PRODUCT ARCHITECTURE

26.09.2023

Learning Objectives

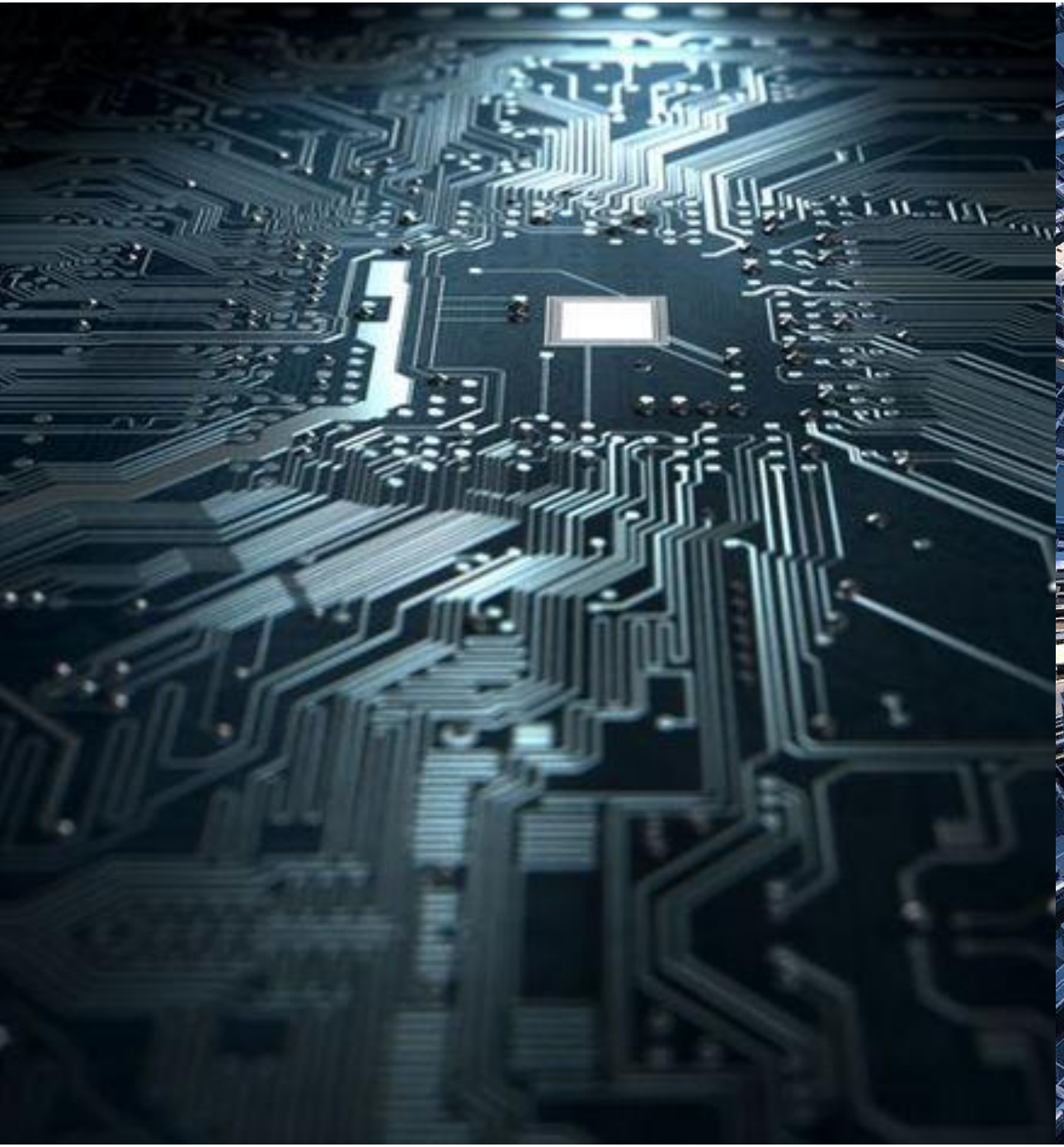
- Understand the fundamentals of product architecture
- Learn to establish a product architecture
- Learn to evaluate the product’s architectural differences, features and limitations

What’s Product Architecture?

Product architecture mainly deals with how a product is arranged into physical parts, components and assemblies.

