Robust Systems Design

~~Systems Analysis & Design~~

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Outline

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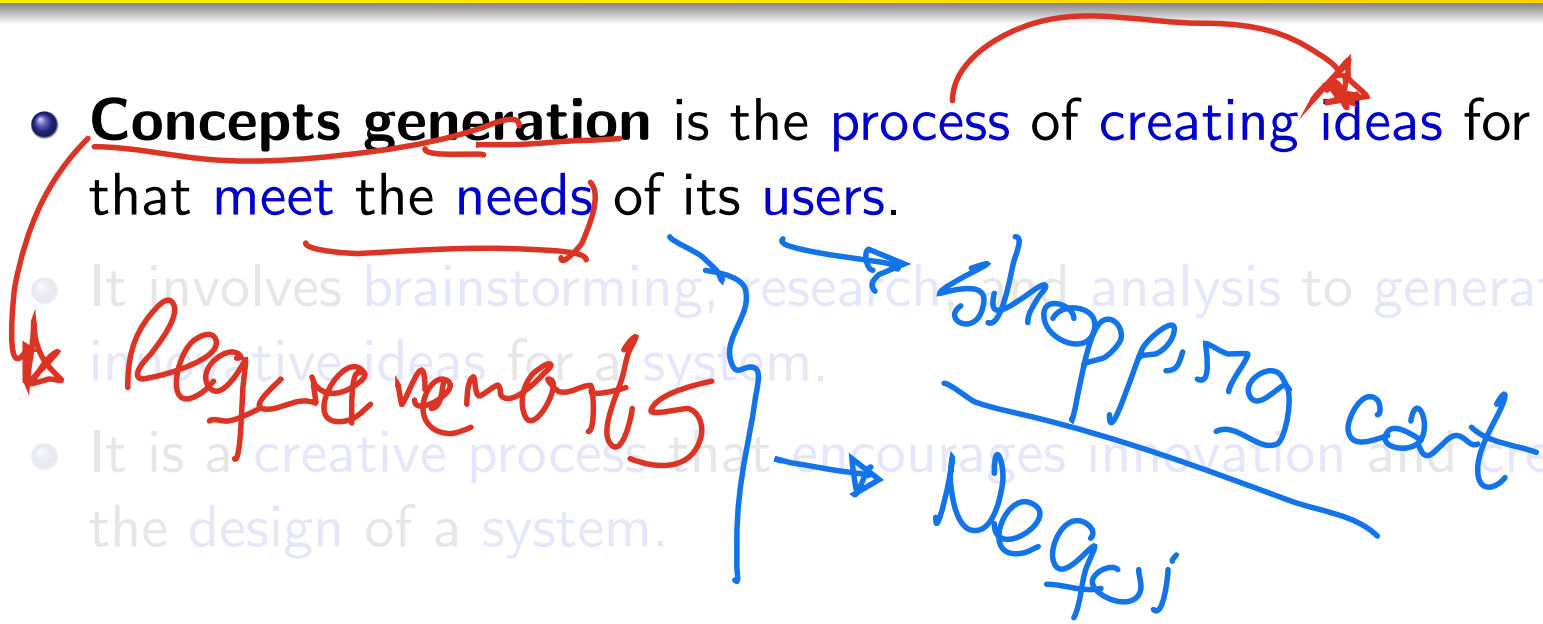
Concepts Generation

- **Concepts generation** is the process of creating ideas for a system that meet the needs of its users.
- It involves brainstorming, research, and analysis to generate innovative ideas for a system.
- It is a creative process that encourages innovation and creativity in the design of a system.



