

# Module SEFS Context

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## Abstract

Understanding the context is essential to understand the problem and the solution space. We discuss the way companies work, the customer, business, and life cycle contexts, and how to scope the work.

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version: 0

# SEFS How companies work; workflow in organizations

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## Abstract

Companies have a hierarchical organization structure. However, when developing and deploying systems, most work happens across organizational entities. This nugget explains the typical processes for developing and engineering programs and systems.

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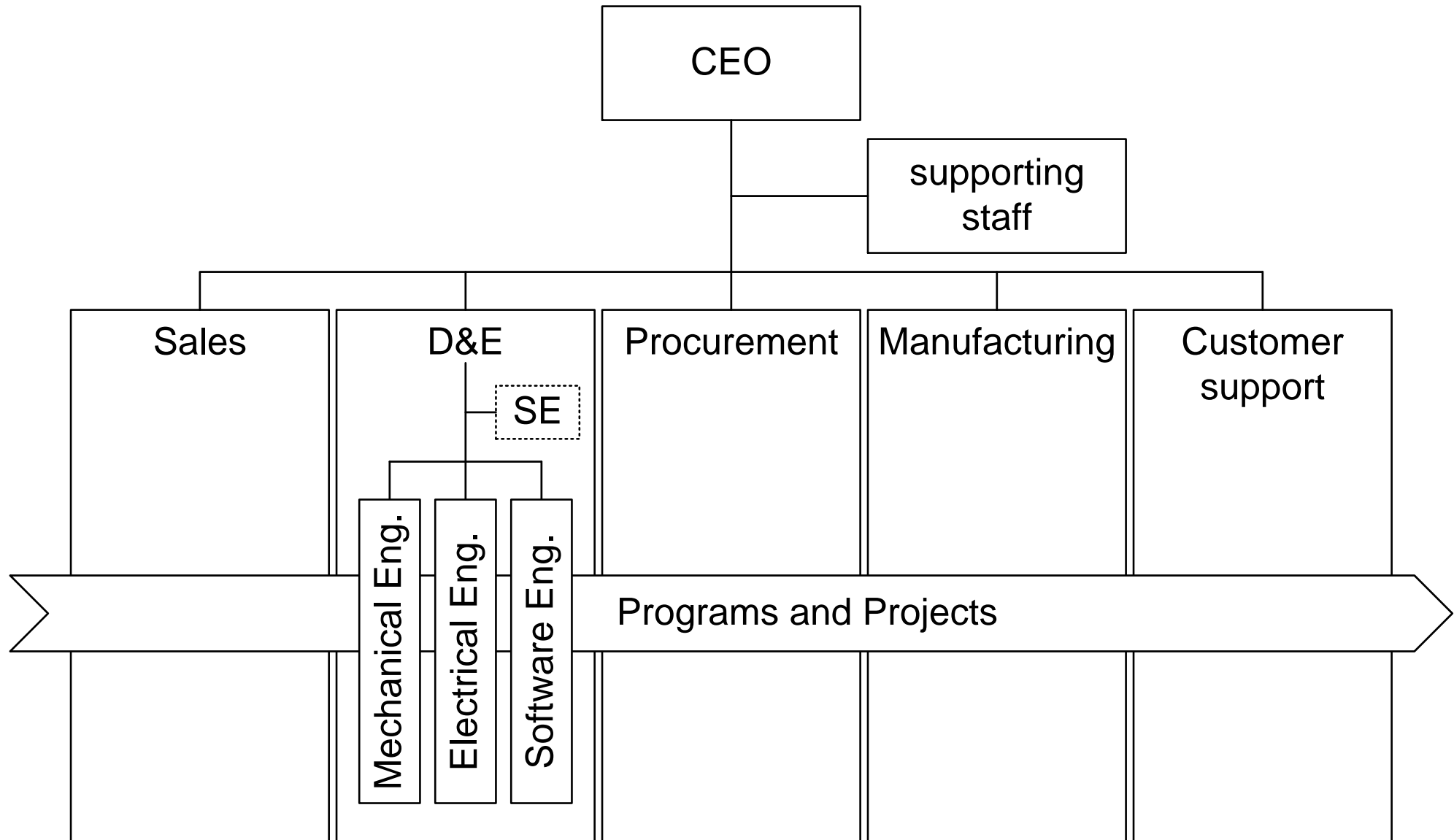
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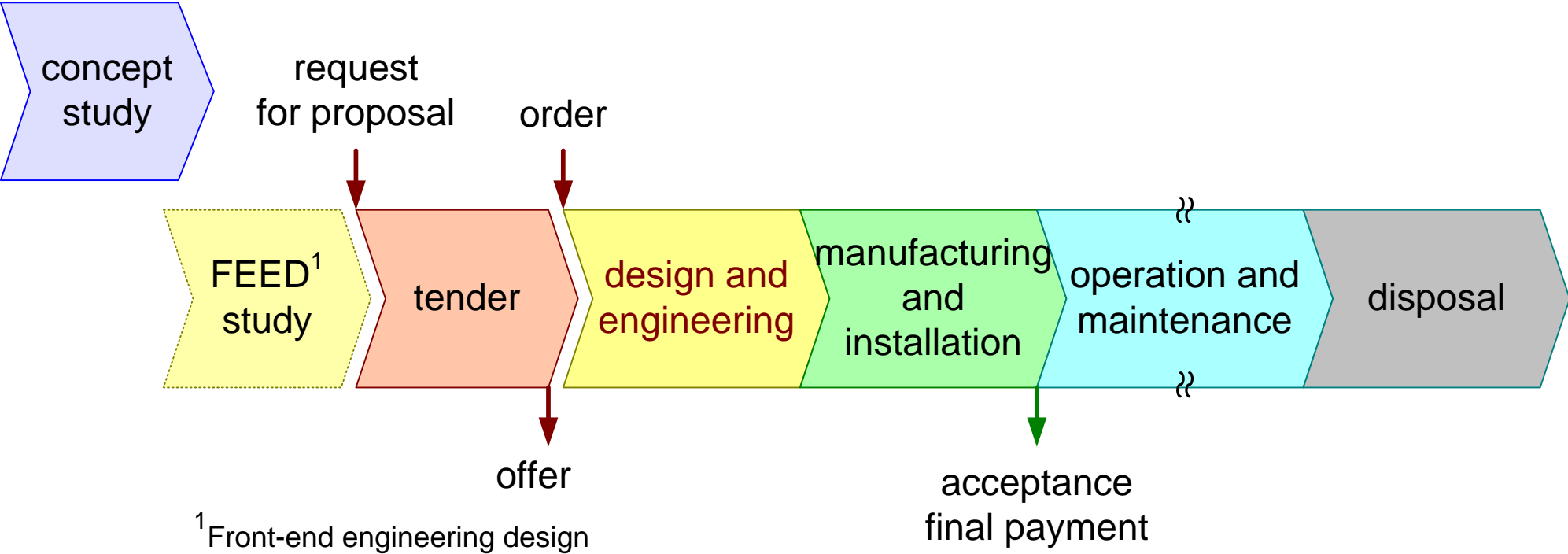
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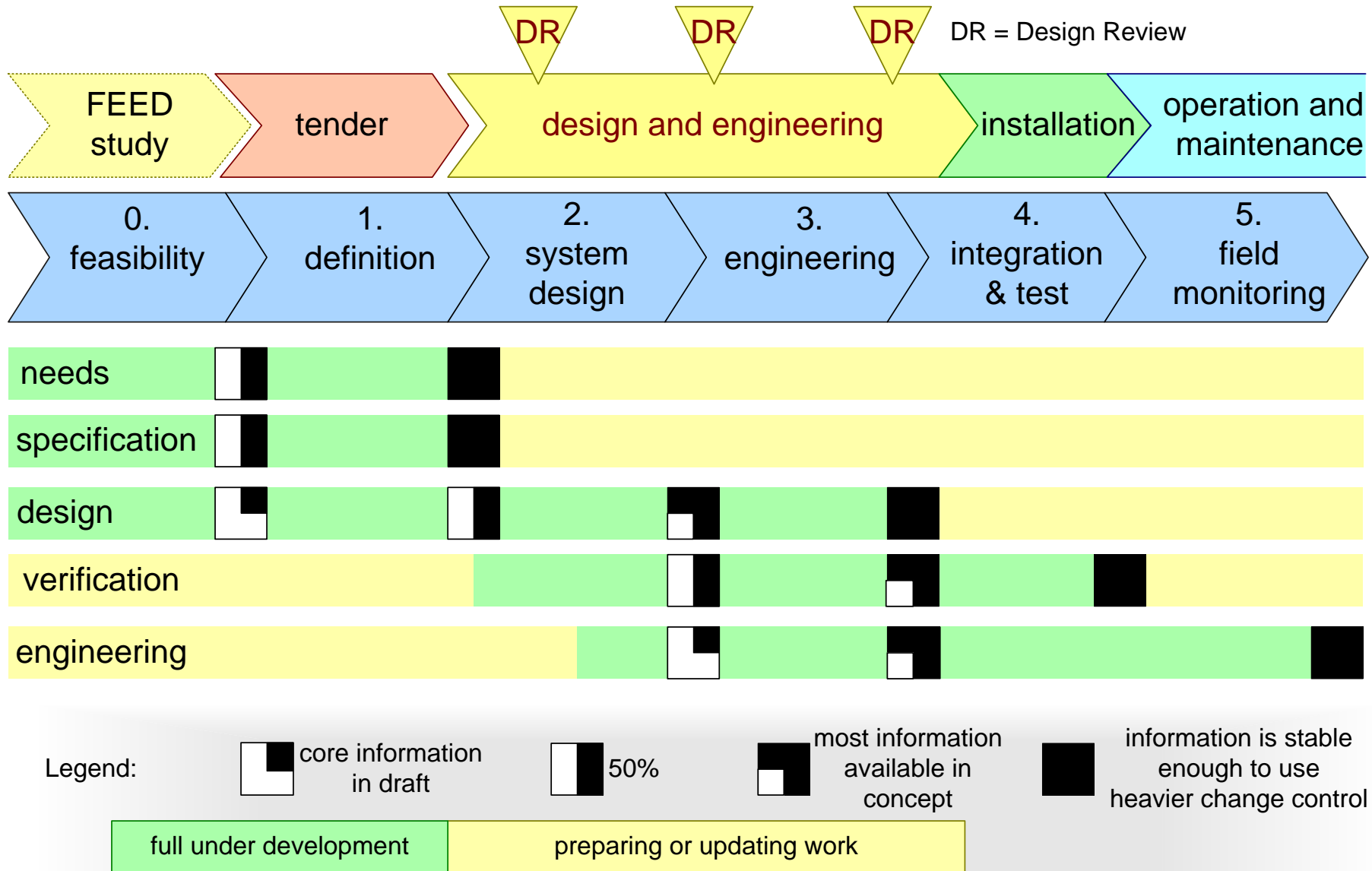
# Typical Company Organization



