REALIZATION®
The Advantage of Real-Time Scheduling

PROJECT PLANNING FOR THE REAL WORLD

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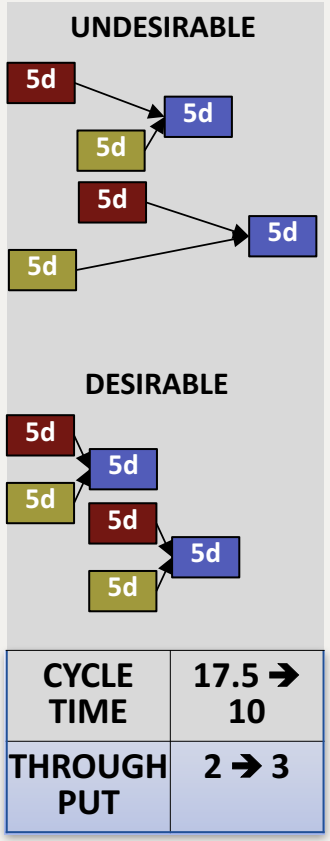
HOW WELL DO PROJECT PLANS DO THEIR JOB?

SCORE OF 1-5

- ❑ **PLANNING**: Provide reliable estimates of costs, timelines, resources… ☐
- ❑ **EXECUTION**: Enable synchronized execution ☐
- ❑ **CONTROL**: Provide reliable status and timely alerts ☐