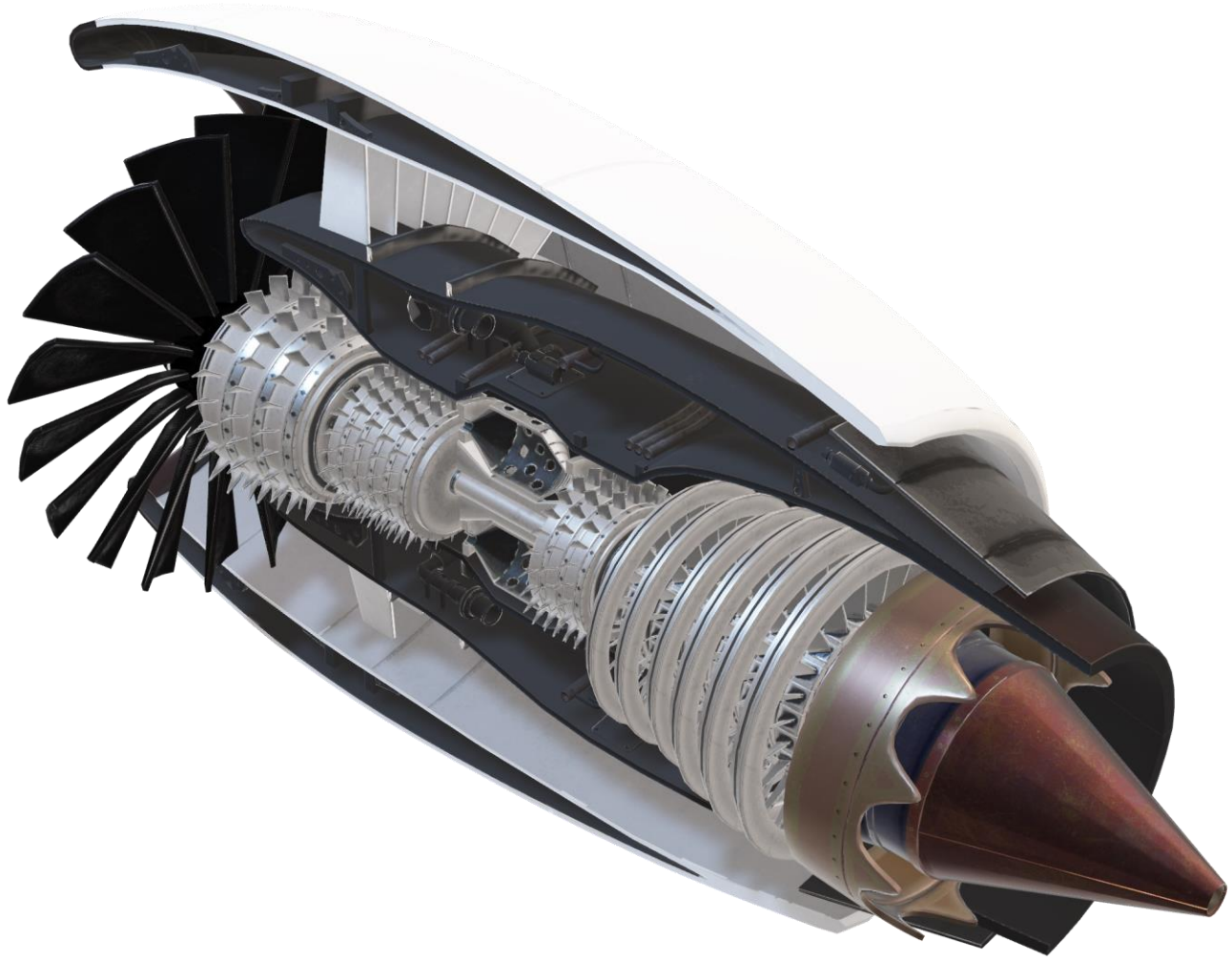
It can be defined as:

1. The arrangement of functional elements.
2. The mapping of functional elements to physical components.
3. The specification of the interfaces between interacting physical components.



