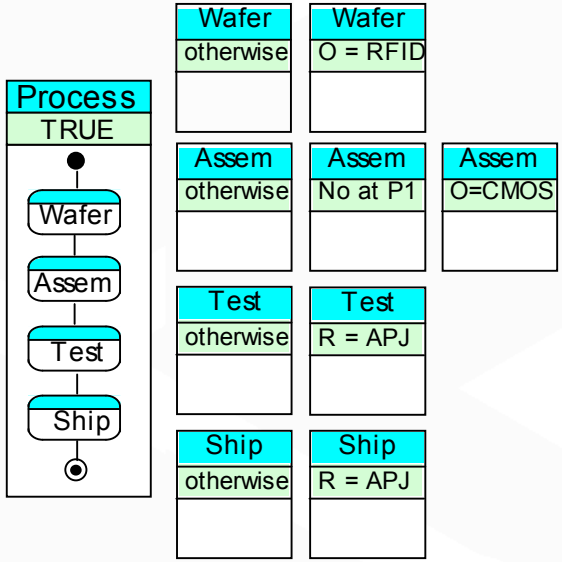
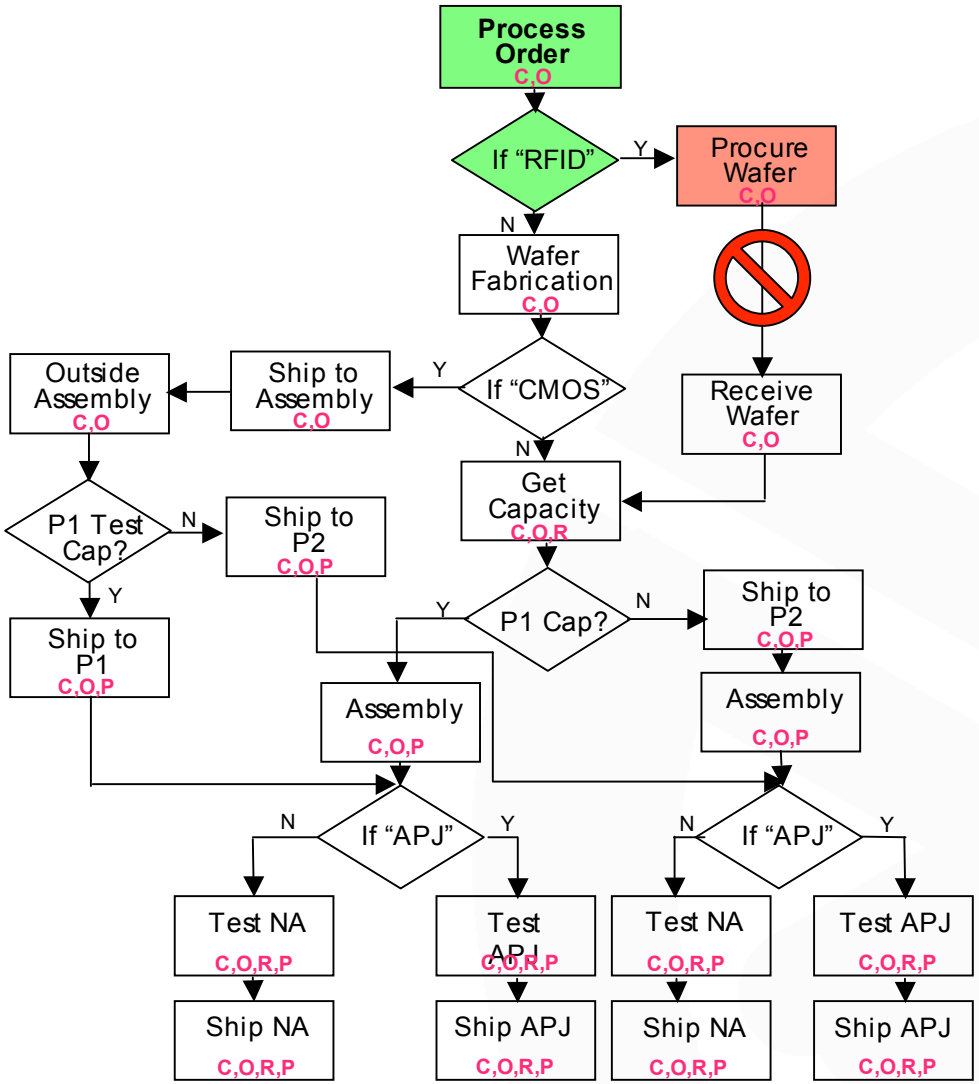
Case 3:
RFID for US customer, capacity available at plant P1
Sub does not deliver RFID wafers