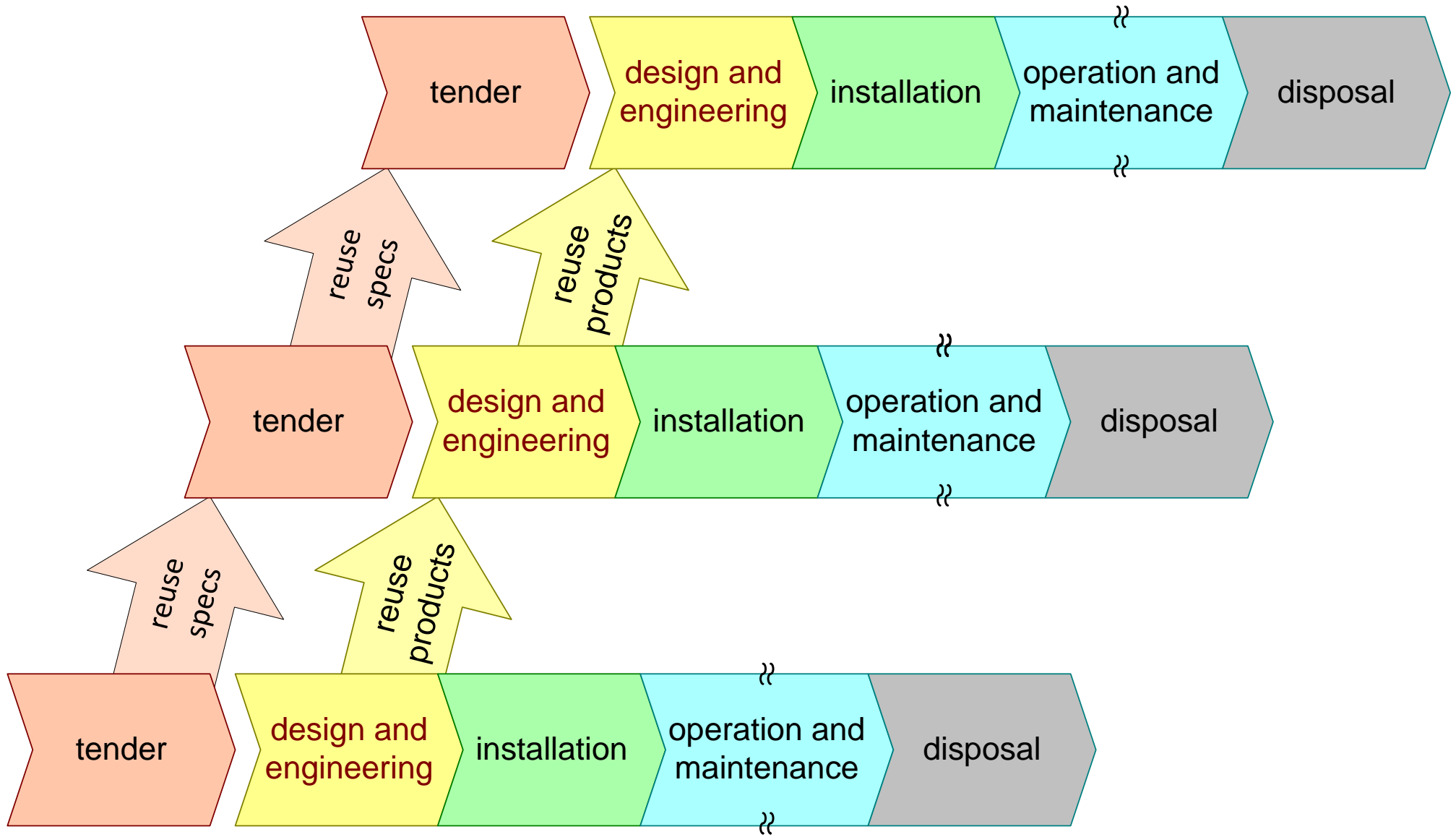
# Project Life Cycle



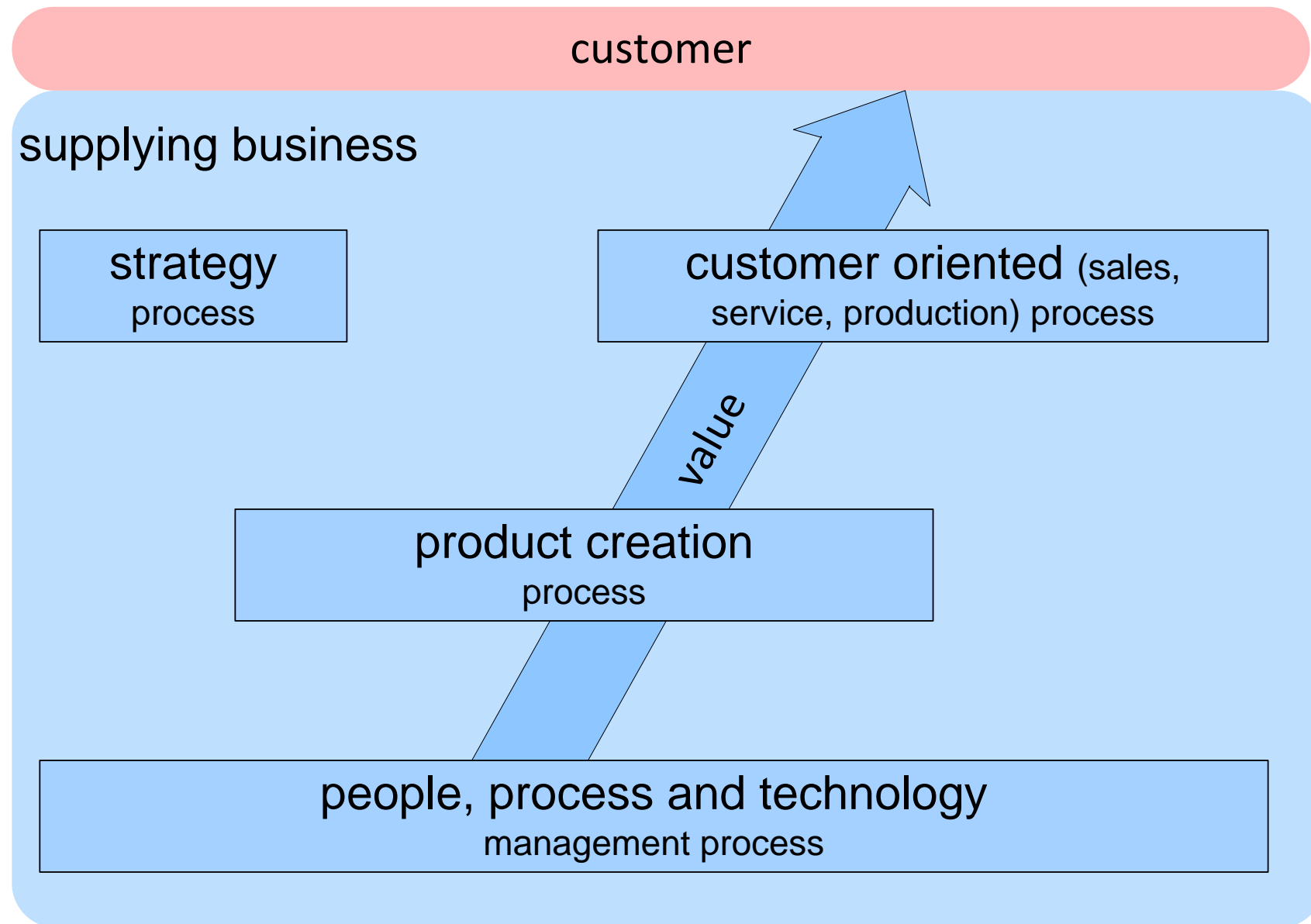
# Phased Project Approach



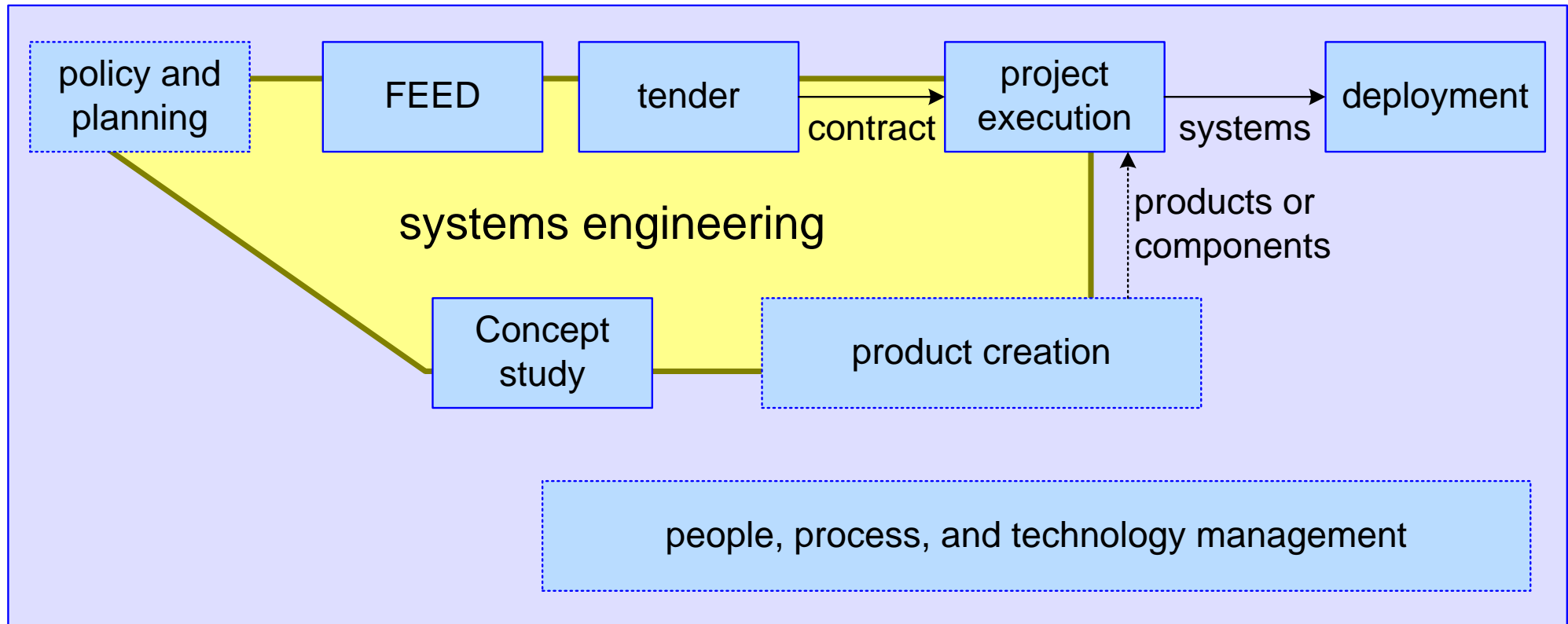
# Reuse and Products



# Simplified Process View



# Systems Engineering in Projects



# SEFS Customer Context

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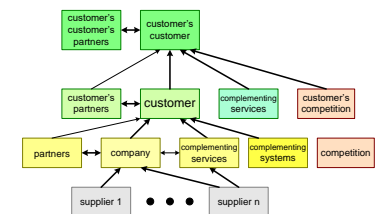
## Abstract

Systems engineers need to understand many aspects about the customer