CYCLE TIME	17.5 ➔ 10
THROUGH PUT	2 ➔ 3

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UNCERTAINTIES CAUSE PROJECT PLANS TO FALL APART

Task durations and efforts are guesstimates at best

Not all tasks can be defined upfront

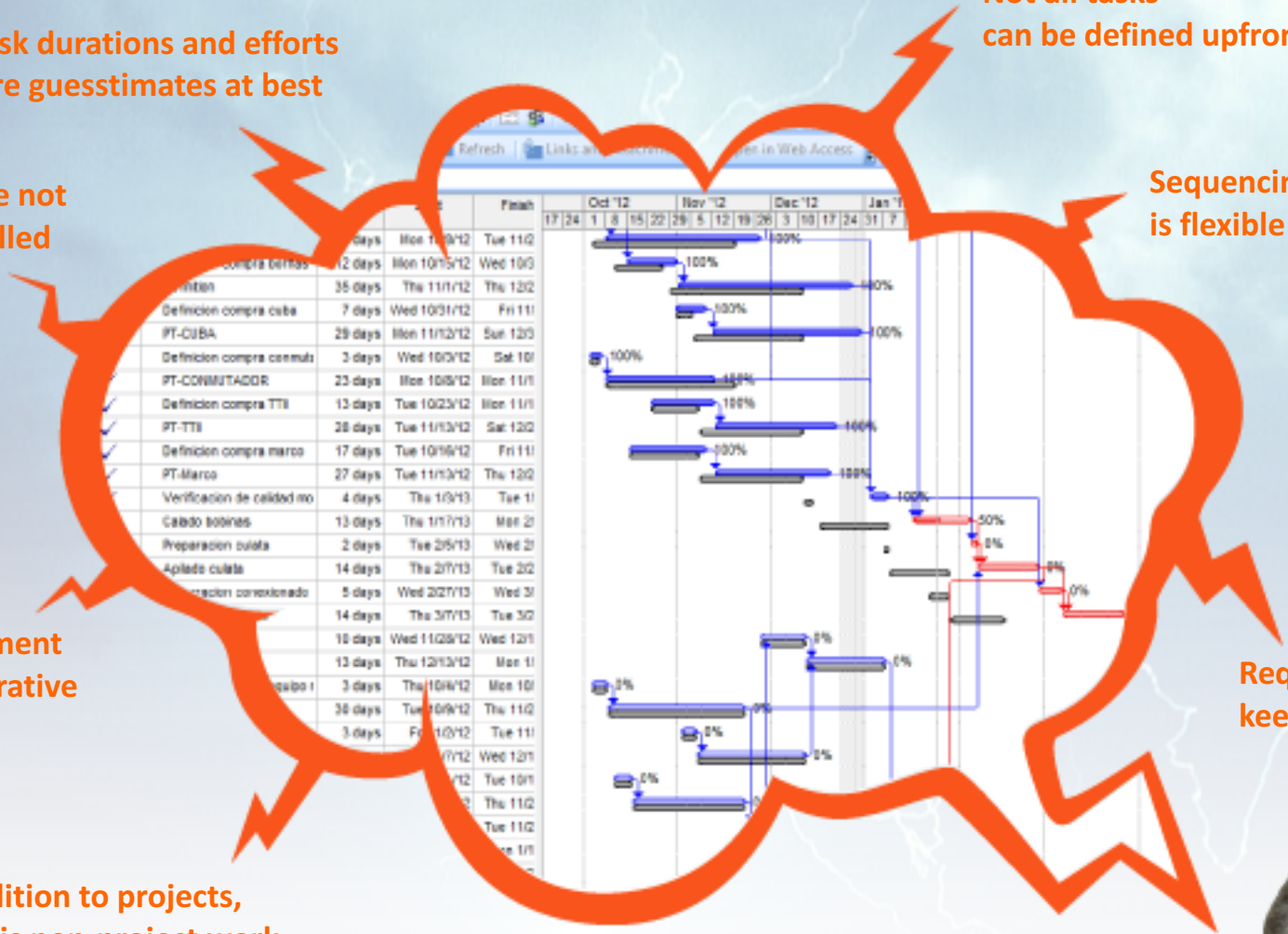
Resources are not uniformly skilled

Sequencing of tasks is flexible

The development process is iterative

Requirements keep changing

In addition to projects, there is non-project work



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BUFFER MANAGEMENT IS A BREAKTHROUGH

Keeps task priorities synchronized.

BUT IT'S INCOMPLETE

Priorities can change too often.
Doesn't tackle changes in tasks and dependencies.

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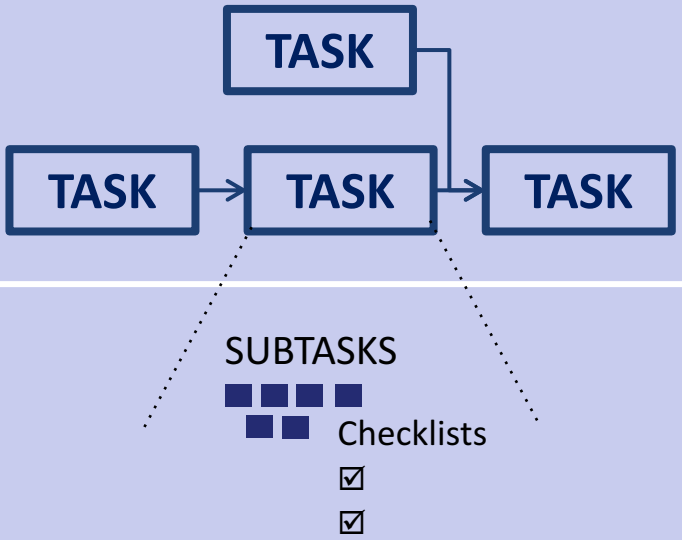
2-TIERED TASKS



TIER 1 (TASKS)
- Work package to be finished
- Enforces FOCUS & FINISH
- Makes plans and priorities stable

TIER 2 (SUBTASKS)
- Individual activities
- Facilitates assignment of work
- Gives flexibility to the frontline

- ***Traditional PERT network is always at the lowest level of tasks***
  - *Critical Chain/ Buffer Management runs at the lowest level*
  - *Causes frequent changes in priorities and multitasking*
- ***Concerto PERT is one level above the lowest level of tasks (Tier 1)***
  - *It is not the same as defining summary tasks*
  - *Critical Chain/ Buffer Management runs one level above the lowest level)*
  - *Maintains FOCUS & FINISH, while enabling More Detailed Tasks*

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USE CASES FOR 2-TIERED TASKS

USE CASE	DESCRIPTION
1. INTERACTIVE WORK	Continual flow of information between different tasks
2. INTERACTING RESOURCES	Back-and-forth handoffs at a high frequency
3. MICRO-ASSEMBLY	Many integration points along the flow of work
4. BATCHING TO SAVE SETUPS	Avoid frequent setup-up, tear down
5. ENFORCE AN EXECUTION SEQUENCE	Any of the many tasks can be done in parallel but only a certain sequence is best for FOCUS & FINISH
6. FLEXIBLE EXECUTION SEQUENCE	Allow flexibility in what task to pick up next
7. ROLLING-WAVE (AGILE) PLANNING	A valid end-to-end plan possible at the project level, but details are available only a few days or weeks out