Types of Product Architectures

- Modular
- Integrated
- Mixed

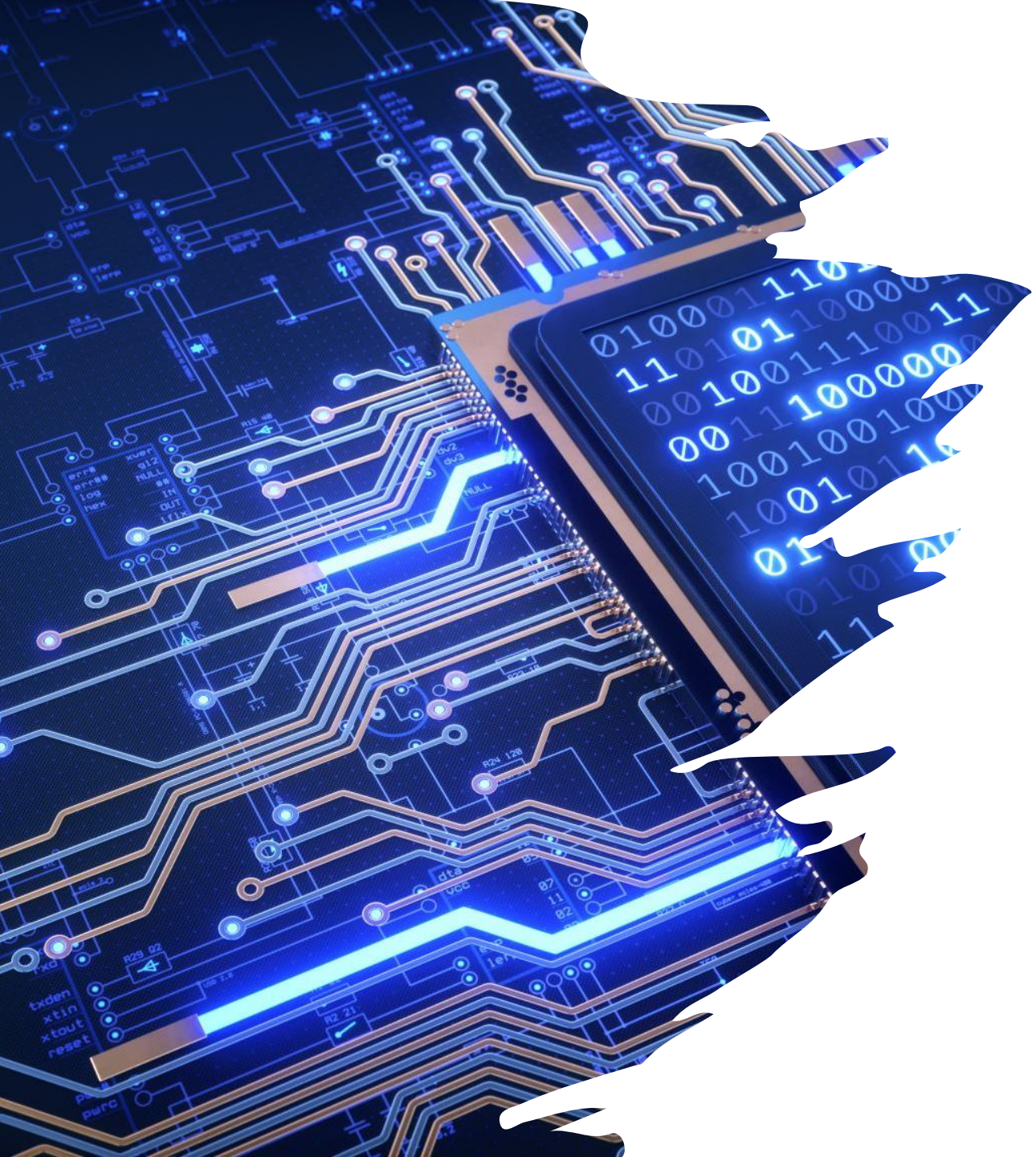


Modular Product Architecture

One Function→ One Component

Integrated Product Architecture

One Function → Multiple Components
Multiple Functions → One Component



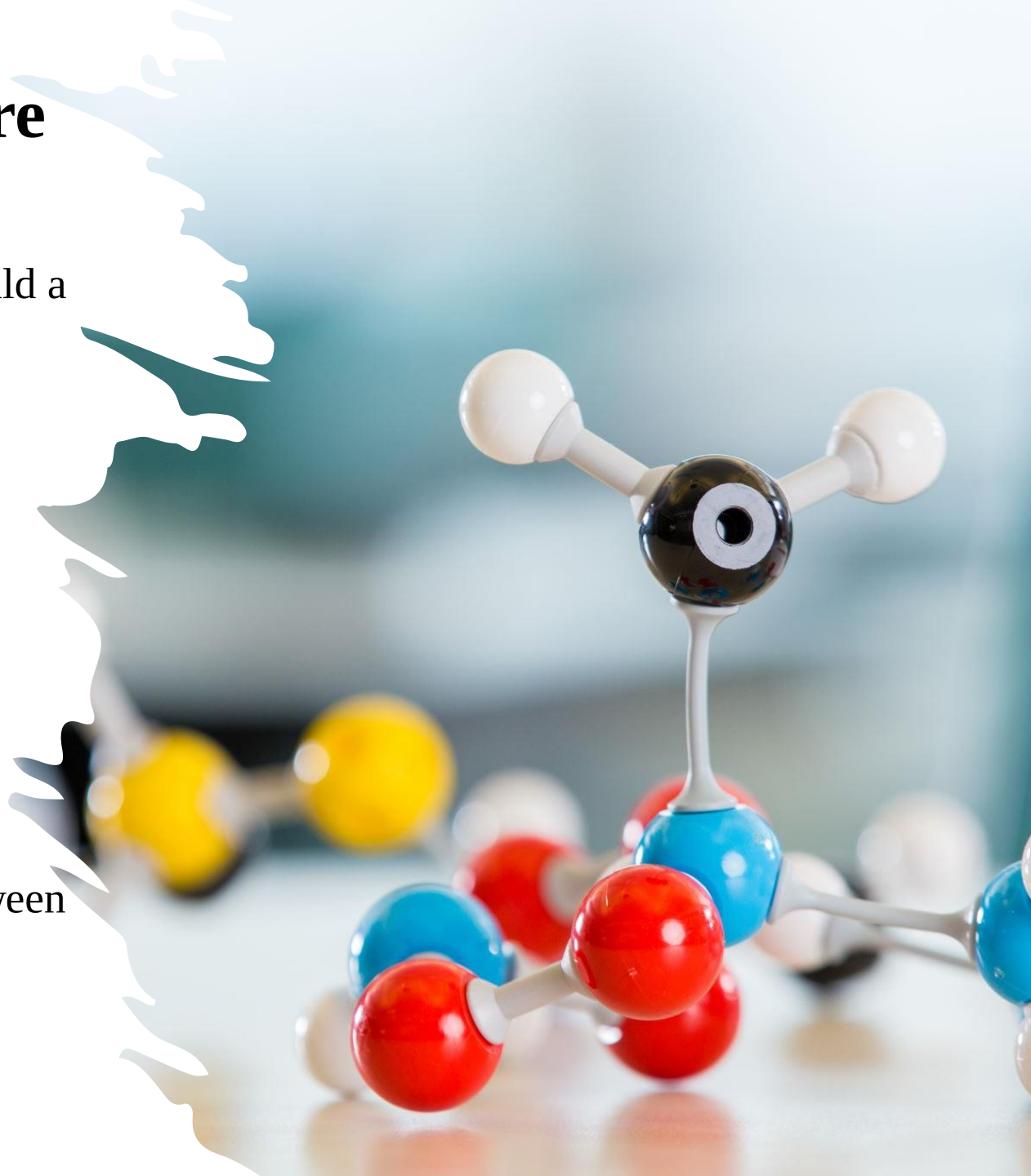
Modular Vs. Integrated Which architecture is better..?

