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Customer Success Is Our Mission

Right Turns and Wrong Turns to Level 5

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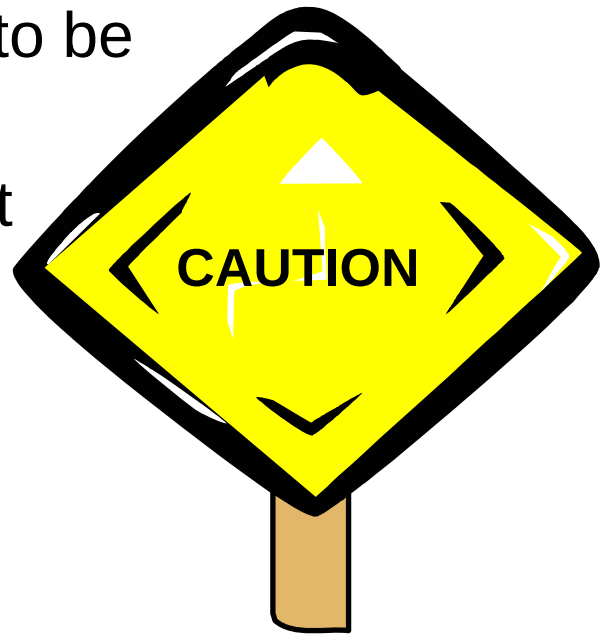
Agenda

- Typical views of organizational and project roles for High Levels of CMMI Maturity
- Risks in using these roles in certain environments
  - Using homogenous assumption in non-homogenous environments
  - Assumption that each project contributes equally to organizational goals
- Improved organizational and project statistical management approach
- Actual example
- Translation into QPM and OPP terms
- Summary

Typical View of Organizational Role at High Maturity

- Organizational quantitative business goals and objectives are injected as project objectives
- Focus on development part of lifecycle
- Organization's process performance baselines and predictive models are established to be common and applied to all projects
- Process performance baselines consist of highly aggregated data



Typical View of Project Role at High Maturity

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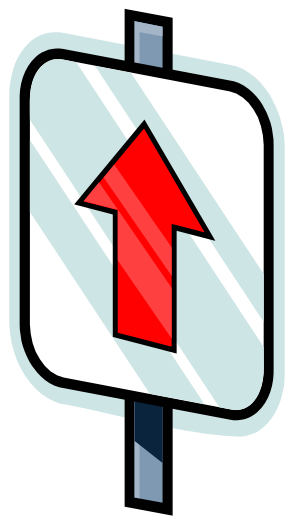
- Project objectives are “given” by the organization
- Selection of critical processes and product parameters
  - Directed by organization, or
  - Performed once, during planning phase
- Projects are managed using organizational process performance baselines and models
- Projects contribute project measurements of sub-process measurements to refine existing organizational process performance baselines and models
- Special cause analyses assume models and baselines are applicable to all projects



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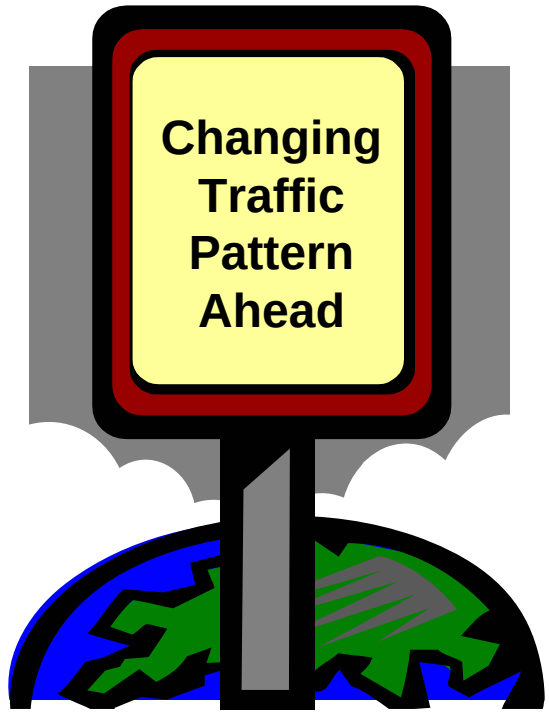
Organizational Changes Drive Implementation Changes