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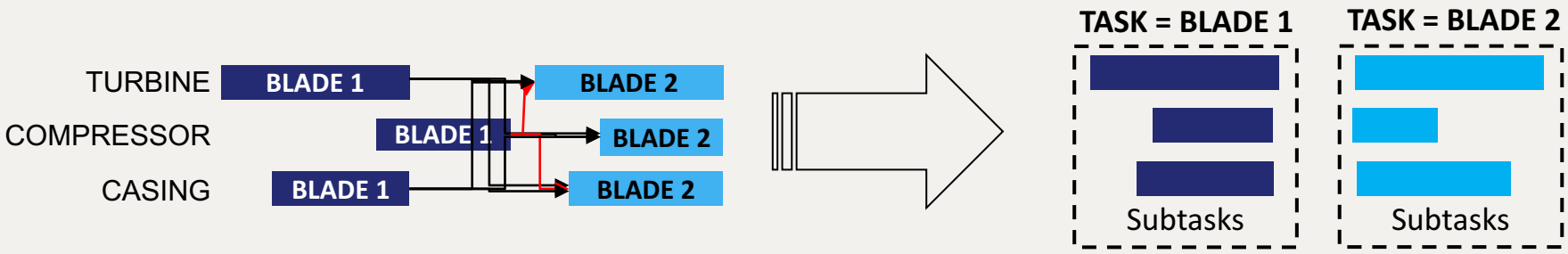
1. INTERACTIVE WORK EXAMPLE: TURBINE DESIGN

- *Project is about improving turbine power and efficiency*
- *Ideally, Turbine, Compressor and Casing should work together*
- *However, if Compressor design is delayed, Turbine and Casing tend to move forward*



SITUATION

- Continual flow of information between TURBINE, COMPRESSOR and CASING Designs

PROBLEM

- Ensuring synchronized execution of parallel designs requires complex dependencies
- Complex dependencies make the plan highly error-prone and impossible to keep up-to-date

SOLUTION

- Group TURBINE, COMPRESSOR and CASING designs as subtasks under a BLADE task
- Exercise “Release Control” for Tier-1 Tasks

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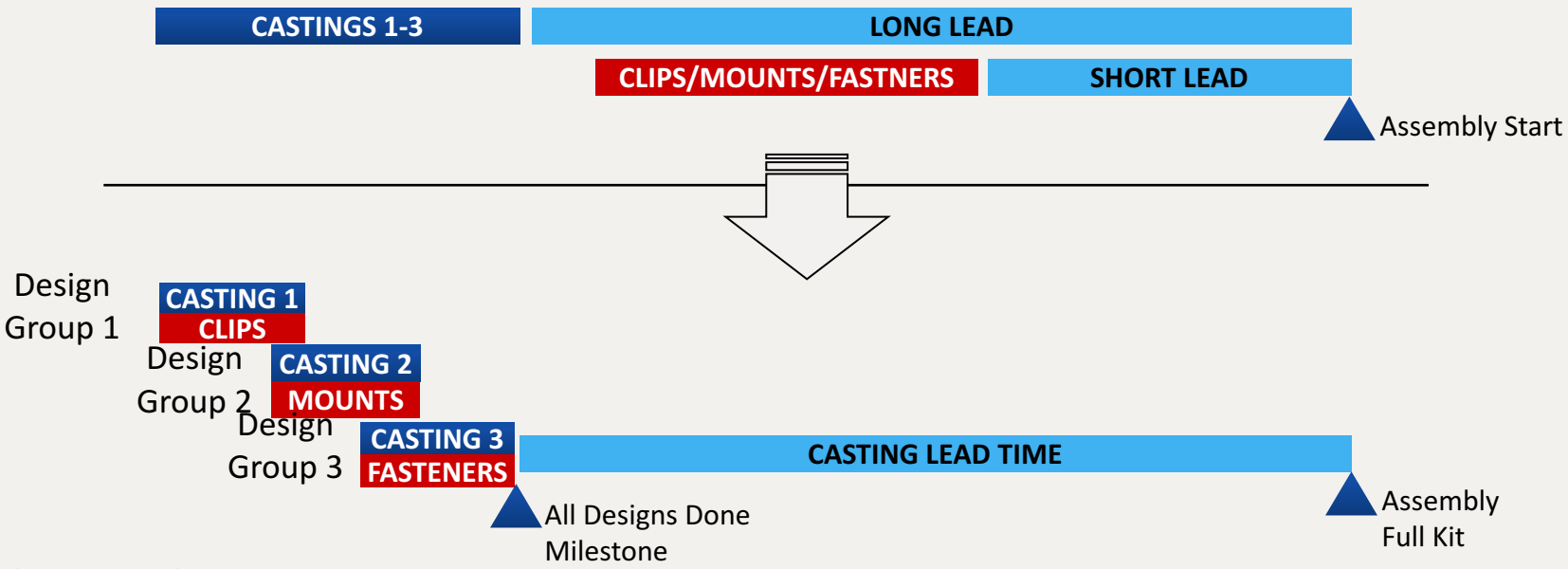
1. INTERACTIVE WORK: ANOTHER EXAMPLE