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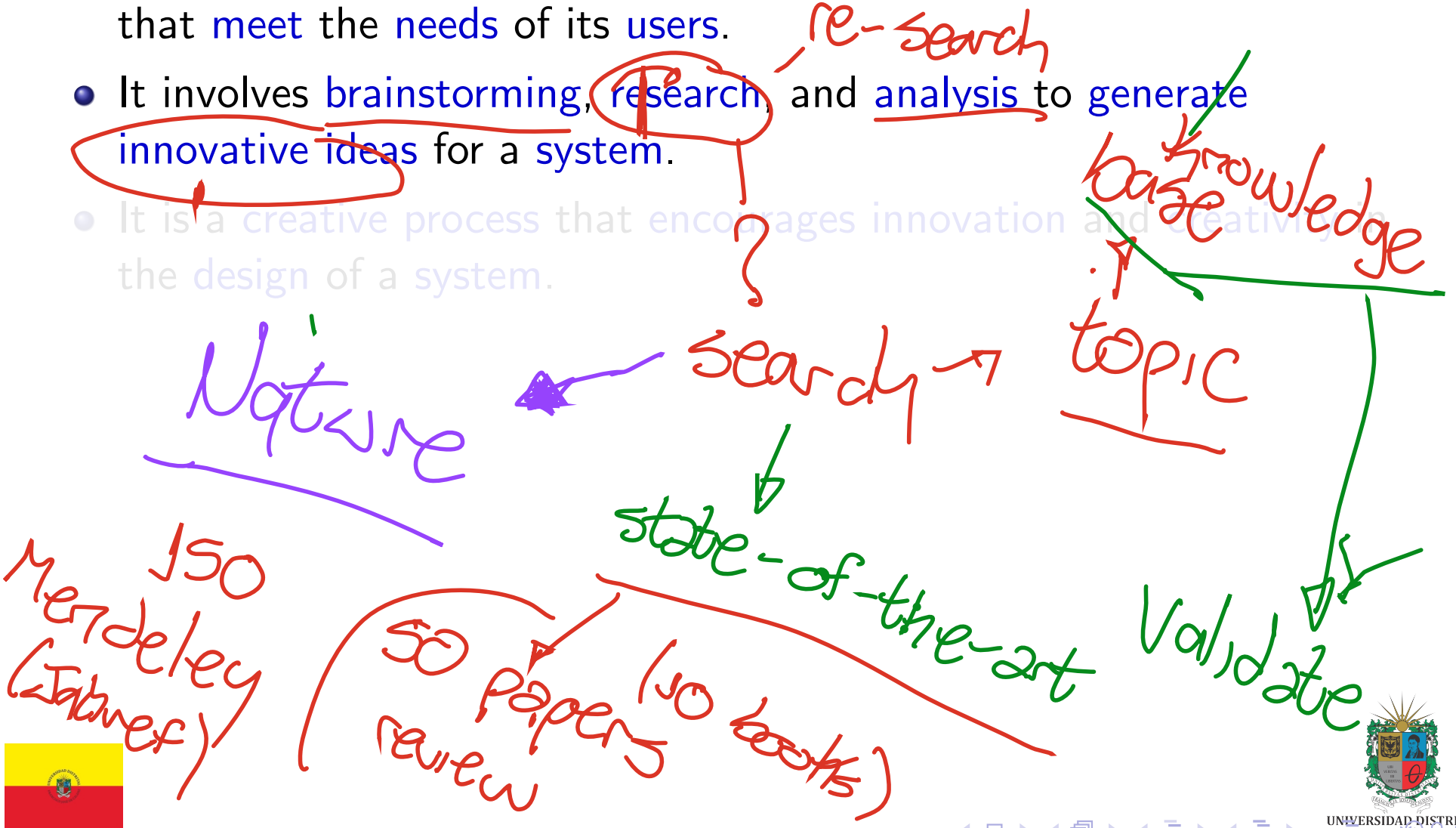

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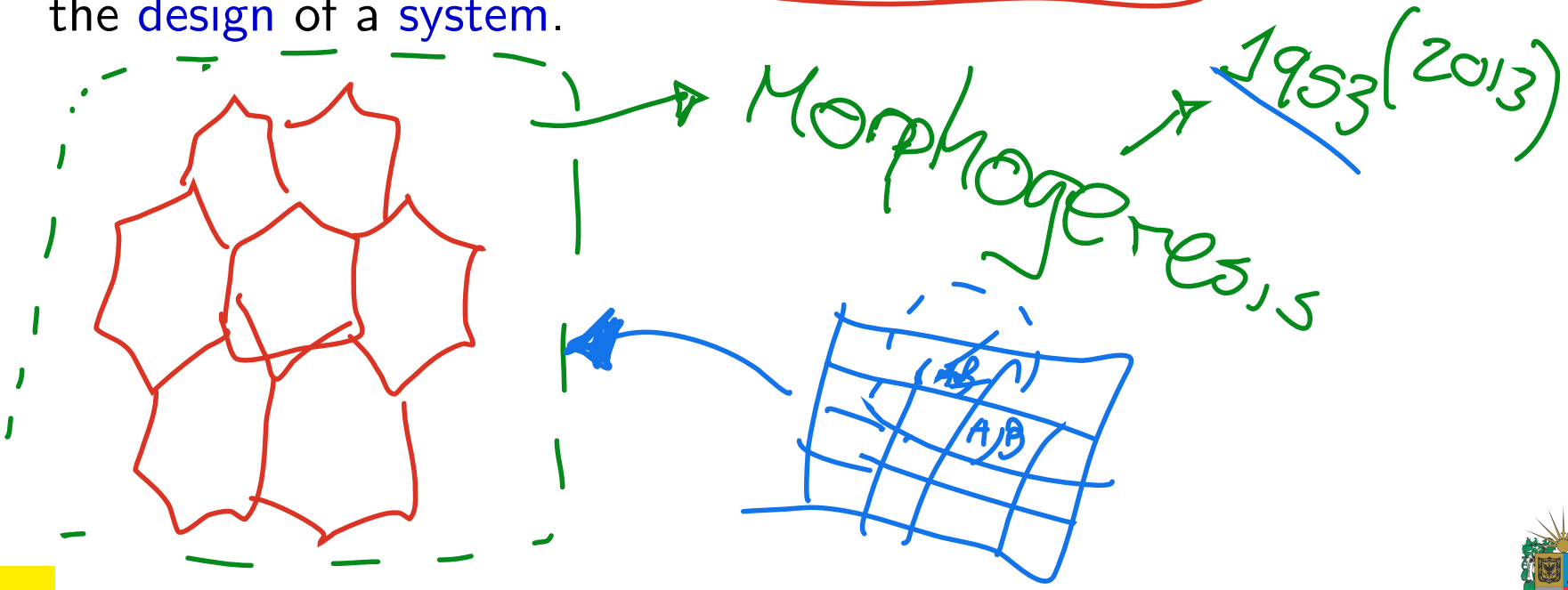

Innovation and Creativity

- **Innovation** is the process of creating new ideas and solutions that improve the performance of a system.
- **Creativity** is the ability to generate original and innovative ideas that solve problems and meet the needs of users.
- They are important for ensuring that a system is robust, efficient, and effective.