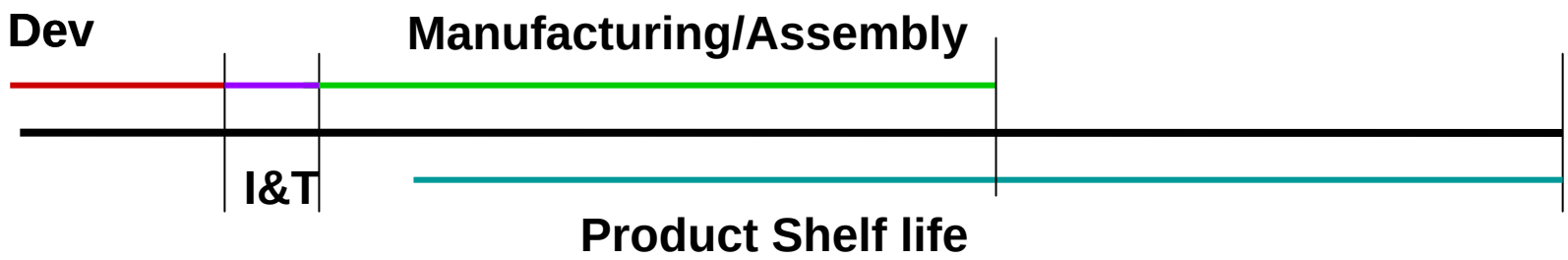
- Organizations are becoming less homogenous
  - Expanding boundaries
    - Multiple sites
    - Strategic acquisitions
    - Multiple disciplines
  - Breadth of organizational responsibilities growing
    - Development
    - Sustainment and Maintenance
    - Services
- Product development is evolving
  - New products are based on existing products
  - Cost and profitability are critical components



Interpretation of High Maturity needs to be revisited as well

Today's Environment

- The business model is now to provide complete solutions not just components, disciplines, etc.
- Development is only small part of solution (lifecycle) for more and more programs
- Models generally need iterative refinement to incorporate real data as it becomes available as the product matures
- Project solution space extends beyond technical requirements, to include business factors like cost, affordability and producibility



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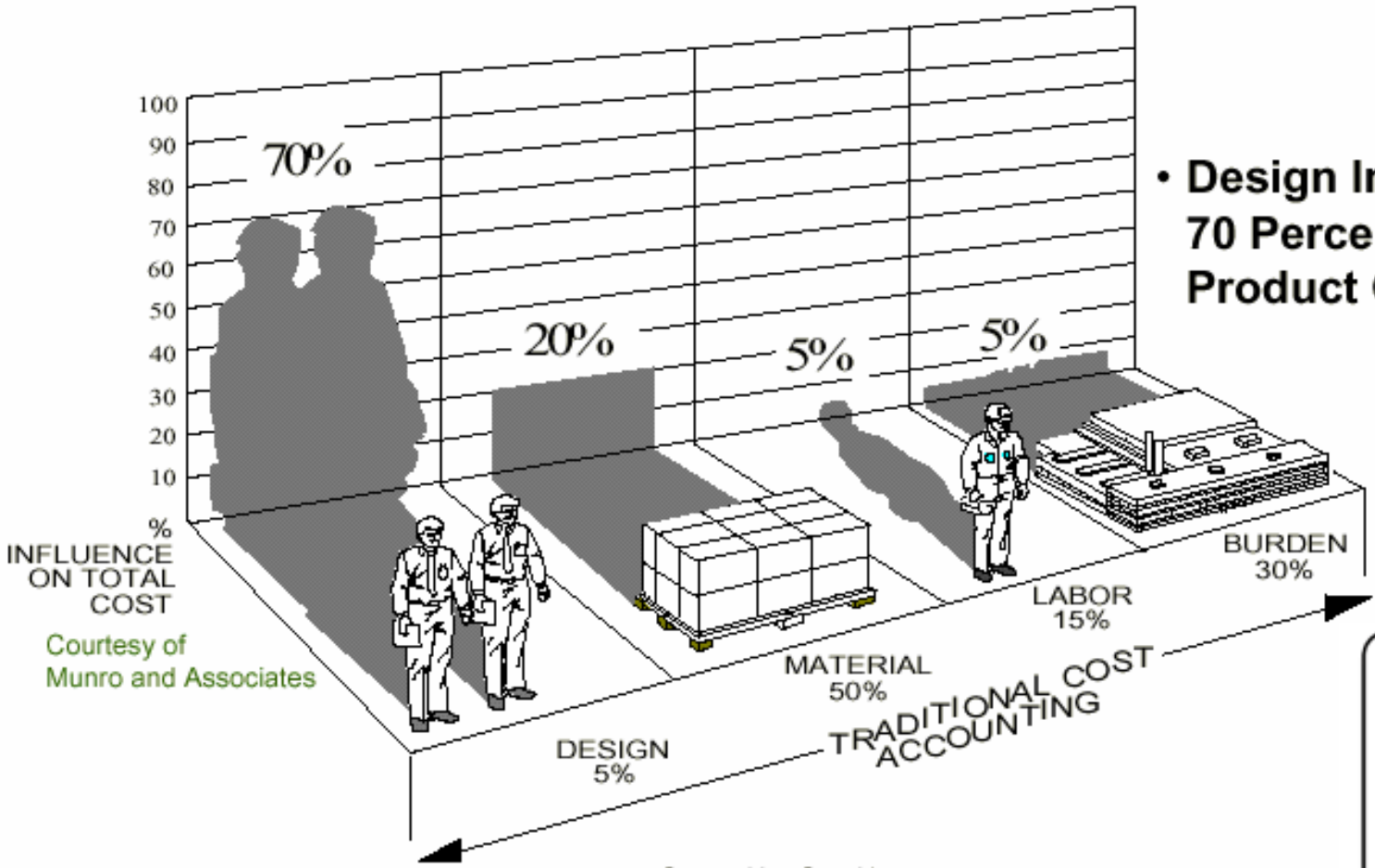
Product Costs Must be Addressed Early



