

Work Structuring

LCI White Paper #~~4~~ 5

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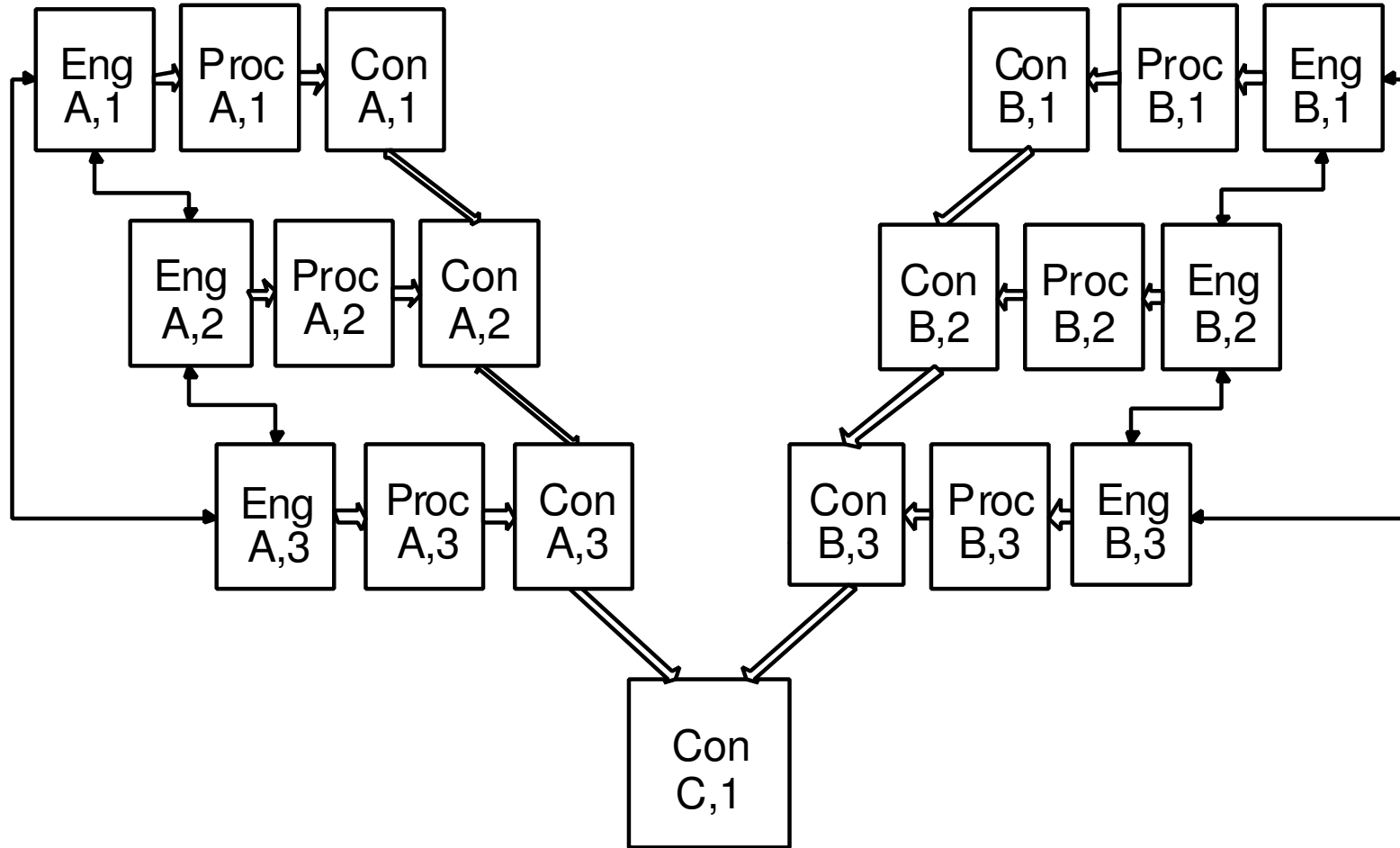
Work Structuring = Process Design

- In what chunks will work be assigned to specialists?
- How will work chunks be sequenced?
- How will work be released from one production unit (PU) to the next?
- Where will decoupling buffers be needed and how should they be sized?
- When will the different chunks of work be done?

