Systems Project Management

Systems Analysis & Design

Author: Eng. Carlos Andrés Sierra, M.Sc.
cavirguezs@udistrital.edu.co

Full-time Adjunct Professor
Computer Engineering Program
School of Engineering
Universidad Distrital Francisco José de Caldas

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Outline

1. Information Systems
2. Enterprises as Systems
3. Software Methodologies

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1 Information Systems

2 Enterprises as Systems

3 Software Methodologies

Information Systems

- An **Information System** is a system that *collects*, *processes*, *stores*, and *disseminates* information.
- **Information systems** are used to support and manage business operations.
- **Information systems** are used to automate and optimize business processes.
- Examples of information systems include transaction processing systems, management information systems, decision support systems, executive information systems, expert systems, and data systems.

first Project

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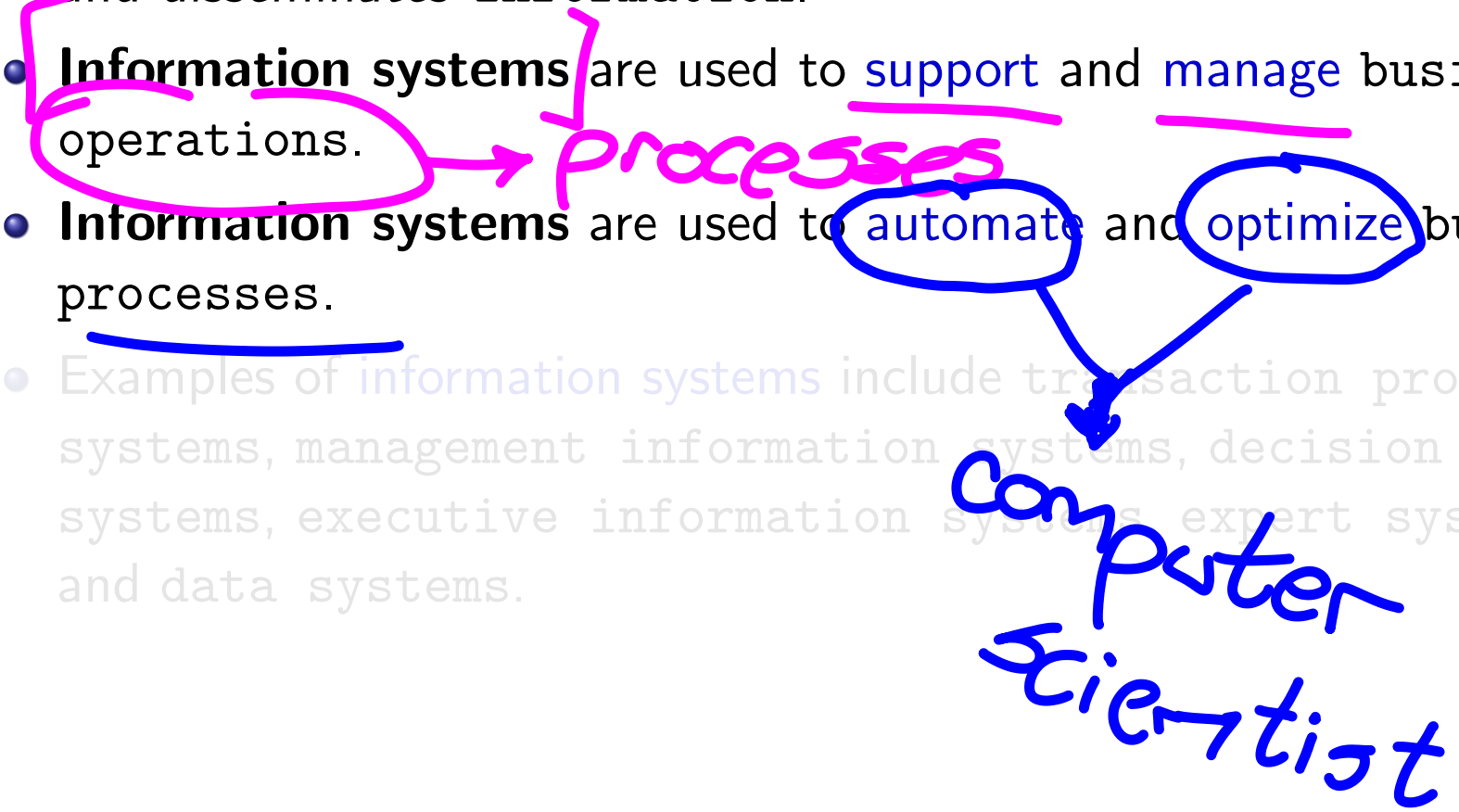