Adaptive Process Execution



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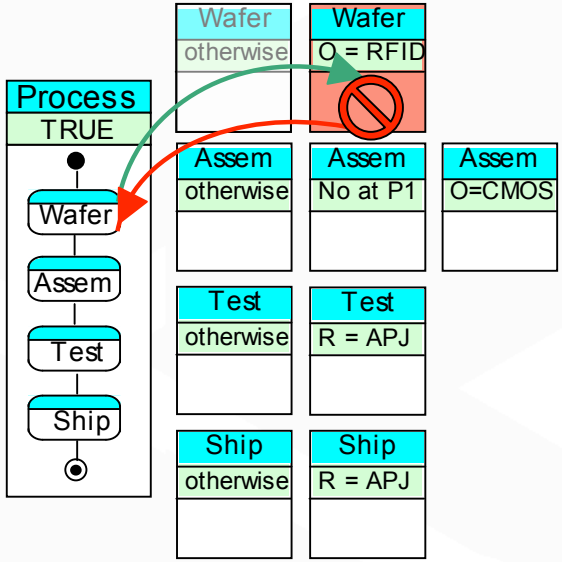
Sub does not deliver RFID wafers



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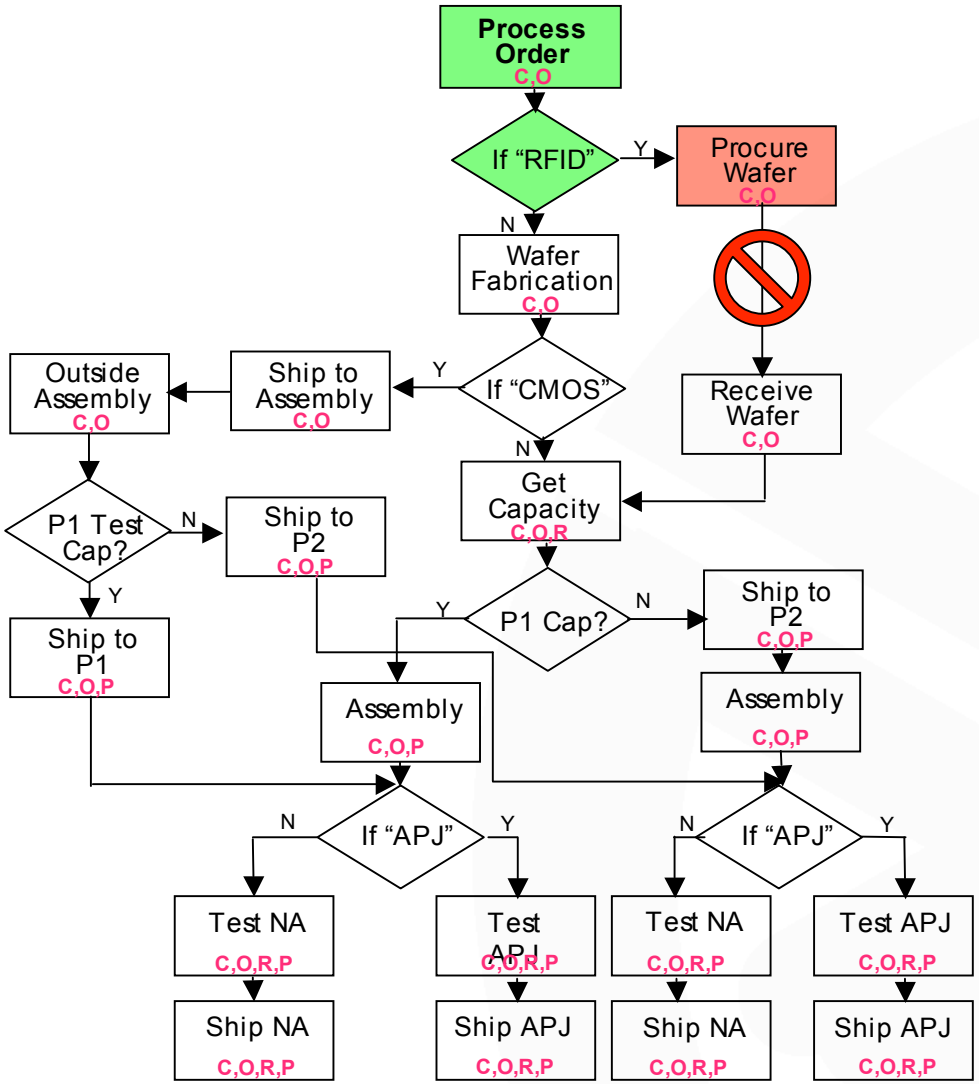