- Performance
- Serviceability
- Sustainability
- Cost to develop
- Cost to manufacture
- Maintenance

Mixed Product Architecture

Steps to Define Product Architecture

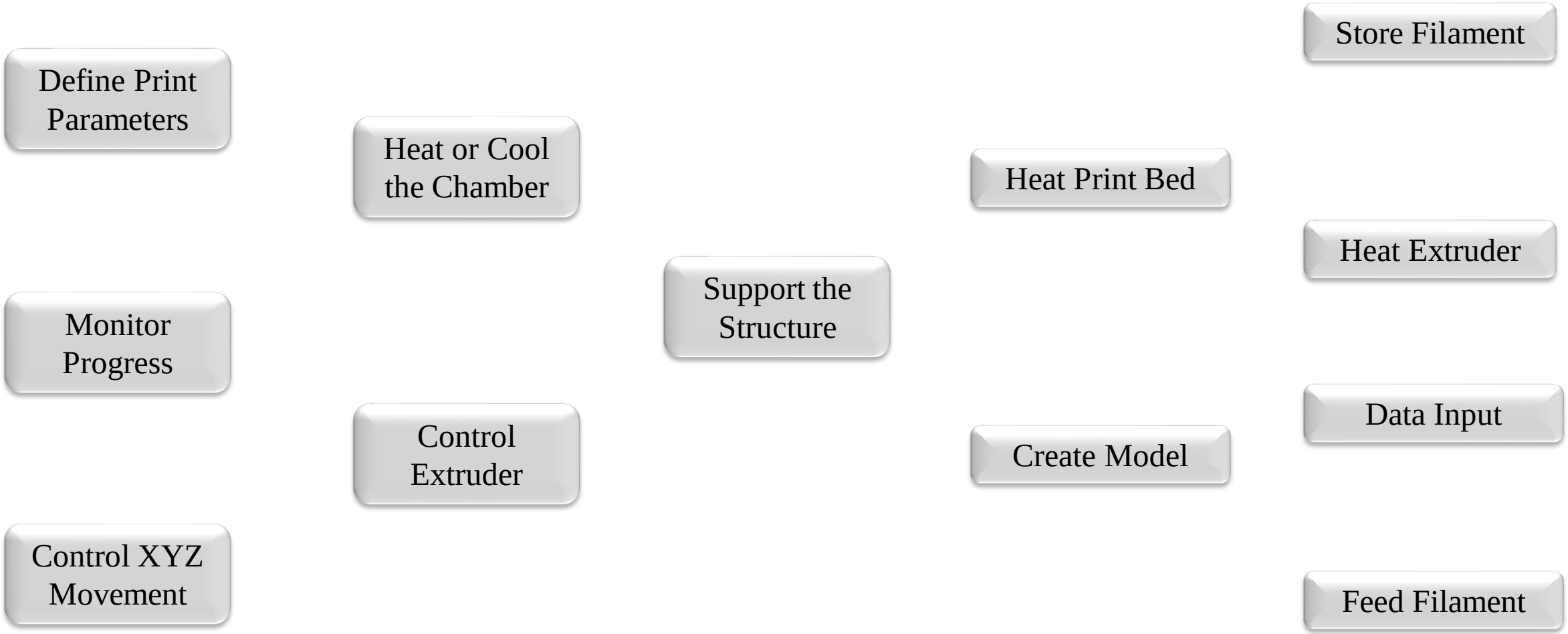
1. Identify and list all possible functions essential to build a product
2. Understand the relationship between those functions
3. Create a functional model/ diagram showing those relations
4. Create Clusters
5. Draw approximate product layouts or geometries
6. Identify mandatory or unintentional interactions between those functions