context where the system-of-interest will be operating in. This nugget introduces the CAFCR model to understand the relation between customer and system. Then it introduces a number of questions and techniques for eliciting and capturing the customer context.

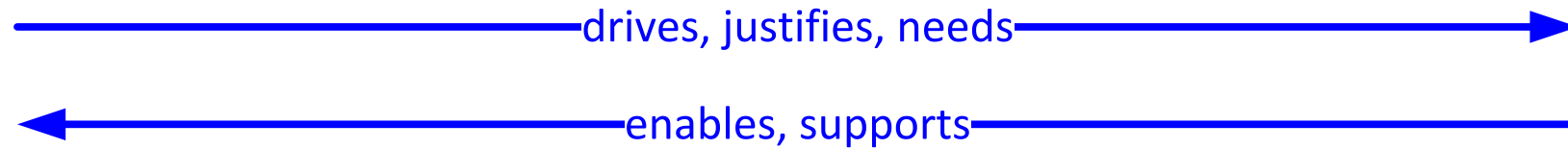
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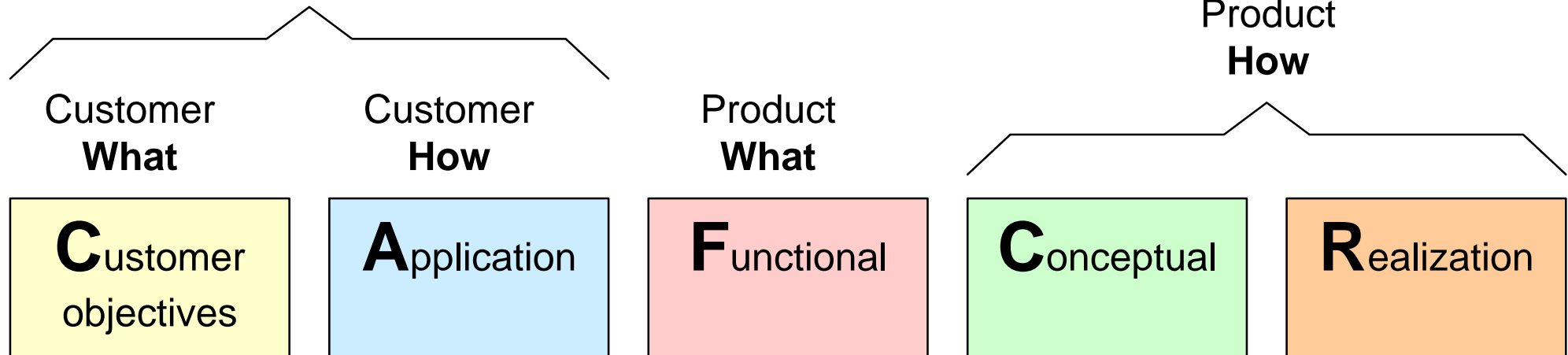
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# The "CAFCR" model