- **Design Influences 70 Percent of Initial Product Cost**

RIGHT TURN

Potholes With Typical Approach - 1

- Organizations tend to search for commonalities that transcend each project
  - Common lifecycle phases may not share same criticality
  - Models tend to be single dimensional – cost, affordability and producibility not integrated with technical performance parameters
  - Aggregated data from multiple projects increases variability thus reducing usefulness
  - Unique objectives for projects not always taken into account

- Organizational models and baselines fail to provide needed project insight
  - Expected range typically not tight enough to aid projects
  - Subprocesses which are statistically managed aren't the ones that are key to project success
  - Lack of rational subgrouping leads to baselines common to all but useful to none
  - Models are not always calibrated/rerun as actual data becomes available

Potholes With Typical Approach - 2

- Not working for the project
  - Same allocation of organization objectives to all projects
  - Having “directed” subprocess stable and capable doesn’t always guarantee success
  - Not enough insight into what is key
  - Takes time and money to chase non-critical measures
  - Focus is diverted away from what is truly critical to project success
- Not working for the organization
  - Customers aren’t always satisfied
  - Not enough insight into what needs to be fixed

Project and organizational achievement of business goals is sub-optimized

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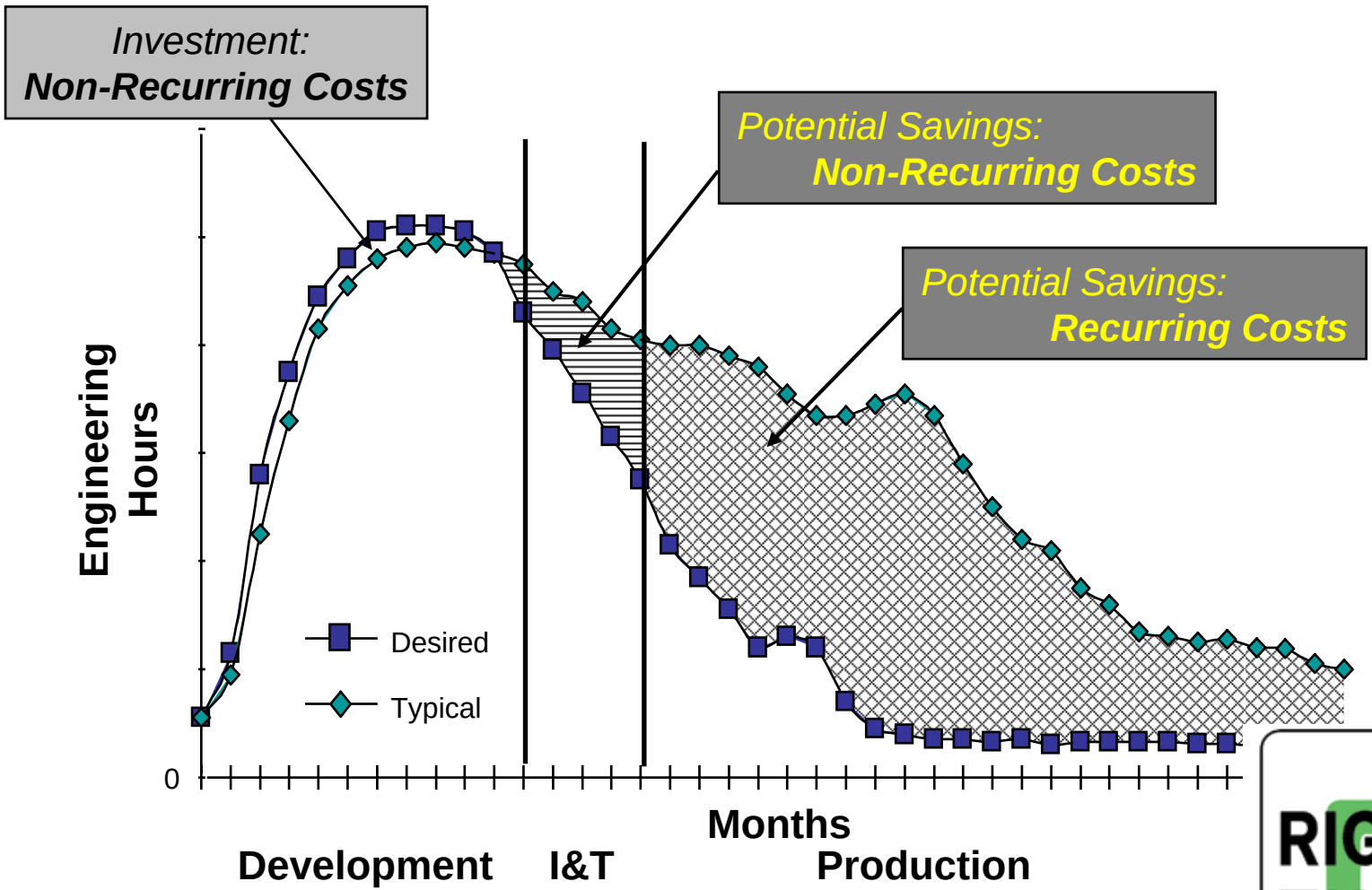
Understanding What's Critical



Need to address the characteristics critical to each project's success

RIGHT TURN

The Idea is to Predict Performance Early……

- Understand the voice of the customer – what is this product's objectives?
- Determine product characteristics that affect the voice of the customer
  - Key Product Characteristics (KPC)
- Understand what influences the KPCs
  - Key Control Characteristics (KCC)
- Use existing methods, models and simulations to determine where to set the KCCs to maximize probability of achievement of the product's objectives
- By statistically managing these, it will be possible to predict whether the project will be able to achieve its objectives

…To increase the probability of meeting project requirements, at reduced cost and in less time.