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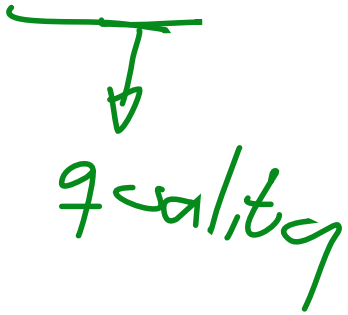
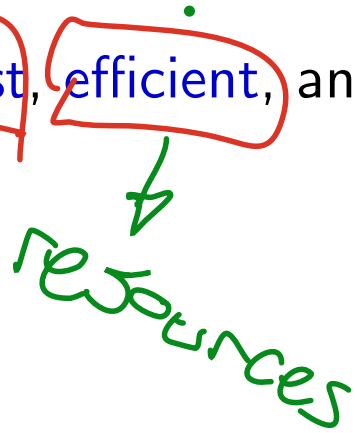
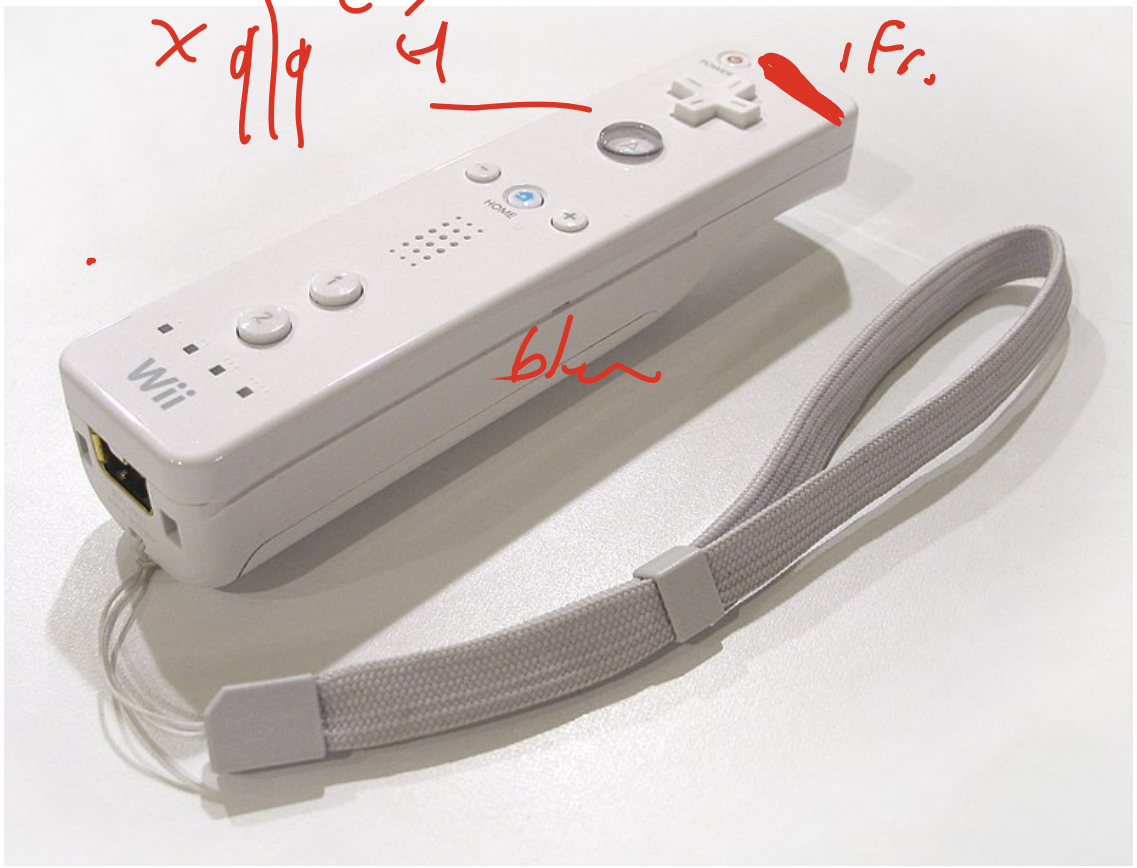




Is this Innovation & Creativity?



Concepts Selection

- **Concepts selection** is the process of evaluating and choosing the best ideas for a system.
  - ↳ Abstraction
- It involves analysis, comparison, and evaluation of concepts to determine which ones are the most feasible and effective.
- It is a critical process that ensures that the final design of a system meets the needs of its users.