Objectives of Work Structuring

- Mega Objectives:
 - Deliver value to the customer.
 - Make work flow reliable and quick.
- Work Flow Objectives:
 - Design for continuous flow processes where possible.
 - Increase the overlap between cyclical operations.
 - Shift fabrication and subassemblies to shops.

3 Kinds of Flows



Assembly Hierarchy

- Product (a 6 story office building)
- Phase (superstructure)
- Module (floors 1-3)
- Process (Erect steel frame)
- Operation (Align steel frame)
- Assignment (Torque bolts)

Design Flow

- Determine requirements
- Translate requirements into design criteria
- Select concepts, systems, & technologies
- Design the design, supply, & assembly processes
- Select components and materials
- Integrate components into systems and systems into the facility through detailed engineering

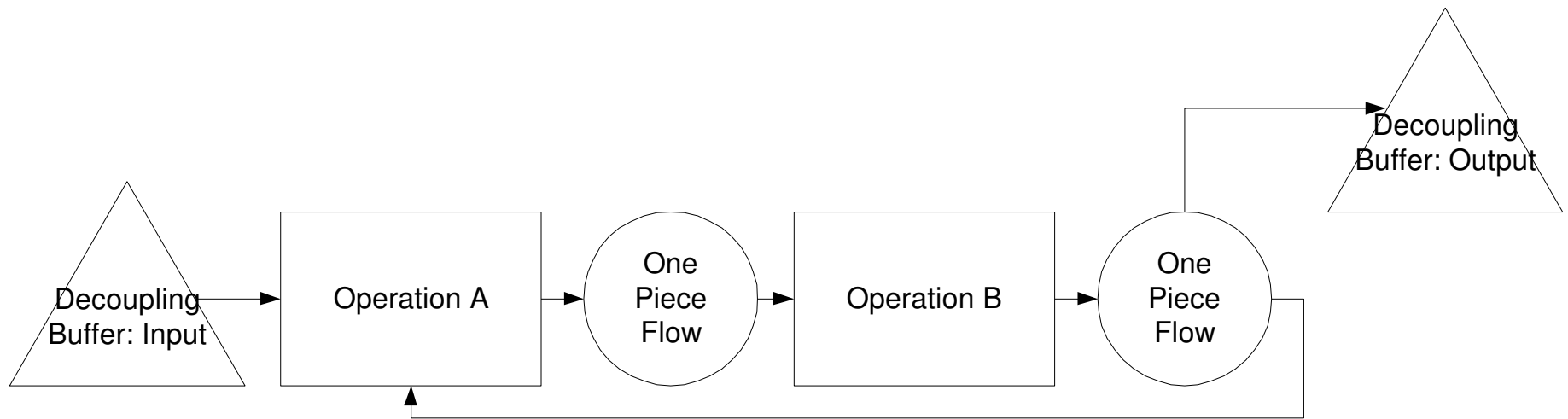
Supply Flow

- Detail the design
- Acquire materials
- Fabricate components
- Make subassemblies
- Transport to assembler