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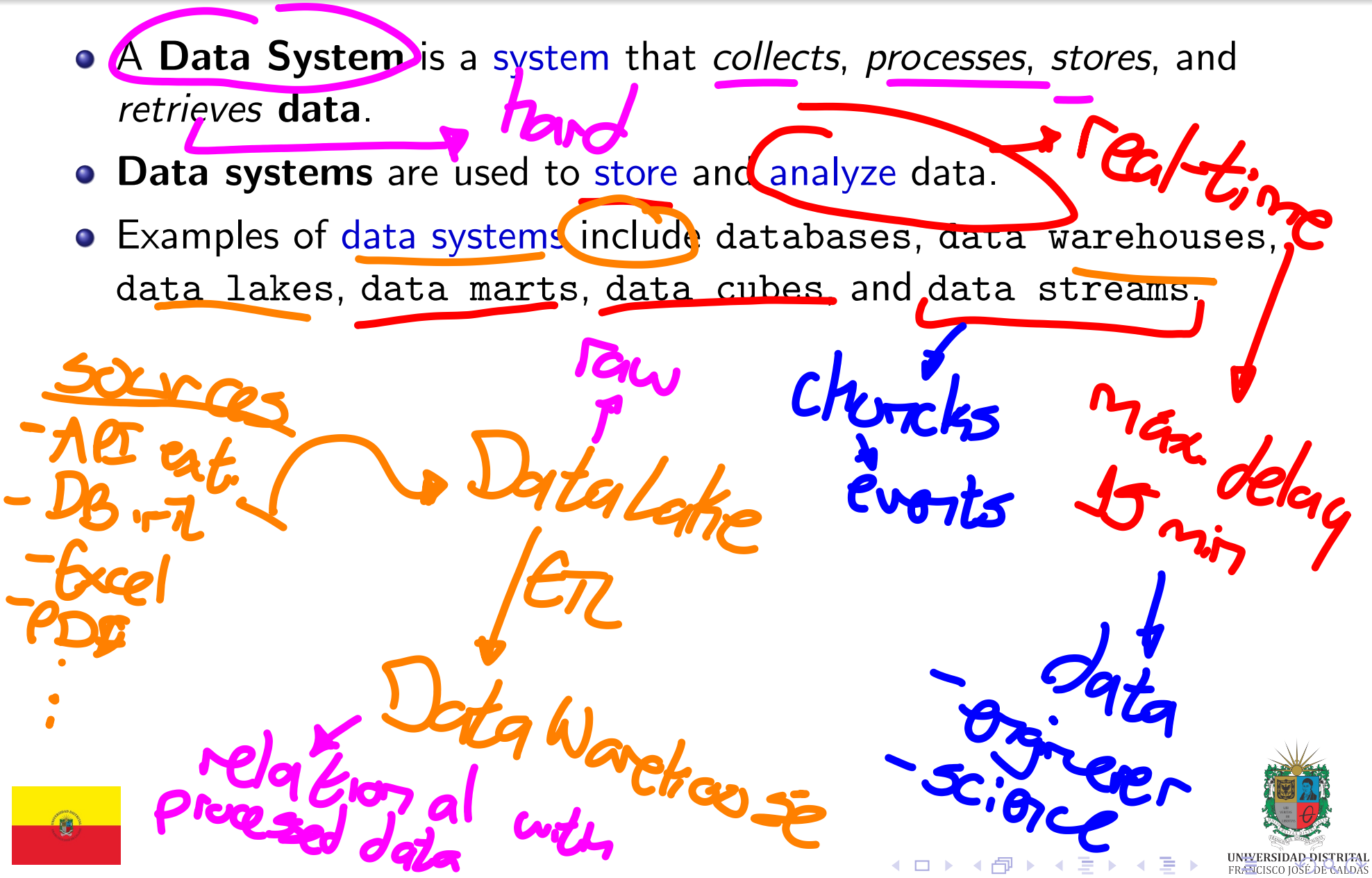
Data Systems

- A **Data System** is a system that *collects*, *processes*, *stores*, and *retrieves* **data**.
- **Data systems** are used to store and analyze data.
- Examples of data systems include `databases`, `data warehouses`, `data lakes`, `data marts`, `data cubes` and `data streams`.



Expert Systems