SITUATION

- Continual flow of information between design of CASTINGS and FABRICATED PARTS
- CASTINGS are long lead time item whereas FABRICATED PARTS are short lead items

PROBLEM

- Traditional PERT + “Silo Approach” attempts synchronization according to lead time

SOLUTION

- Group a CASTING and its associated FABRICATED PARTS subtasks under one task
- Even if it means that FABRICATED PARTS have slack in their execution flow

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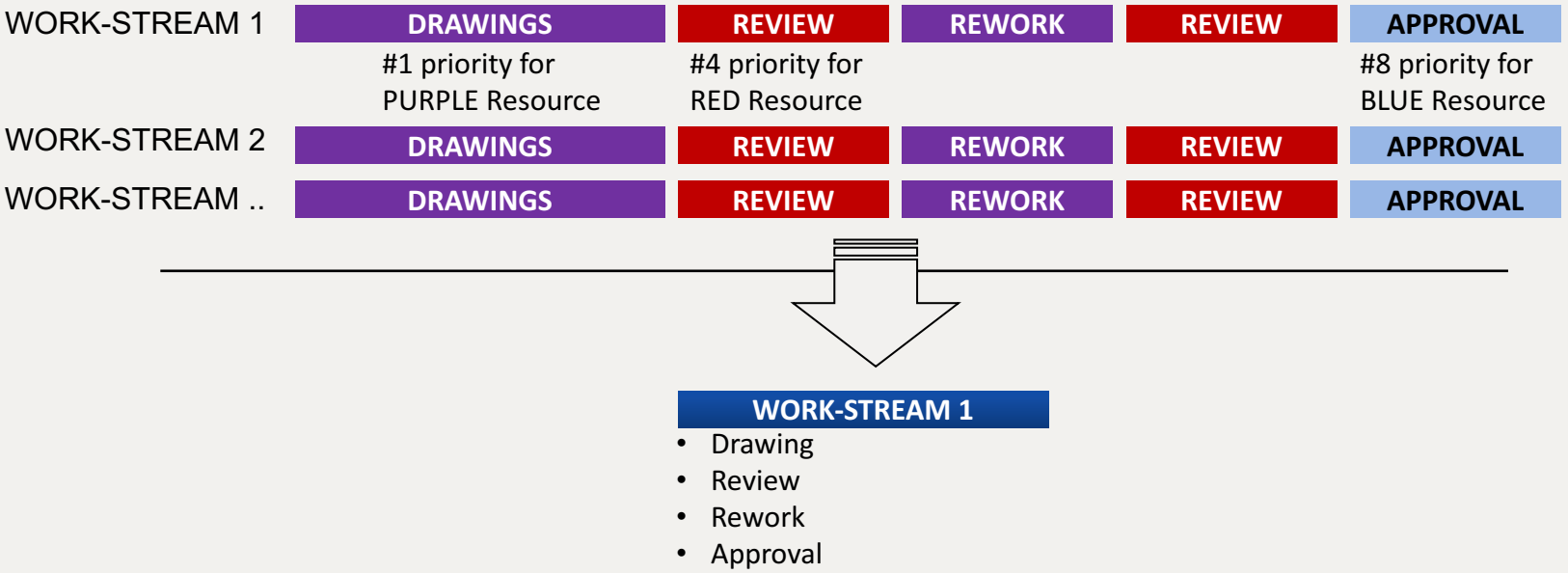
2. INTERACTING RESOURCES



