How to use ISA95 part 3 for MES functional URS

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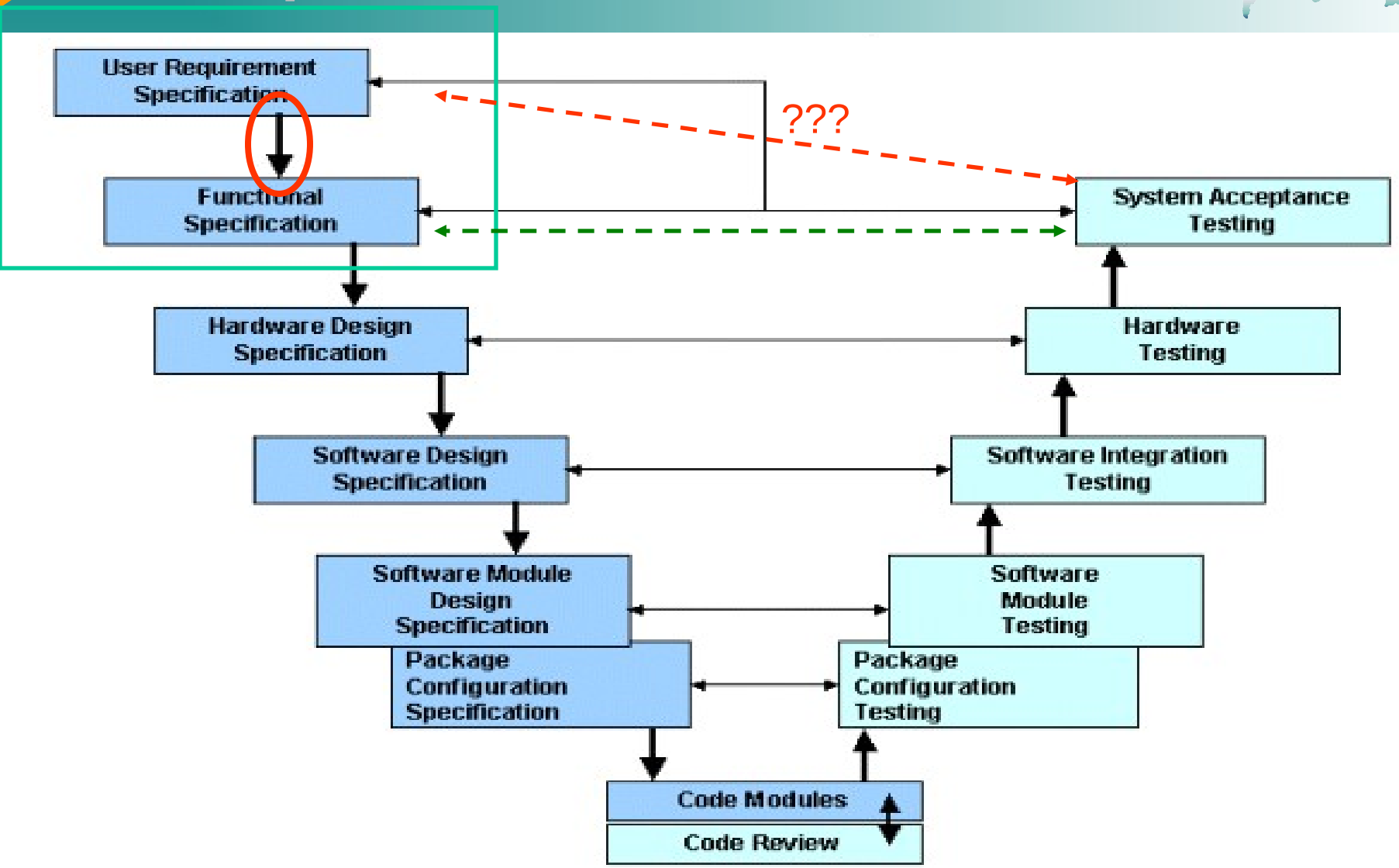
Agenda

- What's wrong with MES and URS?
- ISA95 part 3 functional framework
- Methodology
- Conclusion

MES: between Business and Manufacturing

- MES is a fuzzy area:
  - IT/Business community hardly understand actual manufacturing control constraints and needs
  - Control community doesn't catch business mind,
- MES
  - Crosses business processes, business tasks and control tasks
  - Encompassed production, quality, maintenance, and inventory execution control
- Not a complex technical issue
  - Compared to automation: no fancy algorithmic, multipath sequencing…
- However
  - Structure requirements and assessment process takes a unique mixture of skill sets and years of study and practice