- An **Expert System** is a system that uses knowledge and reasoning to solve problems.
- **Expert systems** are used to automate and optimize decision-making processes.
- Examples of expert systems include diagnostic systems, predictive systems, prescriptive systems, decision support systems, and automated reasoning systems.

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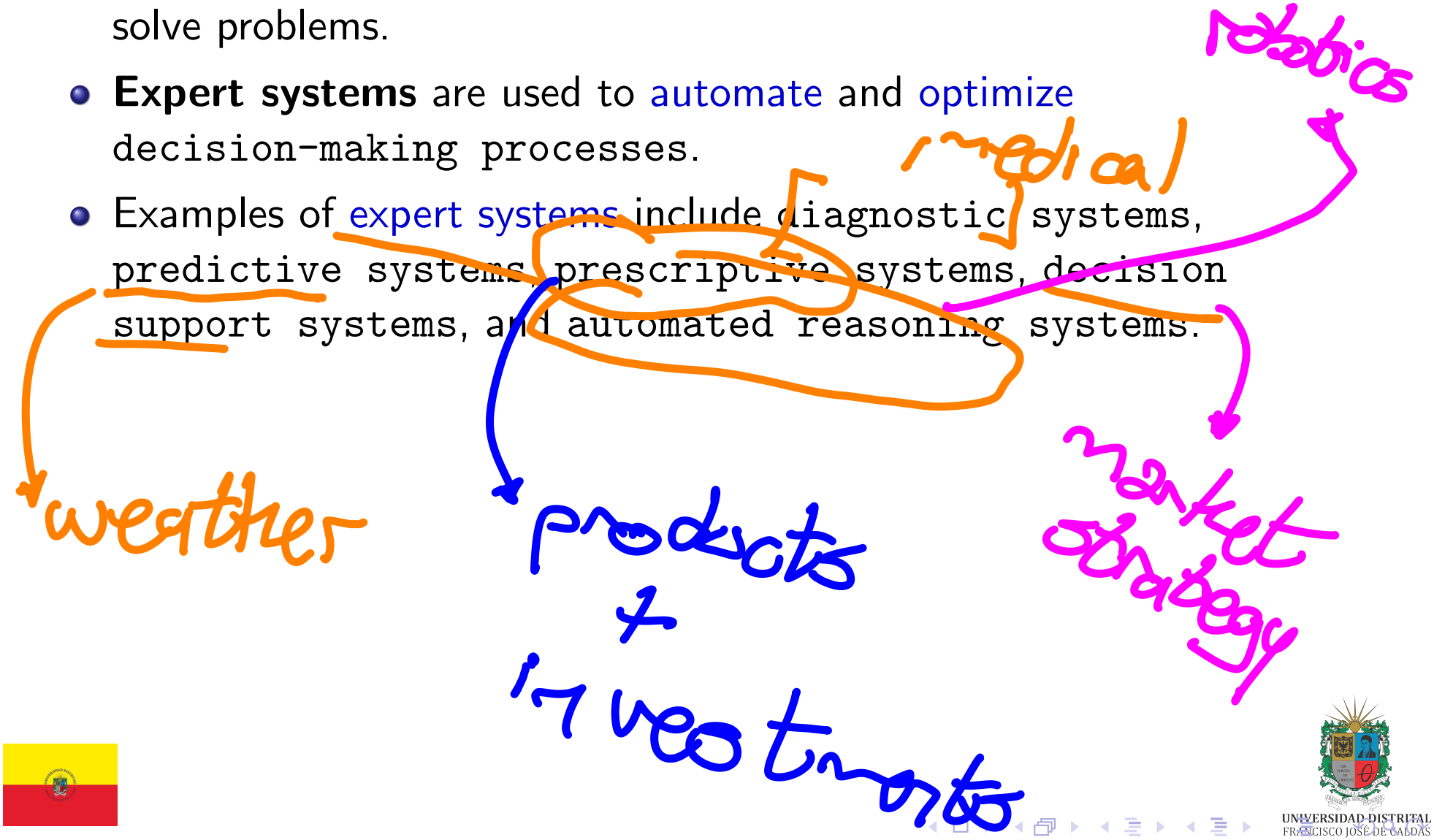
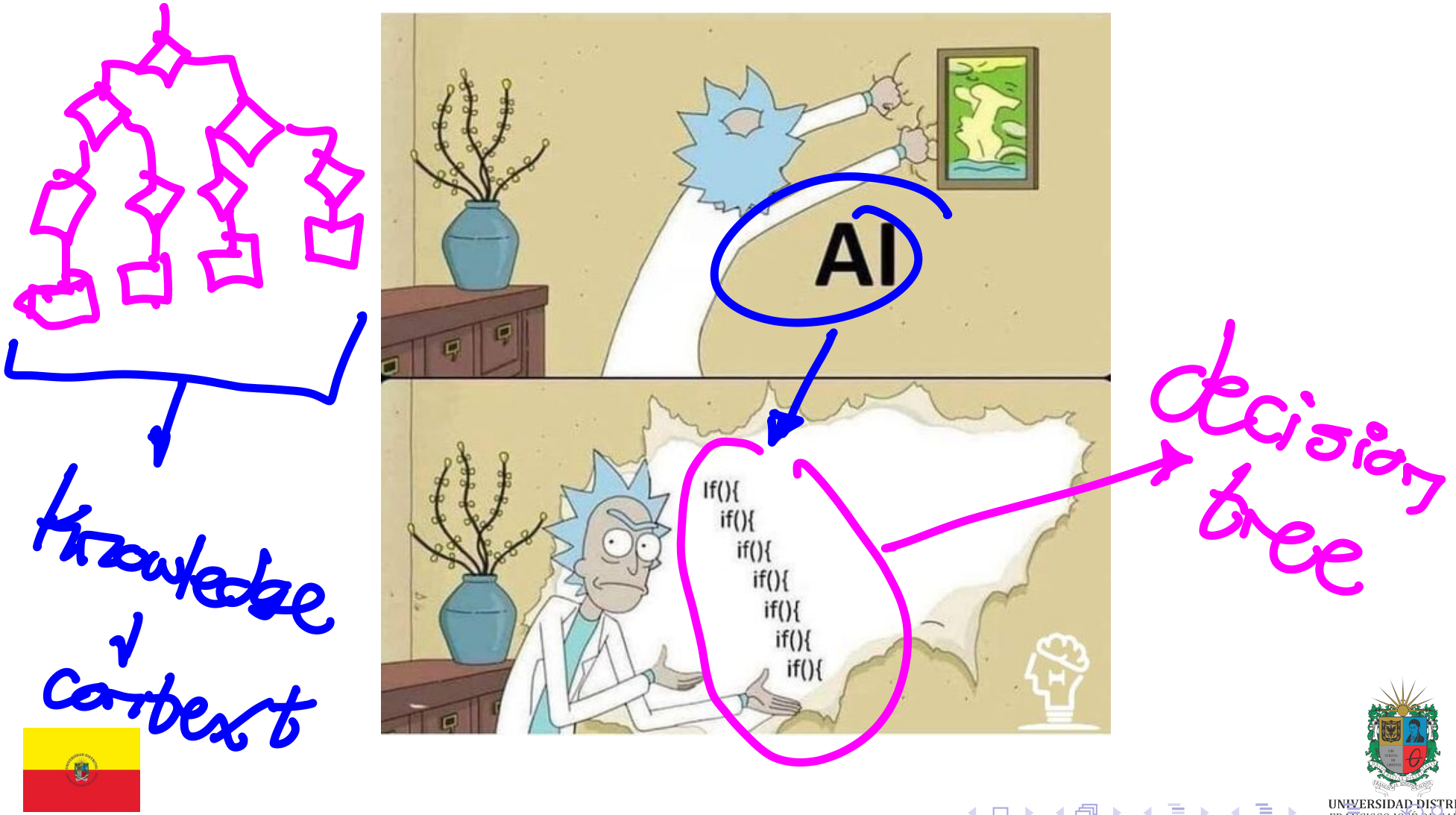