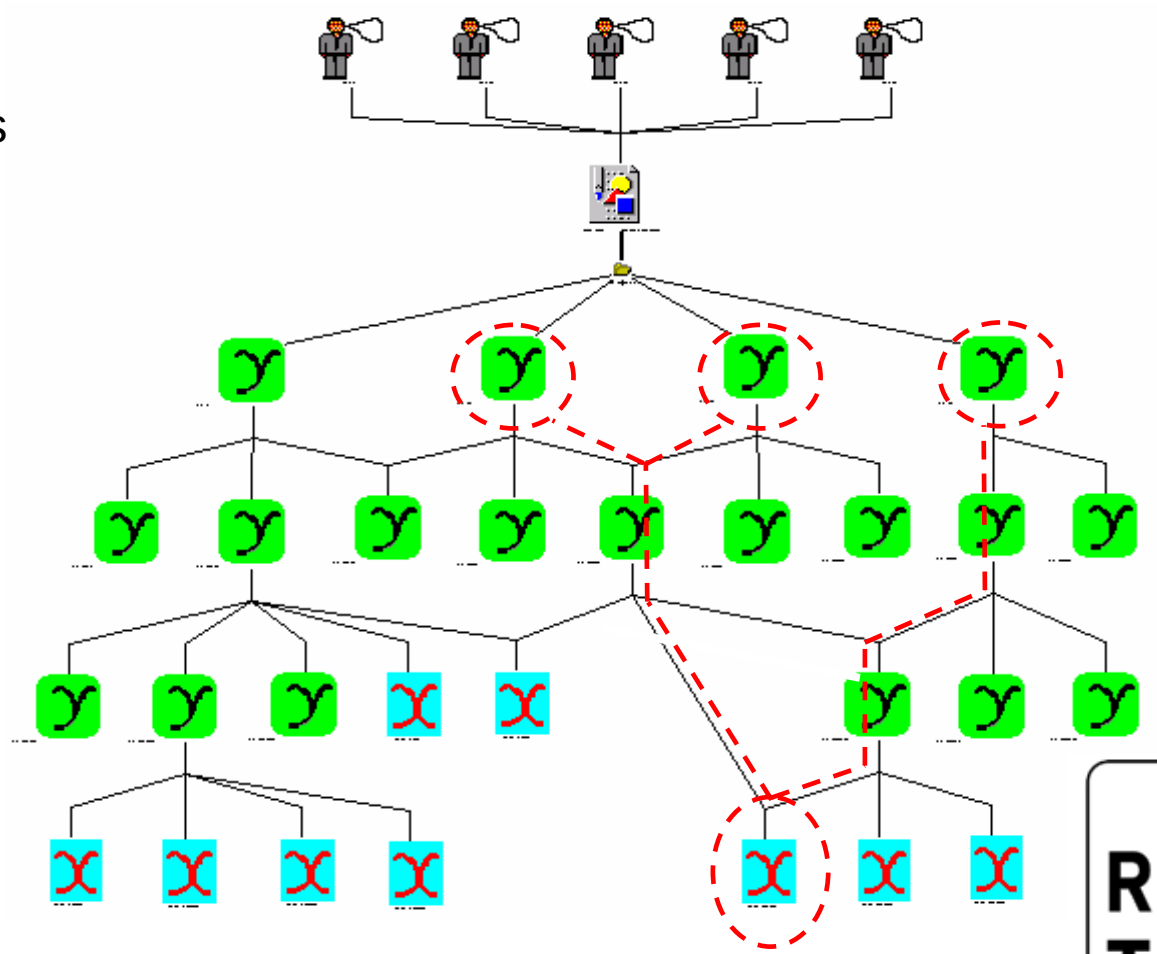
RIGHT TURN

Identify Key Control Characteristics

Programs identify Key Product Characteristics (KPC)

Continued identification of KPCs to lower levels through Functional Analysis

Finally identify Key (Process) Control Characteristics (KCC)