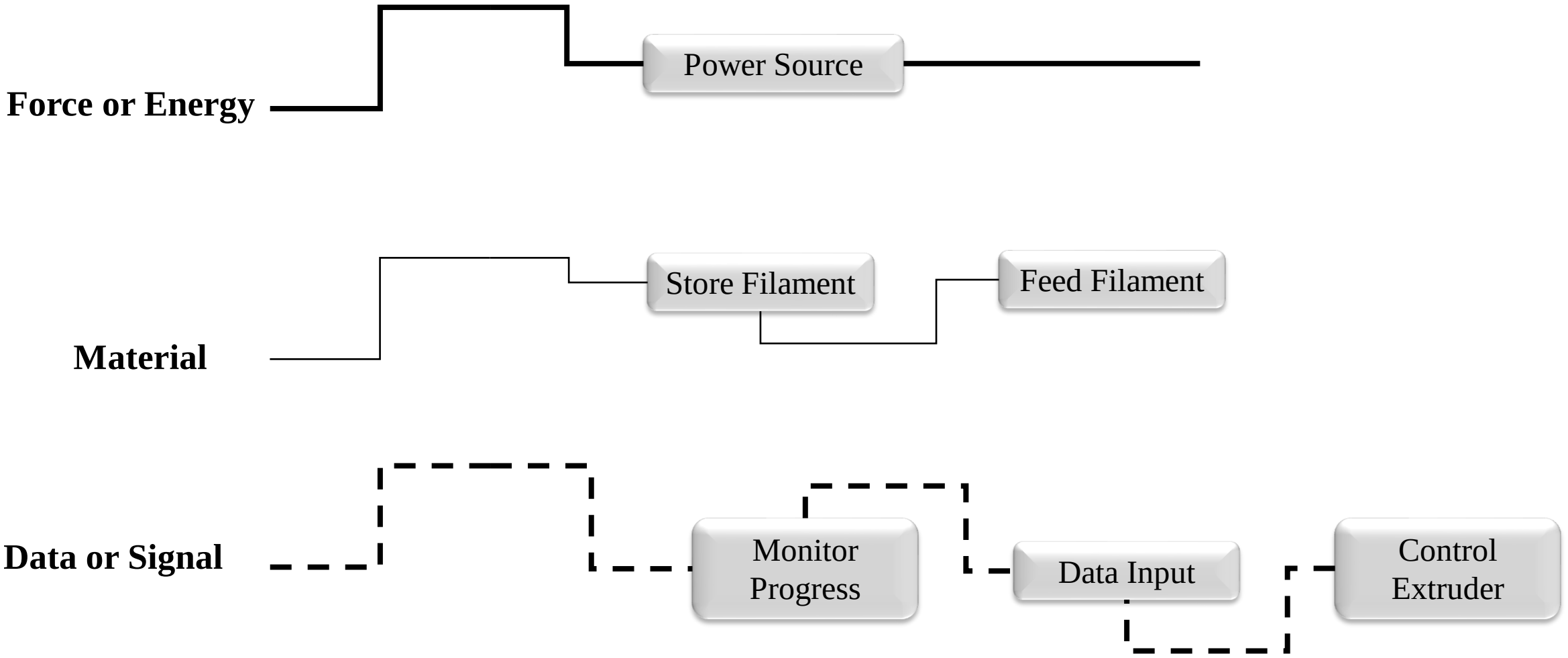
Practical Example

3D Printers

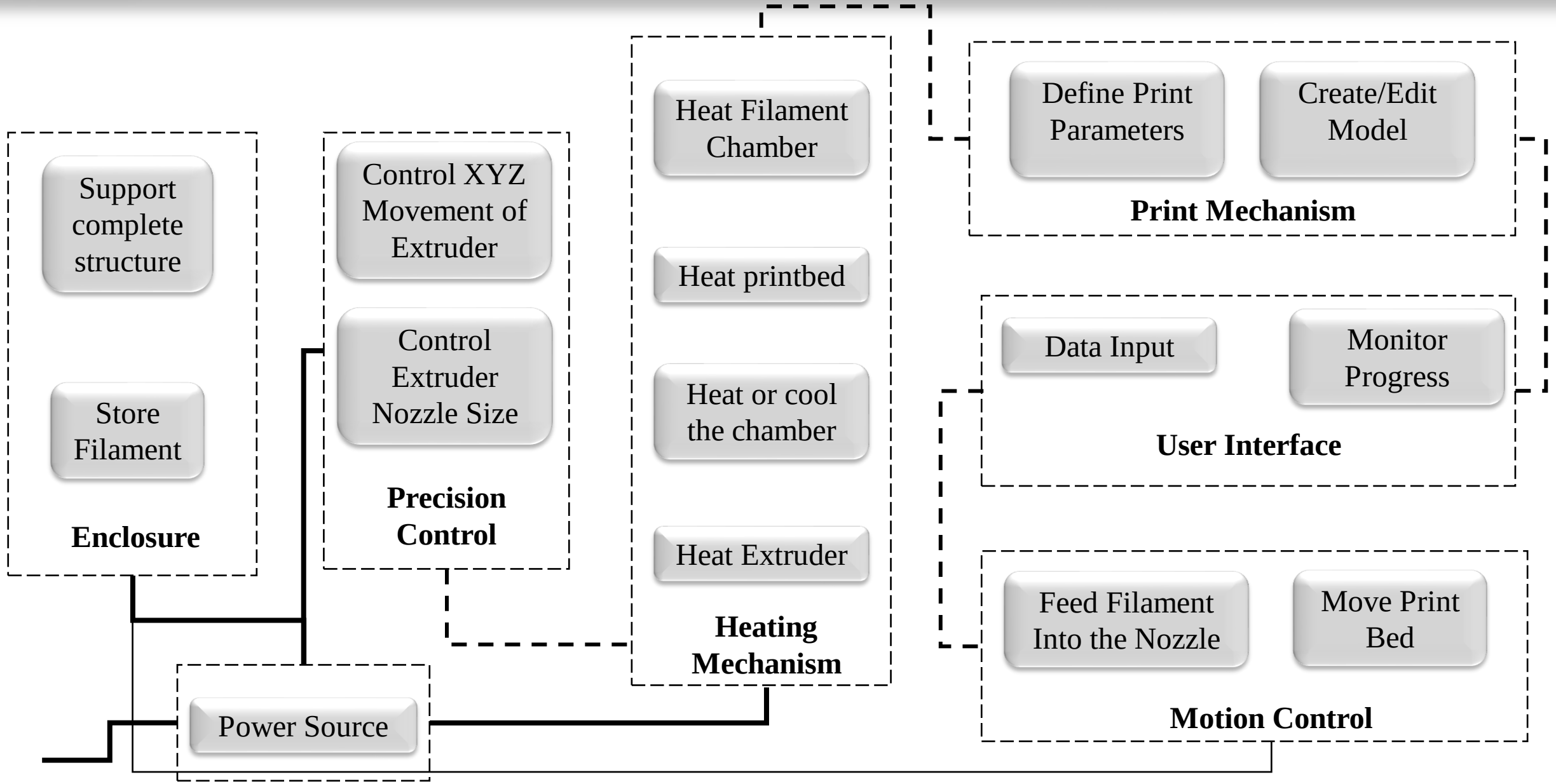
Functions Essential to Build a 3D Printer