Expert Systems as Classical Artificial Intelligence

Here there is a great example of a diagnostic system.



Risks and Failures in Information

- **Information systems** are subject to risks and failures that can impact business operations.
- **Risks and failures** can be mitigated through security measures, backup systems, disaster recovery plans, and monitoring tools.
- Examples of risks and failures include security breaches, data loss, system downtime, performance issues, and compliance violations.

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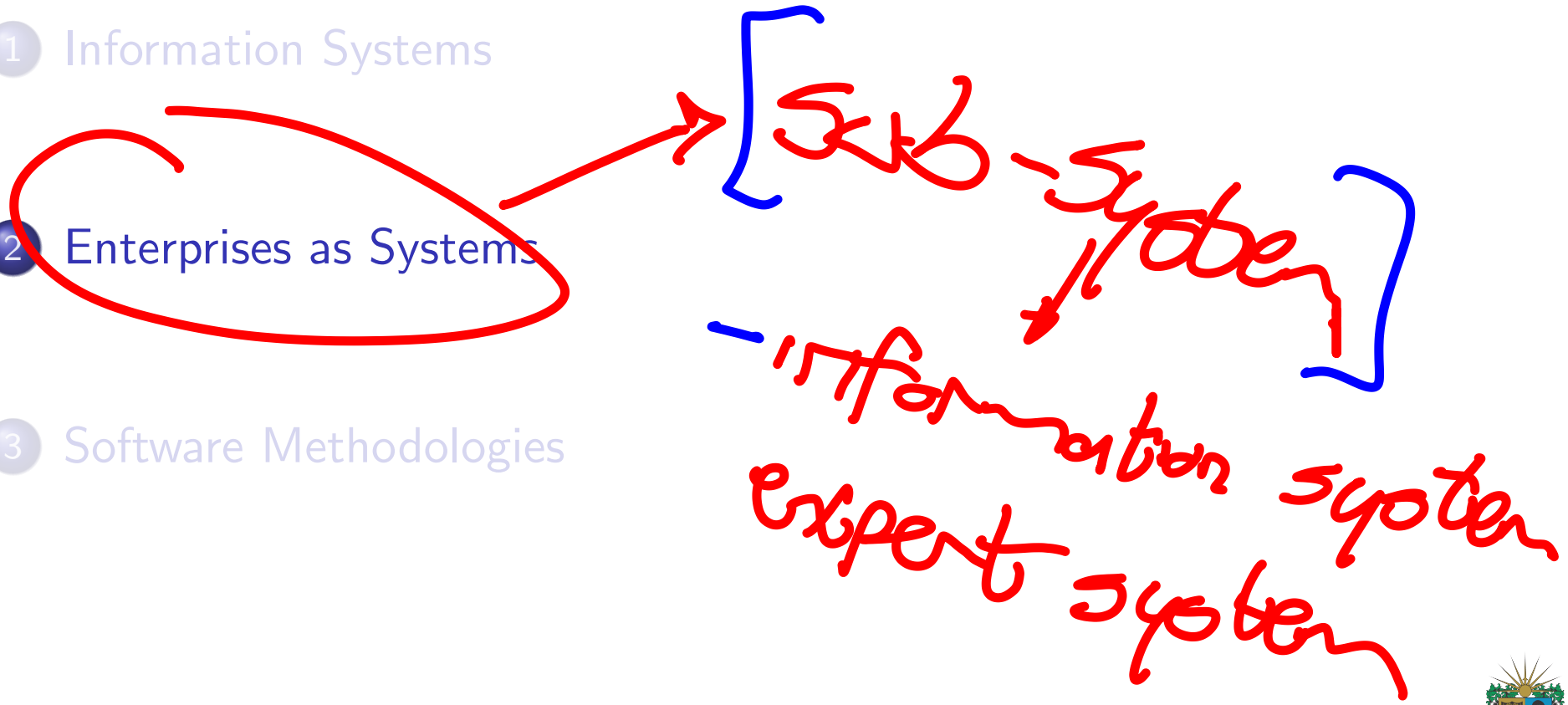
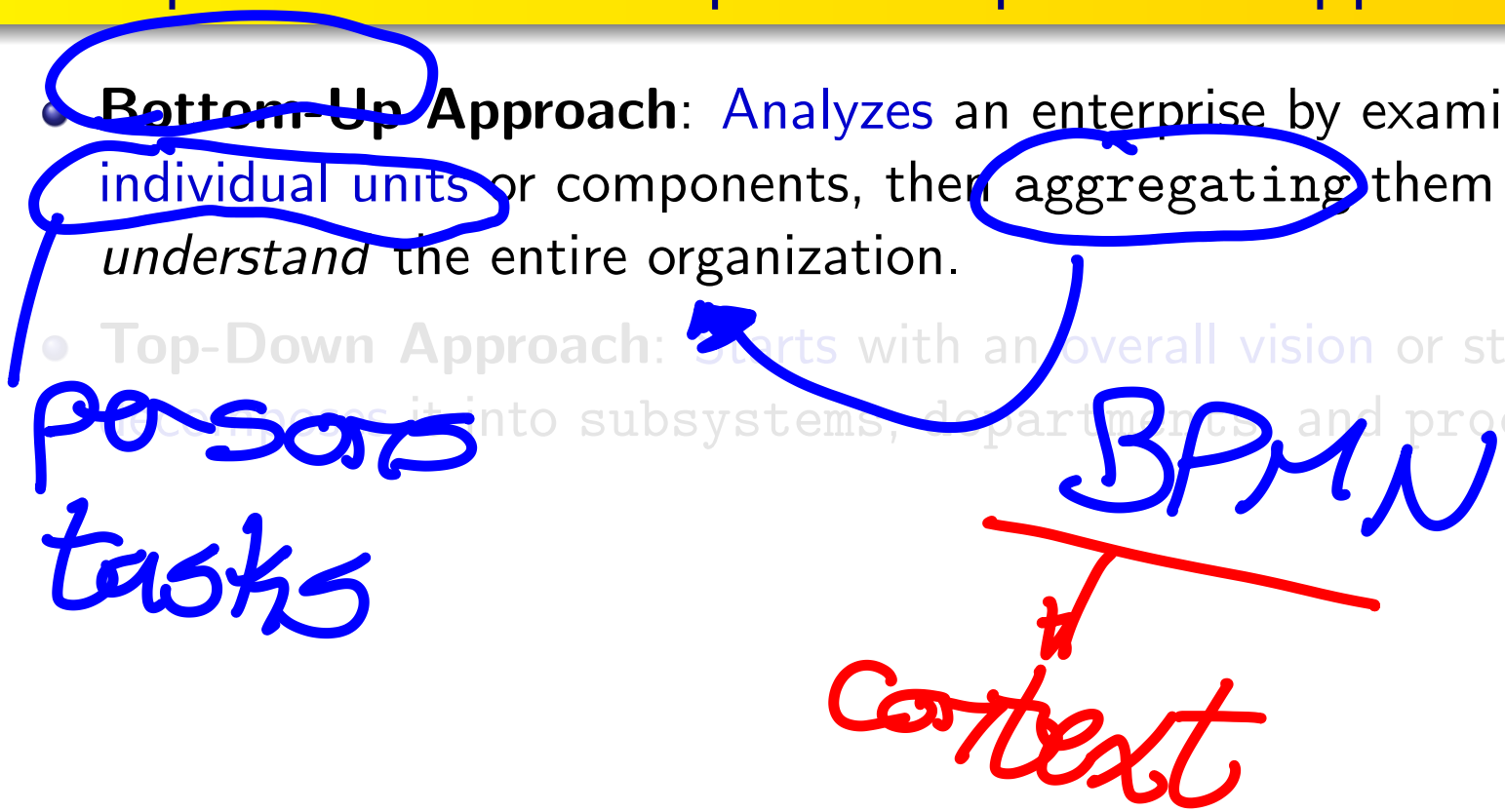


Enterprises: Bottom-Up and Top-Down Approaches

- **Bottom-Up Approach**: Analyzes an enterprise by examining its individual units or components, then aggregating them to *understand* the entire organization.
- **Top-Down Approach**: Starts with an overall vision or strategy and decomposes it into subsystems, departments, and processes.



