

# Software Engineering

# Introduction to Software Engineering

1132SE01

MBA, IM, NTPU (M5010) (Spring 2025)

Wed 2, 3, 4 (9:10-12:00) (B3F17)

Min-Yuh Day, Ph.D,  
**Professor**

Institute of Information Management, National Taipei University

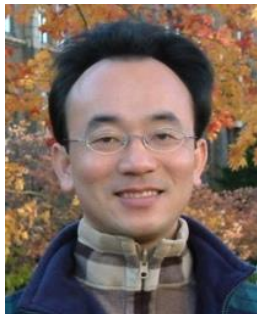
<https://web.ntpu.edu.tw/~myday>



<https://meet.google.com/ish-gzmy-pmo>

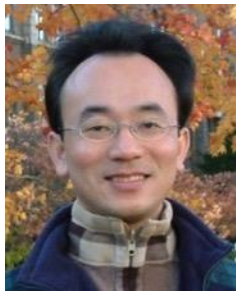


aws  
educate | Cloud  
Ambassador  
2020 Cohort





國立臺北大學  
National Taipei University



# Min-Yuh Day, Ph.D.

aws educate | Cloud Ambassador

2020 Cohort

**Professor, Information Management, NTPU**

**Visiting Scholar, IIS, Academia Sinica**

**Ph.D., Information Management, NTU**

**Director, Intelligent Financial Innovation Technology, IFIT Lab, IM, NTPU**

**Director, Fintech and Green Finance Research Center, NTPU**

**Division Director, Sustainable Development, Sustainability Office, NTPU**

**Artificial Intelligence, Generative AI, ESG and Green Financial Technology,  
Big Data Analytics, Electronic Commerce, Biomedical Informatics**

aws educate | Cloud Ambassador

2020 Cohort

aws academy

Accredited Educator

aws certified

Solutions Architect

Associate

aws certified

Cloud Practitioner



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National Taipei University



# Course Syllabus

## National Taipei University

### Academic Year 113, 2<sup>nd</sup> Semester (Spring 2025)

- **Course Title: Software Engineering**
- **Instructor: Min-Yuh Day**
- **Course Class: MBA, IM, NTPU (3 Credits, Elective)  
GMBA in Finance; SHM; IPUG**
- **Details**
  - **In-Person and Distance Learning EMI Course  
(3 Credits, Elective, One Semester) (M5010)**
- **Time & Place: Wed, 2, 3, 4, (9:10-12:00) (B3F17)**
- **Google Meet: <https://meet.google.com/ish-gzmy-pmo>**



[https://meet.google.com/  
ish-gzmy-pmo](https://meet.google.com/ish-gzmy-pmo)



# Course Objectives

1. Understand the **fundamental concepts and research issues of software engineering**.
2. Equip with **Hands-on practices of software engineering**.
3. Conduct **information systems research in the context of software engineering**.

# Course Outline

- This course introduces the **fundamental concepts, research issues, and hands-on practices of software engineering.**
- **Topics include:**
  1. Introduction to Software Engineering
  2. Software Products and Project Management: Software product management and prototyping with Generative AI
  3. Agile Software Engineering: Agile methods, Scrum, and Extreme Programming
  4. Features, Scenarios, and Stories
  5. Software Architecture: Architectural design, System decomposition, and Distribution architecture
  6. Cloud-Based Software: Virtualization and containers, Everything as a service, Software as a service
  7. Cloud Computing and Cloud Software Architecture
  8. Microservices Architecture, RESTful services, Service deployment
  9. Security and Privacy; Reliable Programming
  10. Testing: Functional testing, Test automation, Test-driven development, and Code reviews
  11. DevOps and Code Management: Code management and DevOps automation
  12. Case Study on Software Engineering

# Core Competence

- **Exploring new knowledge in information technology, system development and application 80 %**
- **Internet marketing planning ability 10 %**
- **Thesis writing and independent research skills 10 %**

# Four Fundamental Qualities

- **Professionalism**
  - **Creative thinking and Problem-solving 30 %**
  - **Comprehensive Integration 30 %**
- **Interpersonal Relationship**
  - **Communication and Coordination 10 %**
  - **Teamwork 10 %**
- **Ethics**
  - **Honesty and Integrity 5 %**
  - **Self-Esteem and Self-reflection 5 %**
- **International Vision**
  - **Caring for Diversity 5 %**
  - **Interdisciplinary Vision 5 %**

# College Learning Goals

- **Ethics/Corporate Social Responsibility**
- **Global Knowledge/Awareness**
- **Communication**
- **Analytical and Critical Thinking**



# Department Learning Goals

- **Information Technologies and System Development Capabilities**
- **Internet Marketing Management Capabilities**
- **Research capabilities**

# Syllabus

Week	Date	Subject/Topics
1	2025/02/19	<b>Introduction to Software Engineering</b>
2	2025/02/26	<b>Software Products and Project Management: Software product management and prototyping with Generative AI</b>
3	2025/03/05	<b>Agile Software Engineering: Agile methods, Scrum, and Extreme Programming</b>
4	2025/03/12	<b>Case Study on Software Engineering I</b>
5	2025/03/19	<b>Features, Scenarios, and Stories</b>
6	2025/03/26	<b>Software Architecture: Architectural design, System decomposition, and Distribution architecture</b>

# Syllabus

**Week Date Subject/Topics**

7 2025/04/02 Make-up holiday for NTPU Sports Day (No Classes)

**8 2025/04/09 Midterm Project Report**

**9 2025/04/16 Cloud-Based Software: Virtualization and containers,  
Everything as a service, Software as a service**

**10 2025/04/23 Cloud Computing and Cloud Software Architecture**

**11 2025/04/30 Case Study on Software Engineering II**

**12 2025/05/07 Microservices Architecture, RESTful services,  
Service deployment**

# Syllabus

**Week Date Subject/Topics**

**13 2025/05/14 Industry Practices of Software Engineering**

**14 2025/05/21 Security and Privacy; Reliable Programming;  
Testing: Functional testing, Test automation,  
Test-driven development, and Code reviews;  
DevOps and Code Management:  
Code management and DevOps automation**

**15 2025/05/28 Final Project Report I**

**16 2025/06/04 Final Project Report II**

# Teaching Methods and Activities

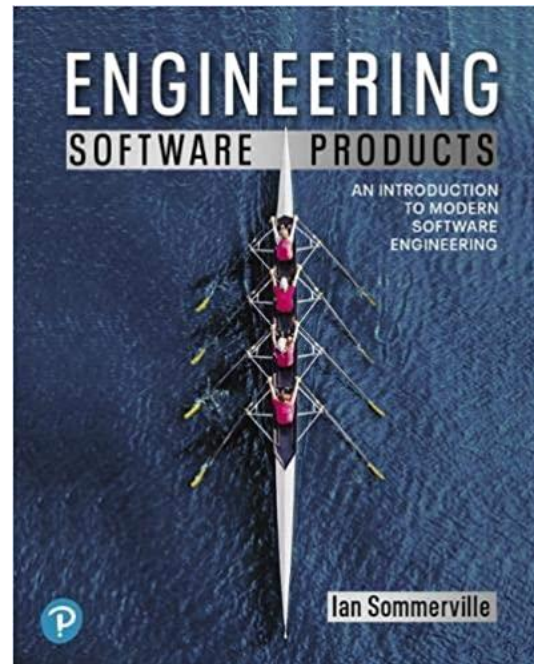
- **Lecture**
- **Discussion**
- **Practicum**

# Evaluation Methods

- **Individual Presentation 60 %**
- **Group Presentation 10 %**
- **Case Report 10 %**
- **Class Participation 10 %**
- **Assignment 10 %**

# Required Texts

- **Ian Sommerville (2019),  
Engineering Software Products:  
An Introduction to Modern Software Engineering,  
Pearson.**