SITUATION

- Work flows as shown above
- PURPLE, RED and BLUE resource groups are supporting multiple streams of work

PROBLEM

- Traditional PERT can cause different resource groups prioritize their work differently

SOLUTION

- Group all steps as subtasks under one work-stream task
- Assign PURLE, RED and BLUE resources to the work-stream task

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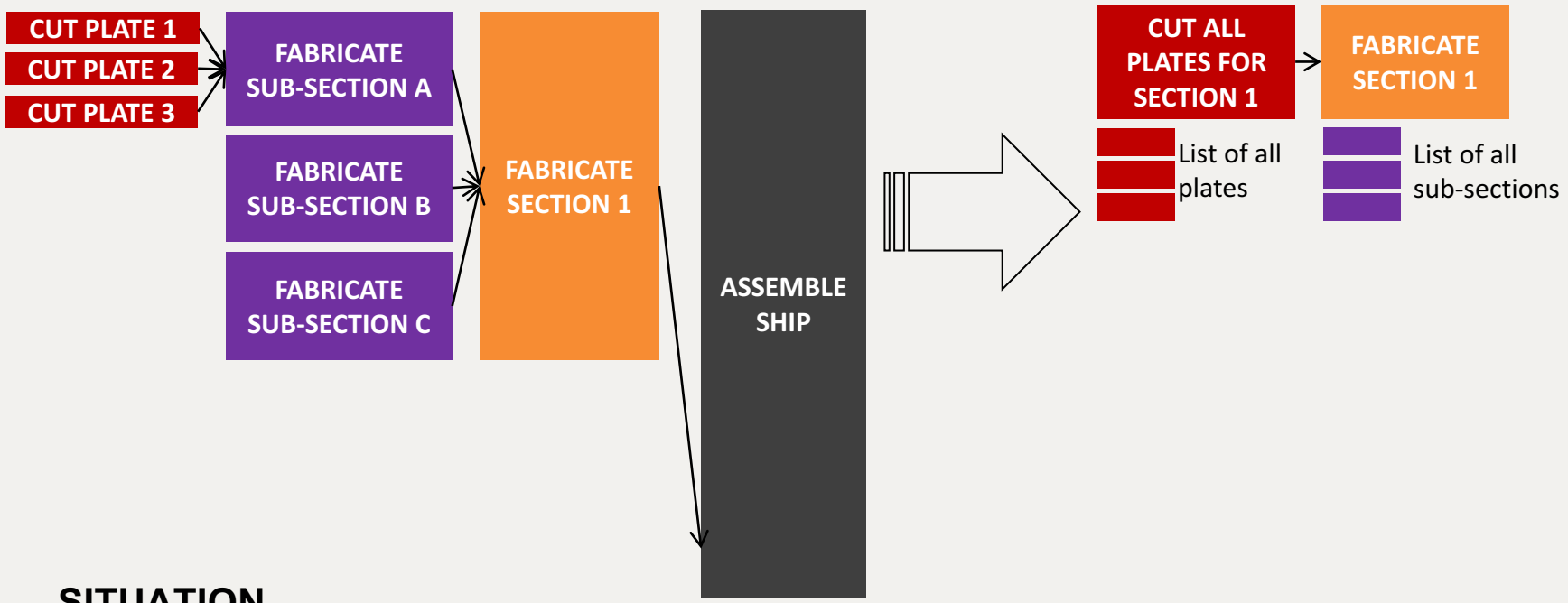
3. MICRO ASSEMBLY



SITUATION

- Work flows as shown above, with hundreds to a few thousand PLATES per SHIP
- All 3 PLATES “must-have” for fabricating SUB-SECTION 1, all 3 SUB-SECTIONS for SECTION 1 …

PROBLEM

- Traditional PERT, even if accurately and perfectly planned, gets de-synchronized during execution