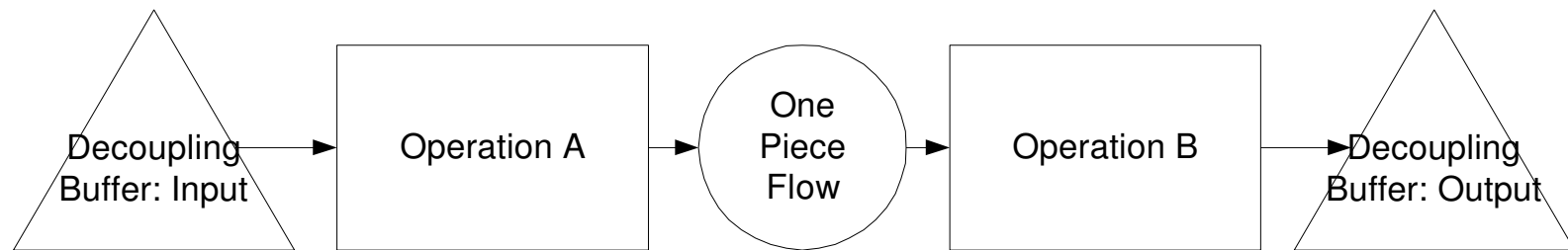
Work Structuring Framework

- Define processes as sets of connected operations through which work flows iteratively or with little or no queue time.
- Use decoupling buffers and explicit release mechanisms to control work flow at the handoffs between processes.
- Assign PUs with the needed skills & capacities to operations.
- Note: Typically, PU teams will be assigned collective responsibility for the processes in which they participate.

BASIC WORK FLOW PATTERN: ITERATIVE LOOP



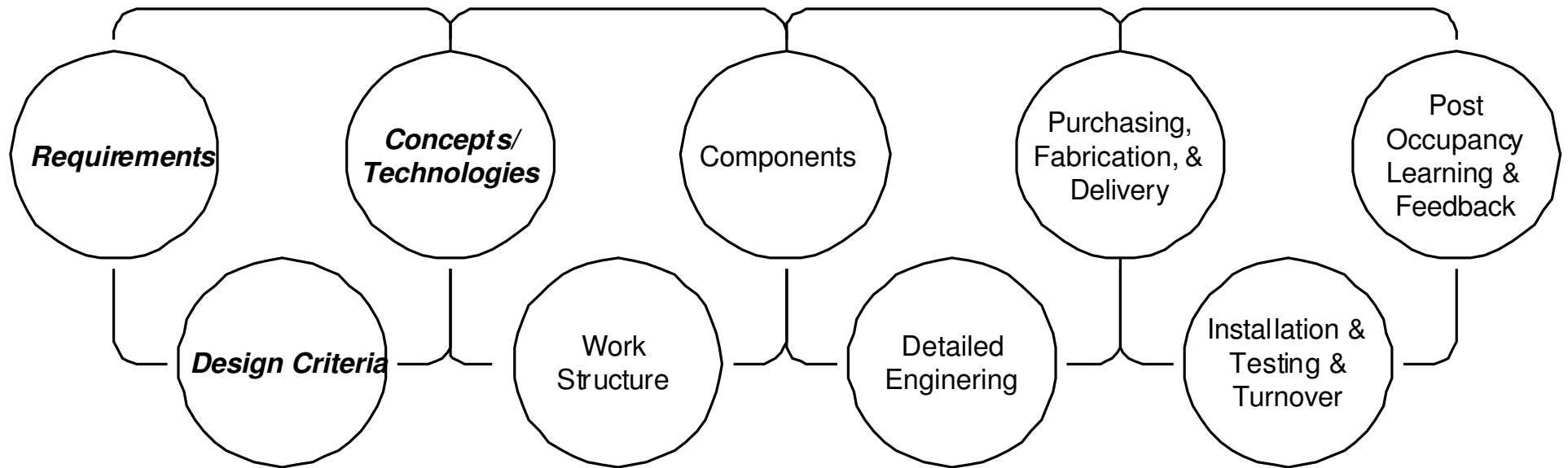
BASIC WORK FLOW PATTERN: CONTINUOUS FLOW PROCESS (CFP)