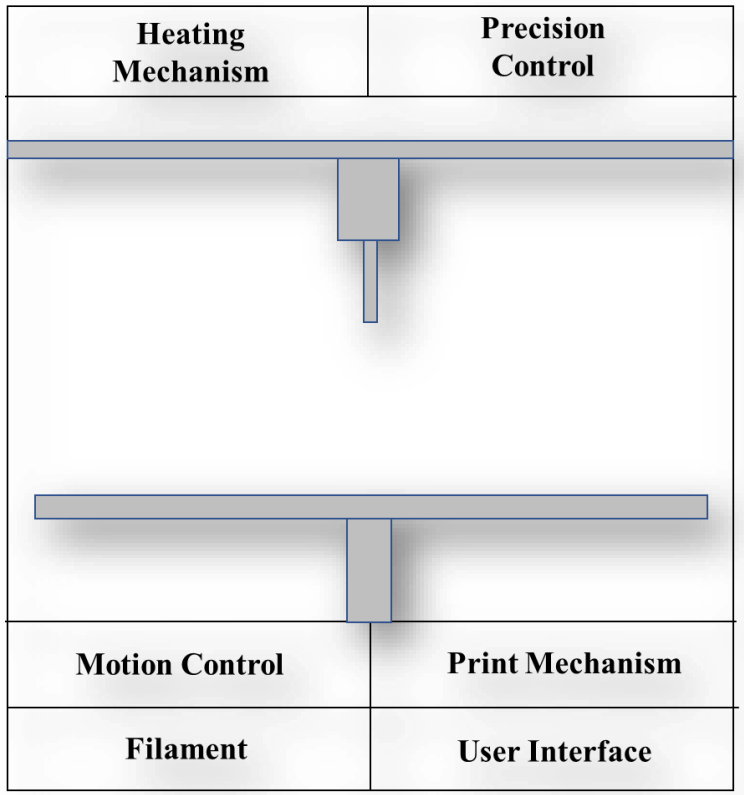
Relation Between Functions



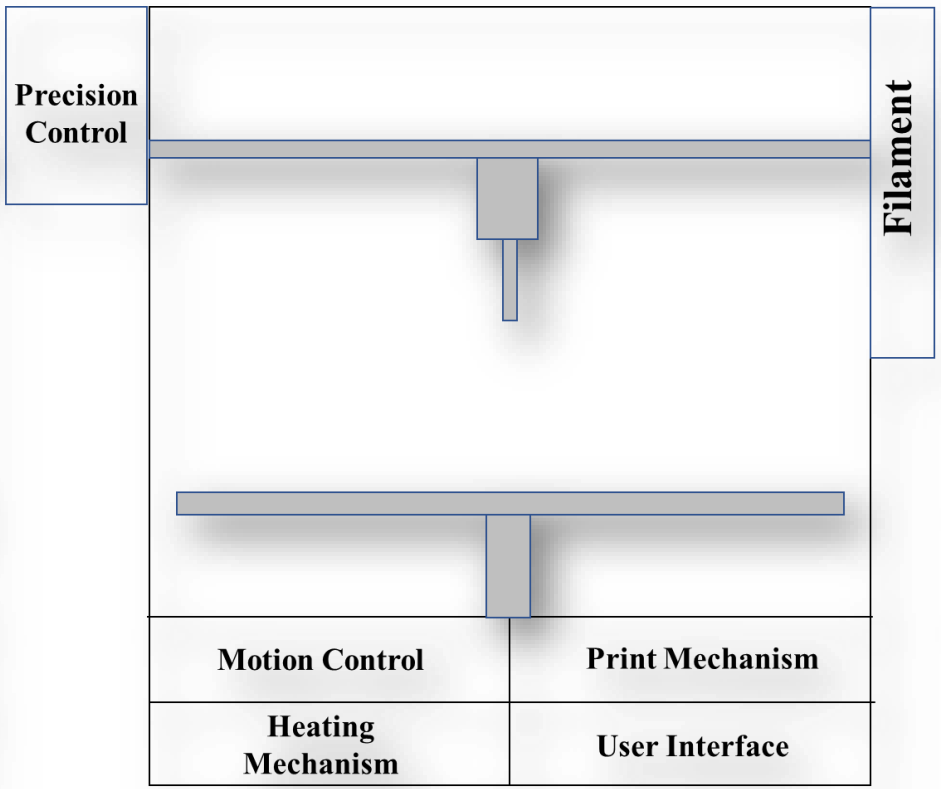
Chunks


Support complete structure
Store Filament
Enclosure
Control XYZ Movement of Extruder
Control Extruder Nozzle Size
Precision Control
Heat Filament Chamber
Heat printbed
Heat or cool the chamber
Heat Extruder
Heating Mechanism
Define Print Parameters
Create/Edit Model
Print Mechanism
Data Input
Monitor Progress
User Interface
Feed Filament Into the Nozzle
Move Print Bed
Motion Control
Power Source

