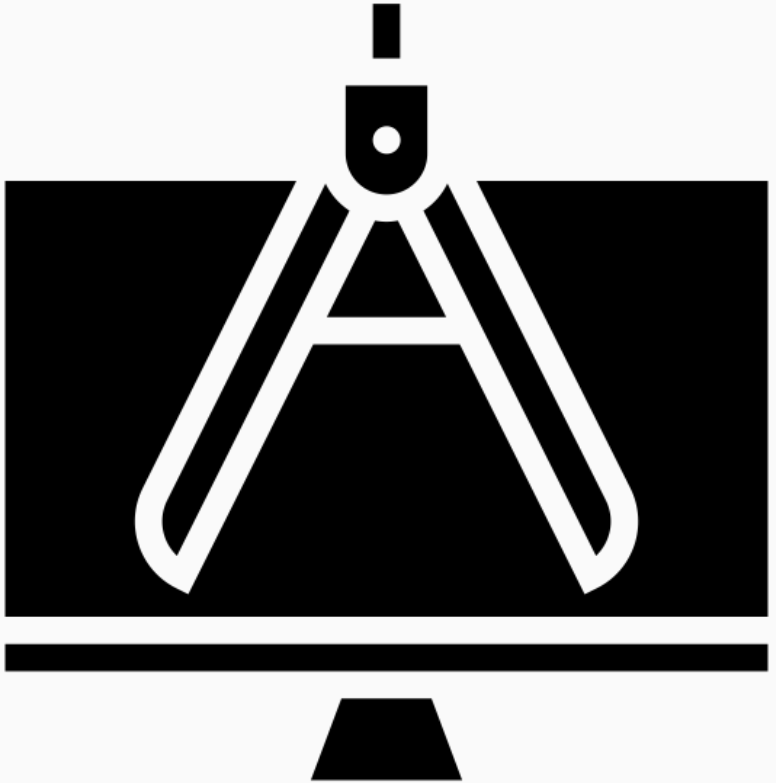
Software Architecture

Chizzy Meka

Motivation

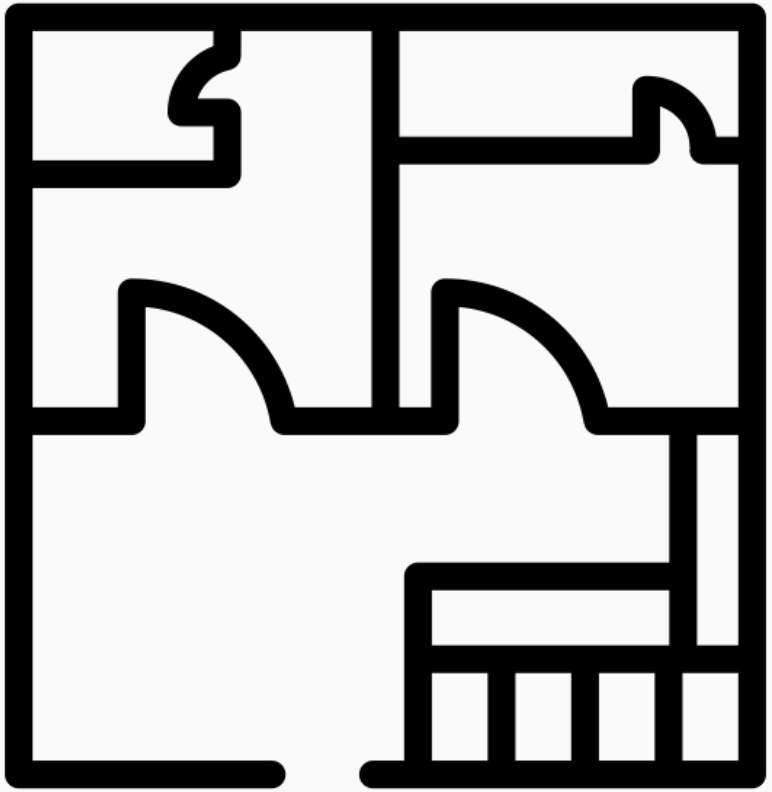
- Why is software architecture important?