Example: URS vs FS in GAMP4



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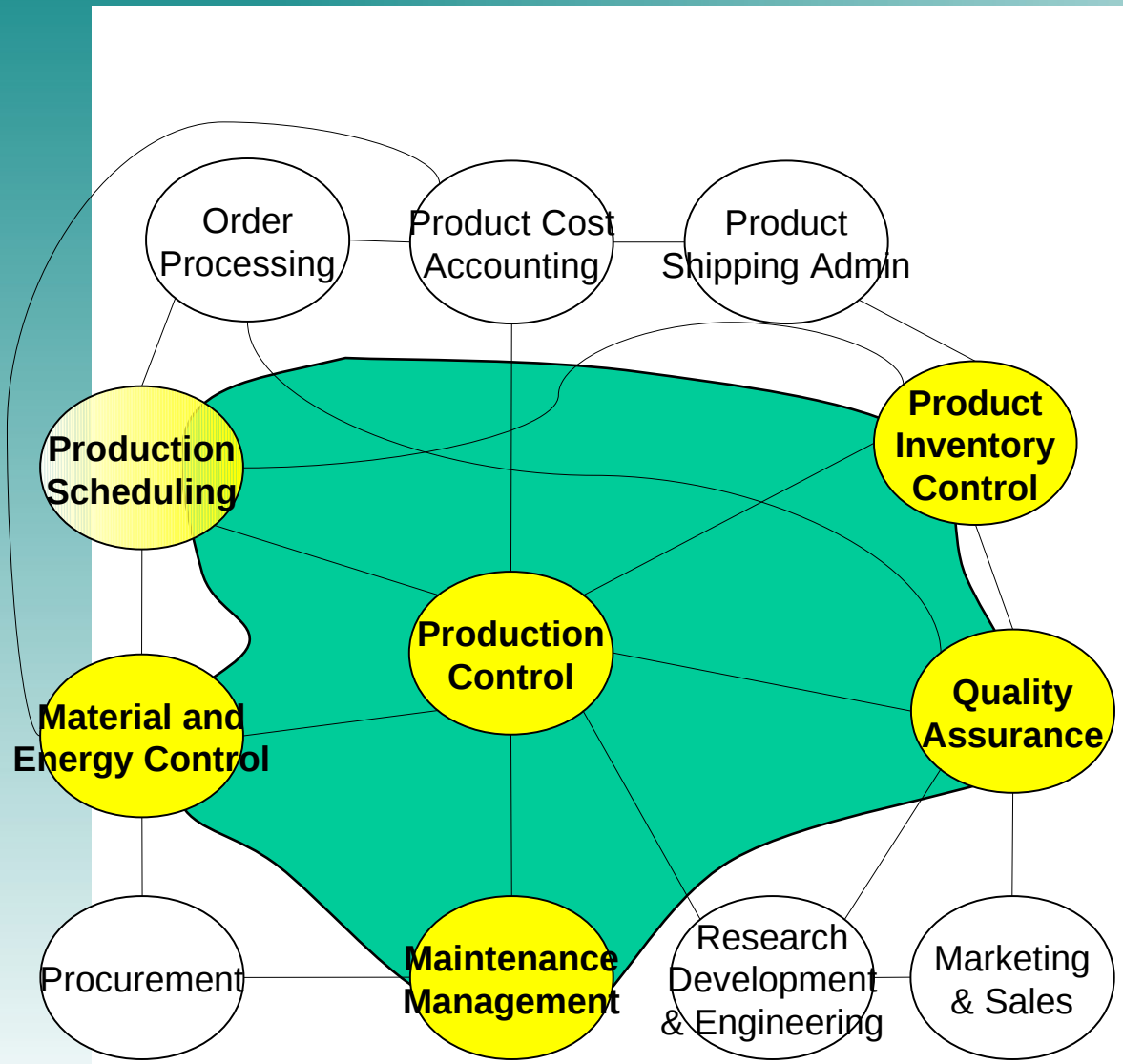
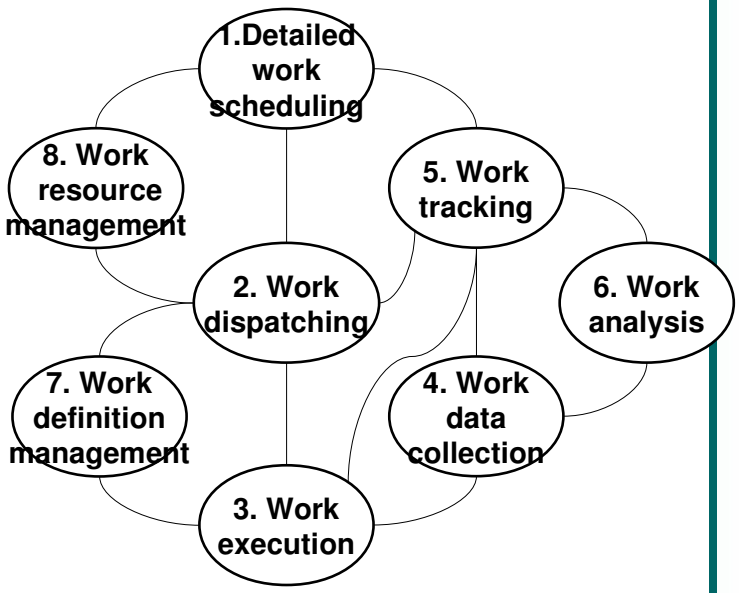
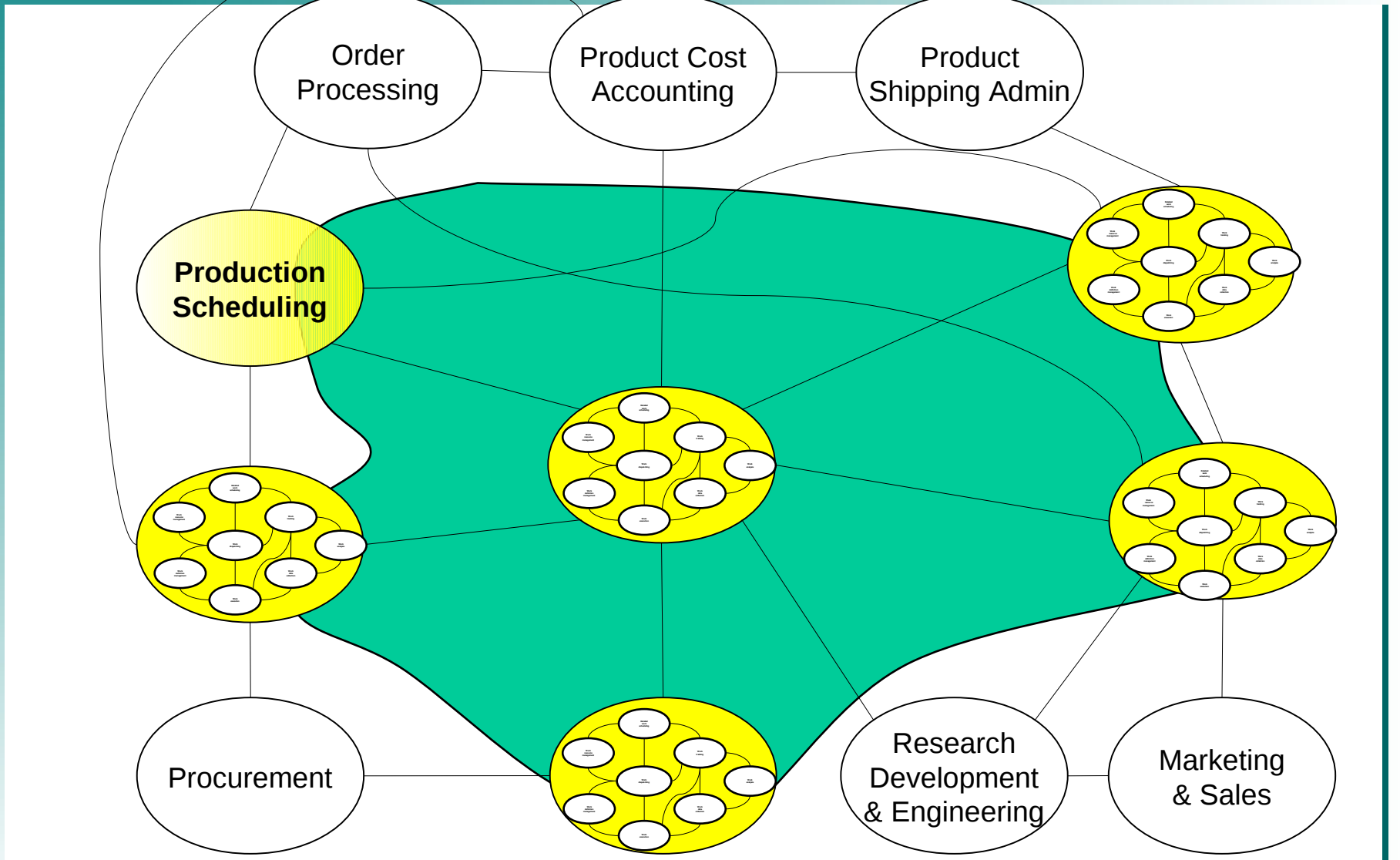
PRM + ISA95-3 functional models