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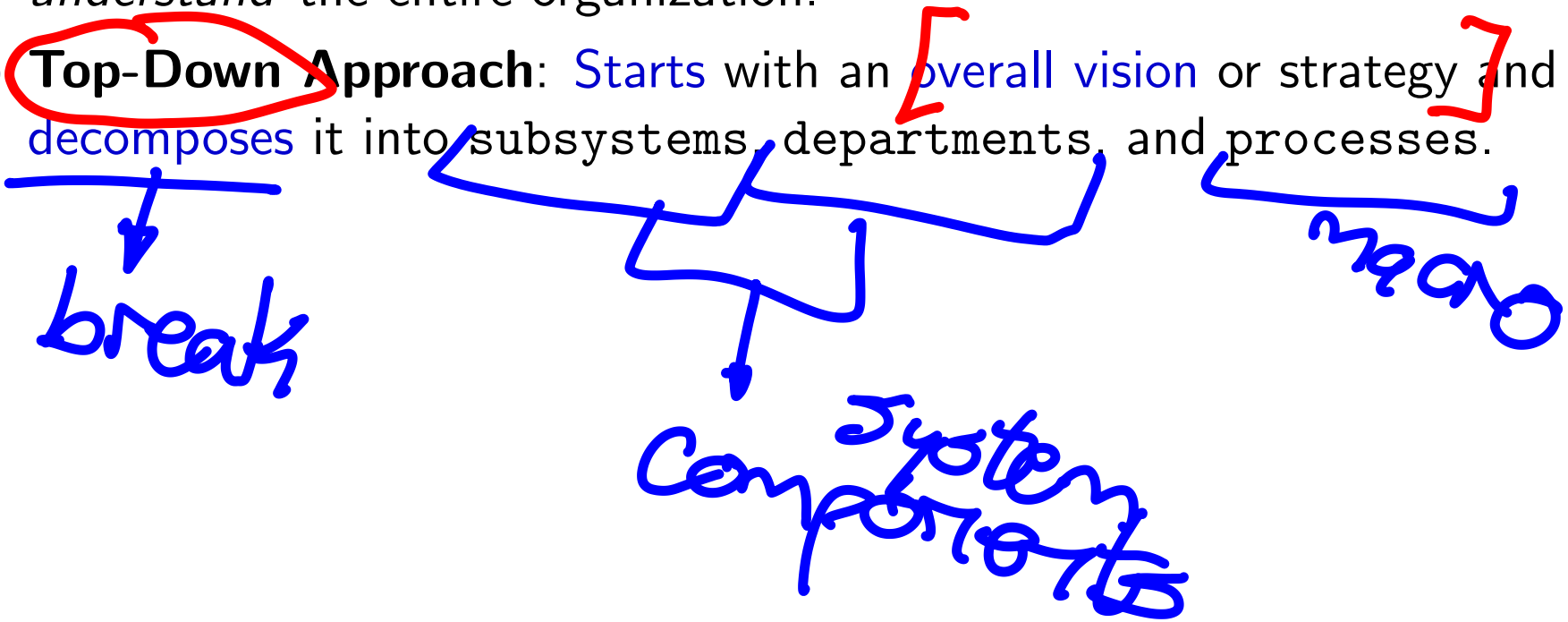

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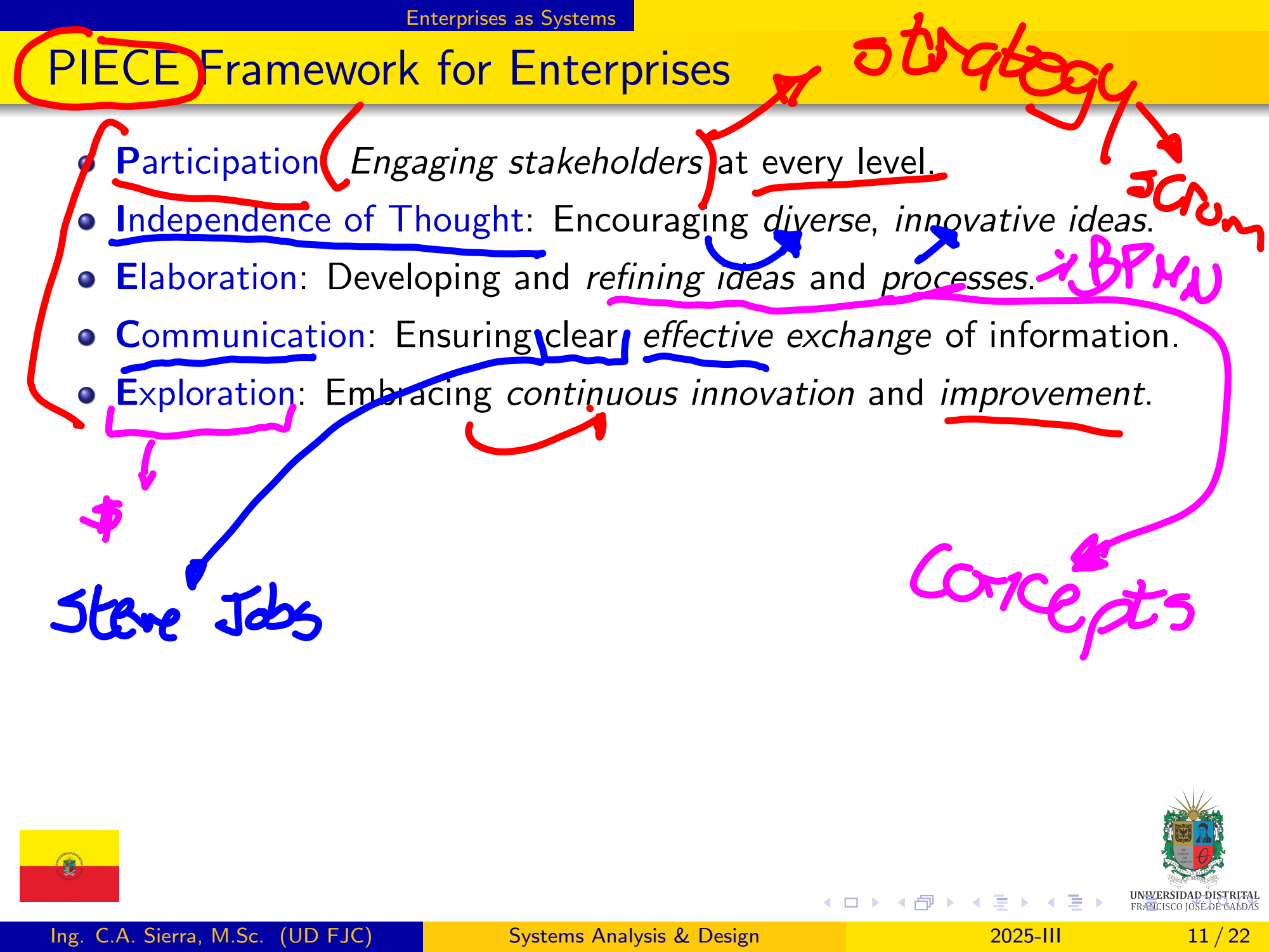
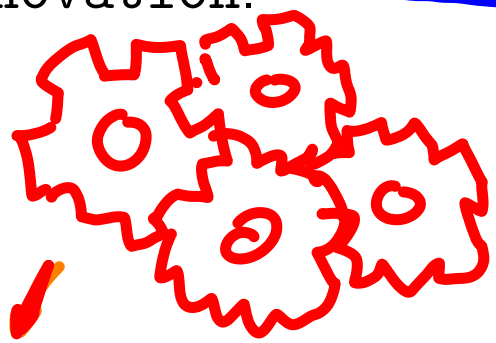
PIECE Framework for Enterprises

- **P**articipation: *Engaging stakeholders* at every level.
- **I**ndependence of Thought: Encouraging *diverse*, *innovative ideas*.
- **E**laboration: Developing and *refining ideas* and *processes*.
- **C**ommunication: Ensuring clear, *effective exchange* of information.
- **E**xploration: Embracing *continuous innovation* and *improvement*.