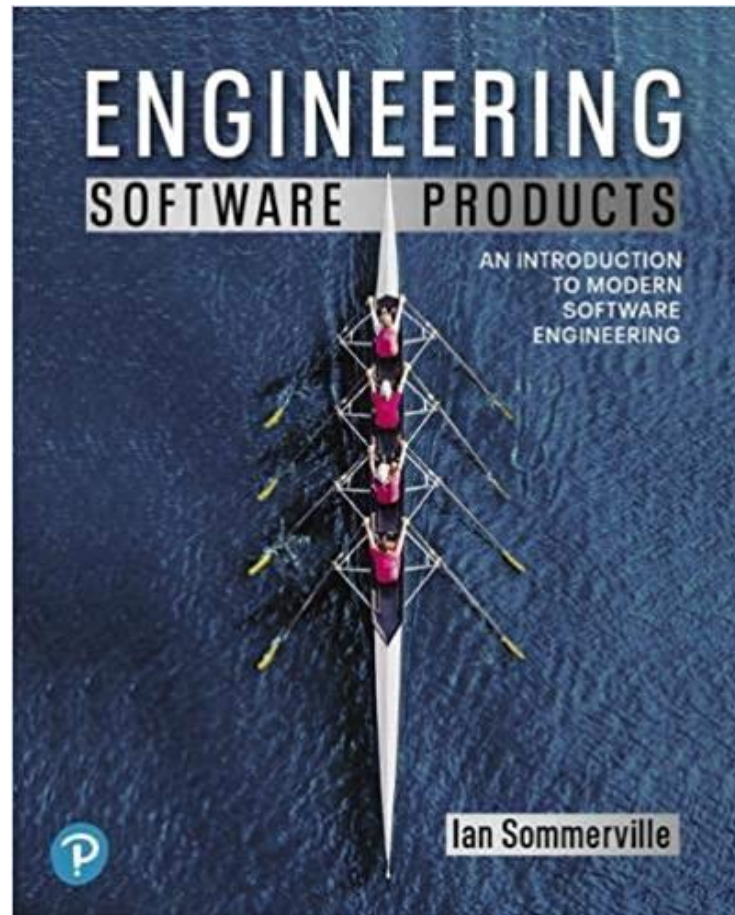


# References

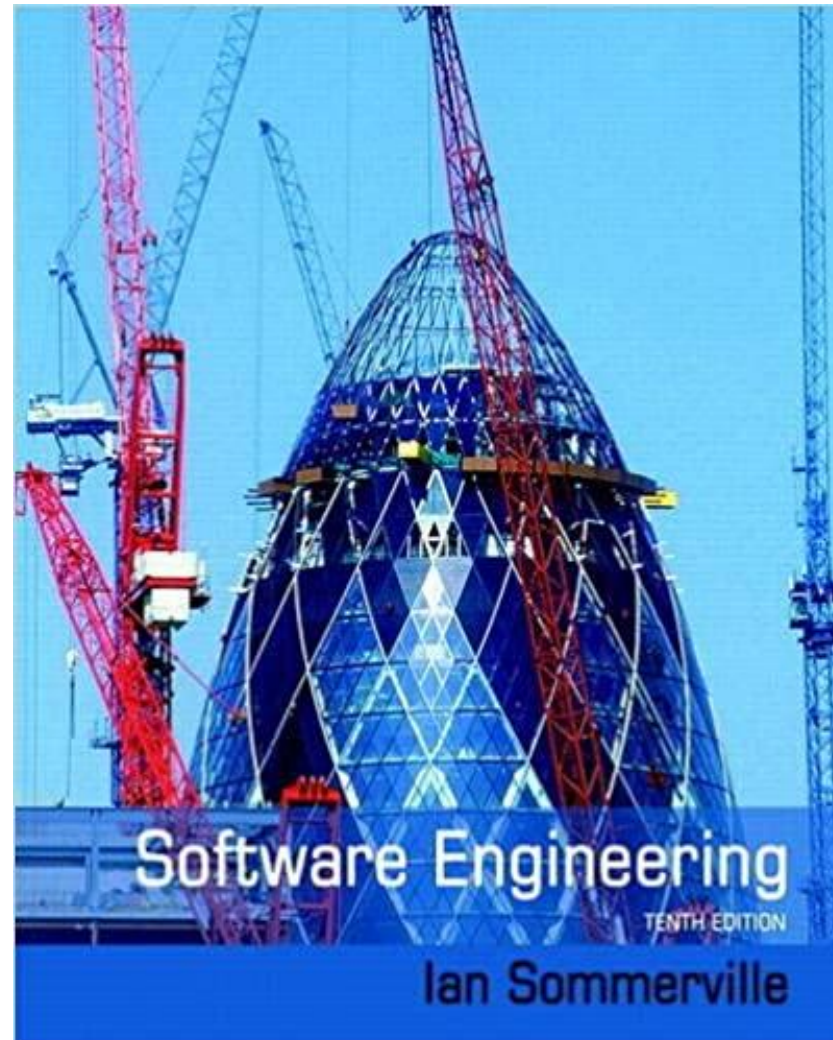
- Ian Sommerville (2015),  
Software Engineering, 10th Edition, Pearson.
- Titus Winters, Tom Manshreck, and Hyrum Wright (2020),  
Software Engineering at Google: Lessons Learned from Programming Over Time, O'Reilly Media.
- Project Management Institute (2017),  
Agile Practice Guide, PMI
- Project Management Institute (2021),  
A Guide to the Project Management Body of Knowledge (PMBOK Guide) – Seventh Edition and The Standard for Project Management, PMI
- Denis Rothman (2024),  
RAG-Driven Generative AI: Build custom retrieval augmented generation pipelines with LlamaIndex, Deep Lake, and Pinecone, Packt Publishing
- NVIDIA DLI (2025), Building RAG Agents with LLMs, [https://learn.nvidia.com/courses/course-detail?course\\_id=course-v1:DLI+S-FX-15+V1](https://learn.nvidia.com/courses/course-detail?course_id=course-v1:DLI+S-FX-15+V1)
- NVIDIA DLI (2025), Generative AI with Diffusion Models, [https://learn.nvidia.com/courses/course-detail?course\\_id=course-v1:DLI+S-FX-14+V1](https://learn.nvidia.com/courses/course-detail?course_id=course-v1:DLI+S-FX-14+V1)



Ian Sommerville (2019),  
**Engineering Software Products:**  
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Pearson.



Ian Sommerville (2015),  
**Software Engineering,**  
10<sup>th</sup> Edition, Pearson.