From ISA95 standards

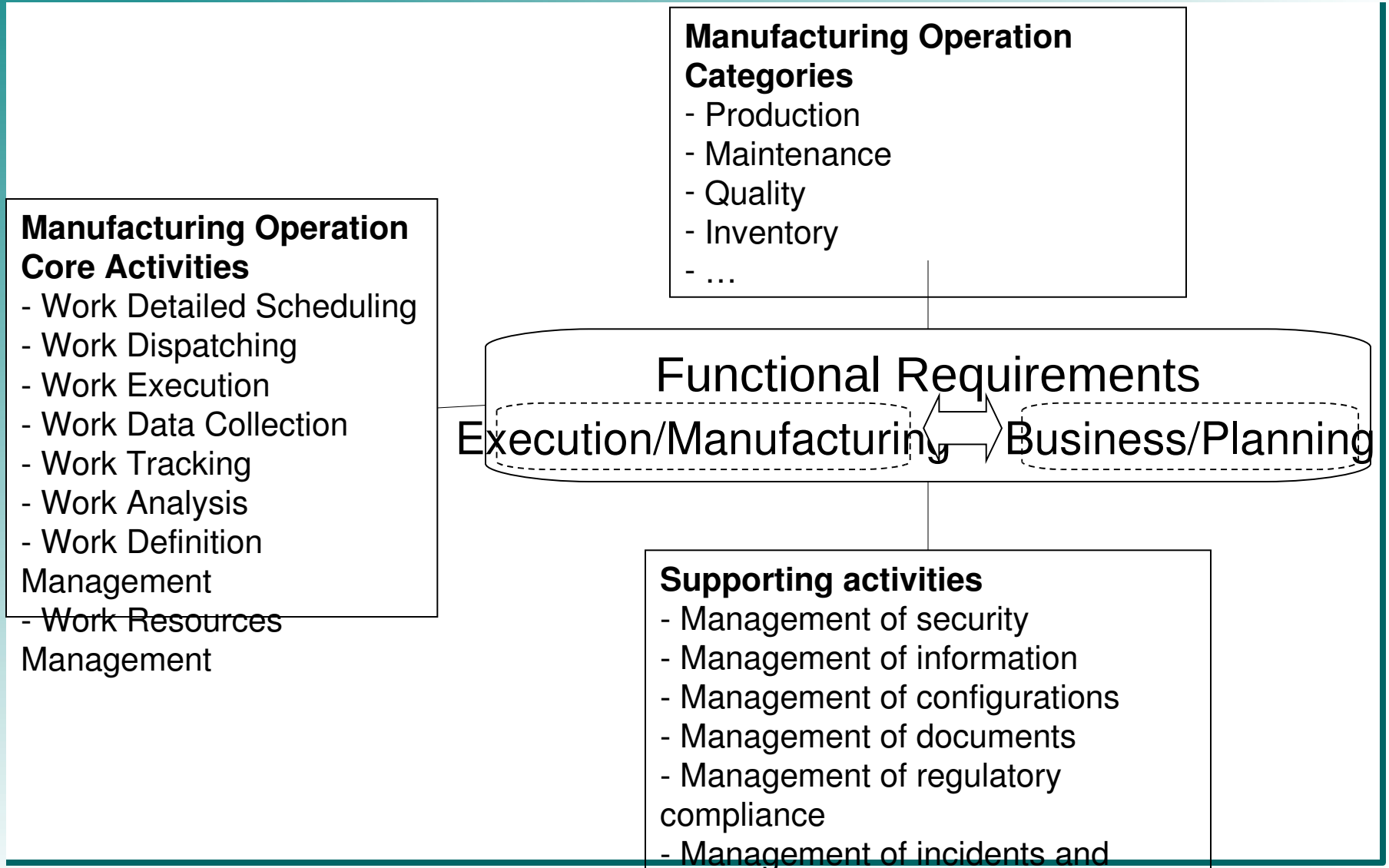
Combined



Beyond Production

- ISA95 Part 3 defines the following Manufacturing Operation Categories (MOCs):
  - Production
  - Quality tests
  - Maintenance
  - Inventory control
- Other or different MOCs can be defined. Example:
  - Distribution, Transportation
  - Inbound, Outbound logistics, Internal transfers
  - Tooling
  - Cleaning
  - …
- It's all about execution!
- Advanced MES solutions take care of many aspects of product manufacturing and handling