Enterprise System Typologies

- **Rational Systems**: Organizations driven by logical, structured processes and clear hierarchies.
- **Natural Systems**: Organizations viewed as self-organizing entities with emergent behavior.
- **Open Systems**: Enterprises that continuously interact with their external environment for information, resources, and innovation.



Human Resources

Supply Chain

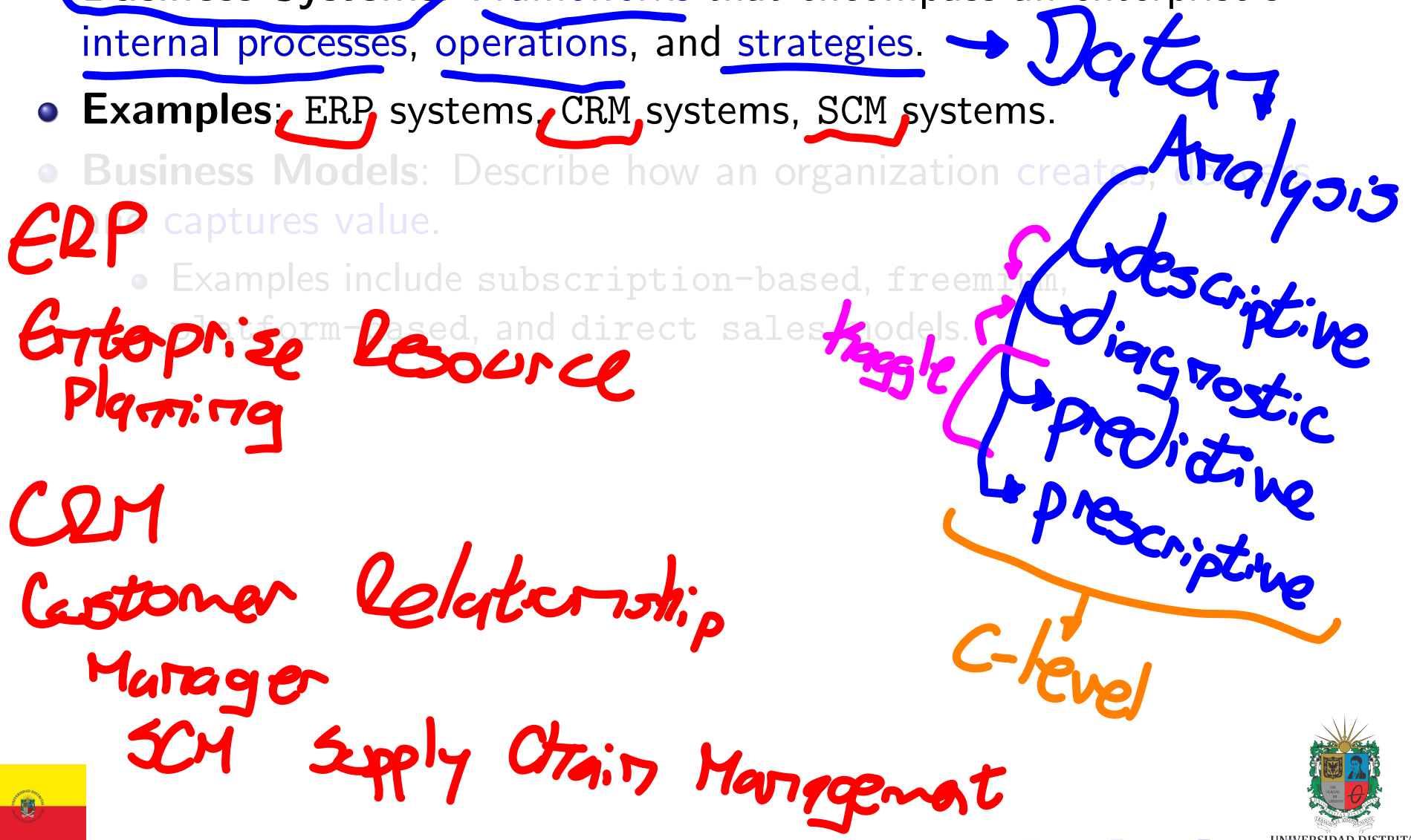
Human + Interaction

Skills Matrix

Human Talent

Business Systems and Models

- **Business Systems**: Frameworks that encompass an enterprise's internal processes, operations, and strategies.
- **Examples**: ERP systems, CRM systems, SCM systems.
- **Business Models**: Describe how an organization creates, delivers, and captures value.
  - Examples include subscription-based, freemium, platform-based, and direct sales models.