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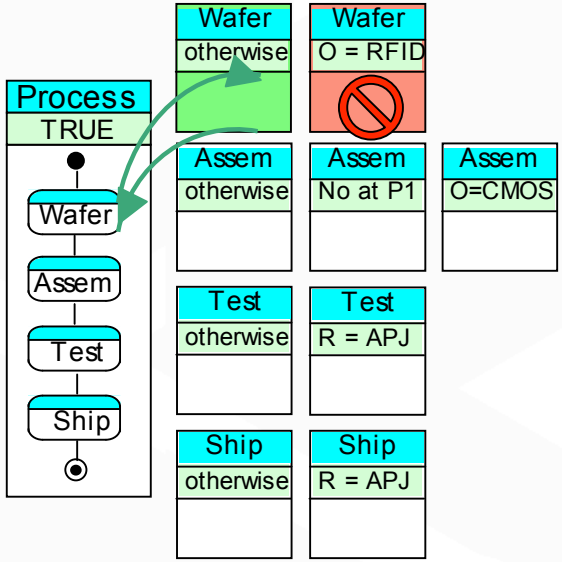

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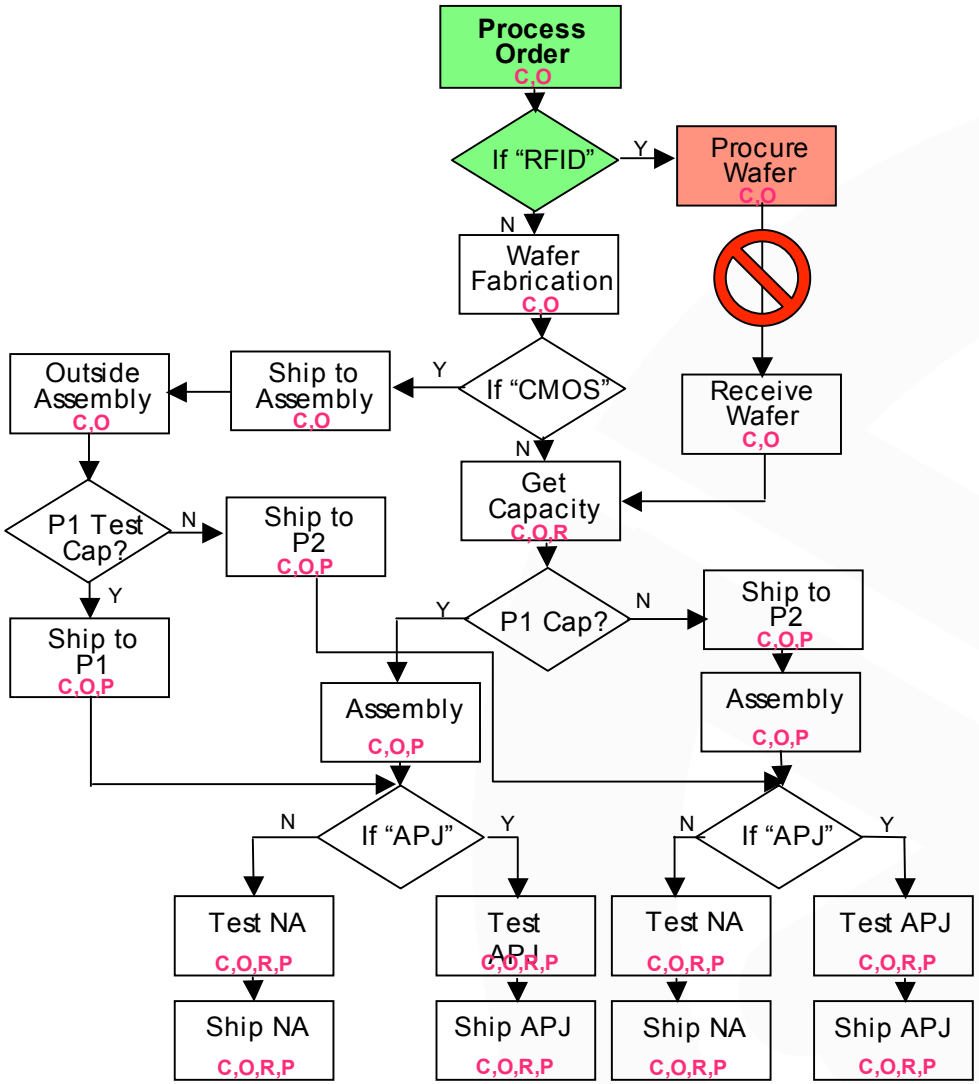