What does Customer need  
in Product and **Why?**

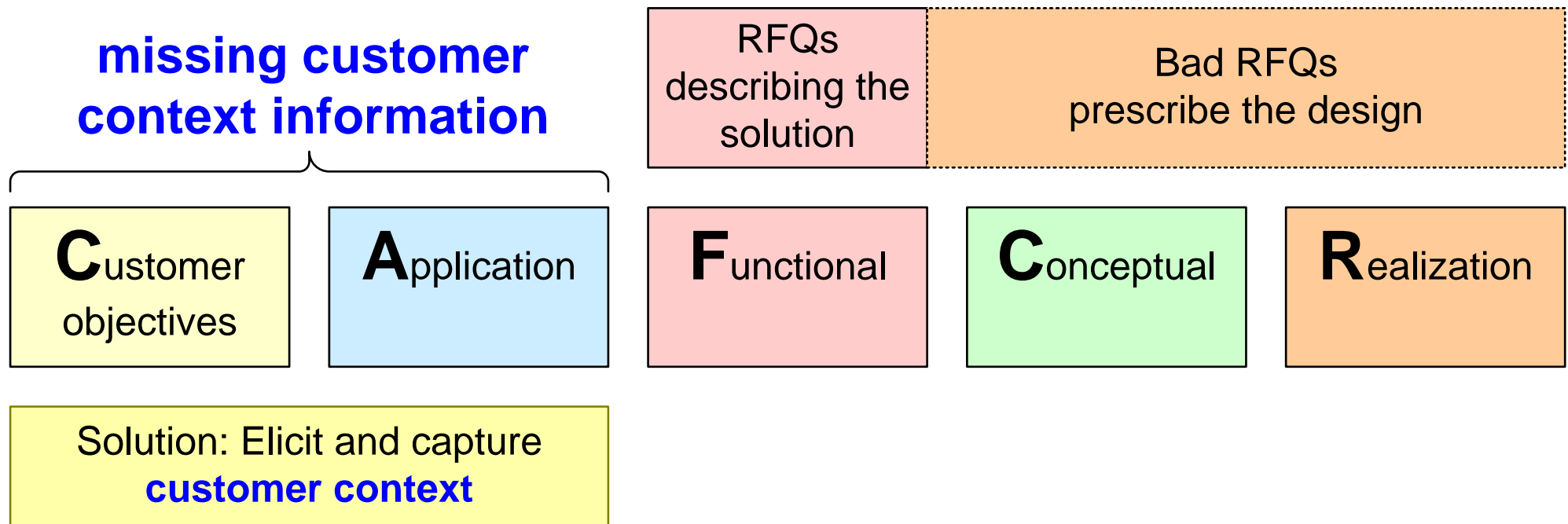


# Problem Statement

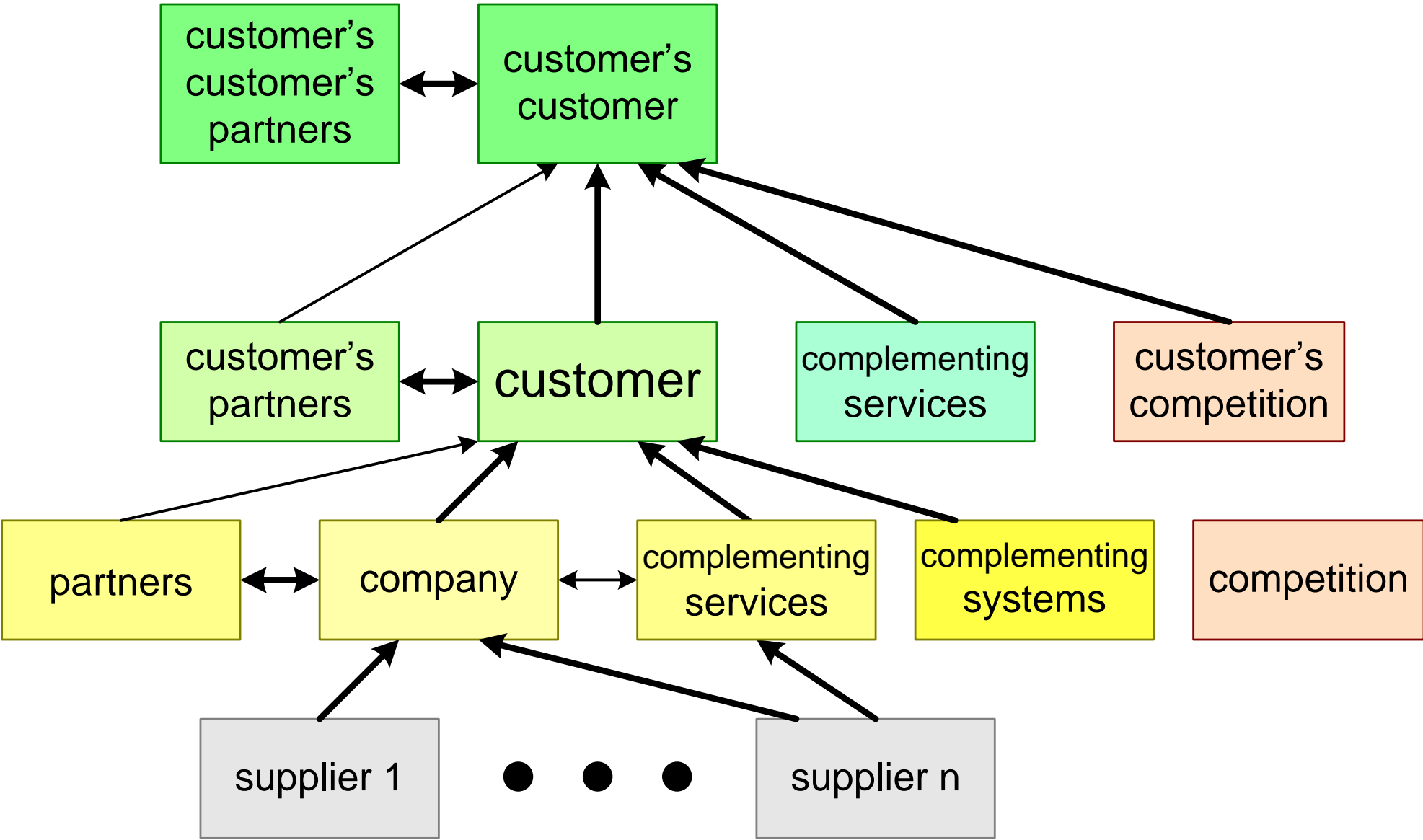
## Problem statement

A typical Request for Quotation (the starting point of the tender) asks for a **solution**, without describing the problem and needs.

Best case it specifies **system requirements** (F-view; what must the system do with what performance), worst case it prescribes many **realization aspects**



# Context of the Context



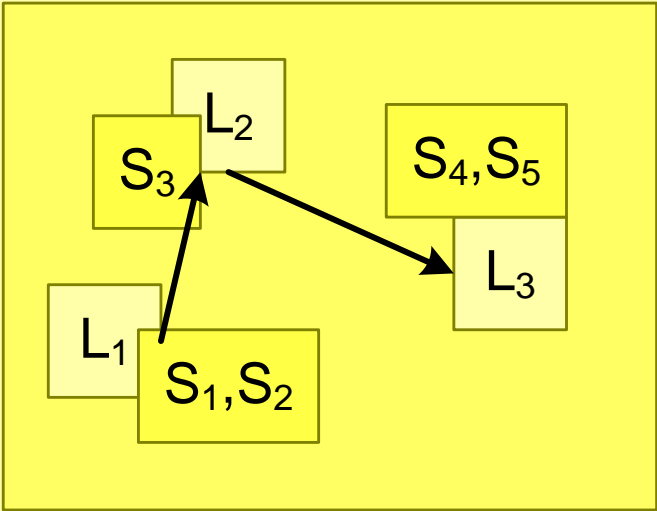
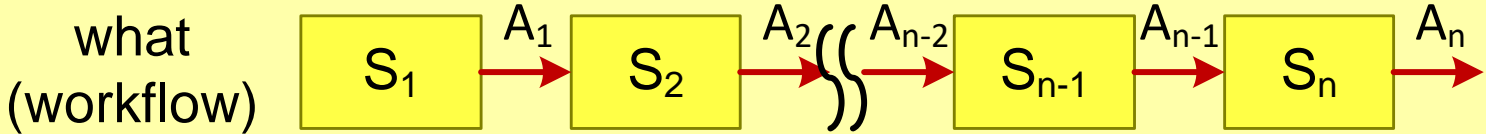
- What is the role of the customer in the value network?
- How do they earn their money, what is their business model?
- SWOT analysis; what are their Strengths, Weaknesses, Opportunities and Threats?
- VUCA analysis; what is Volatile (changing fast), what is Uncertain, what is Complex, and what is Ambiguous?