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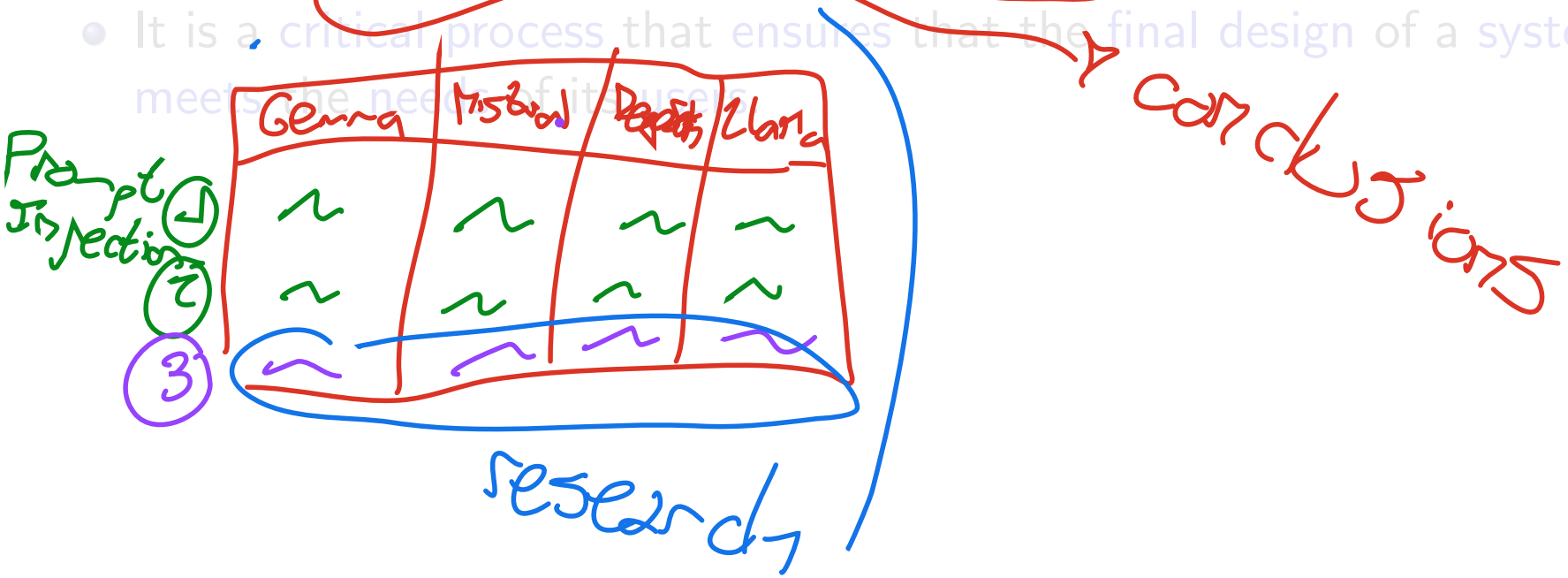

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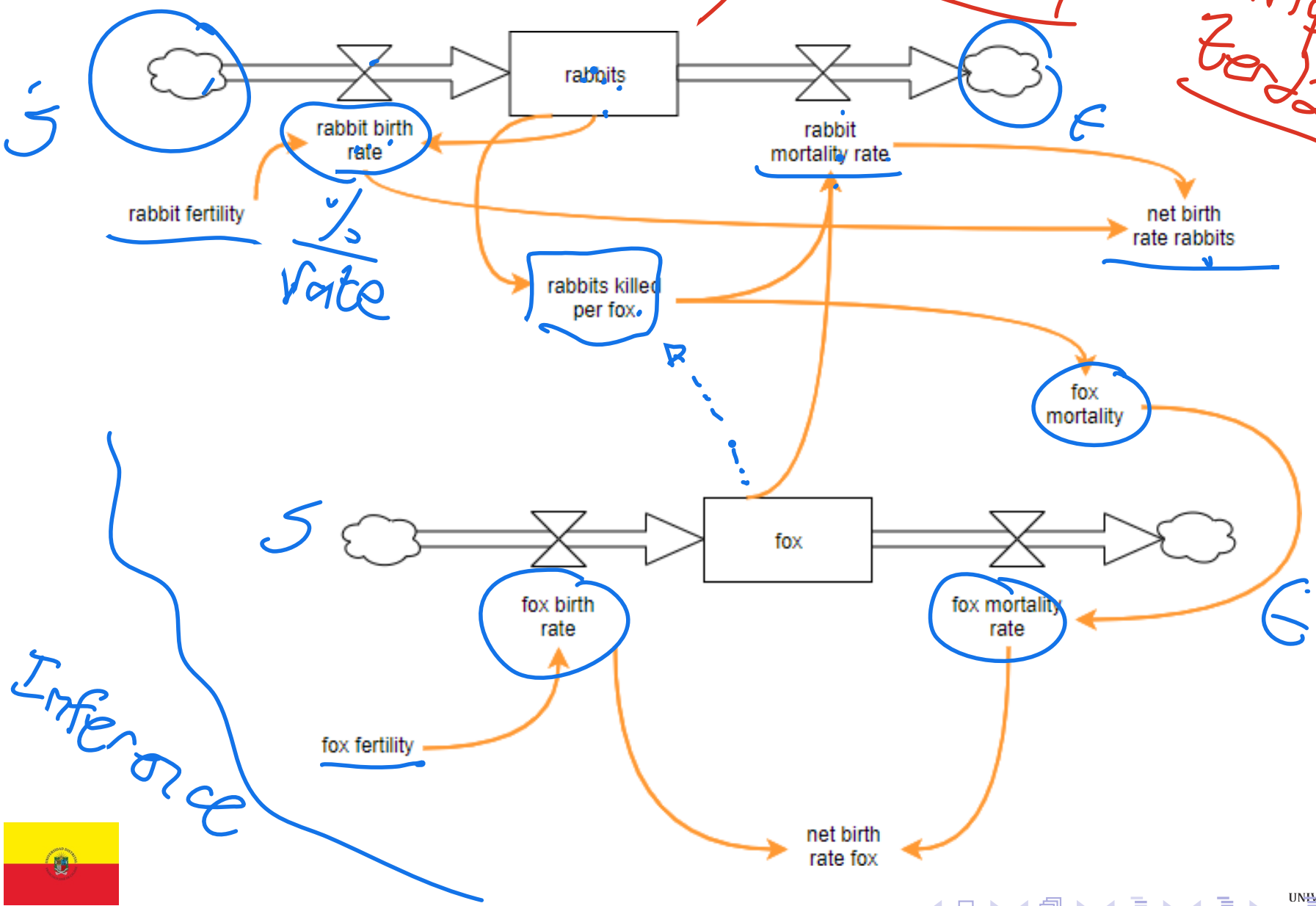
Stock and Flow Diagram