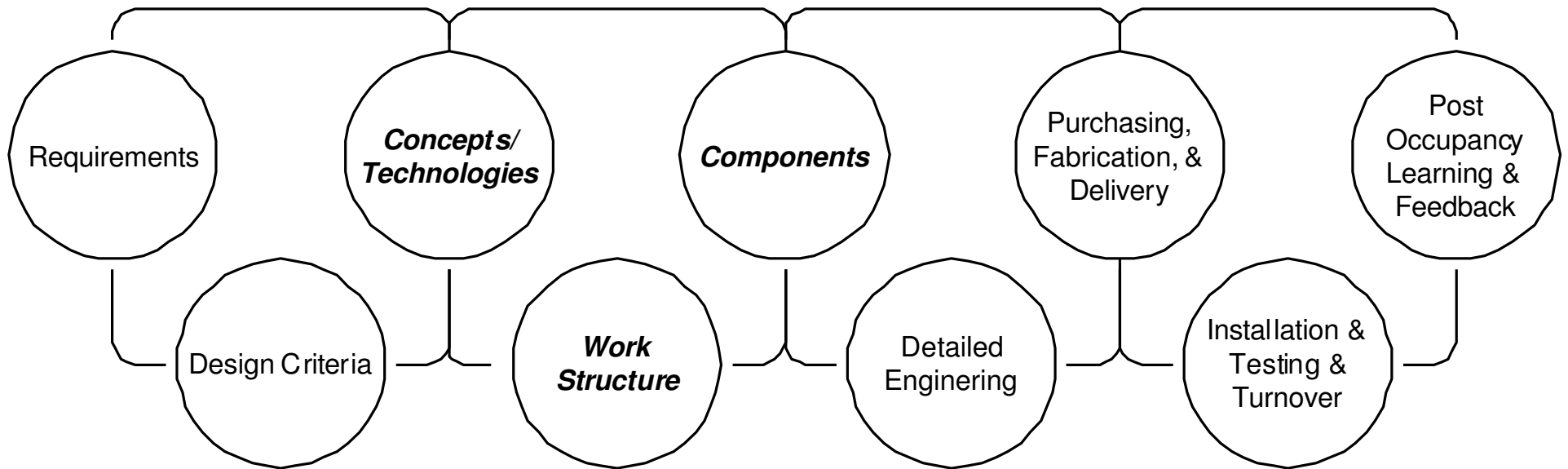
Organizing for Work Structuring

- Work structuring is a design process. Like all design processes, some work flows through iterative loops. Assign the task of work structuring to the entire production team, including design, supply, and assembly.
- Basic roles: Client, Planner, Design Specialist, Supplier, and Specialty Contractor.