# Capturing the Context

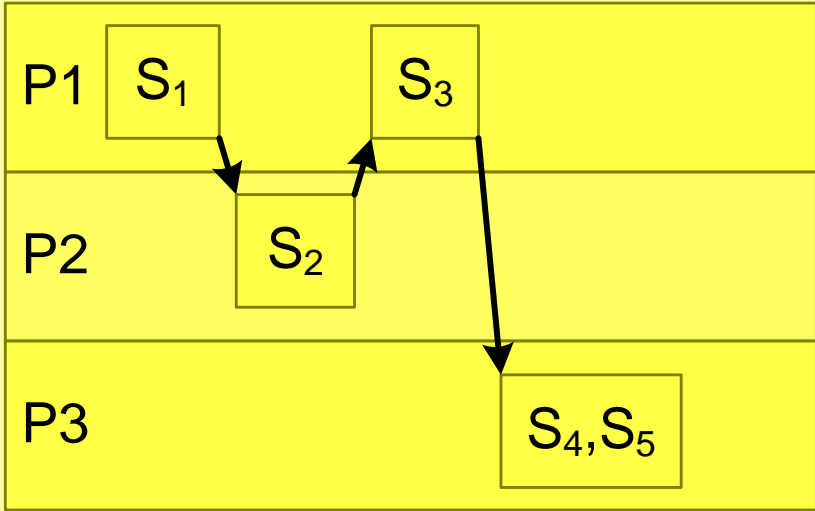
what	ConOps, story telling, scenario
who	stakeholders and concerns <i>humans</i> <i>organizations</i>
how	system context diagram <i>human-made artifacts</i> workflow
when	timeline <b>from seconds to years</b>
where	map <b>from nanometers to kilometers</b>
why	customer key drivers, customer value proposition
financial	productivity model cost of ownership model money flow value network

## Concept of Operations (ConOps)

An envisioning of how the stakeholders will run their operation in relation to the system.



where (map)



who (swimming lanes)

# SEFS Scoping

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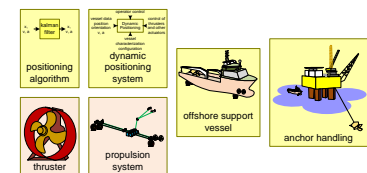
## Abstract

Systems engineering is applicable from small systems to large and complex systems. The notion of a “system” is recursive: a system consists of subsystems that consist of subsystems. However, the subsystem developers may consider their subsystem as their system-of-interest, making the original system their supersystem. That makes systems engineering applicable at each aggregation level. An essential step is to define the scope of the system and the development and engineering effort.

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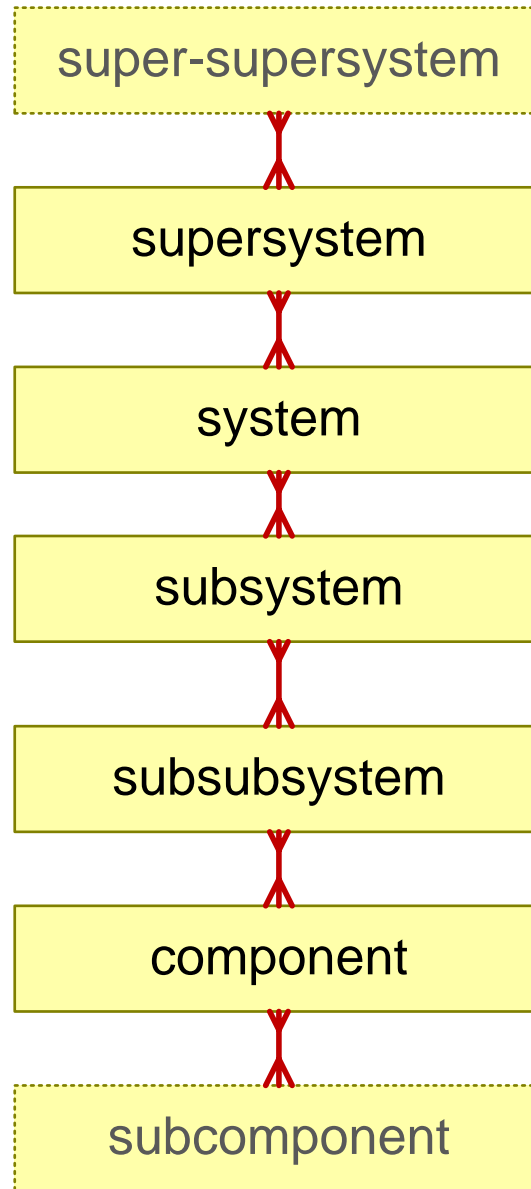


**Systems Engineering** is applicable from **small systems** to **large and complex systems**.

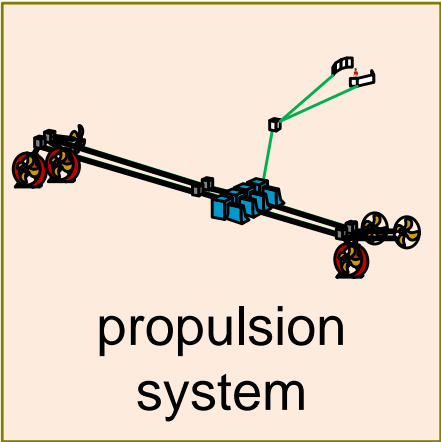
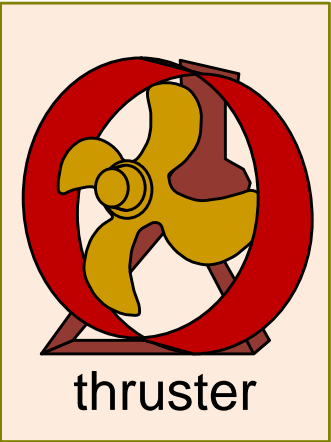
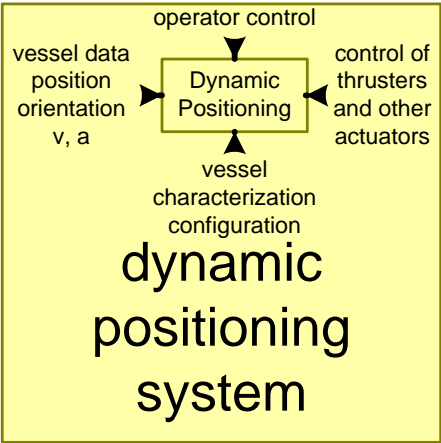
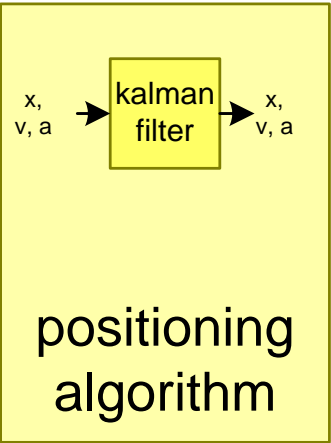
Systems engineers must **tailor** the **systems engineering methods** to the **System of Interest**.