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Quality Guidelines

- **Quality guidelines** are principles that guide the design of a system to ensure that it meets the needs of its users.
- They include reliability, scalability, maintainability, and usability guidelines.
- They are important for ensuring that a system is robust, efficient, and effective.

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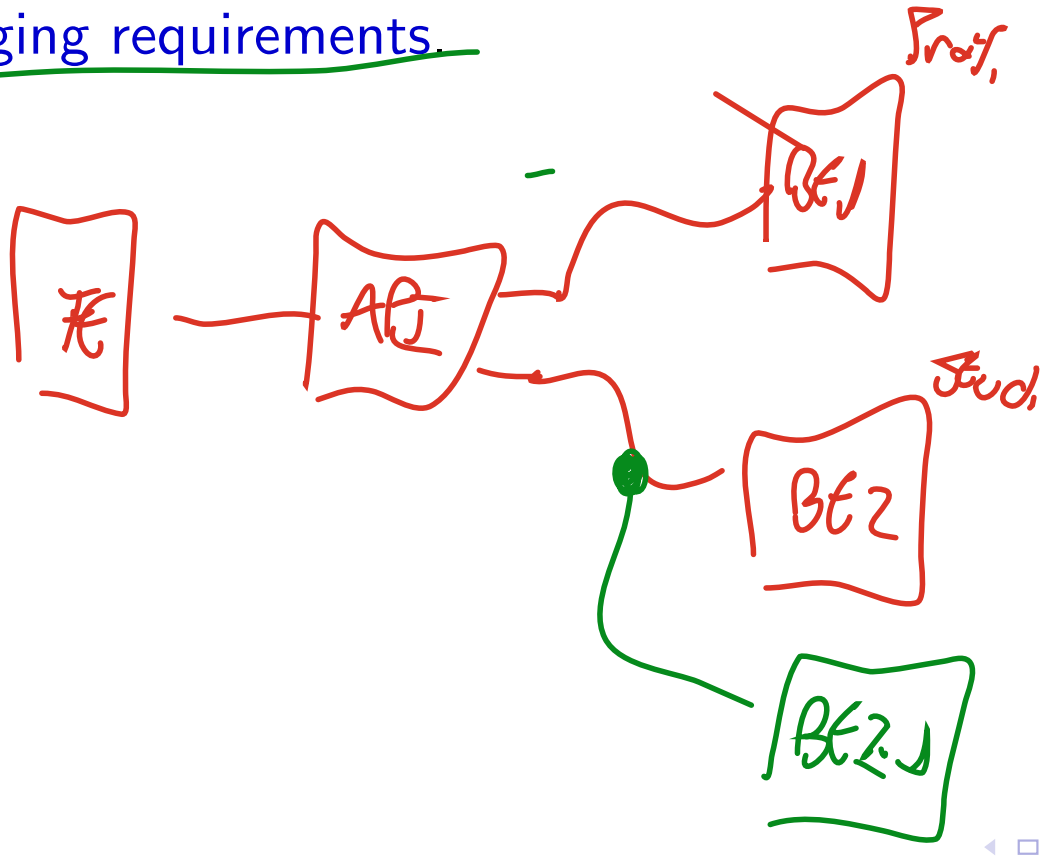
Reliability Guidelines

- **Reliability guidelines** are principles that guide the design of a system to ensure that it is reliable and dependable.
- They include fault-tolerance, redundancy, and error-handling guidelines.
- They are important for ensuring that a system is robust and resilient to failures.