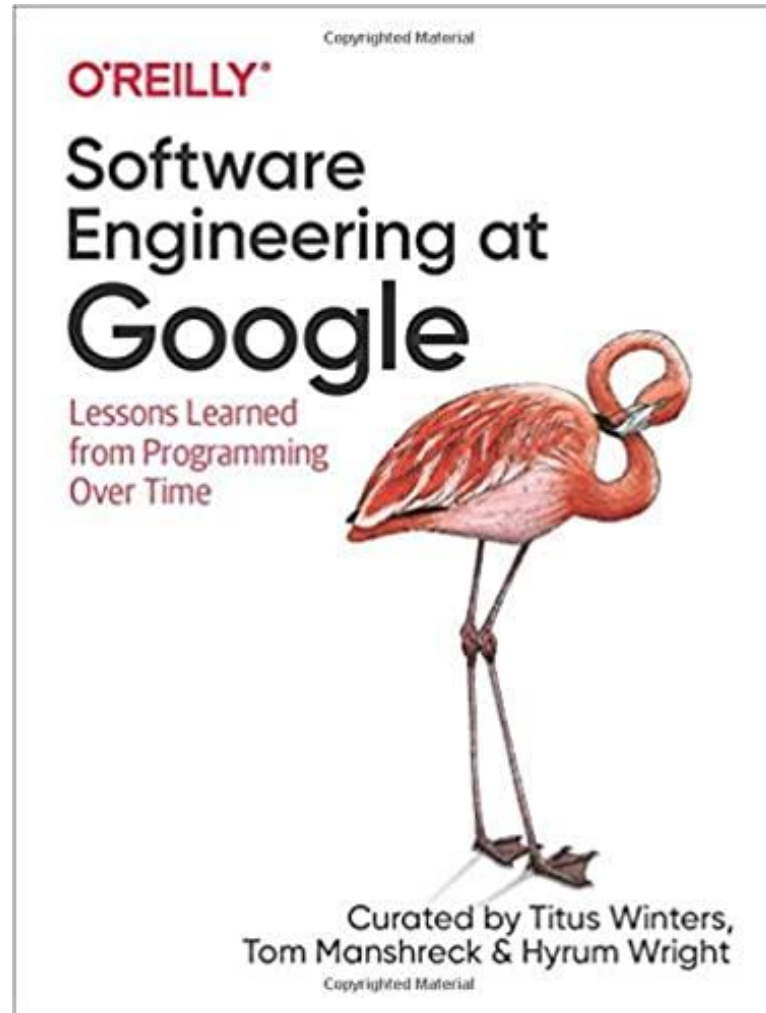


Titus Winters, Tom Manshreck, and Hyrum Wright (2020),

# Software Engineering at Google:

Lessons Learned from Programming Over Time,

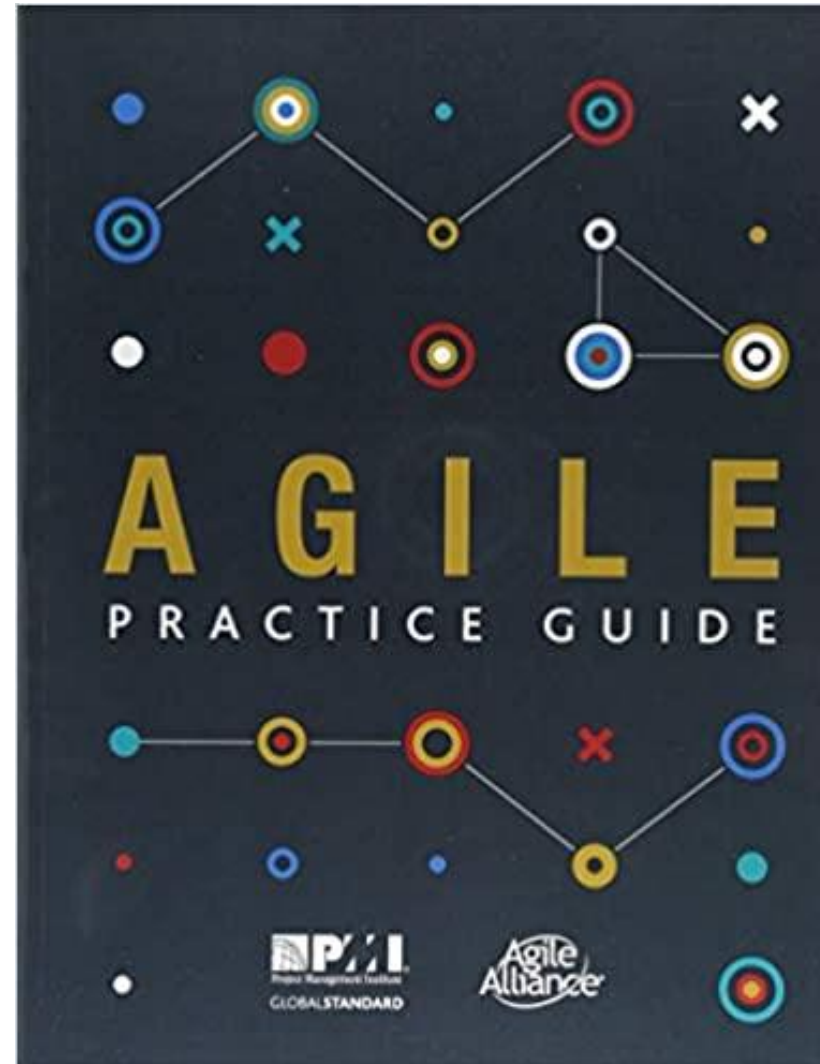
O'Reilly Media.



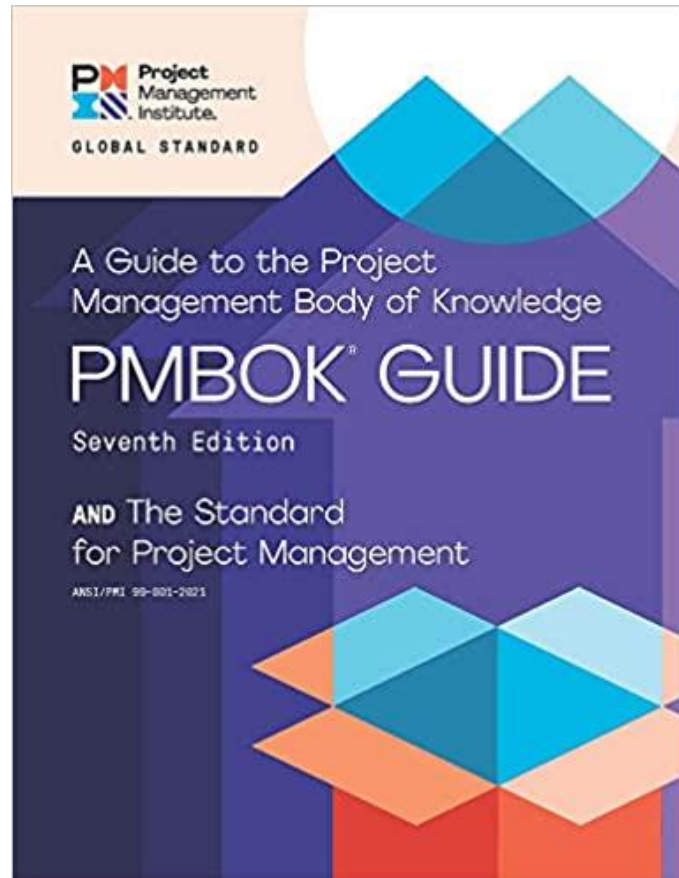
Project Management Institute (2017),

# Agile Practice Guide

PMI



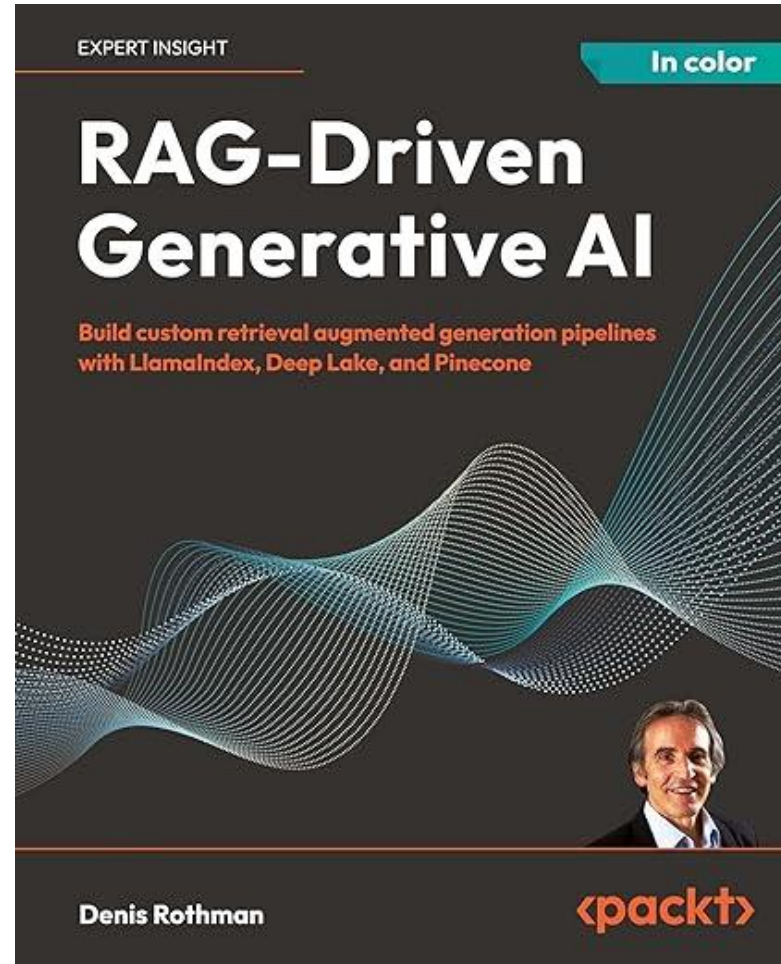
Project Management Institute (2021),  
**A Guide to the  
Project Management Body of Knowledge  
(PMBOK Guide) –  
Seventh Edition and The Standard for Project Management**