# Hierarchy of System Levels

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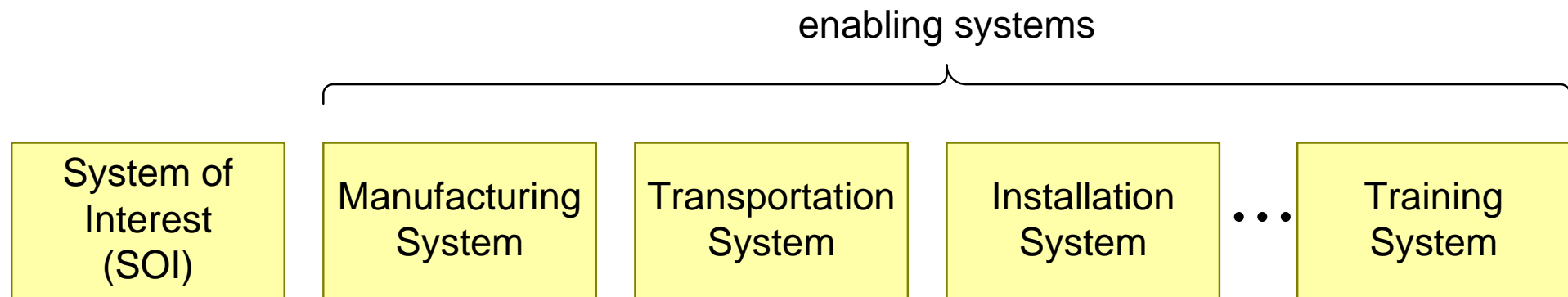


# Example of System Levels



# Enabling Systems

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Development and Engineering must develop the System of Interest and all Enabling Systems

# SEFS Business and Life Cycle Context

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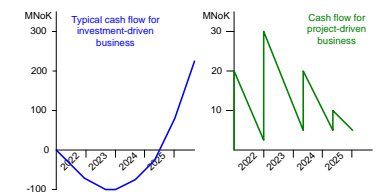
## Abstract

The business context of the system of interest needs a viable business proposition. Many business functions, often active throughout the entire system life cycle, need to operate well. All of them generate life cycle needs. There also needs to be a business model, who pays for what, ensuring an economic sound business.

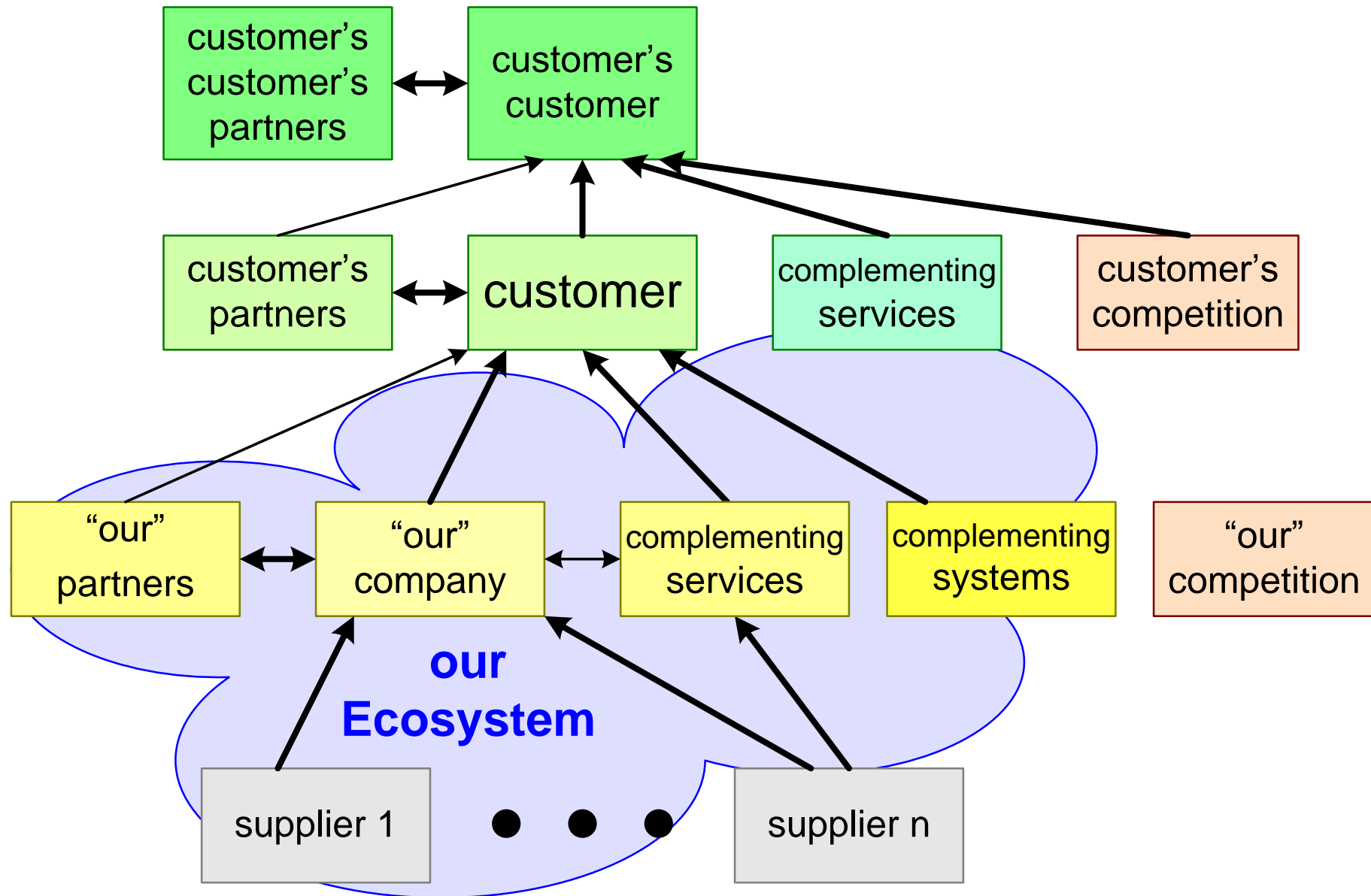
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# What is Our Company's Role?