Created by mynamepong
from Noun Project

An Analogy

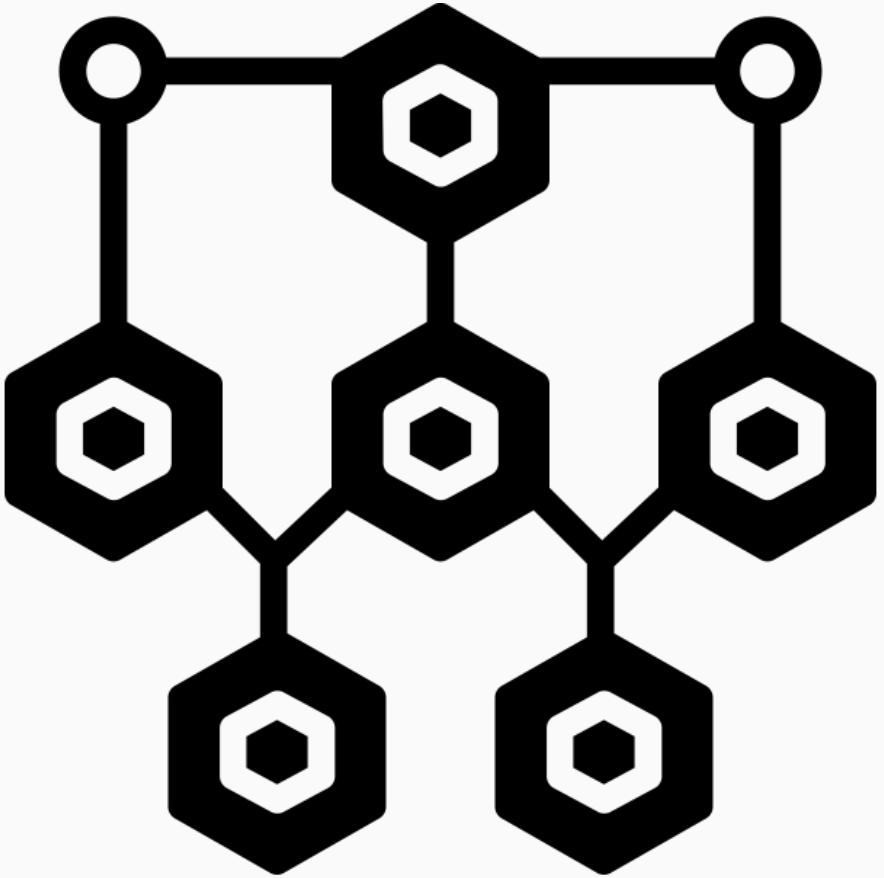
- What is a good real-world analogy?



Created by Econceptive
from Noun Project

Structure

- Everything we build has a structure.



Created by priyanka
from Noun Project

The more we invest in building a product, the harder it is to change its structure after the fact.

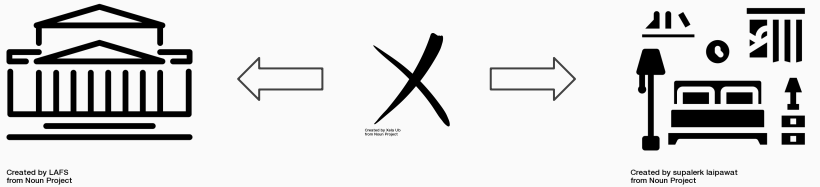
But what is the importance of a structure?

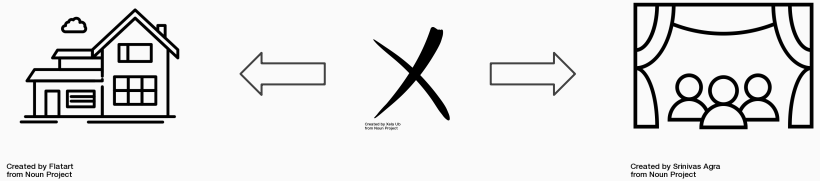
And why would we want to change it at all in the future?

Structure describes both the intent of our product and its qualities.

Architecture and Purpose

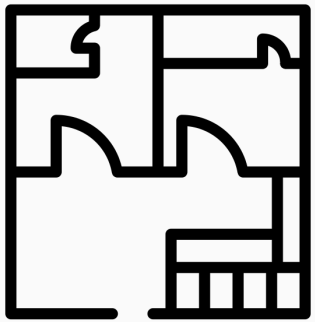
- A theater would not be an ideal living space.
- A residential home would not be ideal for hosting operas.
- It is very difficult to convert a building type to another.





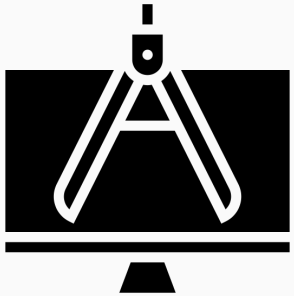
Concept Similarity

- Building architecture shares the same principles as software architecture.