The ISA95 tri-dimension functional framework



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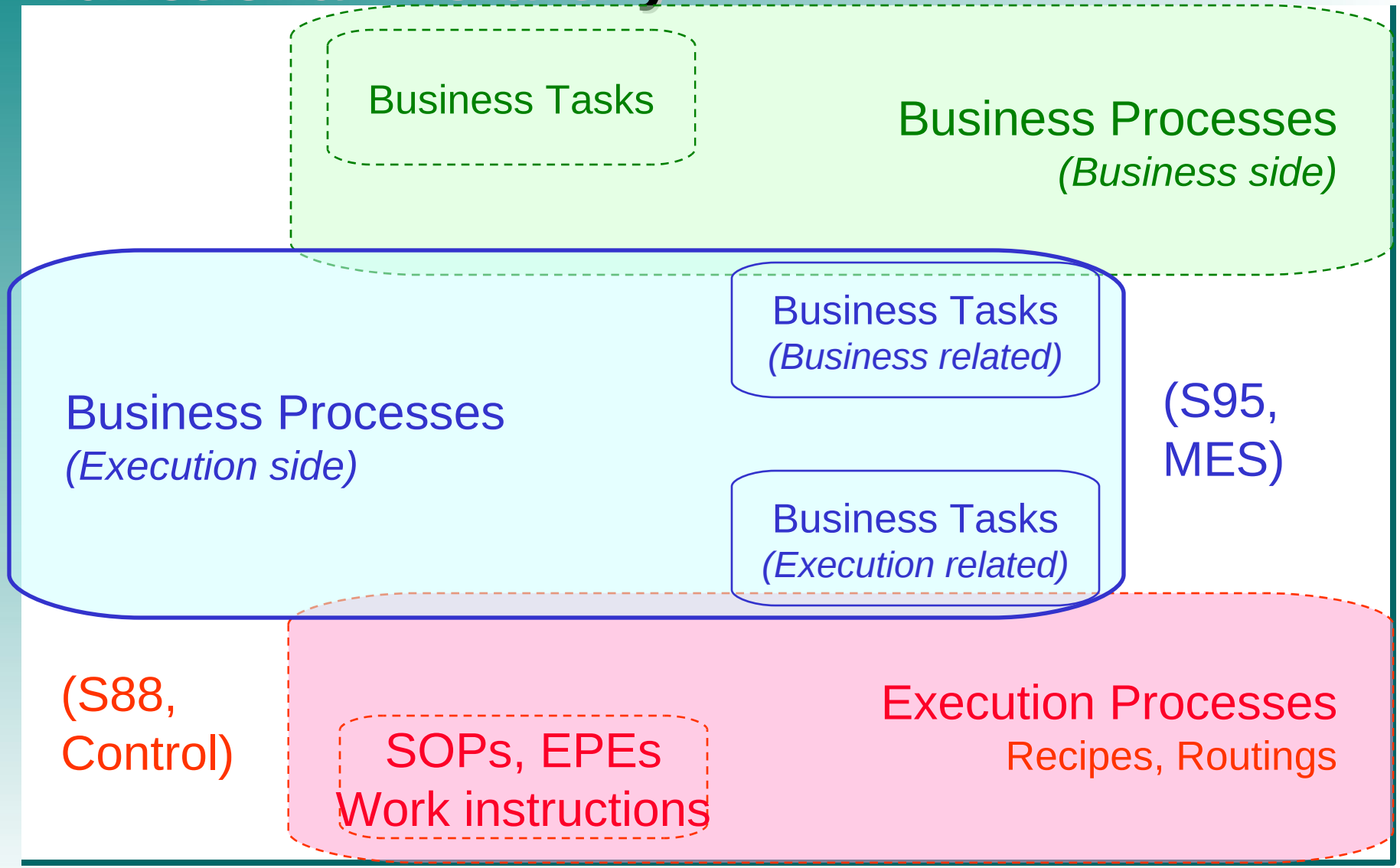
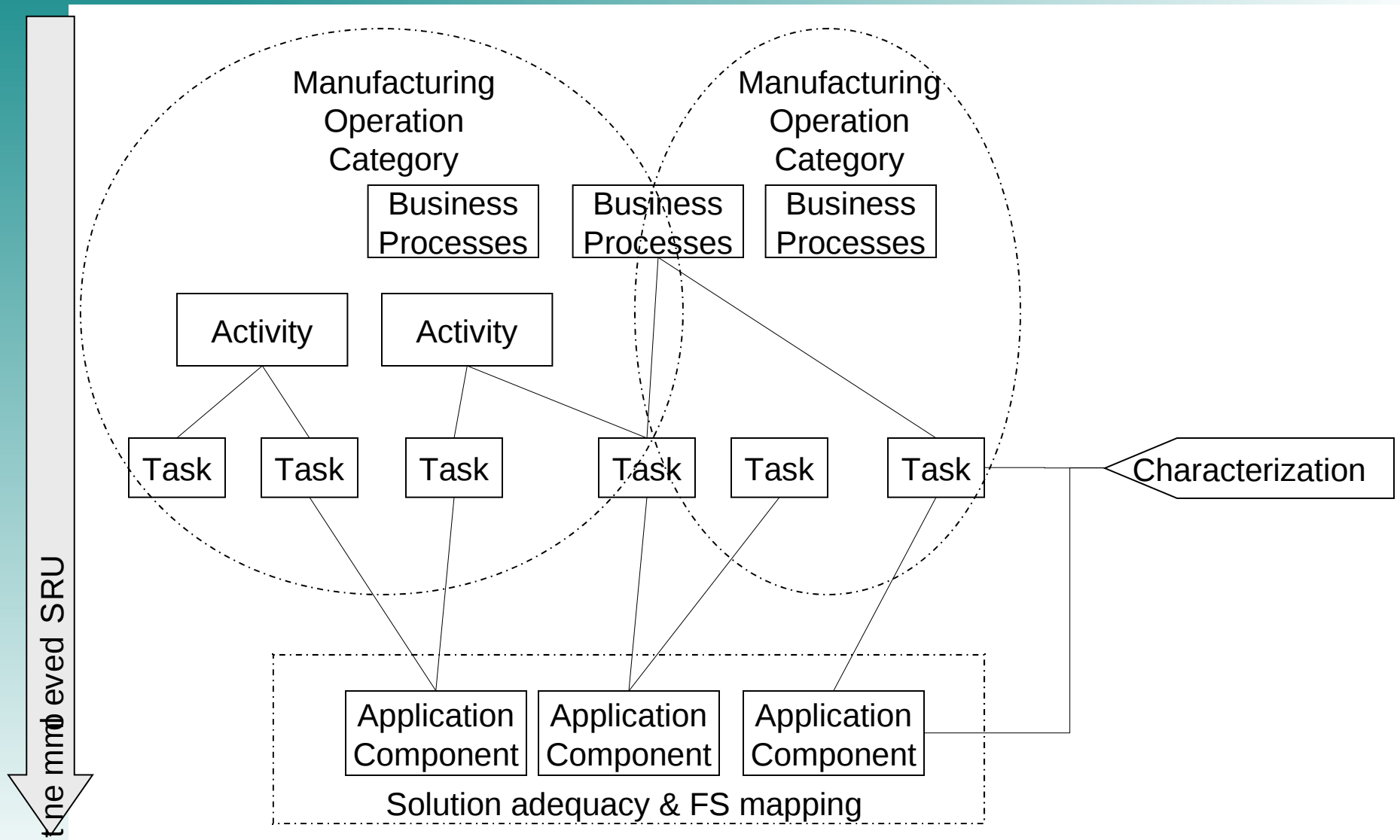
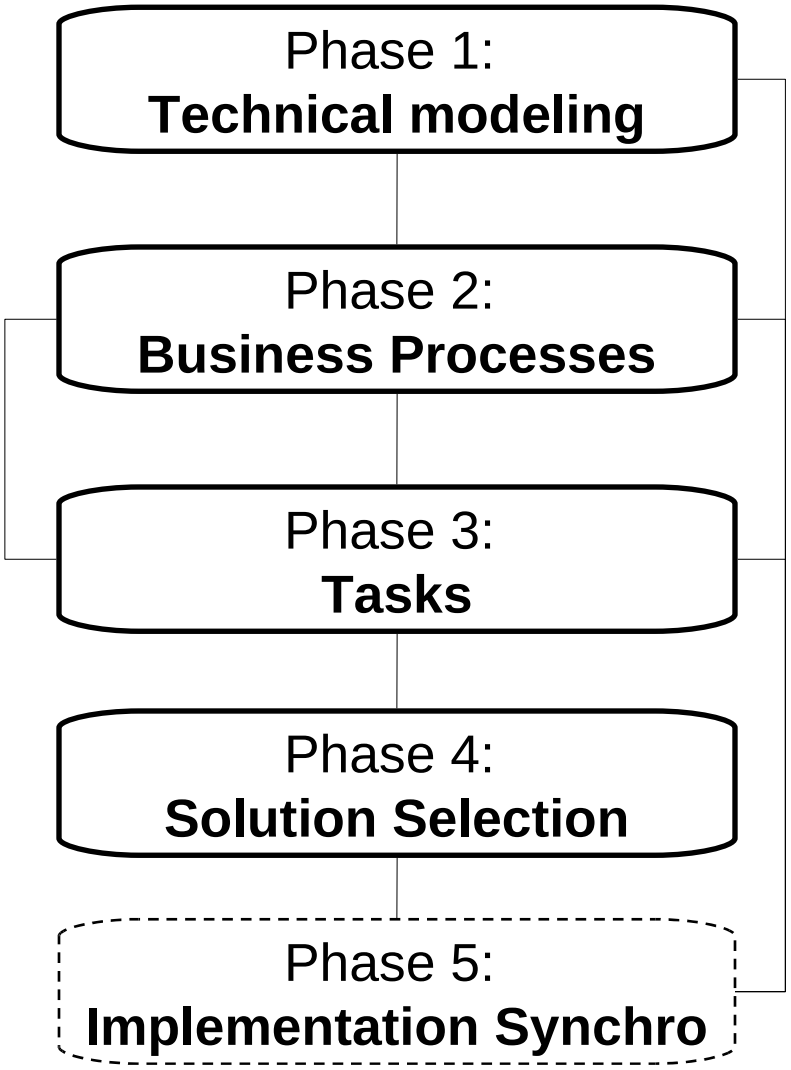
2/3Tiers Business / Execution functional hierarchy