Denis Rothman (2024),

# RAG-Driven Generative AI:

Build custom retrieval augmented generation pipelines with LlamaIndex, Deep Lake, and Pinecone,  
Packt Publishing



# NVIDIA Developer Program

<https://developer.nvidia.com/join-nvidia-developer-program>

## NVIDIA

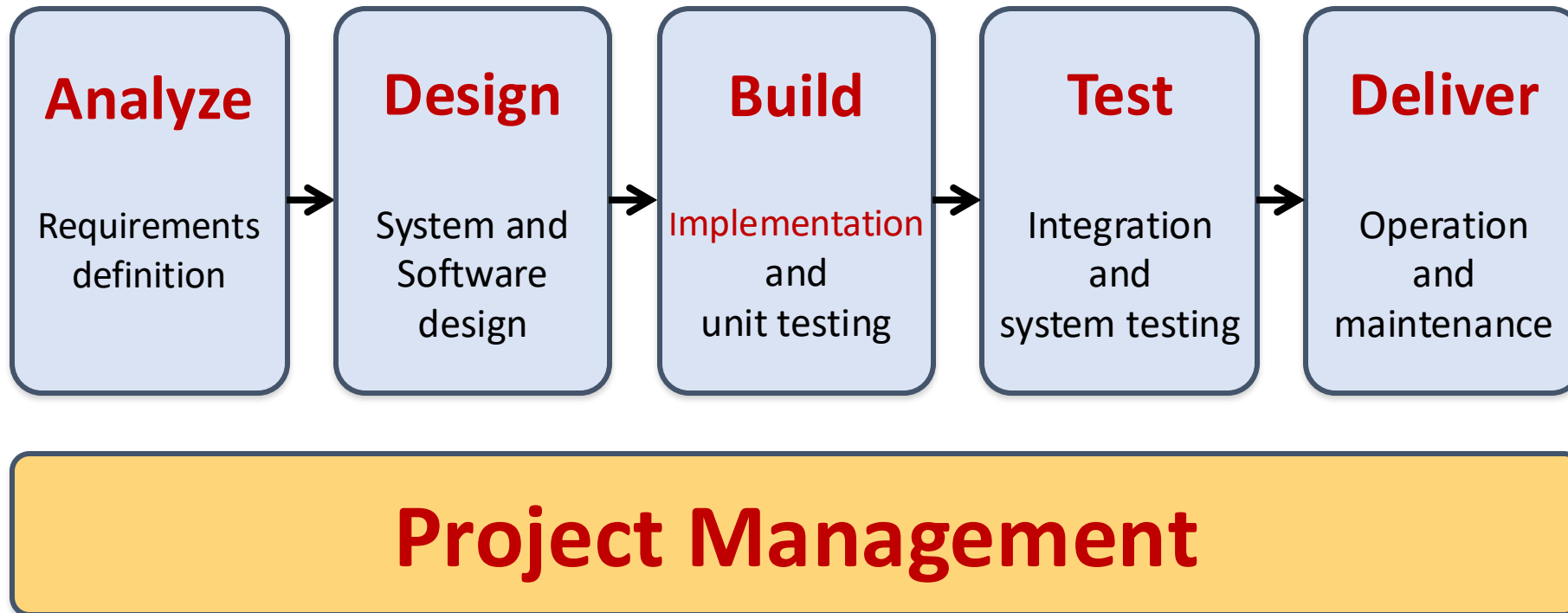
## Deep Learning Institute (DLI)