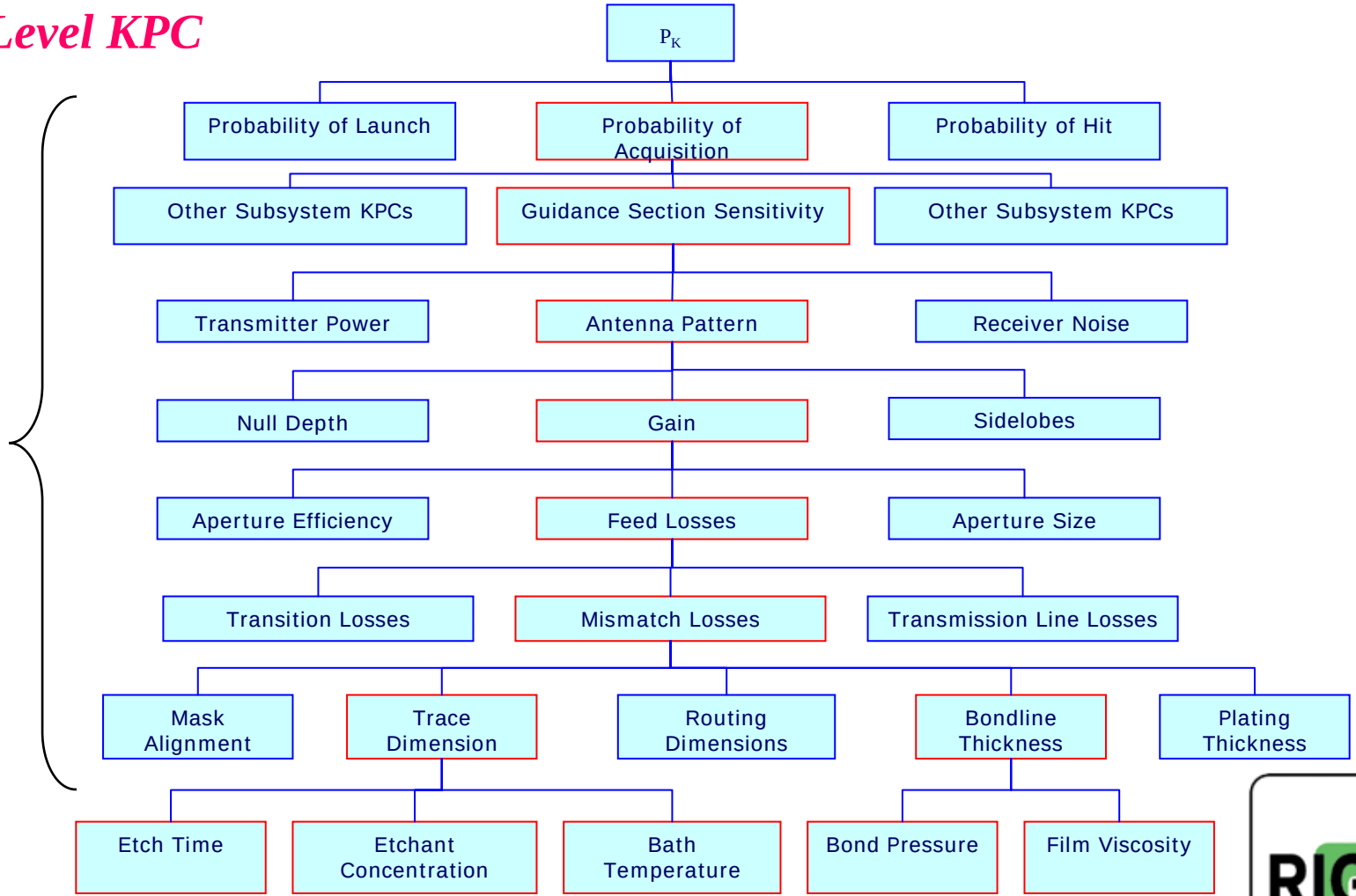


Simple Example of a KCC Affecting Several KPCs

RIGHT TURN

Example of Key Characteristic Development

System Level KPC



KPCs

KCCs