URS methodology overview



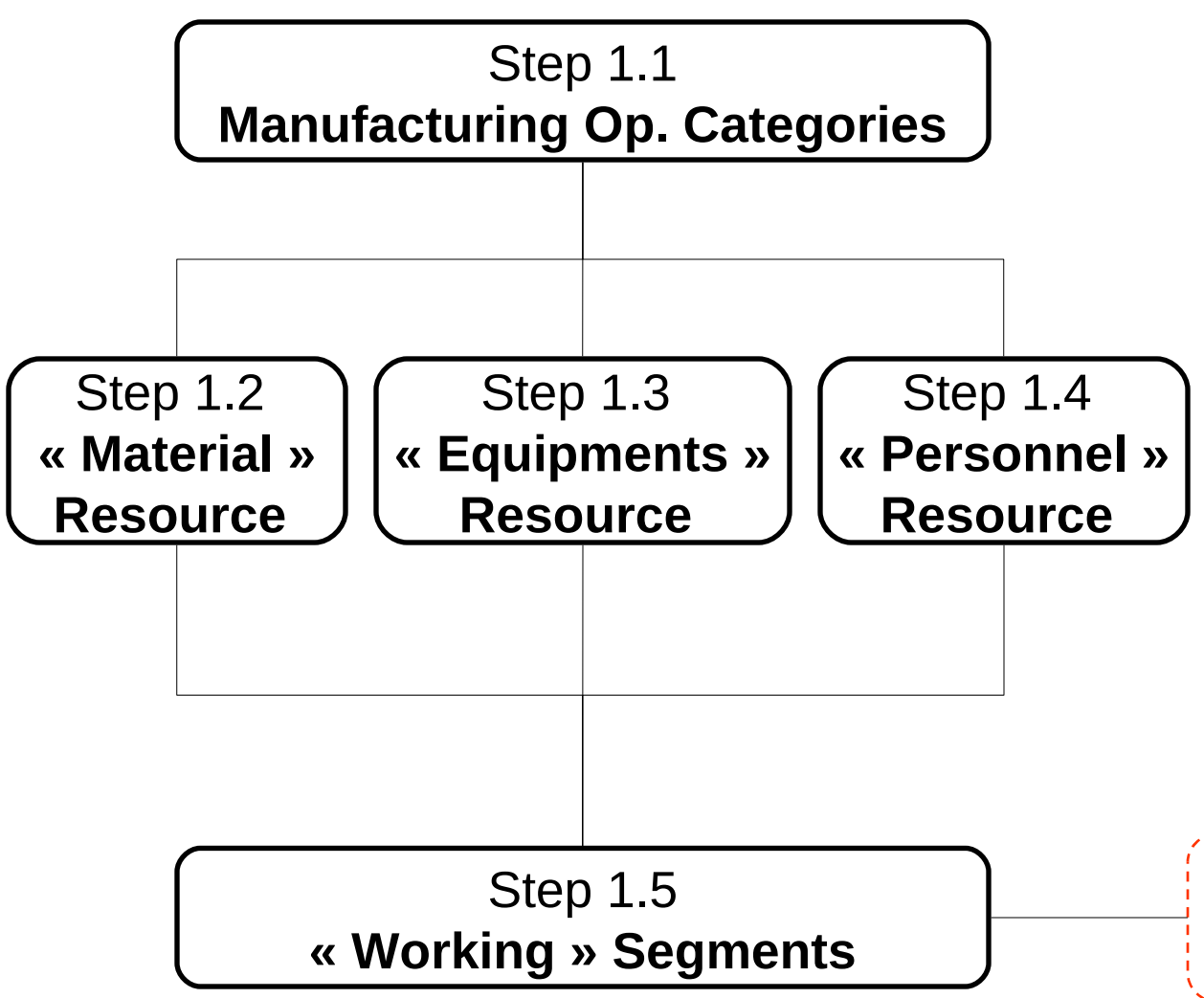
General process

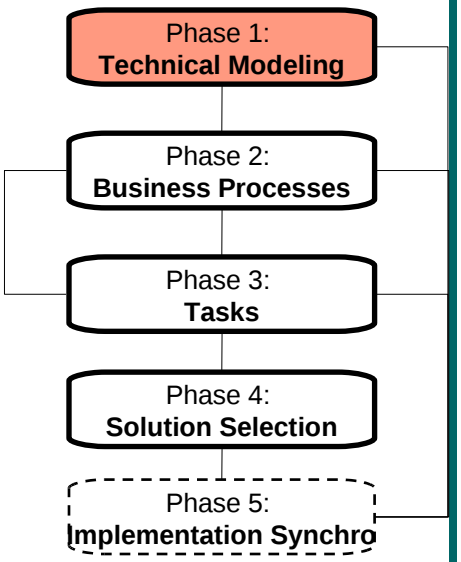


BP / Task iteration

Synchro
Implementation
Maintenance
Evolution

Phase (1): Technical modeling

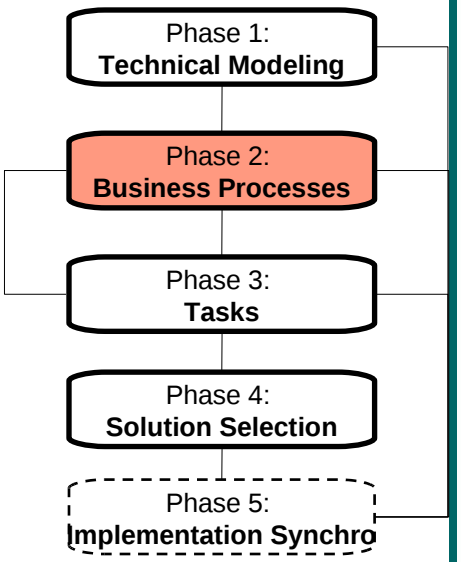




Control
Spec and Design

Phase (2): Business processes

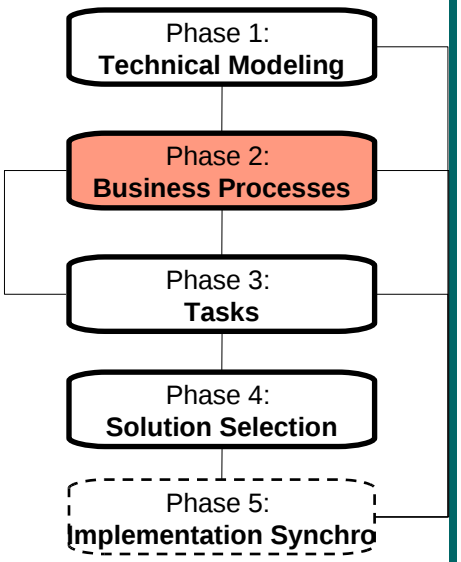
- The highest functional requirement level
- They illustrate situations and tasks (functional services) activation scenarios
- They can be manual, semi or fully automated
- They can be hierarchic
  - High level processes activate lower level processes
  - Elementary processes are tasks…
- They can be compared to Manufacturing processes : ISA88 Recipes (BP) activating EPEs (tasks)



Business processes classification

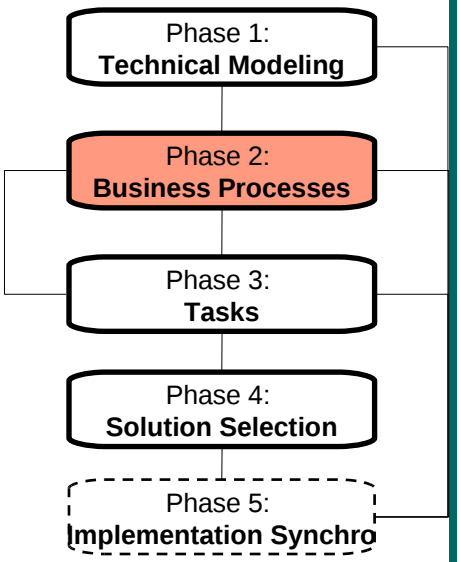
1. Execution management
   - Work organization and execution
   - MOC specific or shared
2. Resources management
   - Resources, not work related activities
3. Operations management
   - Dashboards, performance indicators, activity reports not specifically linked to work orders
4. Repository synchronization