Created by Econceptive
from Noun Project

Created by Melvin Salas
from Noun Project



Created by mynamepong
from Noun Project

Similar Consequences

- Poorly designed buildings may force a redesign.

- Similarly, a sub-optimally organized software system can necessitate a redesign.

What is Software Architecture?

The term ' Software Architecture' means different things to different people.

In this course, we define the software architecture of a system as:

'A high-level description of the system's structure, its different components, and how those components communicate with each other to fulfill the system's requirements and constraints.'

Unpacking the Software Architecture Definition

Created by Soremba
from Noun Project

Software Architecture Definition: First Part

'High-level description' refers to an abstraction level that shows the most critical components in a software system.

Software Architecture Definition: Second Part

'Different Component' refers to black-box elements in the system defined by their behaviors and APIs.

Software Architecture Definition: Third Part

'System's requirements and constraints' refer to how the components fit together to accomplish the system's goals (requirements) and how the system refrains from doing what it is not designed to do (constraints).

We're going to talk about all those concepts in more detail throughout the course but I think having this definition up front is going to set the stage for what we're going to learn in the following lectures.

The Multiformity of the term 'Software Architecture'

Software Architecture

Communications between objects

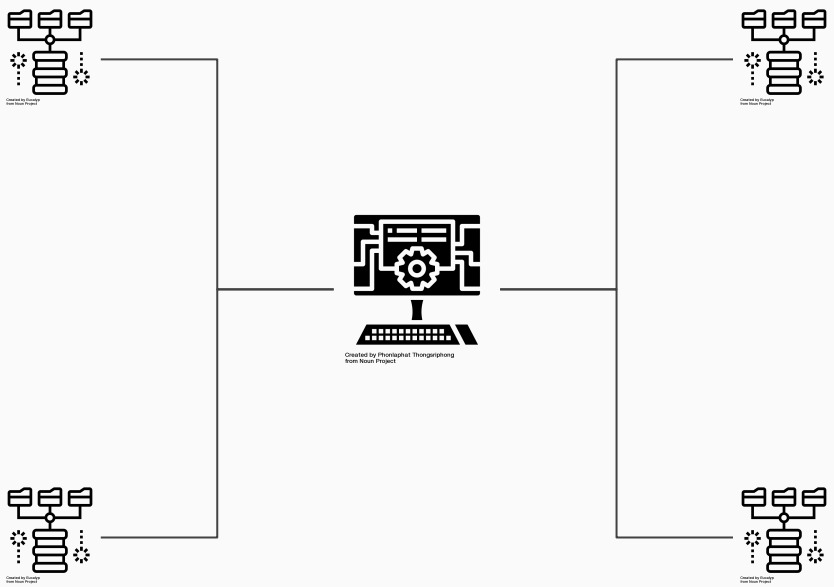
Interactions between modules or libraries