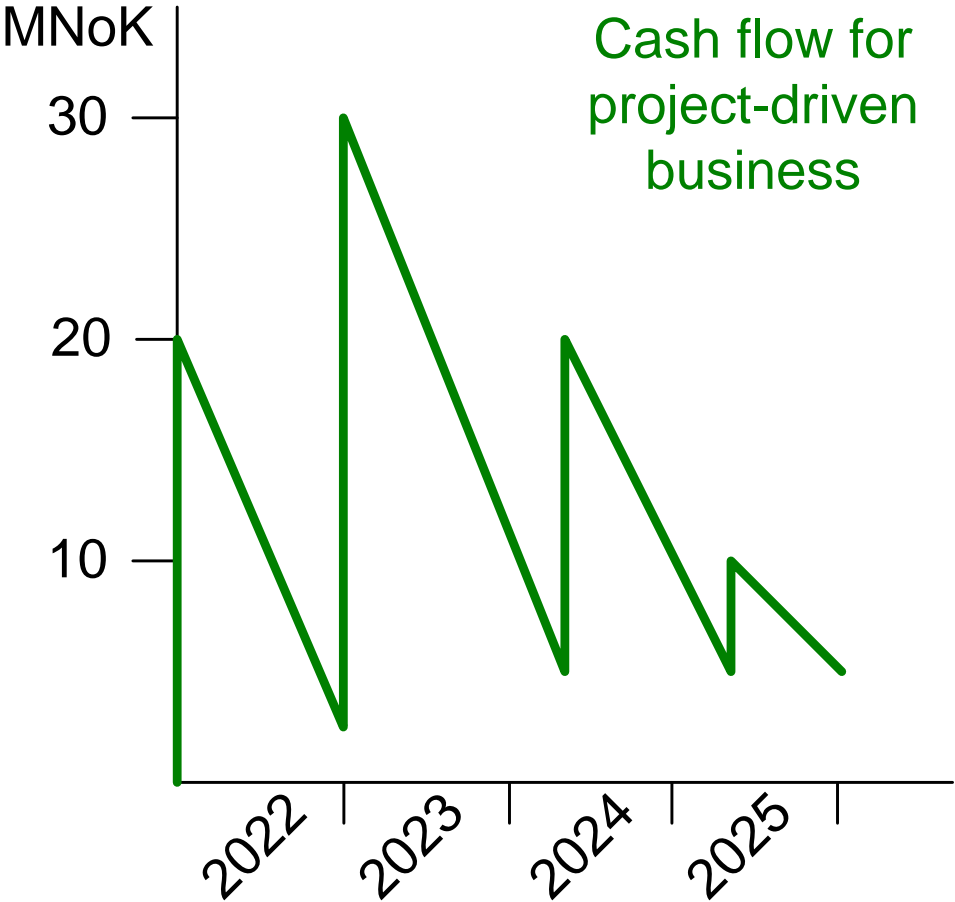
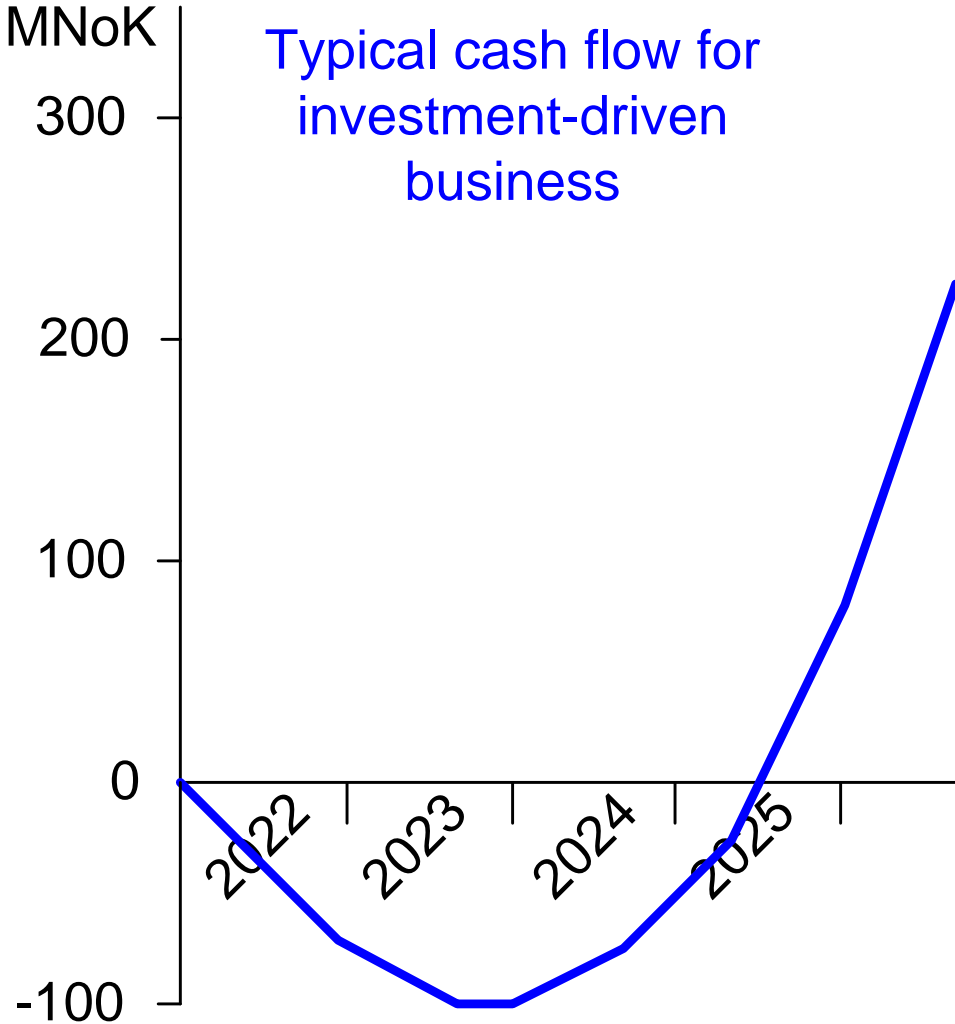


# What is our Business?

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- What is “our” role in the value network and in “our” ecosystem?
- How do we earn money, what is our business model? When and how much?
- How and when do we have expenses? What is our cash flow?
- VUCA analysis; what is Volatile (changing fast), what is Uncertain, what is Complex, and what is Ambiguous?

# Cash Flow Models



# Life Cycle Needs