<https://learn.nvidia.com/>

# Software Engineering



# Software Engineering and Project Management

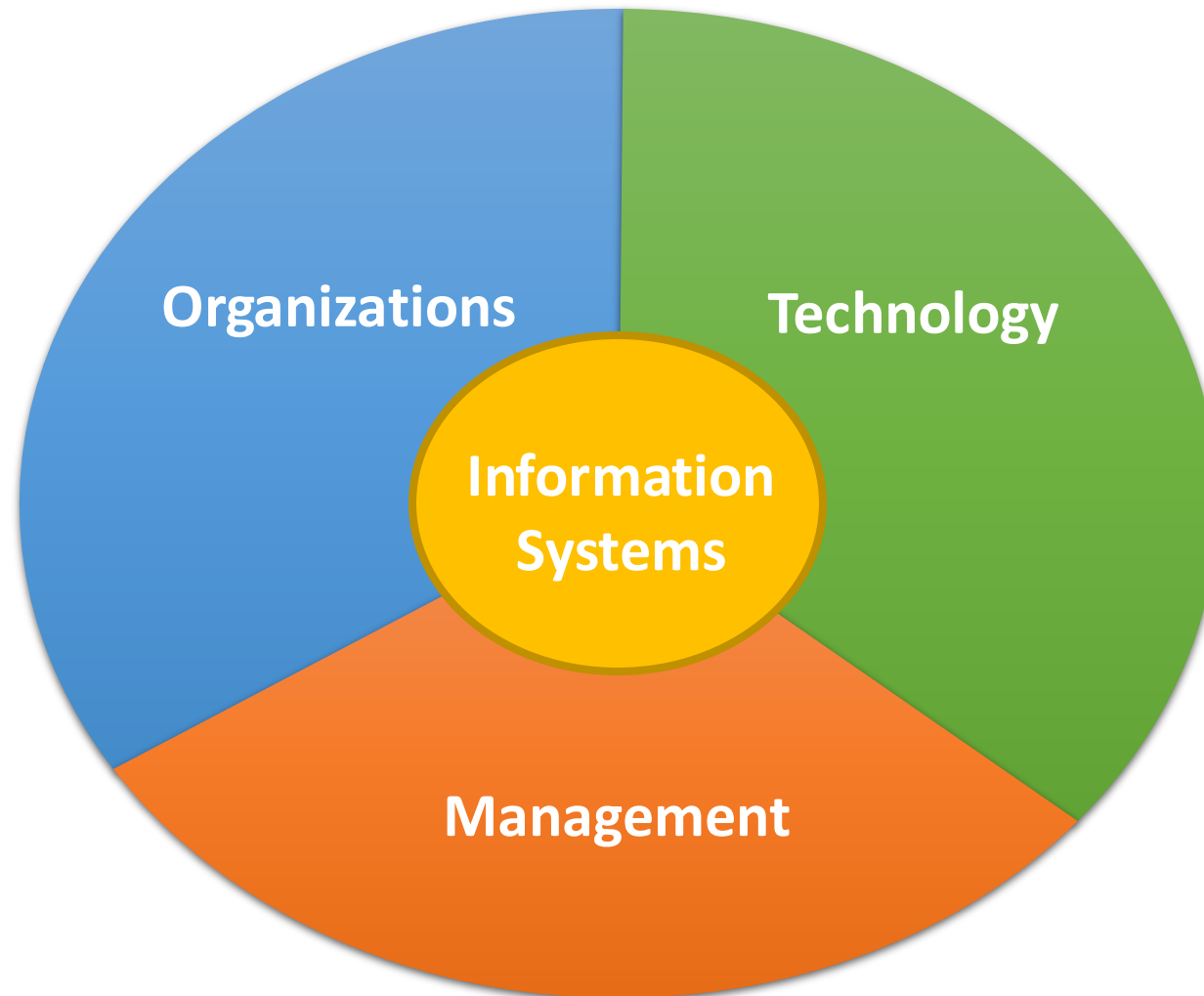


**Information Management**

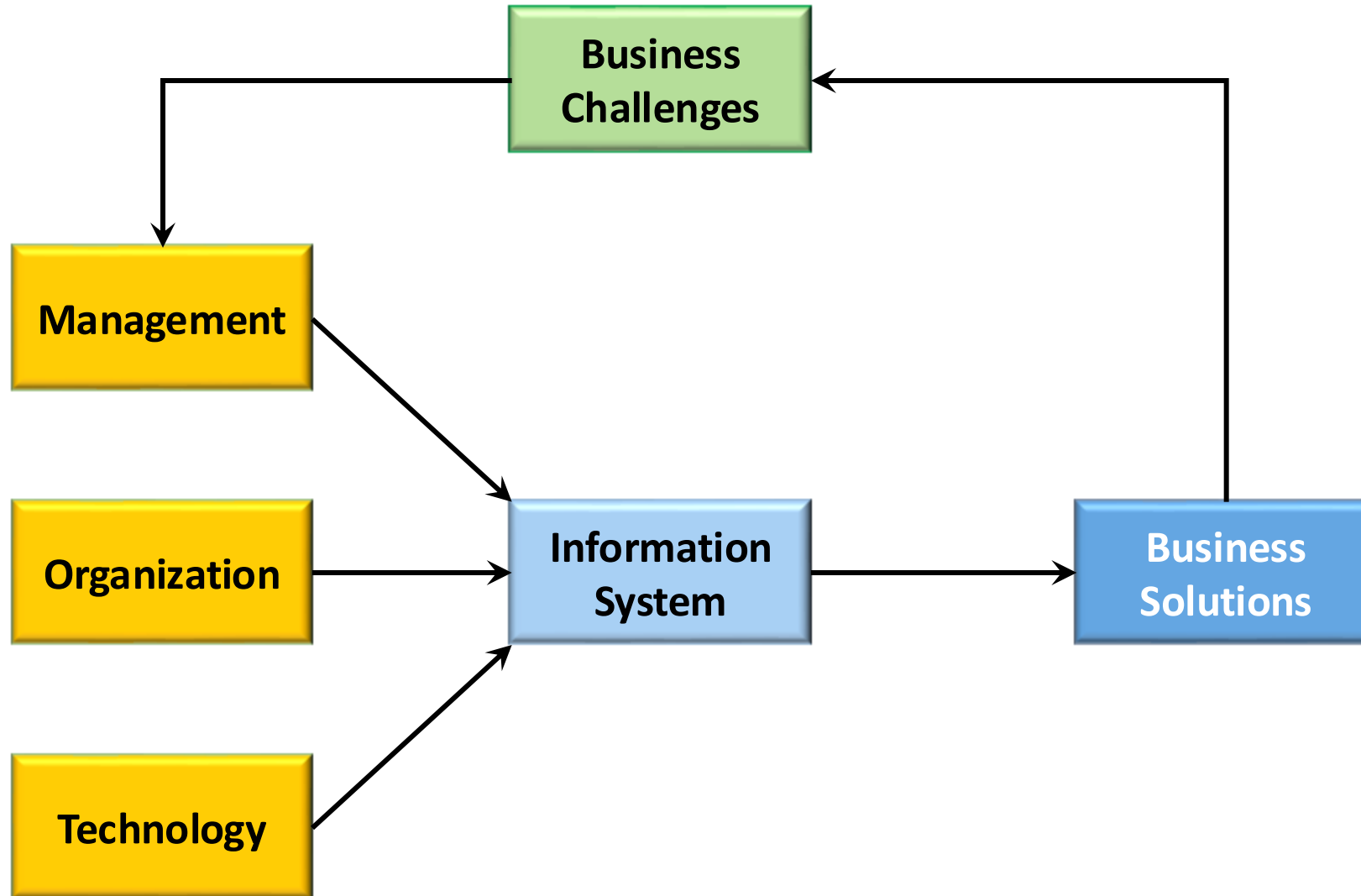
**Management  
Information Systems (MIS)**

**Information Systems**

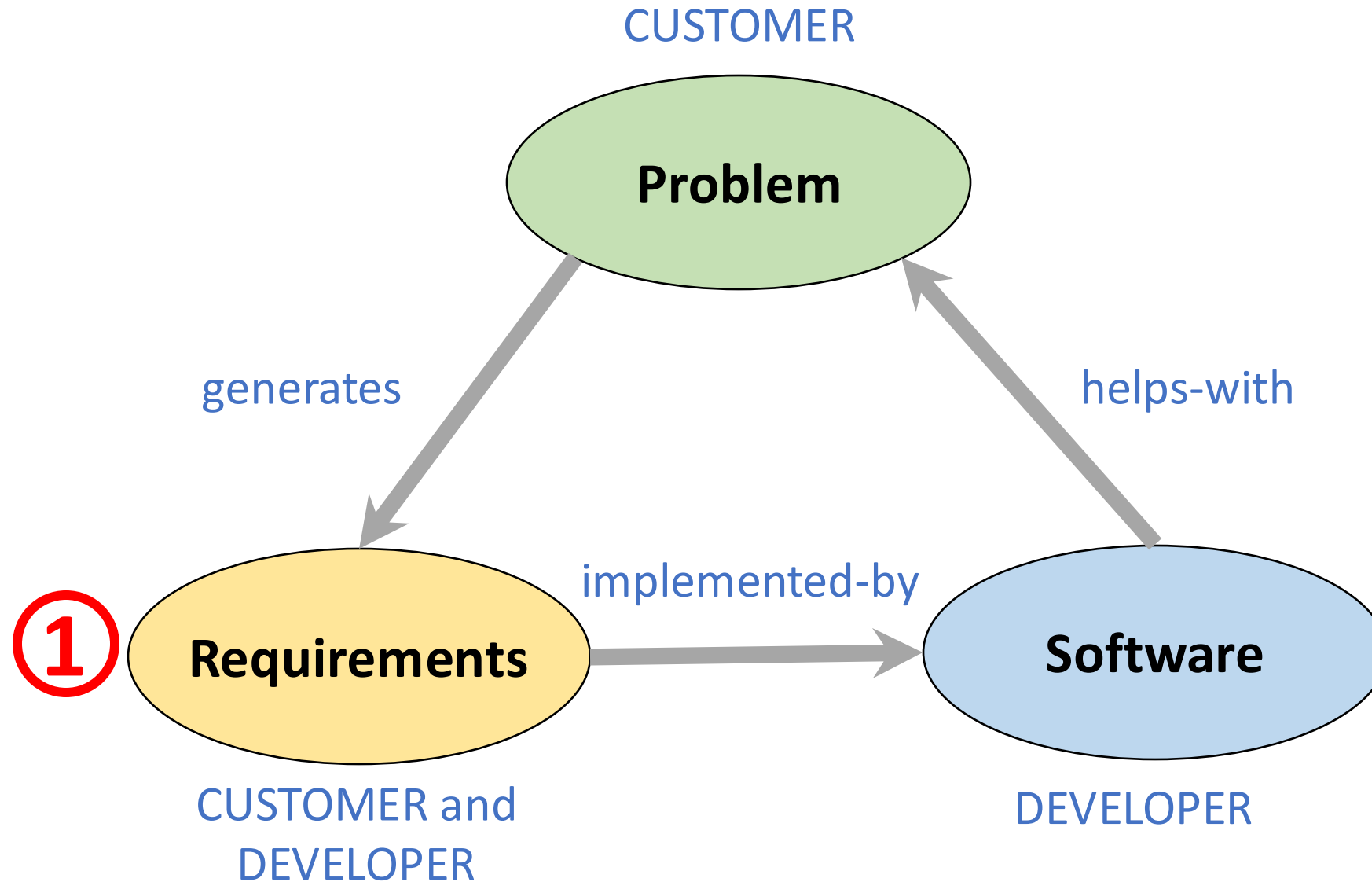
# Information Management (MIS) Information Systems