System Level KPC driven by lower KPCs and KCCs

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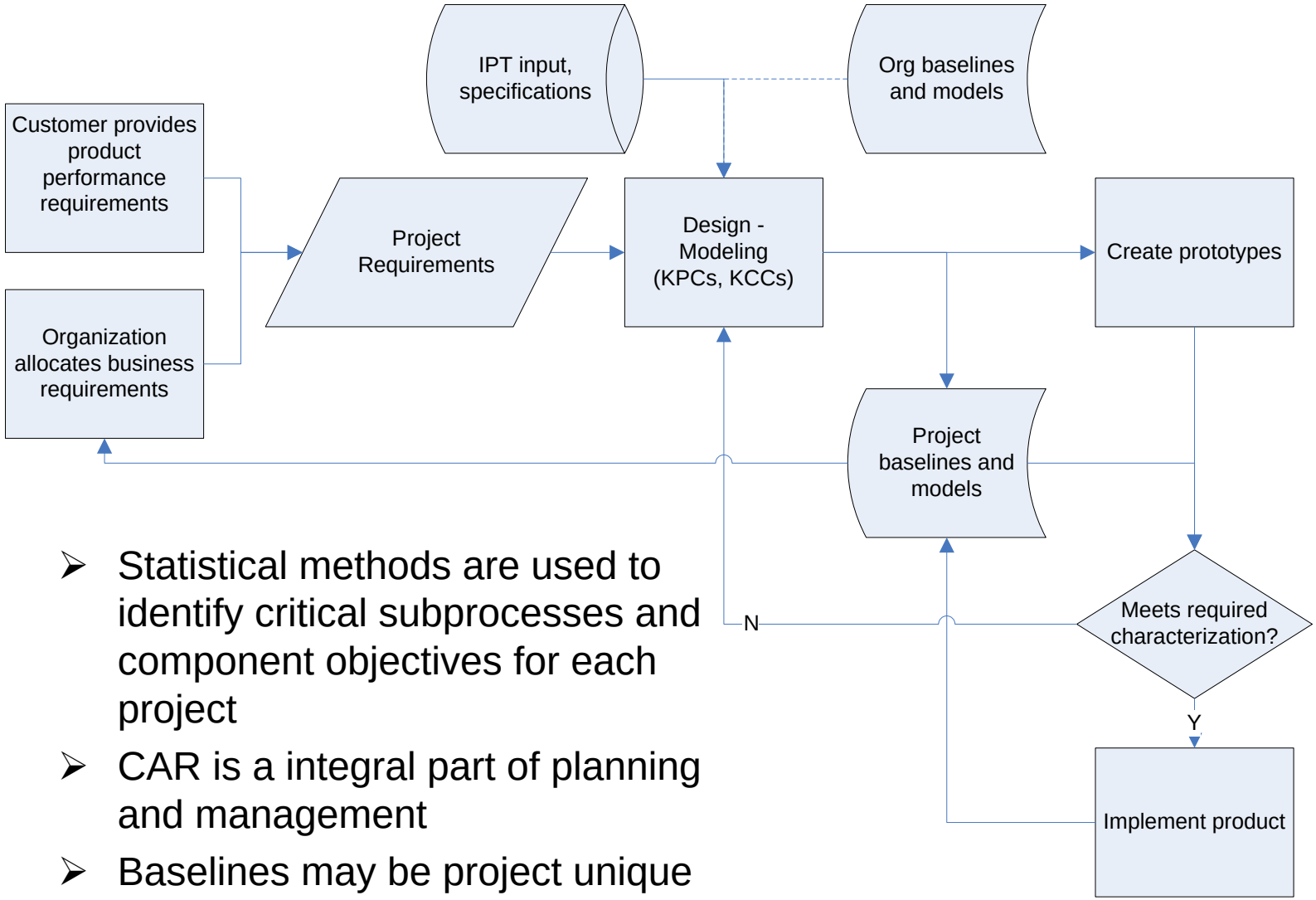
Quantitative Project Management