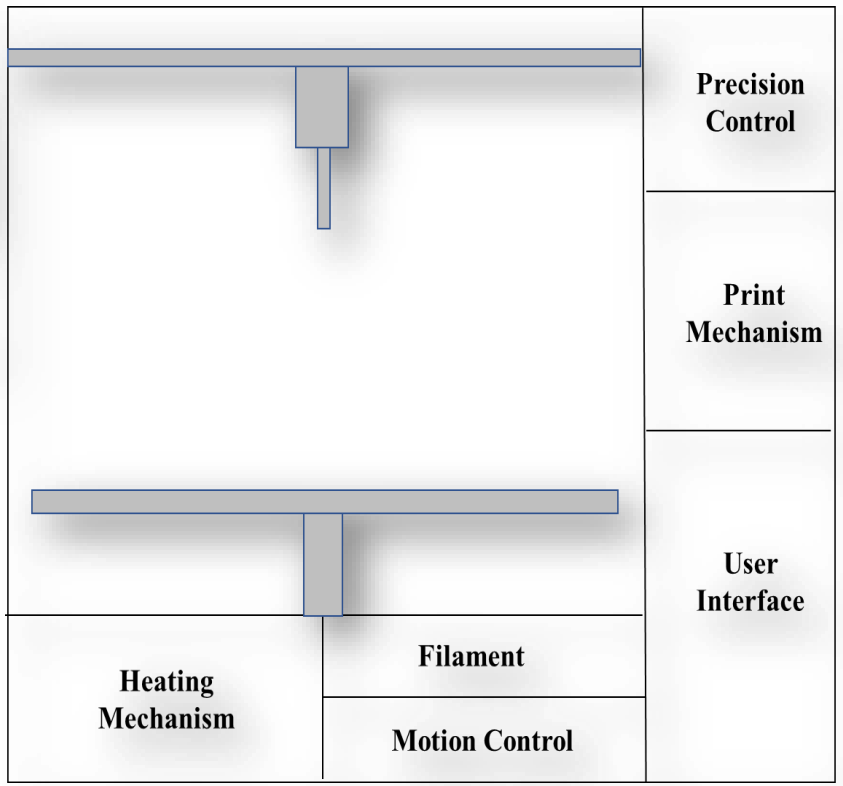
Architecture Layout 1



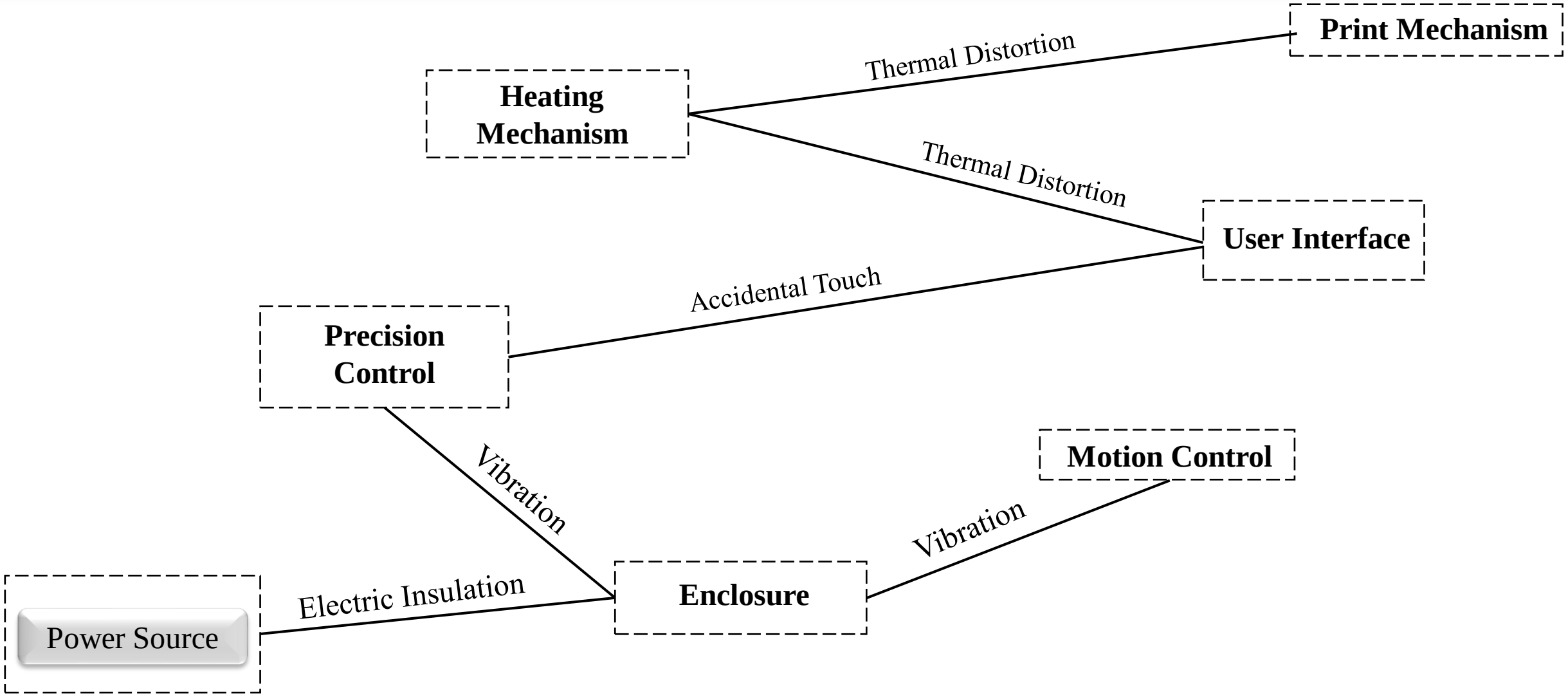
Architecture Layout 2



Architecture Layout 3



Interaction Graph



THE Coca-Cola COMPANY
CCORPORTATE BRAND
BRANDS
SUB-BRANDS
Sprite
FANTA
Barq's
FRESCA
AHA
DASANI
GOLD PEAK TEA
Fruitopia
Five Alive
Crown Every Moment
Appletiser
Coca-Cola
Diet Coke
Schweppes
POWERADE
GLACÉAU
NESTEA
PEACE TEA
Simply
juices and drinks
Minute Maid
fairlife
Coca-Cola zero SUGAR
Coca-Cola life
Coca-Cola ENERGY
Diet Coke EXTRA CAFFEINE
Schweppes ZERO SUGAR
POWERADE ZERO
smartwater
vitaminwater
smartwater sparkling
vitaminwater zero
Simply Orange
Simply 50
Simply almond
CORE POWER
BRAND MARKETING BLOG .COM

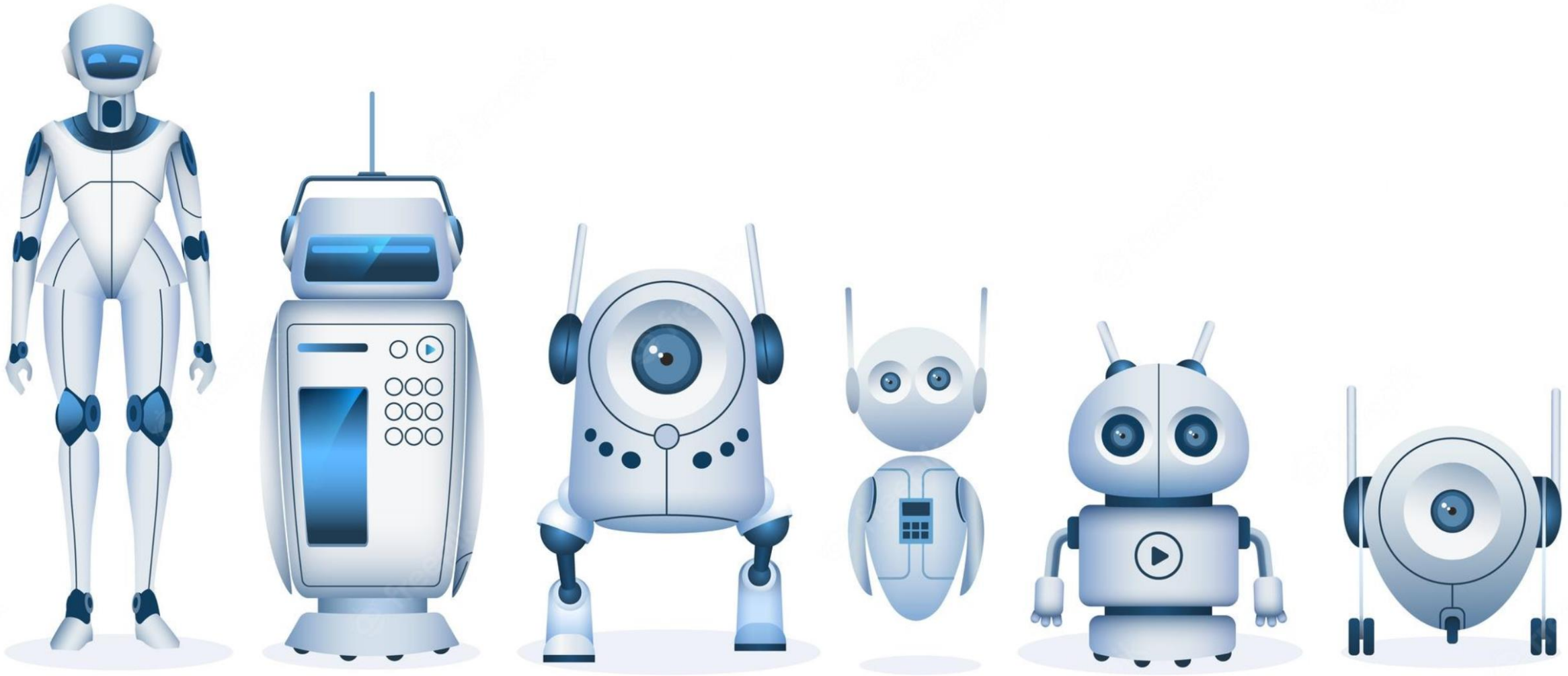
Pro Tips

Generally, we can group technical decisions into three categories

- ***Technical decisions that are easy to change:*** Type of material used, minor versions of software libraries, etc.
- ***Low-risk technical decisions which we probably don't need to change:*** Using Linux, IOS or Android-based systems etc.
- ***High-risk technical decisions:*** Buying storage for a local data center, deciding on a software language, a wireless protocol or a framework/platform, etc

Summary

- Architecture choices define the sub-systems and modules of the product platform or family.
- Architecture determines:
  - Ease of production variety
  - Feasibility of customer modification
  - System-level production costs
- Key Concepts:
  - Modular vs. Integral architecture
  - Clustering into chunks
  - Planning product families



Thank You!