# Fundamental MIS Concepts



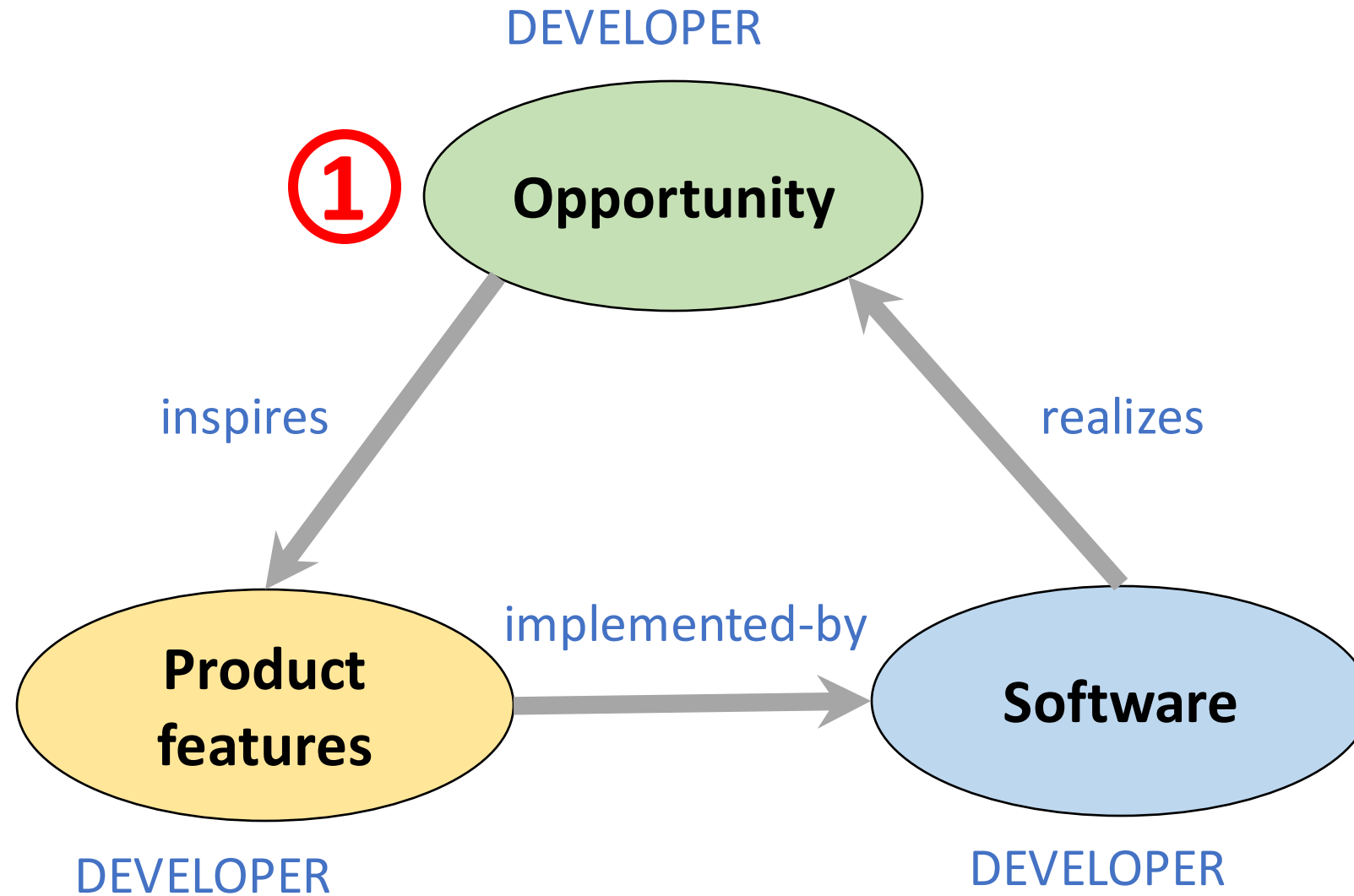
# Project-based software engineering



# Project-based software engineering

- The starting point for the software development is a set of ‘**software requirements**’ that are owned by an external client and which set out what they want a software system to do to support their business processes.
- The software is developed by a software company (the contractor) who **design and implement a system** that delivers functionality to meet the requirements.
- The customer may change the requirements at any time in response to business changes (they usually do). The contractor must change the software to reflect these requirements changes.
- Custom software usually has a long-lifetime (10 years or more) and it must be supported over that lifetime.

# Product software engineering



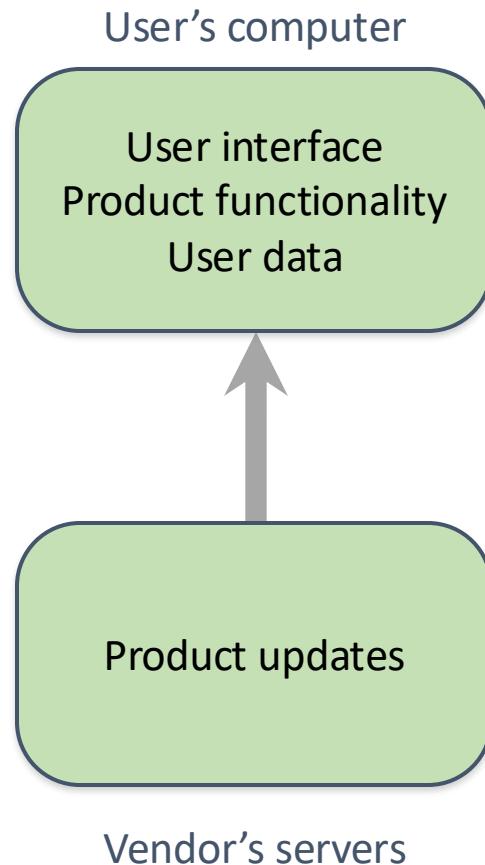
# Product software engineering

- The starting point for product development is a **business opportunity** that is identified by individuals or a company.  
They develop a software product to take advantage of this opportunity and sell this to customers.
- The company who identified the opportunity **design and implement a set of software features** that realize the opportunity and that will be useful to customers.
- The software development company are responsible for deciding on the development timescale, what features to include and when the product should change.
- Rapid delivery of software products is essential to capture the market for that type of product.