SOLUTION

- Group all plates for a major assembly (a SECTION) as subtasks under one task
- Group all subsections for a SECTION as subtasks under another task

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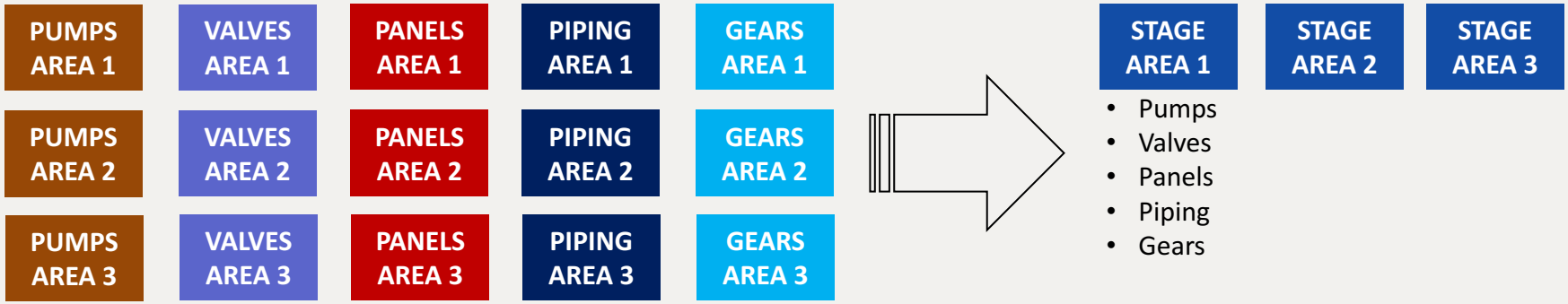
4. BATCHING TO SAVE SETUPS



SITUATION

- A crane is required to stage heavy items; actual time to stage an item is not too long
- However, setting up and tearing down a crane takes significant effort and time

PROBLEM

- Traditional PERT +"Silo Thinking" causes the crane operator to setup and tear down the crane multiple times within an area

SOLUTION

- Group all individual items for an AREA as subtasks under one AREA task

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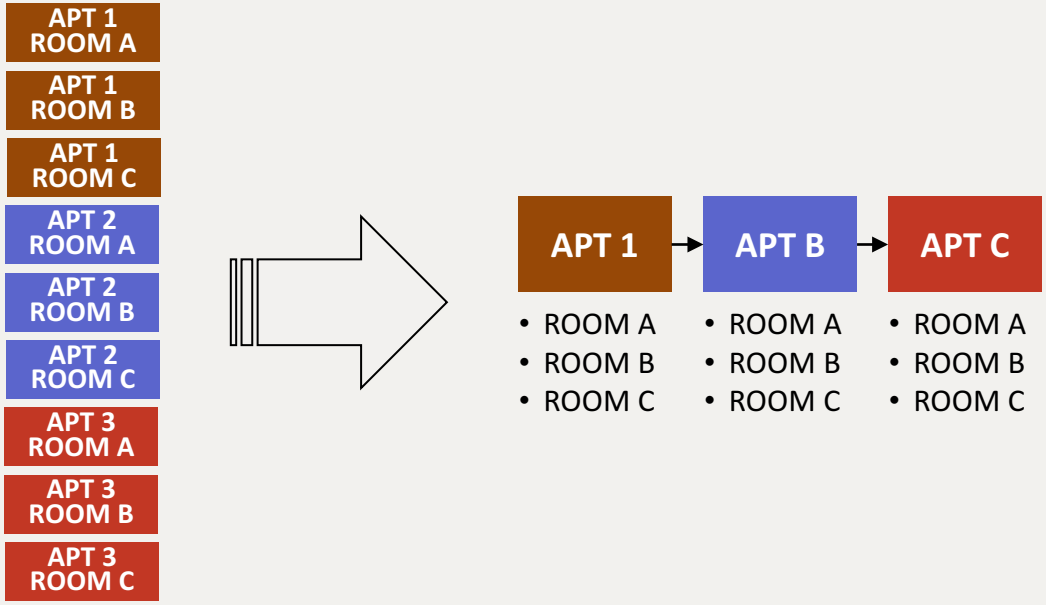
5. ENFORCE AN EXECUTION SEQUENCE