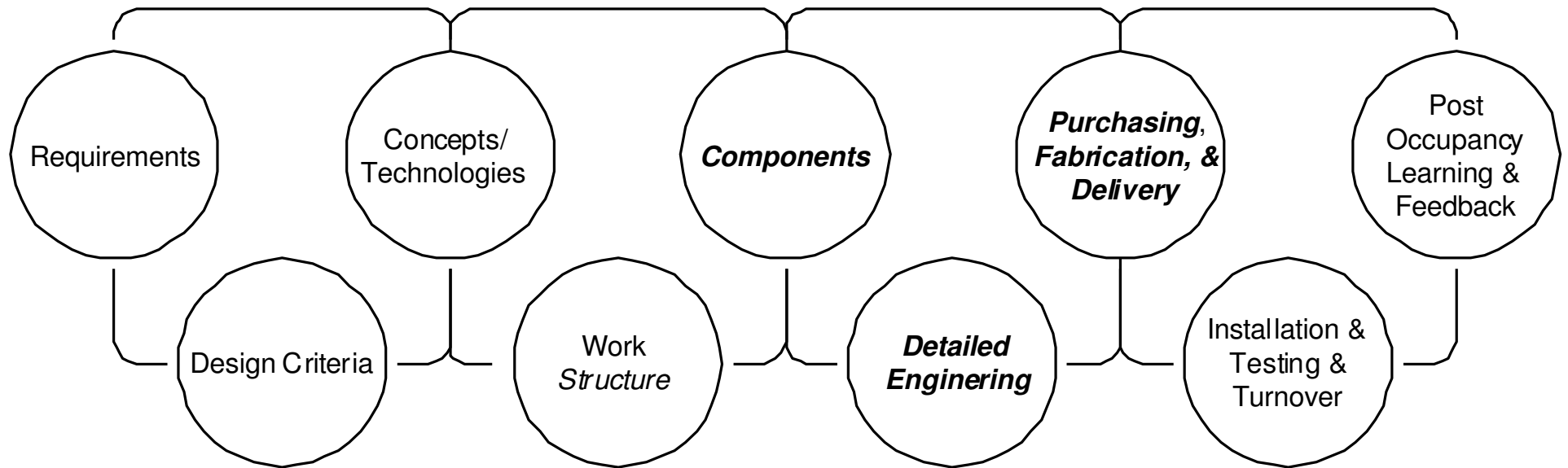
Project Delivery Process



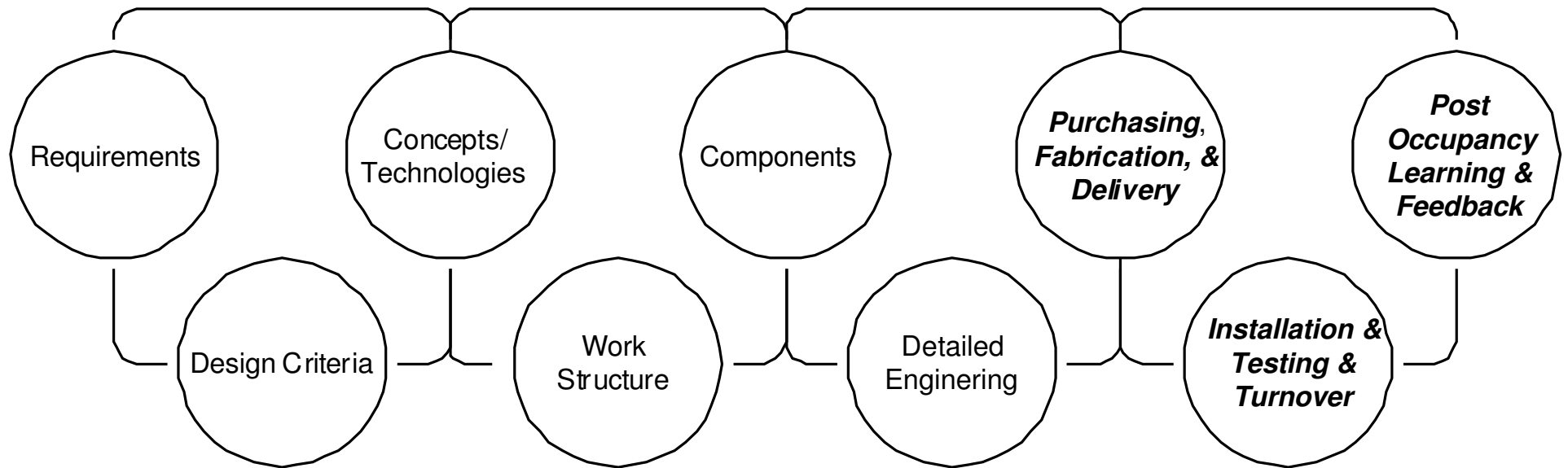
Project Delivery Process



Project Delivery Process



Project Delivery Process



Chunking

- Guidelines
 - Group work together that is to be done by the same resources either simultaneously or consecutively.
 - Assign iterative design tasks collectively to the team having the needed capabilities.
 - Avoid throw-it-over-the-wall.
 - Pursue the lean ideal of providing a custom product, in zero time, from nothing in stores.

Sequencing

- Do only work that releases other work,
- or
- Do work that does not make other work more difficult, costly, or longer.

Releasing

- Recipients pull needed materials and information from providers.
- Work is released to a process when it is placed in the workable backlog of that process.
- Providers assure conformance to requirements.
- Recipients select work from backlog.