Depend on business management options



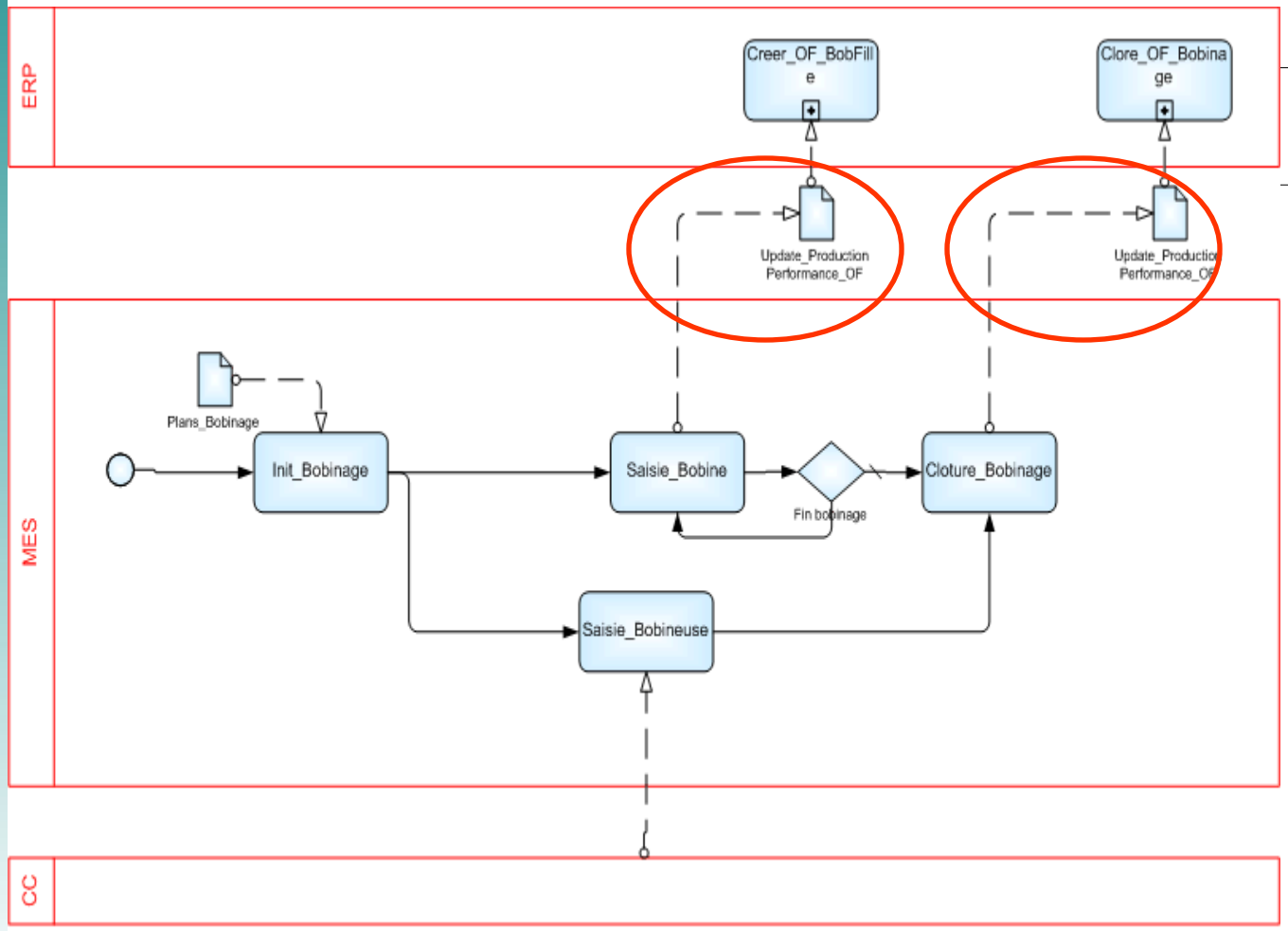
BPs highlight interfaces requirements

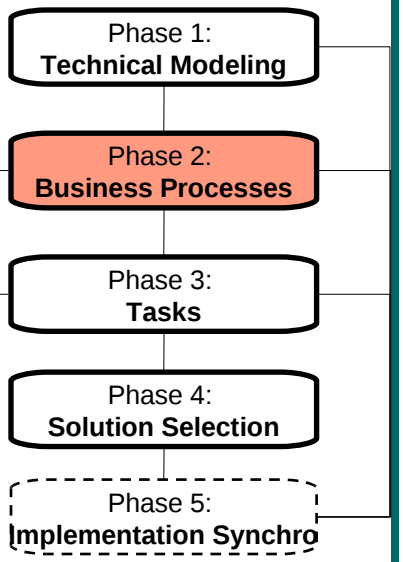
- Some processes are shared
  - Between several MOCs
  - Between Business and Execution
- These situations indicates communication links and likely transactions.