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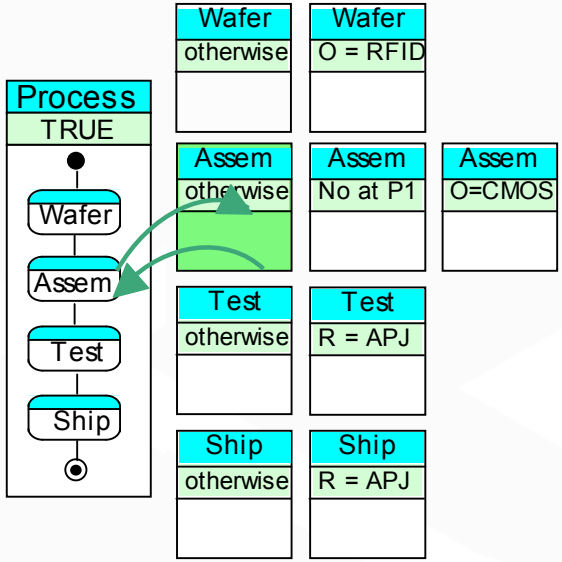

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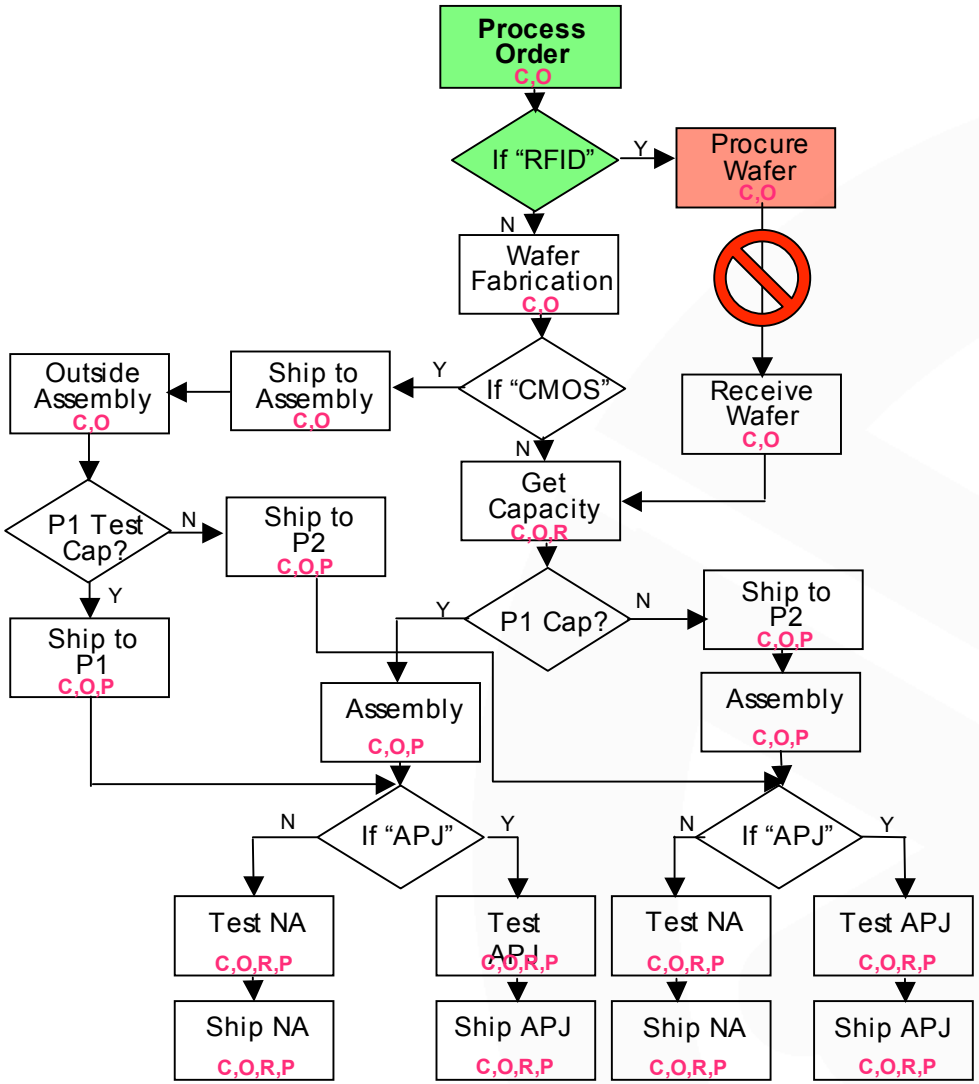