SITUATION

- The 9 flooring tasks shown above can be done in any sequence (parallel tasks)

PROBLEM

- If an APARTMENT is not completely floored, it stops follow-on work in that apartment
- As a result, you have 9 ROOMS stuck in execution

SOLUTION

- Group all 3 ROOMS in an Apartment as subtasks under one task

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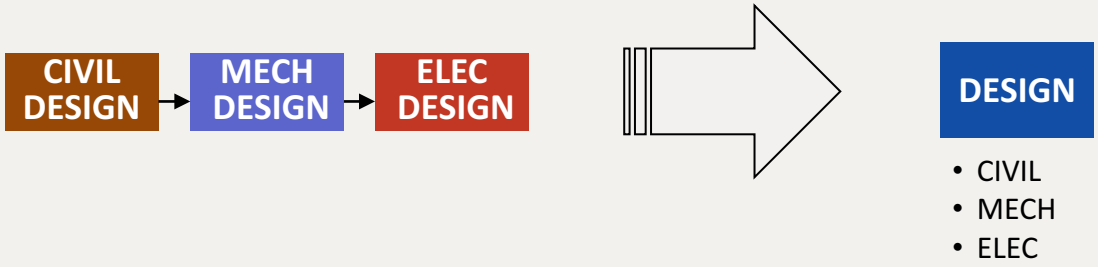
6. LEAVE EXECUTION SEQUENCE FLEXIBLE



SITUATION

- The ideal sequence for designs is CIVIL -> MECH -> ELEC

PROBLEM

- Actual sequence can change in execution depending on resourcing, technical and other factors
- Keeping this sequence up-to-date is cumbersome if not impossible

SOLUTION

- Group all 3 (CIVIL, MECH, ELEC) designs as subtasks under one DESIGN task

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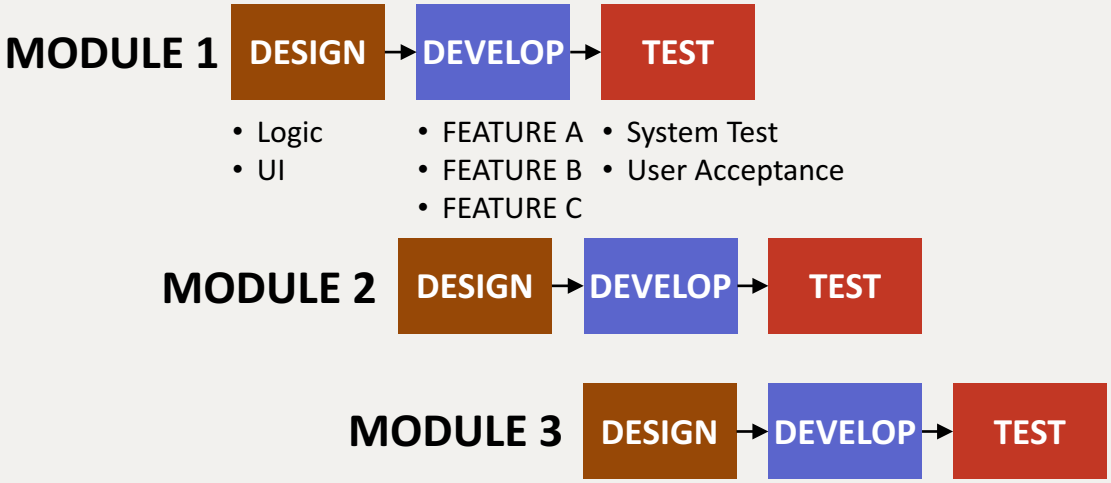
7. ROLLING-WAVE (AGILE) PLANNING



SITUATION

- A software upgrade project has 8 months to get done; on-time completion is critical

PROBLEM

- High level requirements known, but not the exact features (resources, task durations also unknown)
- However, we still need a project and resource plan to ensure timely completion

SOLUTION

- Create a project plan with tasks and resources at the functionality level
- Fill in the features as they become known after design or customer feedback
- Also adjust duration and resource estimates after the exact work is understood

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Webinar by Siemens Gamesa
https://youtu.be/4l3o9cp1u5k

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