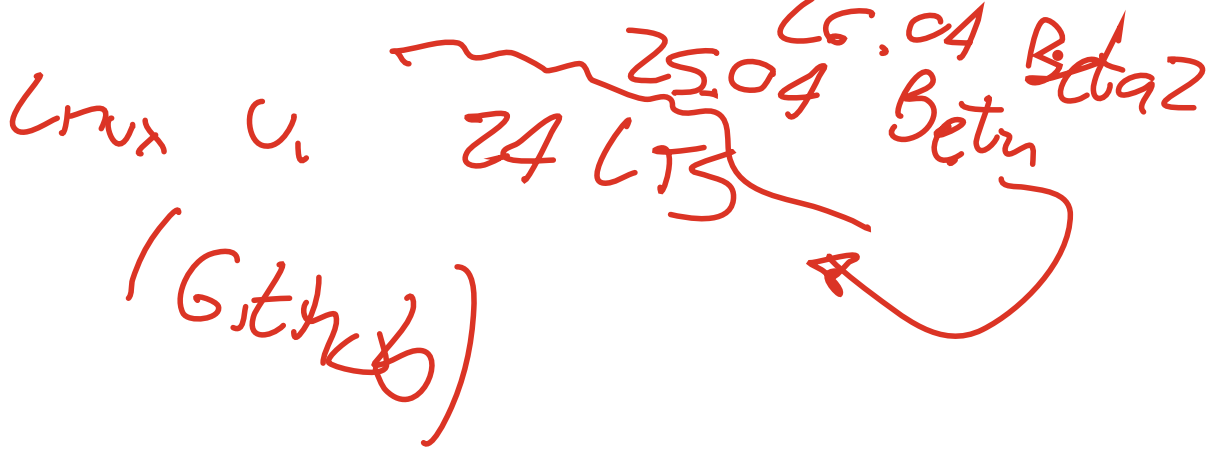
Scalability Guidelines

- **Scalability guidelines** are principles that guide the design of a system to ensure that it is scalable and flexible.
- They include modularity, extensibility, and performance guidelines.
- They are important for ensuring that a system can grow and adapt to changing requirements.



Maintainability Guidelines

- **Maintainability guidelines** are principles that guide the design of a system to ensure that it is easy to maintain and update.
- They include modularity, documentation, and versioning guidelines.
- They are important for ensuring that a system can be easily maintained and updated by its developers.



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ISO 9000

- **ISO 9000** is a quality standard that defines the requirements for a quality management system.
- It is designed to help organizations ensure that they meet the needs of their customers and stakeholders.
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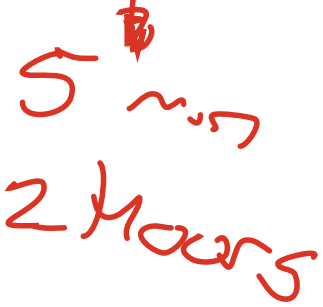

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CMMI

- **CMMI** is a quality standard that defines the requirements for a mature software development process.
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What is a System Architecture?

- A **system architecture** is the structure of a system that defines its components, interactions, and relationships.
- A **system architecture** is the blueprint of a system that guides its development and implementation.
- A **system architecture** is the foundation of a system that ensures that it meets the needs of its users.

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Types of System Architectures

- There are several types of system architectures that are used in systems development.
- They include monolithic, client-server, peer-to-peer, and distributed architectures.
- Each type of architecture has its own advantages and disadvantages that depend on the specific requirements of the system.

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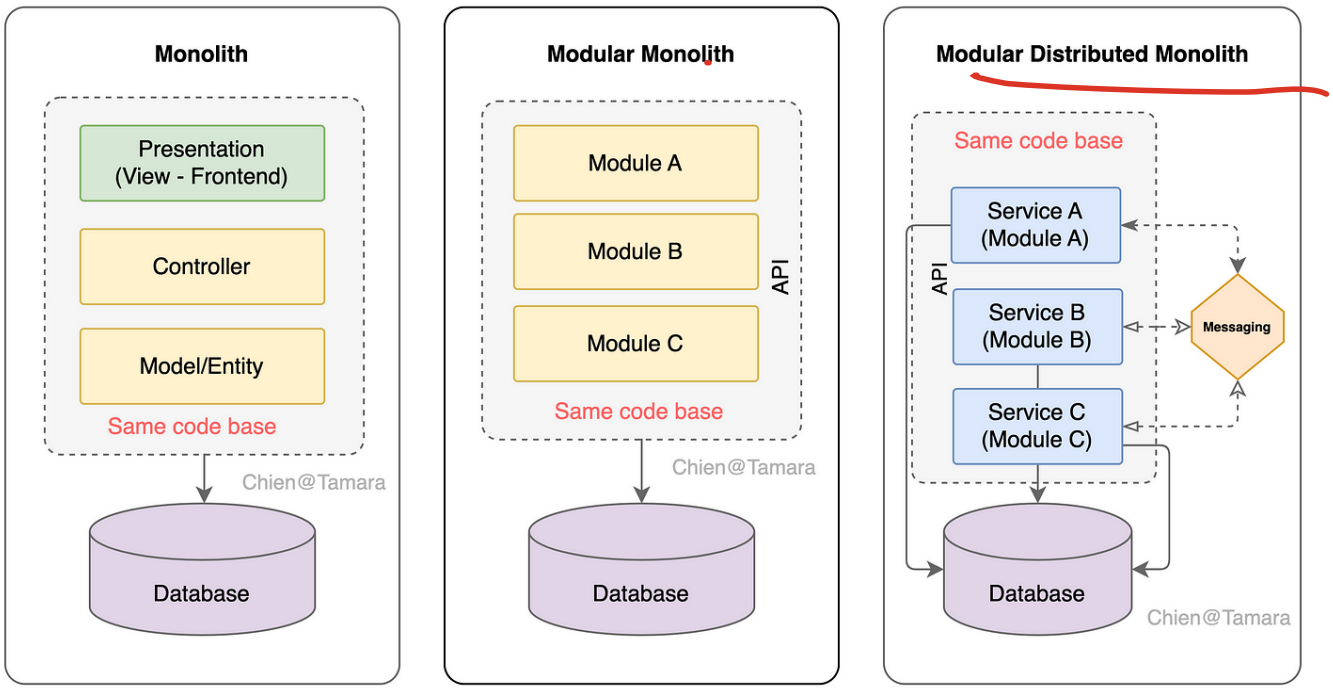
Monolithic System Architecture

- A **monolithic system architecture** is a single-tier architecture that consists of a single unit that performs all the functions of the system.
- It is simple, easy to develop, and maintain, but it is not scalable and flexible.It is used for small systems that do not require high performance or reliability.