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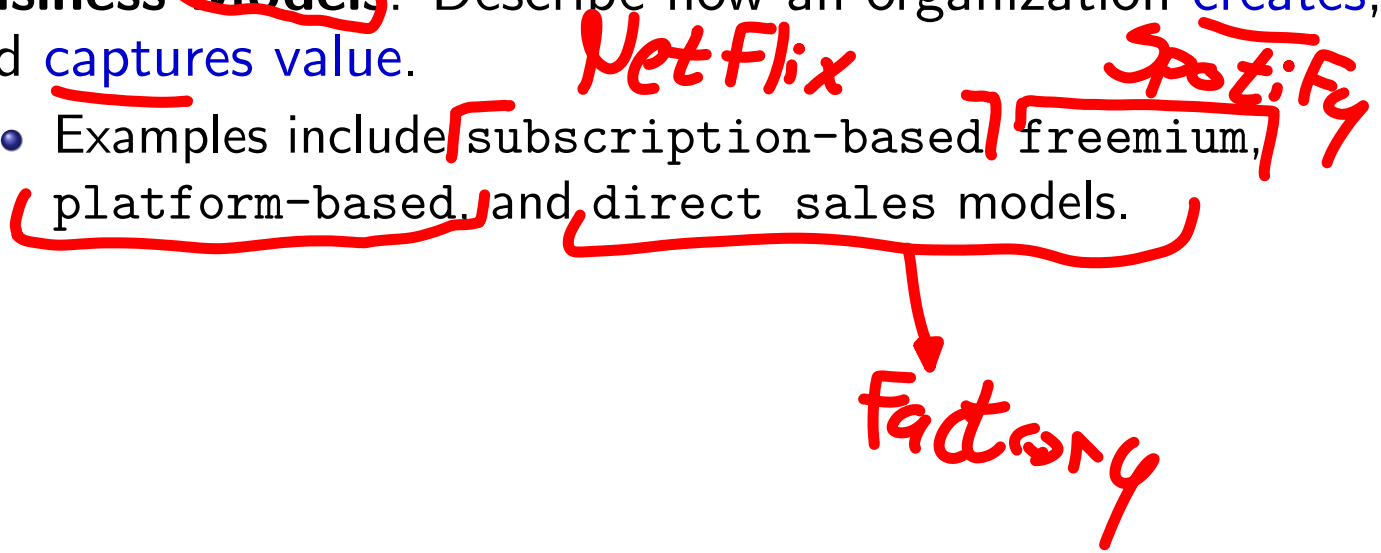
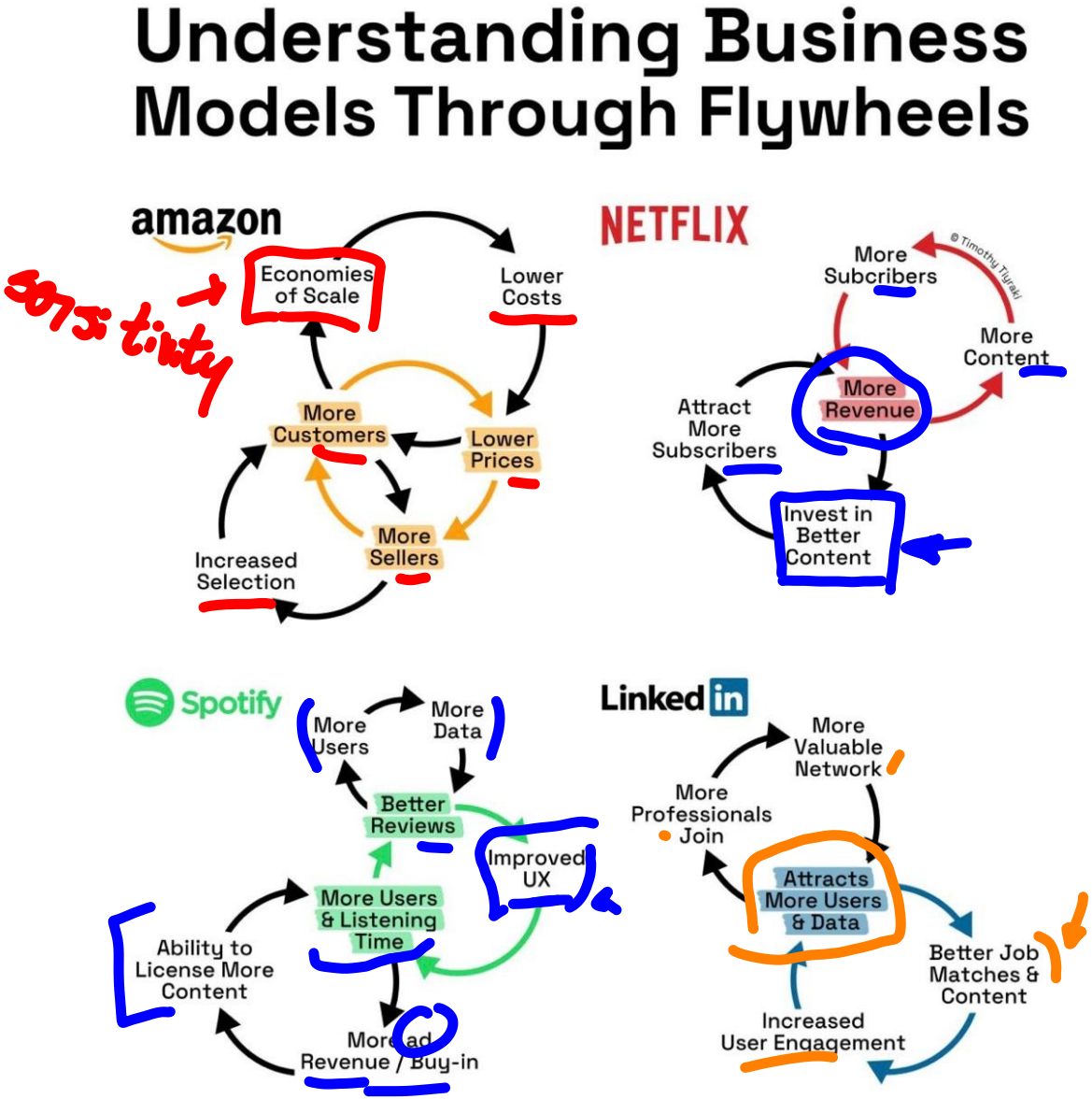


Business Models Examples



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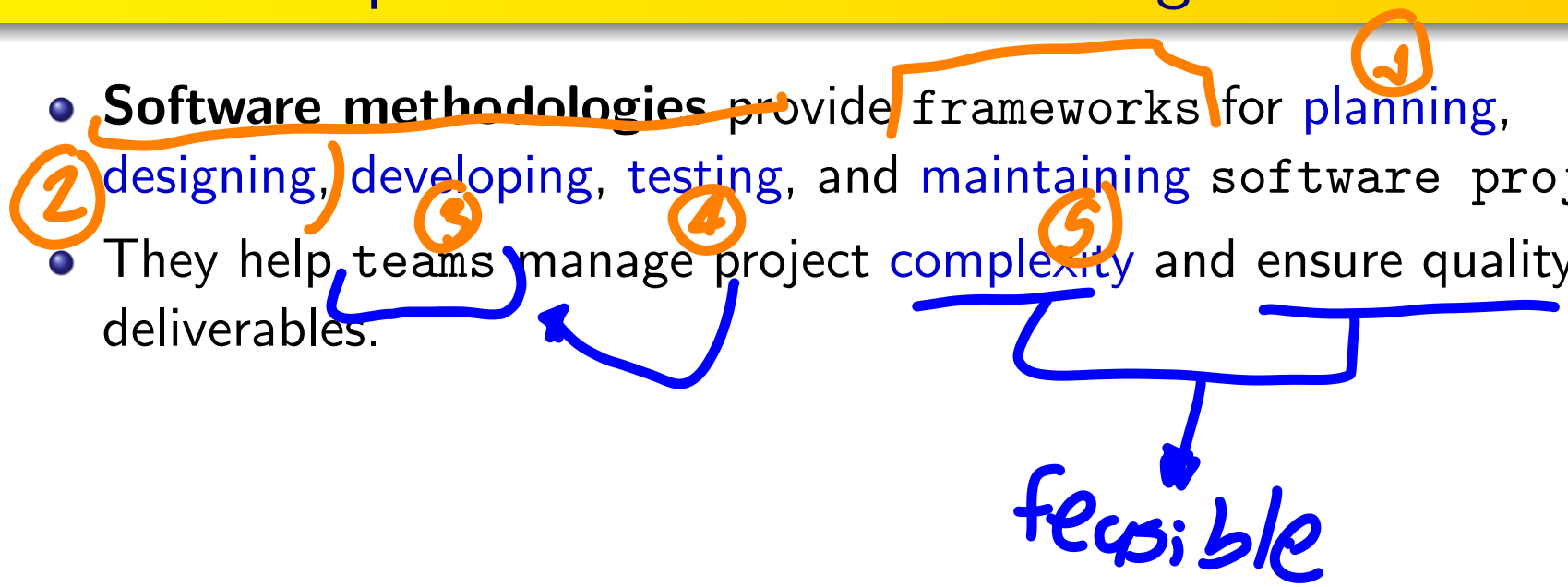
Basic Concepts in Software Methodologies