Large-scale systems

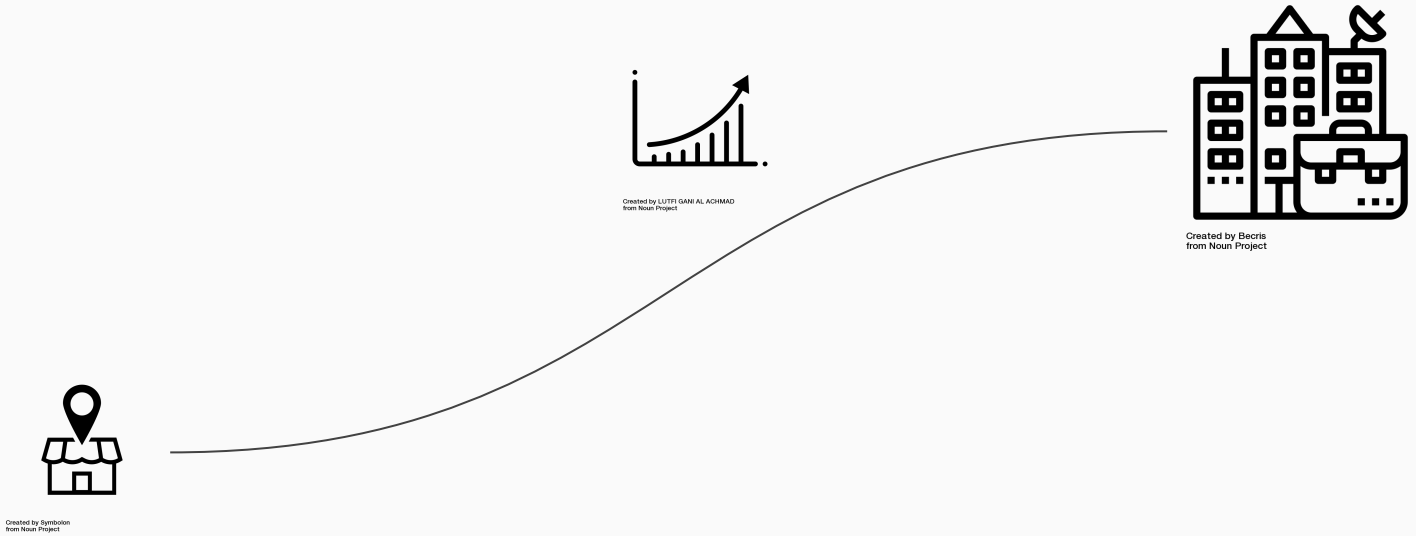
Large-Scale Systems

- These systems are usually distributed and multi-service oriented.

- The design allows them to efficiently handle large amounts of requests.



Why pay attention to the software architecture of a planned system?



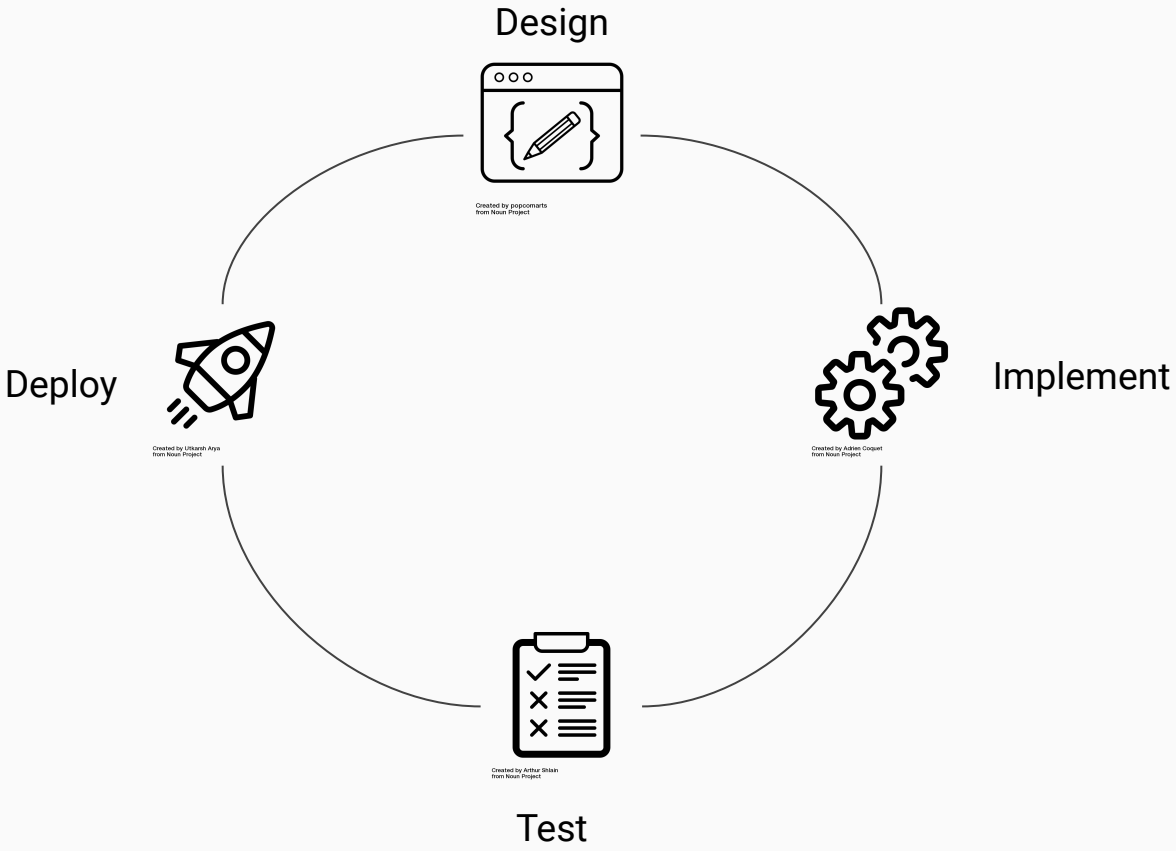
Created by Chameleon Design
from Noun Project