Client-Server System Architecture

- A **client-server system architecture** is a two-tier architecture that consists of a client and a server that communicate with each other over a network.
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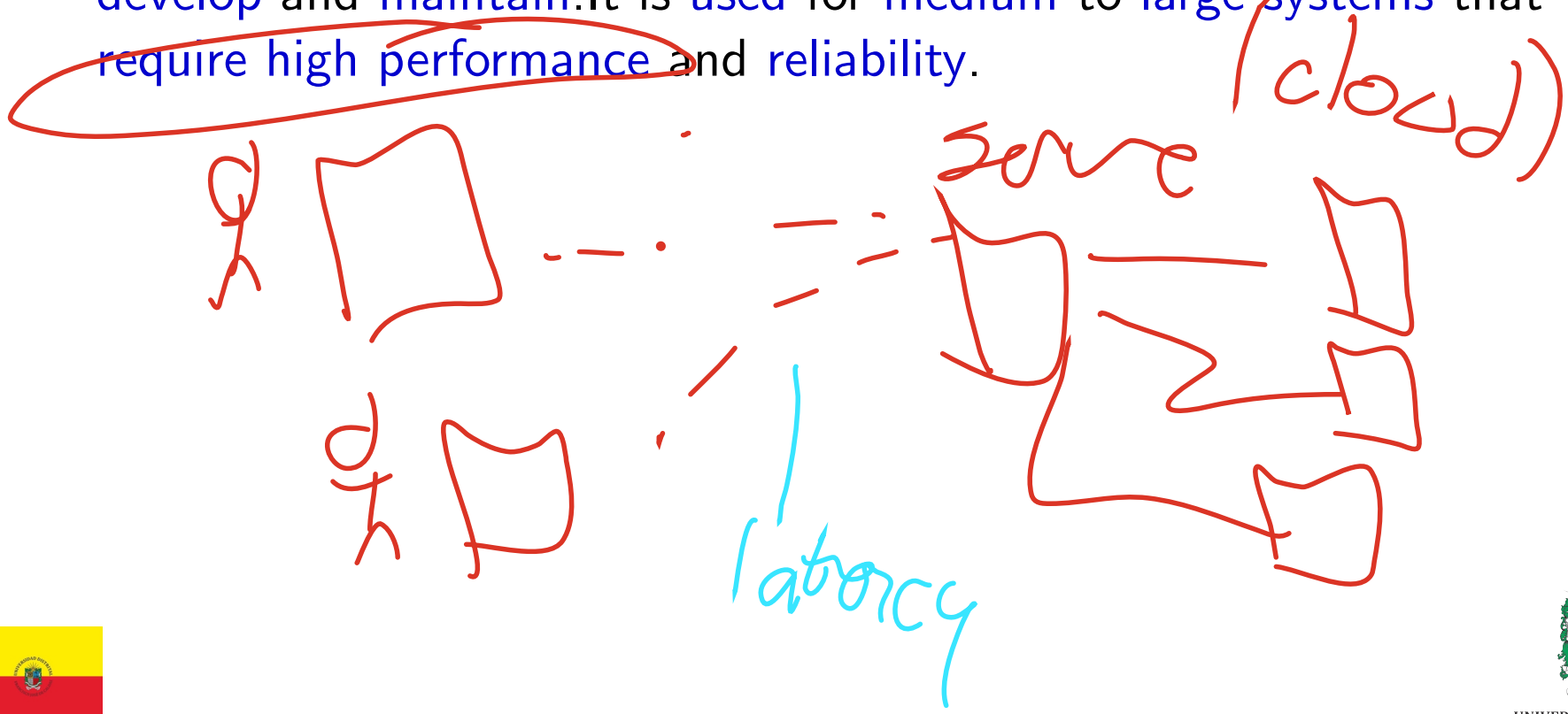