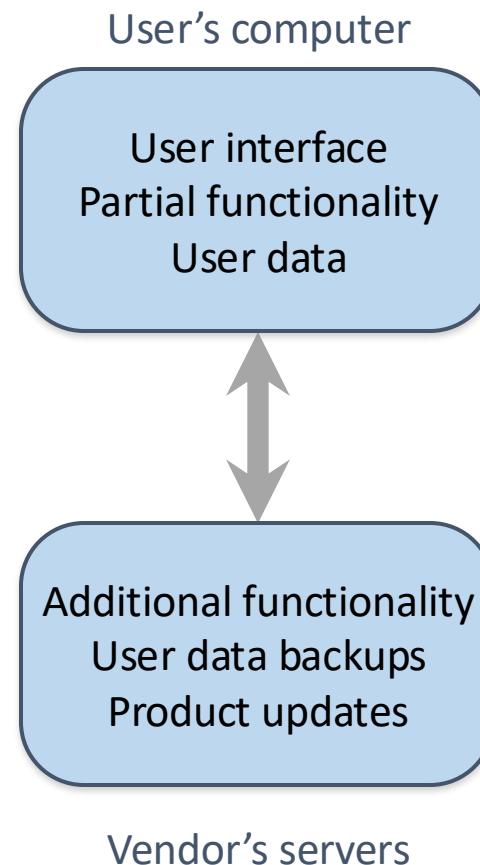


# Software execution models

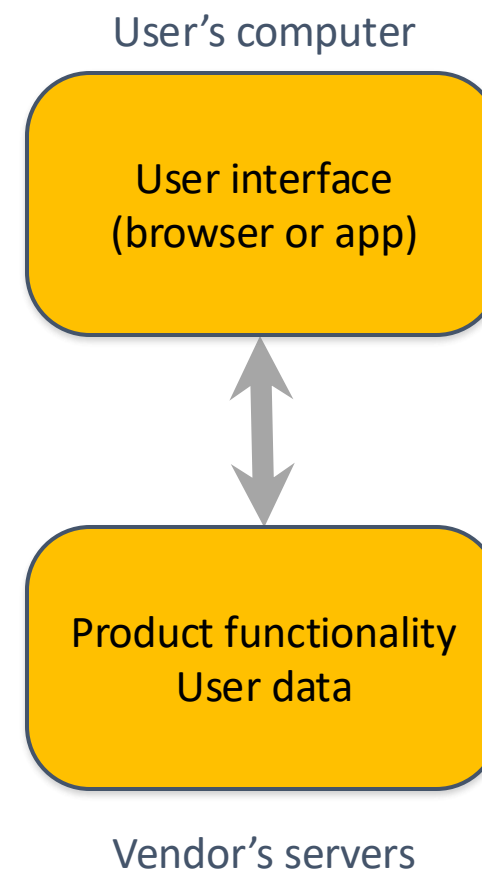
## Stand-alone execution



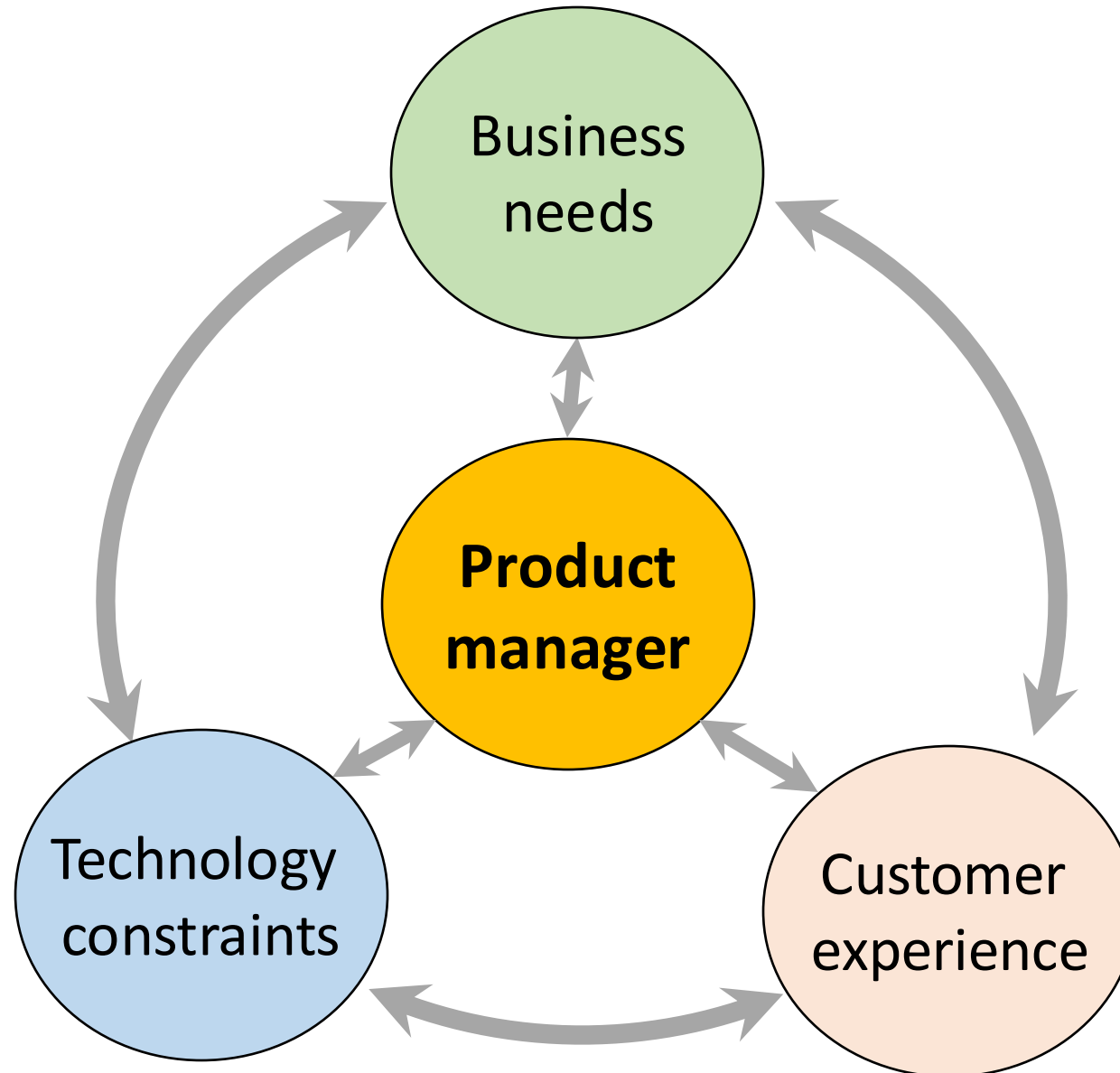
## Hybrid execution



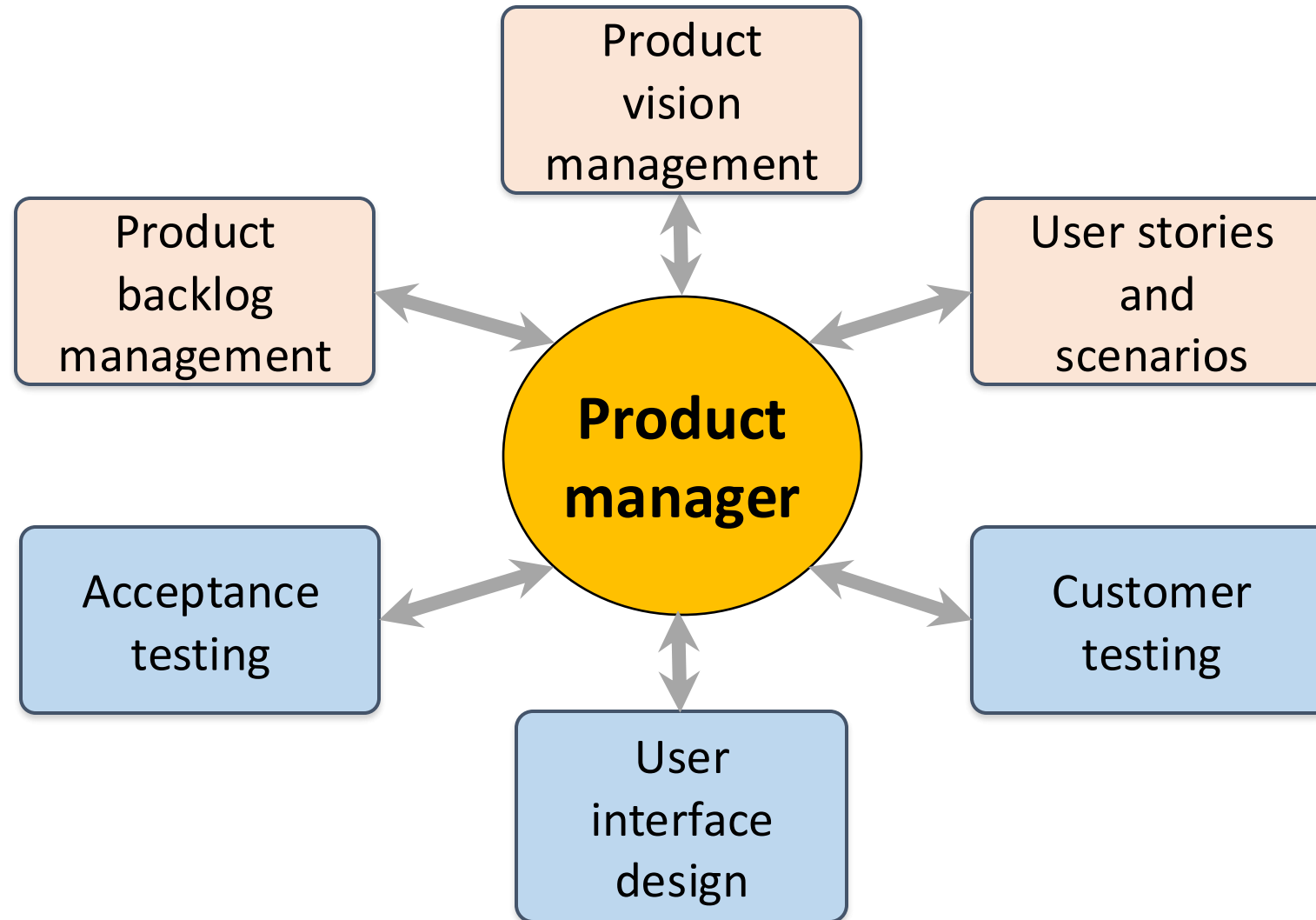
## Software as a service



# Product management concerns

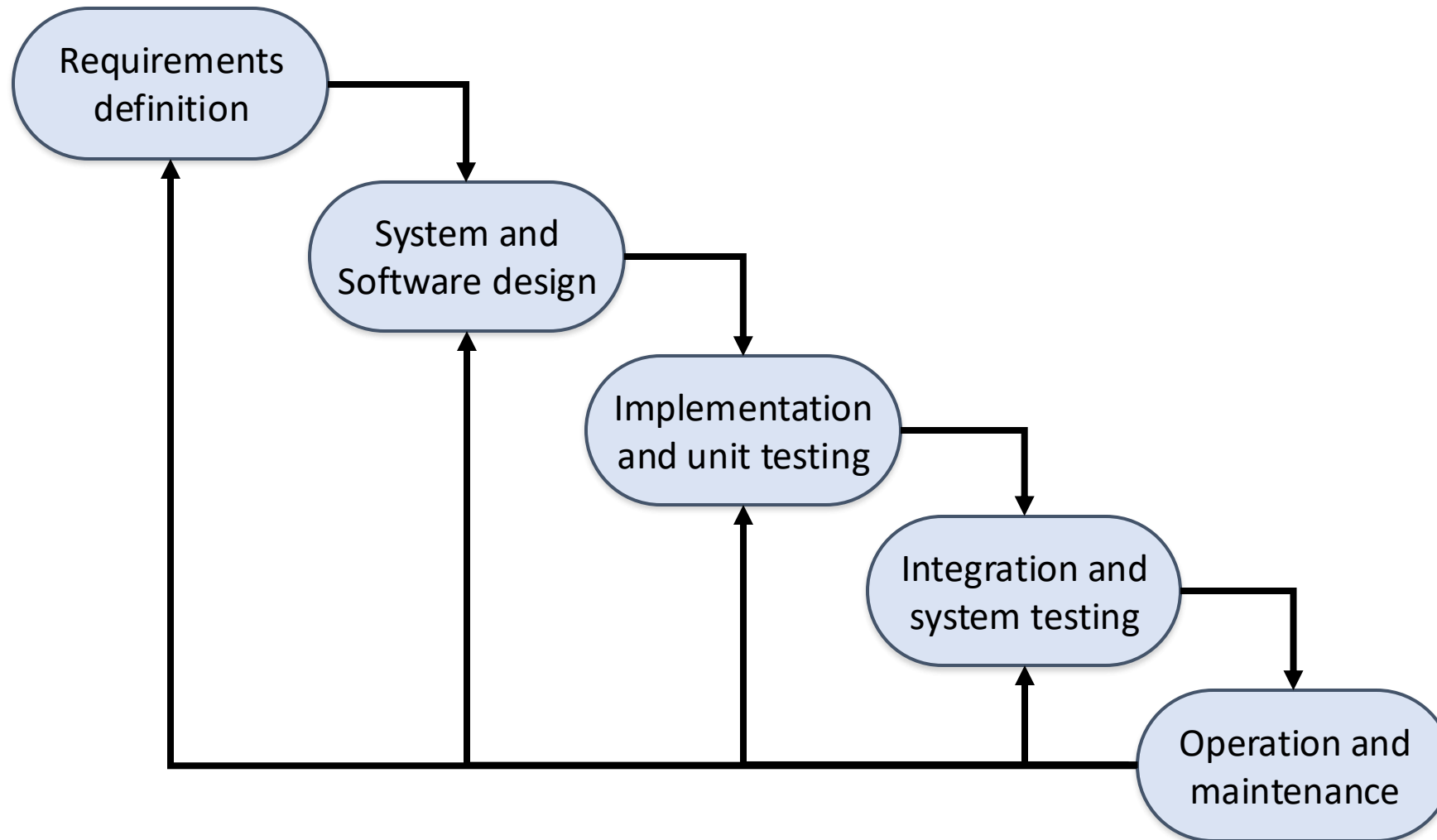