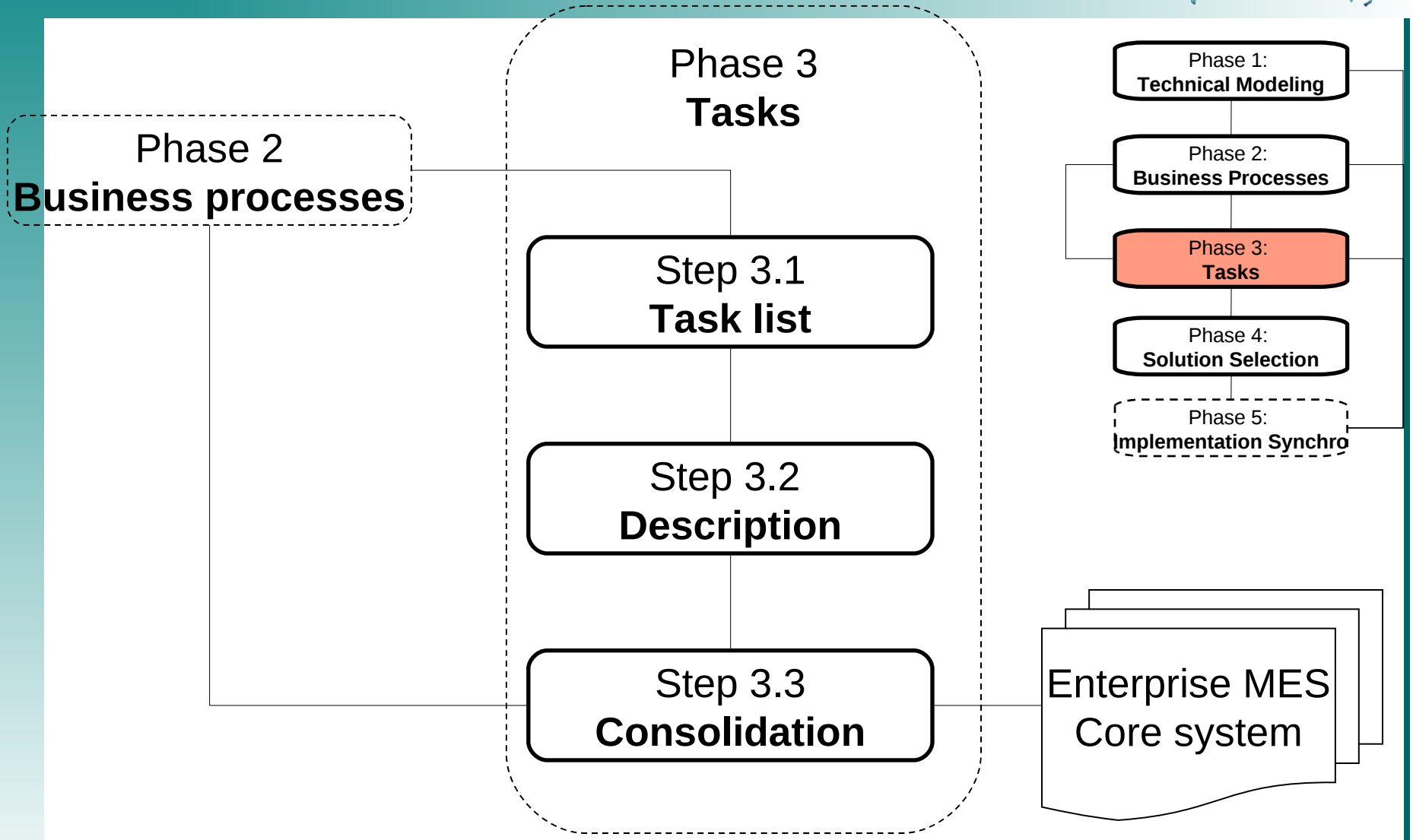
BPMN language

By BPMI, www.bpmi.org



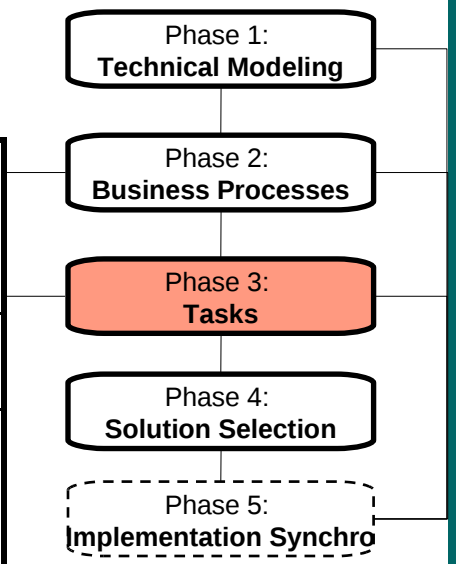


Phase (3) : Tasks



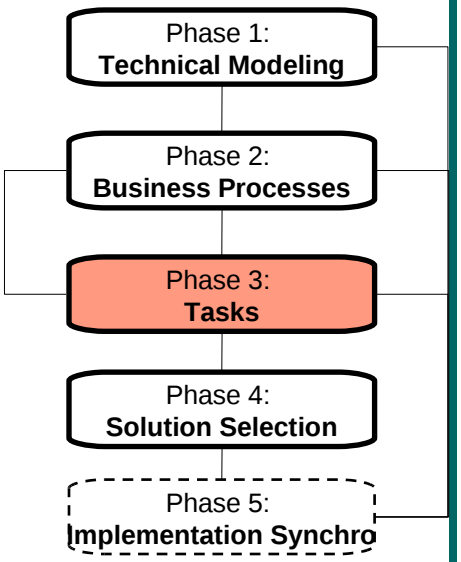
Tasks Characterization

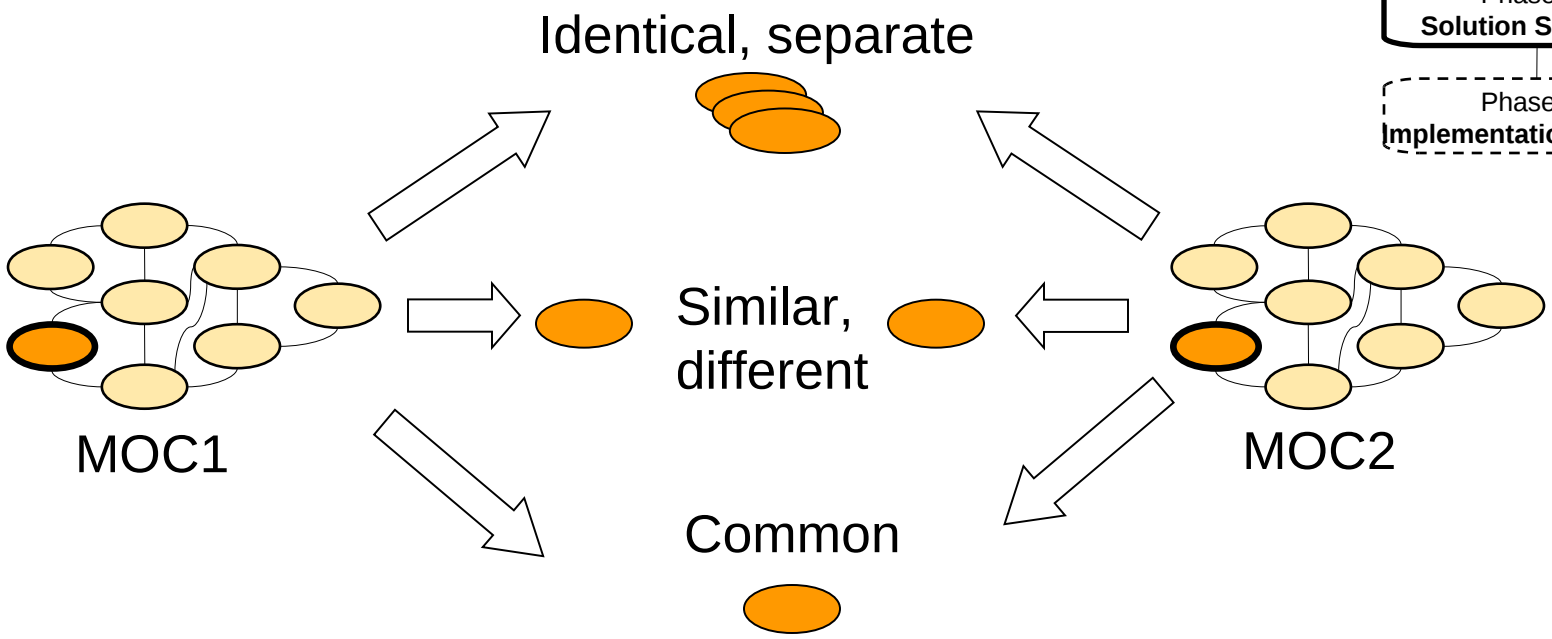
1. Physical level	6.Technical constraints
2. Segments	7.Dependences
3. Manufacturing Operation Categories	8. Task style
4. Responsibility	9. Justification
5. Users	10. Information