- **Software methodologies** provide `frameworks` for planning, designing, developing, testing, and maintaining `software projects`.
- They help `teams` manage project complexity and ensure quality deliverables.



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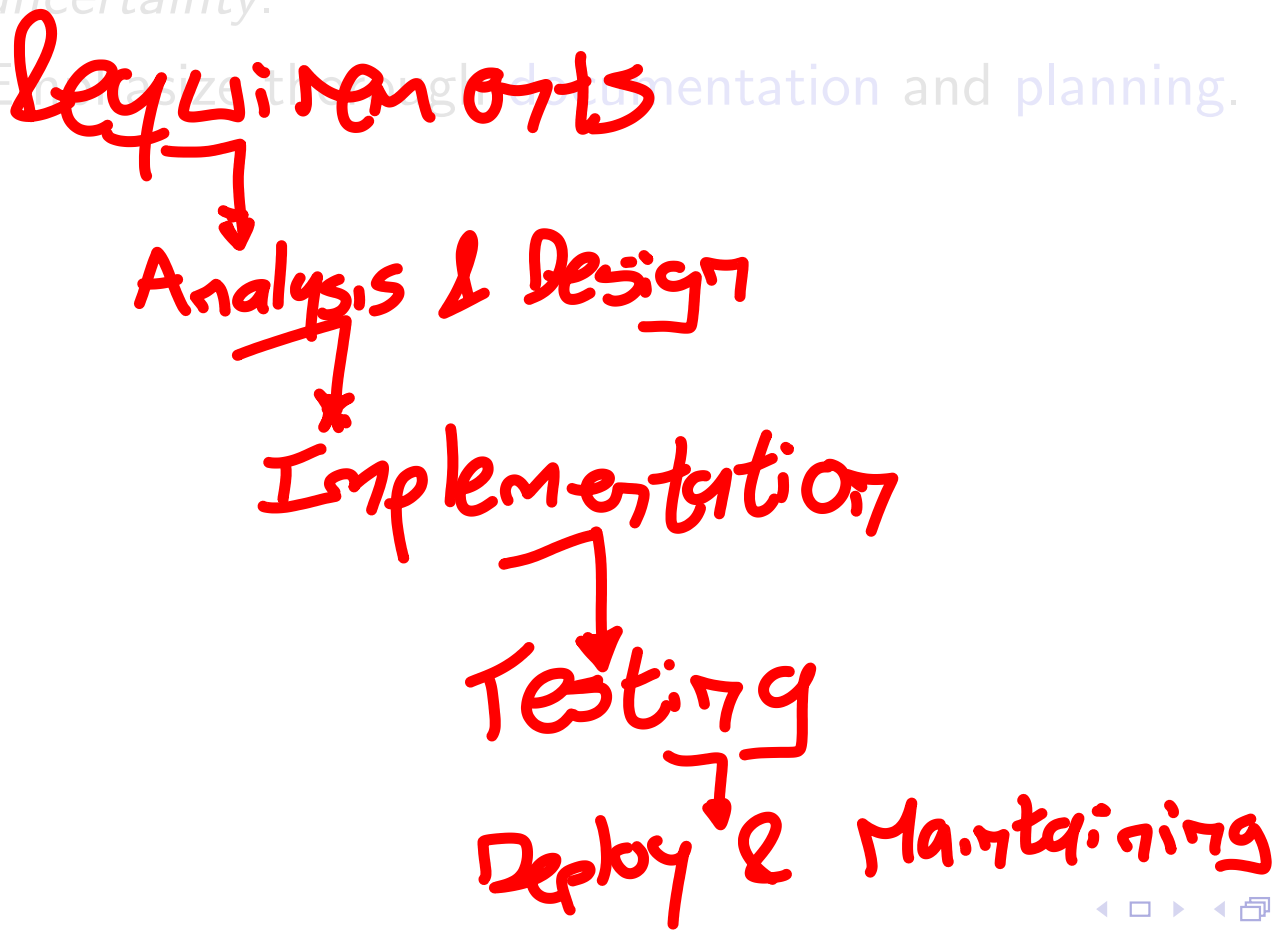
Traditional Methodologies

~ 1960 - 1990

- **Waterfall**: A linear approach where each phase must be *completed before moving* to the next.
- Suitable for projects with well-defined requirements and *low uncertainty*.
- Emphasizes thorough documentation and planning.



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20-30 documents → rigid

Agile Methodologies

- Emphasize iterative development, customer collaboration, and flexibility.
- Based on the **Agile Manifesto**, which values individuals and interactions over processes and tools.
- *Examples* include `Scrum`, `Kanban`, `Extreme Programming` (XP), and `Lean Software Development`.
- **Agile methodologies** are suitable for projects with rapidly changing requirements and high uncertainty.
- Promote adaptive planning, evolutionary development, and early delivery of valuable `software`.

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Case Study: Scrum

- **Scrum** employs short, time-boxed iterations called sprints.
- Key practices include daily stand-ups, sprint planning, reviews, and retrospectives.
- Focuses on adaptability and continuous improvement.

Case Study: Kanban

- **Kanban** visualizes work items on boards and limits `Work In Progress` (*WIP*).
- Emphasizes gradual improvements, flow management, and continuous delivery.
- Ideal for projects requiring flexibility with *minimal iteration planning*.

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Thanks!

Questions?

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

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