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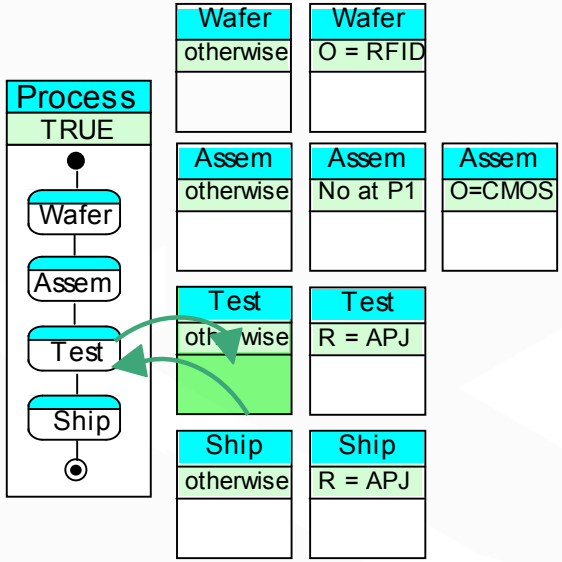

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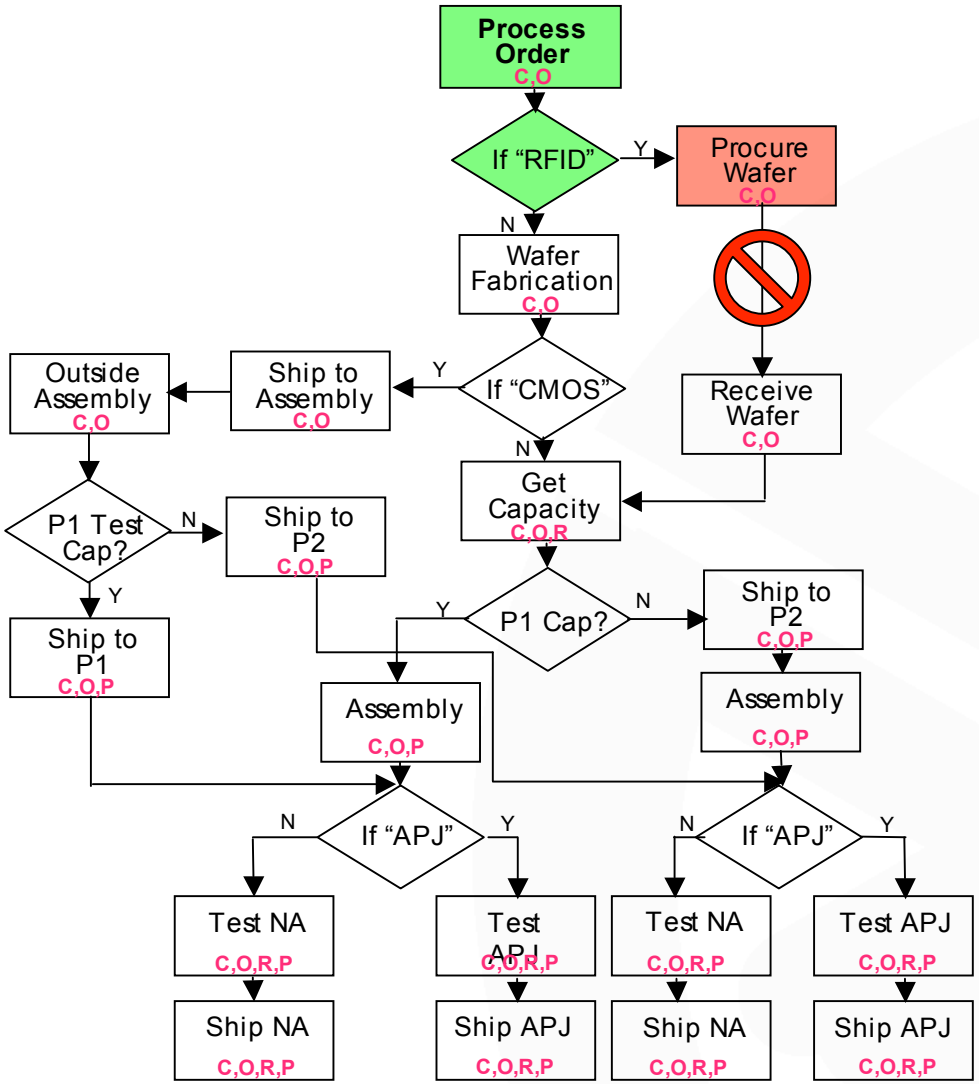