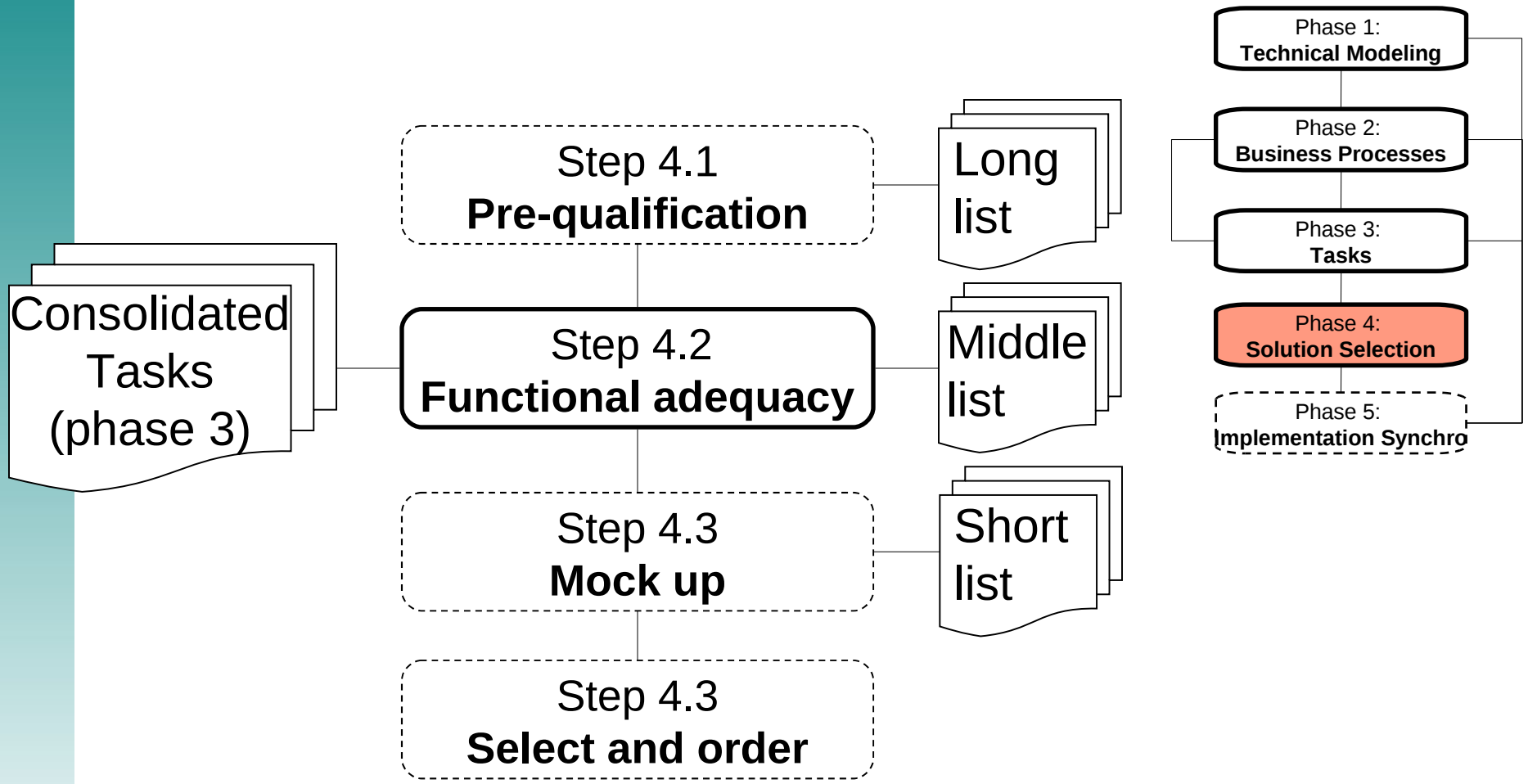
Tasks consolidation

- Similar tasks appear in different MOCs
- Consolidation may be possible

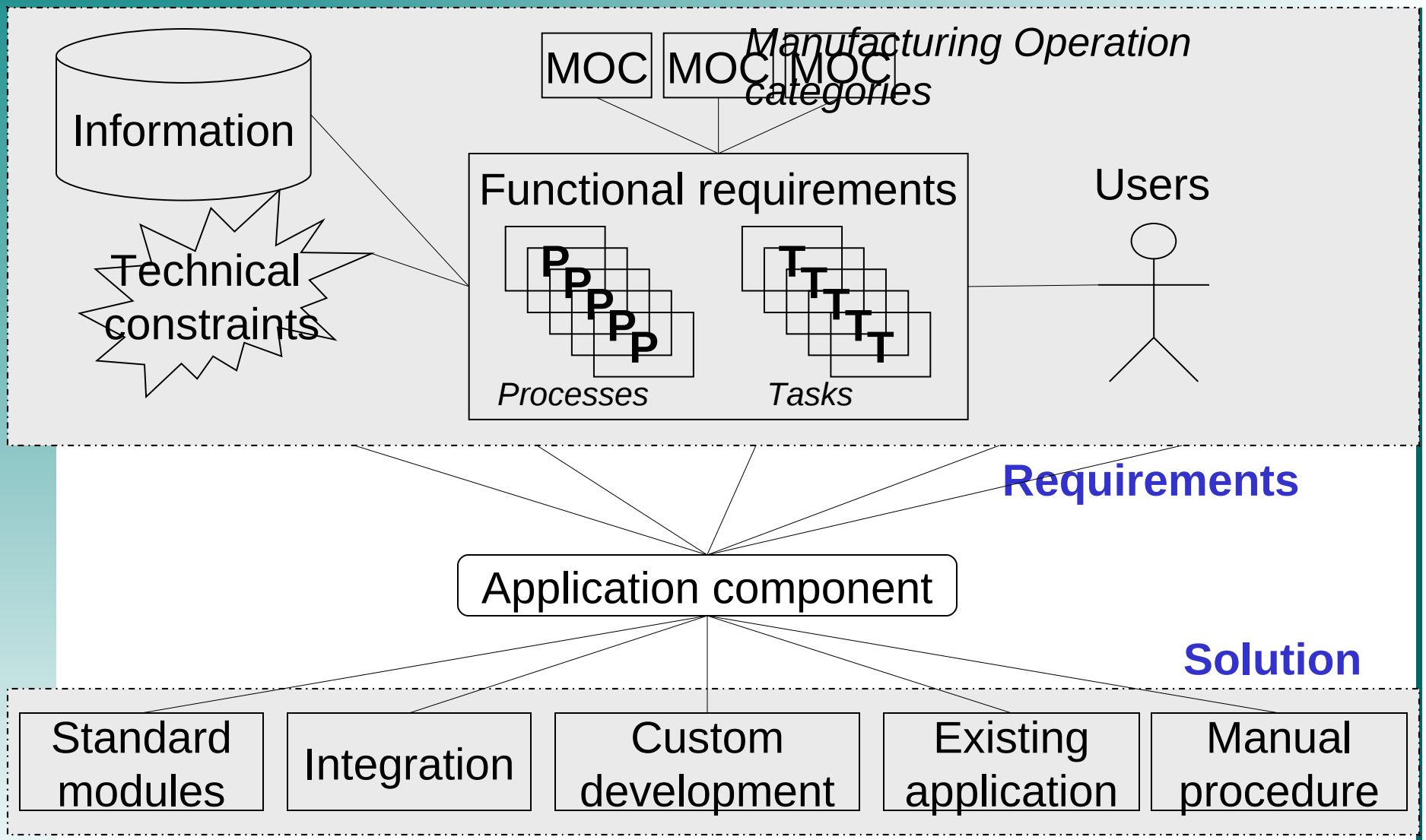




Phase 4: Solution selection



Functional adequacy



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Conclusion

- ISA95-3 offers a robust framework for MES requirements specification
- This makes possible to keeping functional design in sync with URS allowing
  - Closer to expectations delivered solution
  - Consistent evolution
  - Core system build up

However, it implies full User / Solution integrator agreement