Created by corpus delicti
from Noun Project

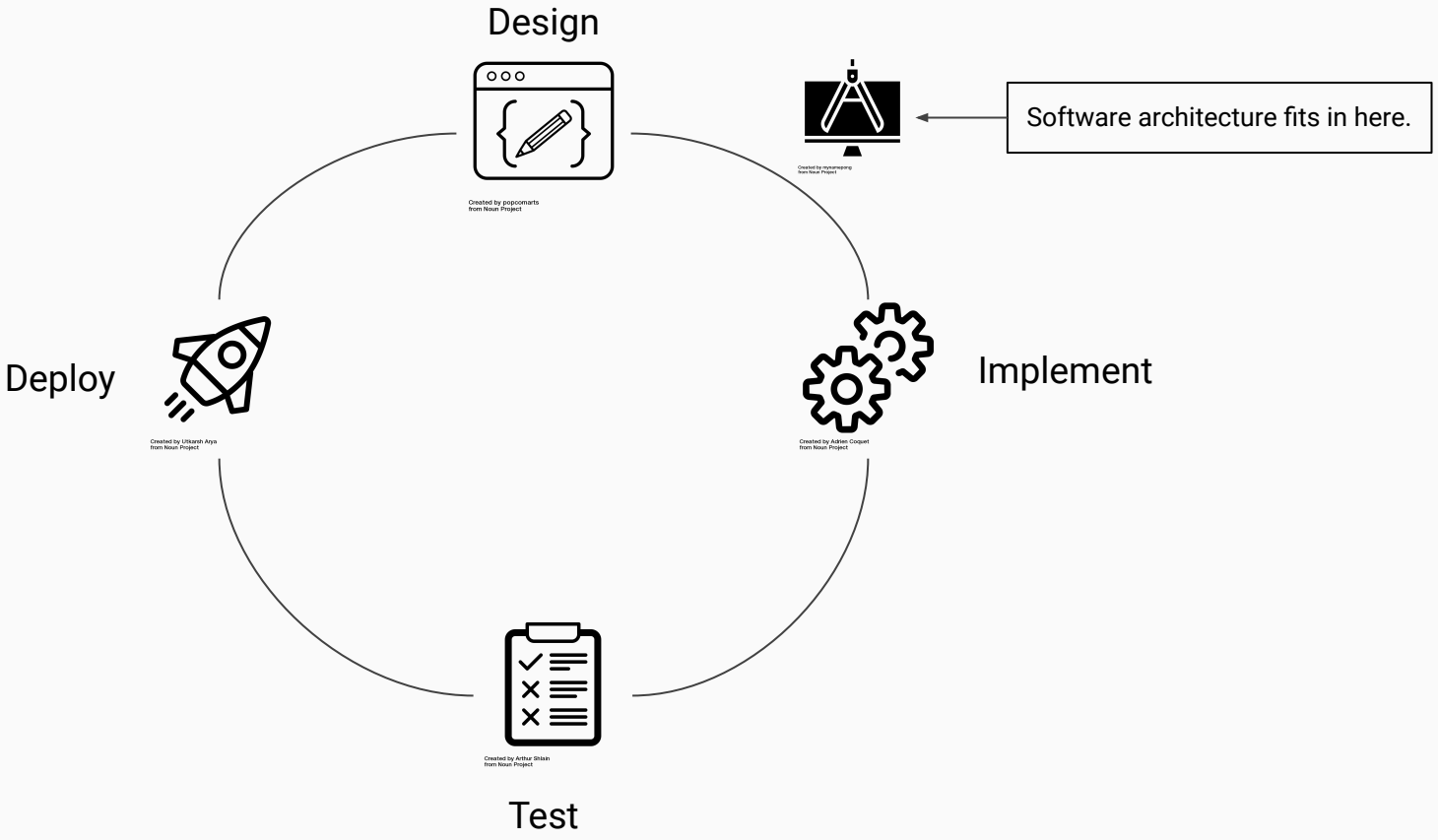
The stakes here are high...

But before we conclude, let us have another important discussion...

The Software Development Process



Where does software architecture fit into the software development process?



Key Takeaways

- Building architecture and software architecture are conceptually identical.
- 'Software Architecture' can mean different things depending on the context.
- Software Architecture is one of the initial steps in software development.
- It pays to pay attention to the architectural design of a software system.