- Statistical methods are used to identify critical subprocesses and component objectives for each project
- CAR is a integral part of planning and management
- Baselines may be project unique

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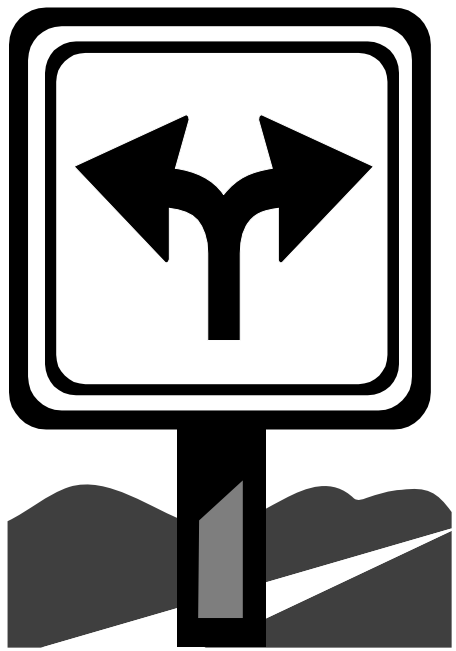
Helps From Design through Manufacturing, All the Way to End User

- ***Helps managing the design complexity*** of a large system, leading to a ***robust design***, by concentrating on the features which significantly impact key objectives
- ***Forces attention*** at those design aspects that are ***most critical to satisfy Customer needs,***
- ***Ties Critical Parameters*** on lower design levels ***back to customer needs*** and quantify their impact,
- ***improves design quality*** by driving a ***"whole system view" mindset*** throughout the design teams and ***increases predictability/reduces risk*** for integration, design/development and manufacturing.
- ***Increase predictability/reduce risk*** for design/development, integration, mfg and ***mission success***.
- Reduces overall development cycle time and cost

Summary - 1

- Organizations with homogenous projects benefit from organizational commonality for quantitative management
  - Selecting critical subprocesses may be pre-determined
  - Baselines and models already exist and only need calibration with use
  - Lessons learned and improvements translate easily to projects throughout the organization



Summary - 2

- Organizations with non-homogenous projects
  - Organization objectives need to be allocated to individual projects/programs
  - Projects identify component characteristics and subprocesses whose variation has greatest impact on all project/program objectives
  - As real data is available models are recalibrated
  - The entire product life-cycle needs to be taken into consideration
- Organizational role
  - Provide baselines and models at component level
  - Manage Organizational Set of Standard Processes (OSSP) to meet organizational objectives

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Questions

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