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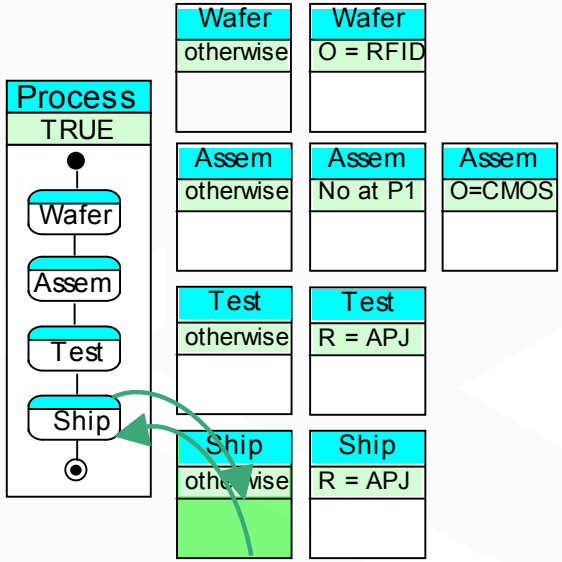
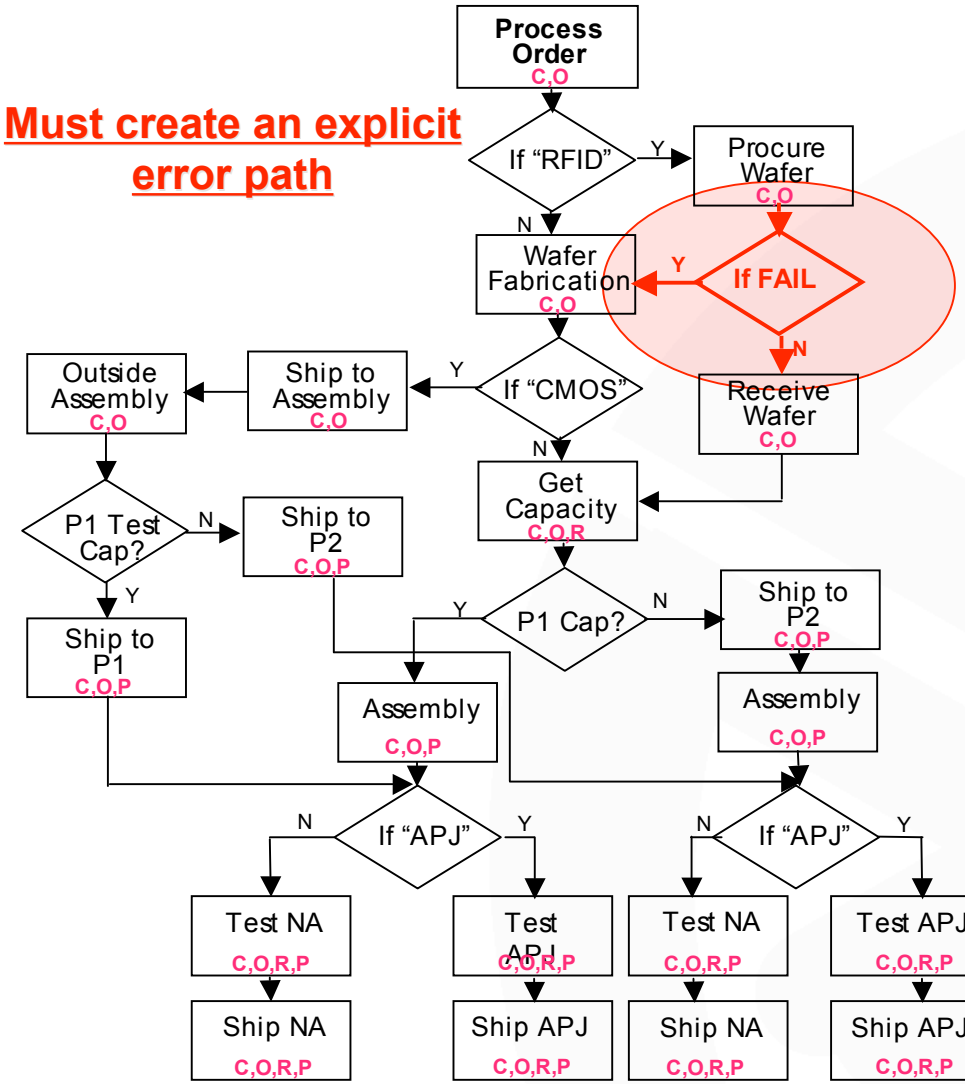