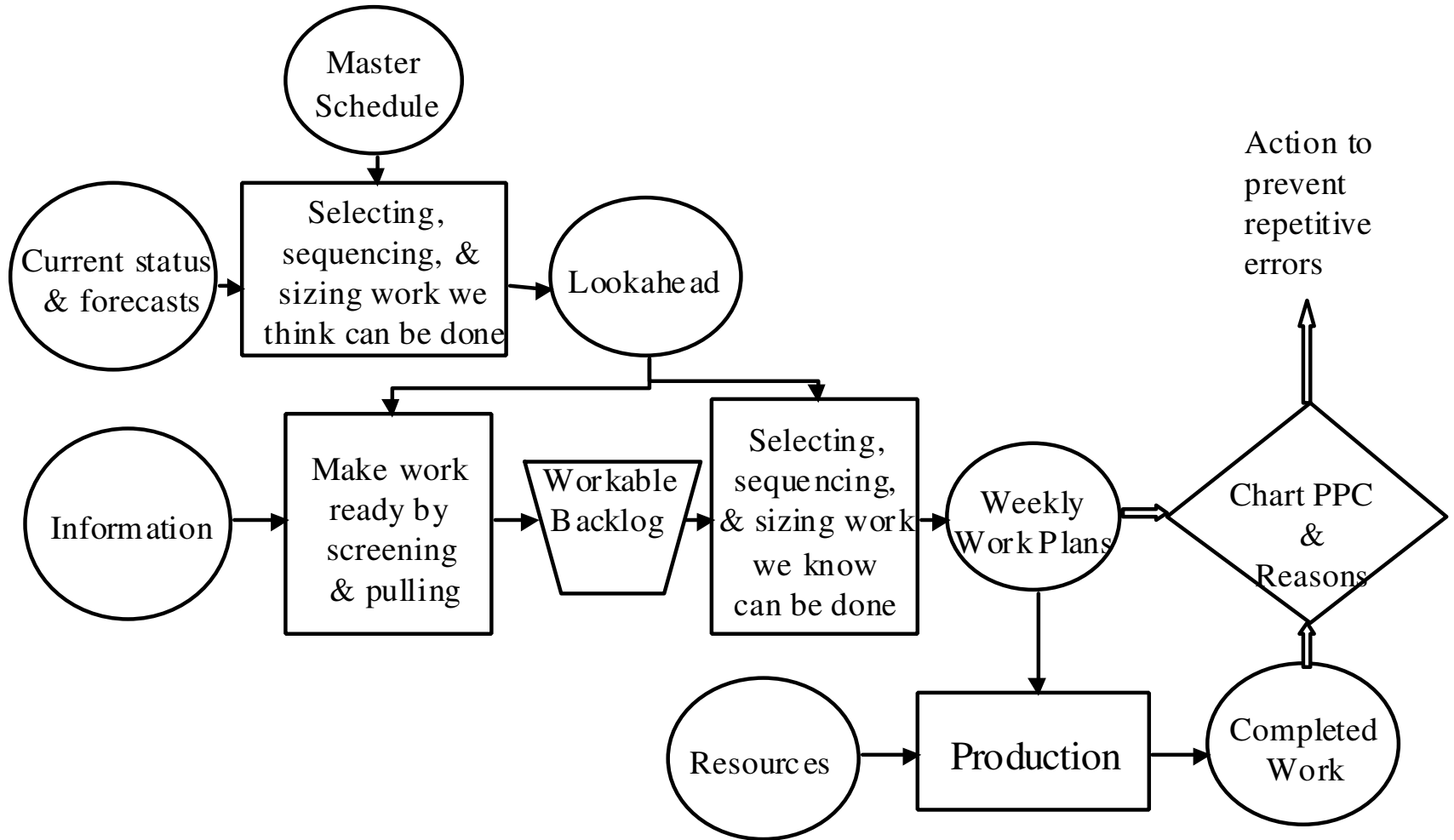
Decoupling

- Where can variability be expected?
 - quantity, timing of deliveries, quality
- Inventory or capacity buffer?
 - Is time or cost more critical?
 - Will the underutilized resource be ‘compensated’?
 - Can an inventory buffer be created?
 - Can a capacity buffer be created?

Scheduling

- Apply available resources within available durations. Adjust as needed
- Hierarchy of schedules
 - master
 - lookahead
 - weekly

PLANNING SYSTEM



Entry Rules

- Rule 1: Allow activities to remain in the master schedule unless positive knowledge exists that it should not or cannot be executed when scheduled.
- Rule 2: Allow activities to remain in the lookahead window only if the planner is confident that it can be made ready for execution when scheduled.
- Rule 3: Allow activities into weekly work plans only if all constraints have been removed.