Peer-to-Peer System Architecture

- A **peer-to-peer system architecture** is a two-tier architecture that consists of a network of peers that communicate with each other directly.
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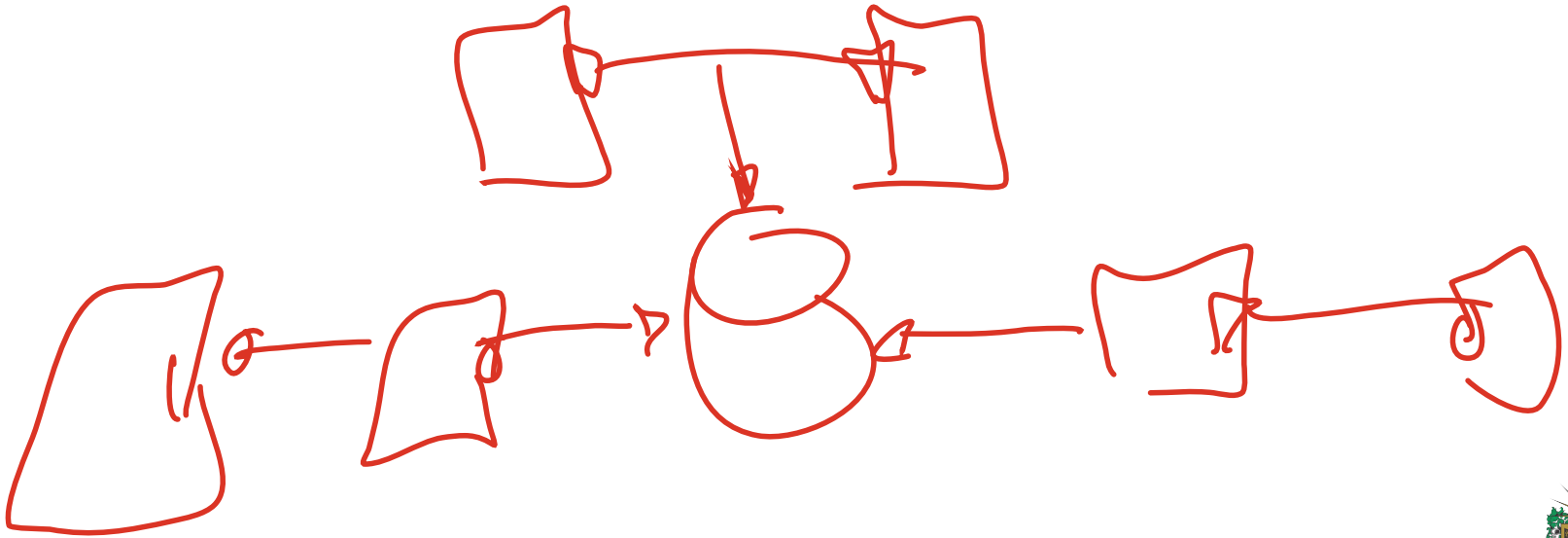

Distributed System Architecture

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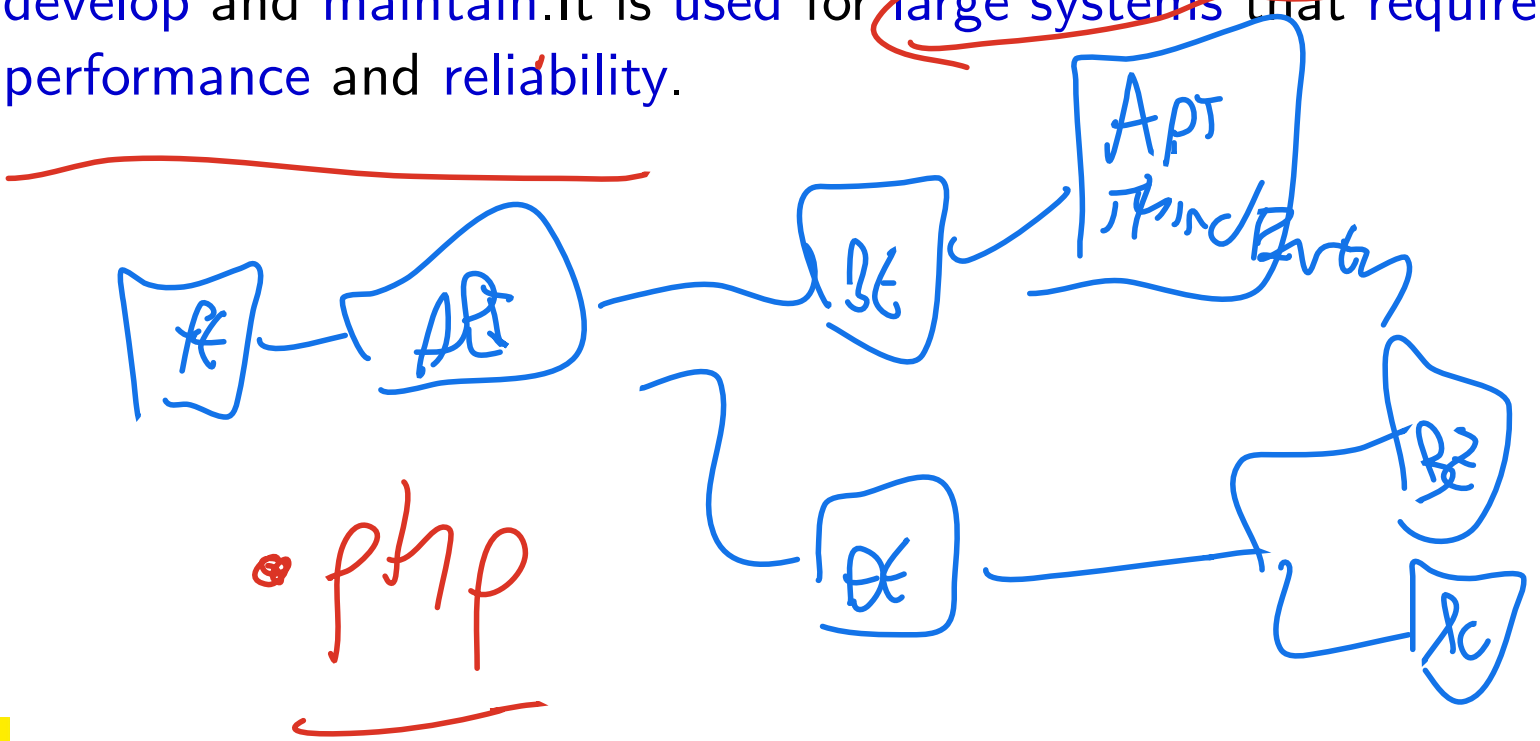

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Thanks!

Questions?

Repo: *https://github.com/EngAndres/ud-public/tree/main/courses/systems-analysis*

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