What happens to the explicit programming?

Must create an explicit error path



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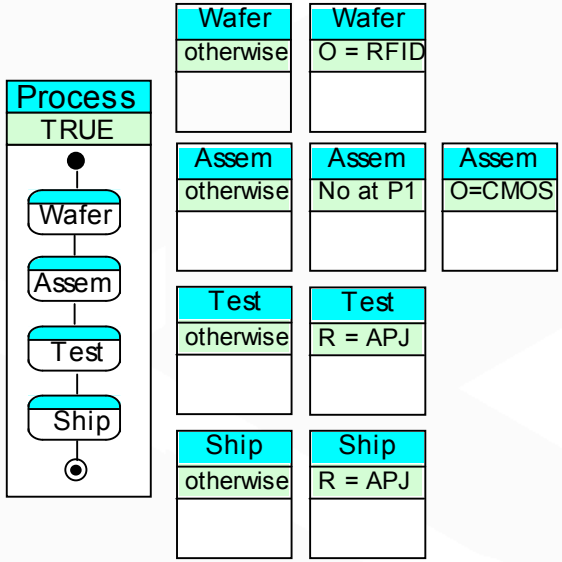
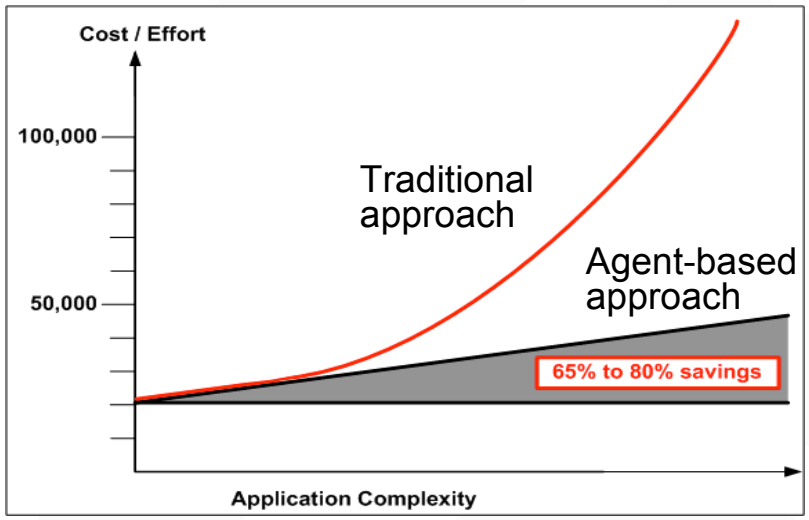


The Agent Value Proposition

LOWER TIME AND COST OF DELIVERY BY 65% TO 80%

Time To Market

- Initial deployment: 3-4 months
- Continuous evolution of the application
- Application always in sync with most current business requirements
- Maximum productivity from business requirement to deployment
- Extensively leverages existing IT assets



Total Cost of Ownership

- Short time to market
- Low maintenance costs
- Application robustness reduces need for manual interventions
- Application robustness reduces risk of human error and its adverse financial impact
- High scalability/performance lowers cost of hardware
- Extensively leverages existing IT assets

THE MORE COMPLEX, THE MORE COST-EFFECTIVE

Agent-based Process Management for SOA and WS Applications

James Odell

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www.jamesodell.com