# Technical interactions of product managers



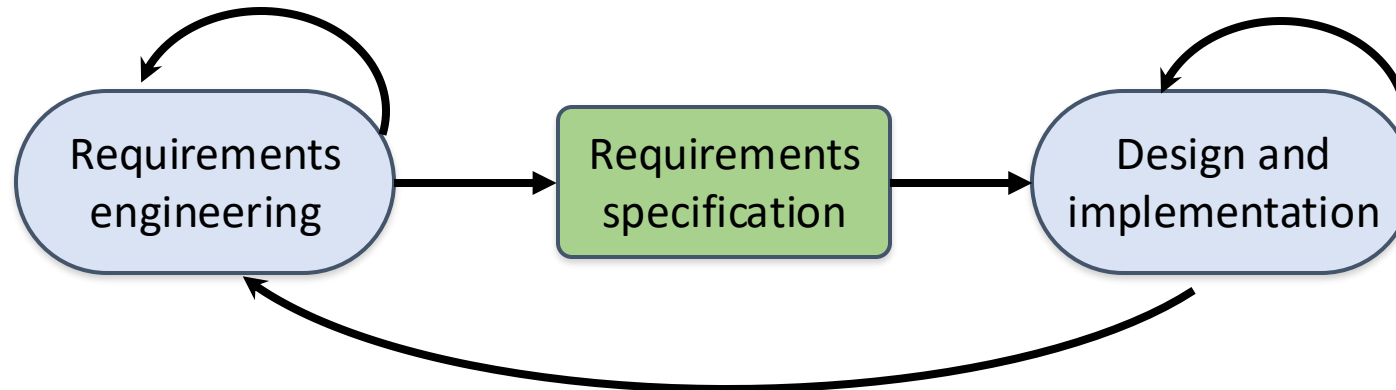
# Software Development Life Cycle (SDLC)

## The waterfall model



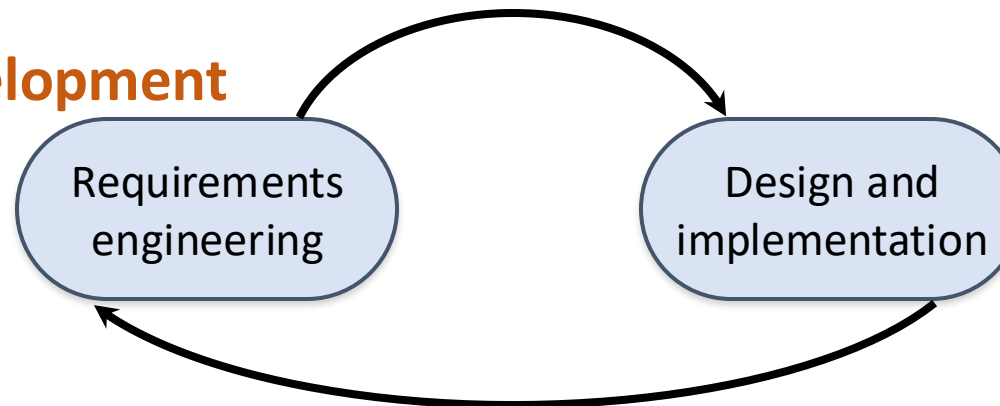
# Plan-based and Agile development

## Plan-based development

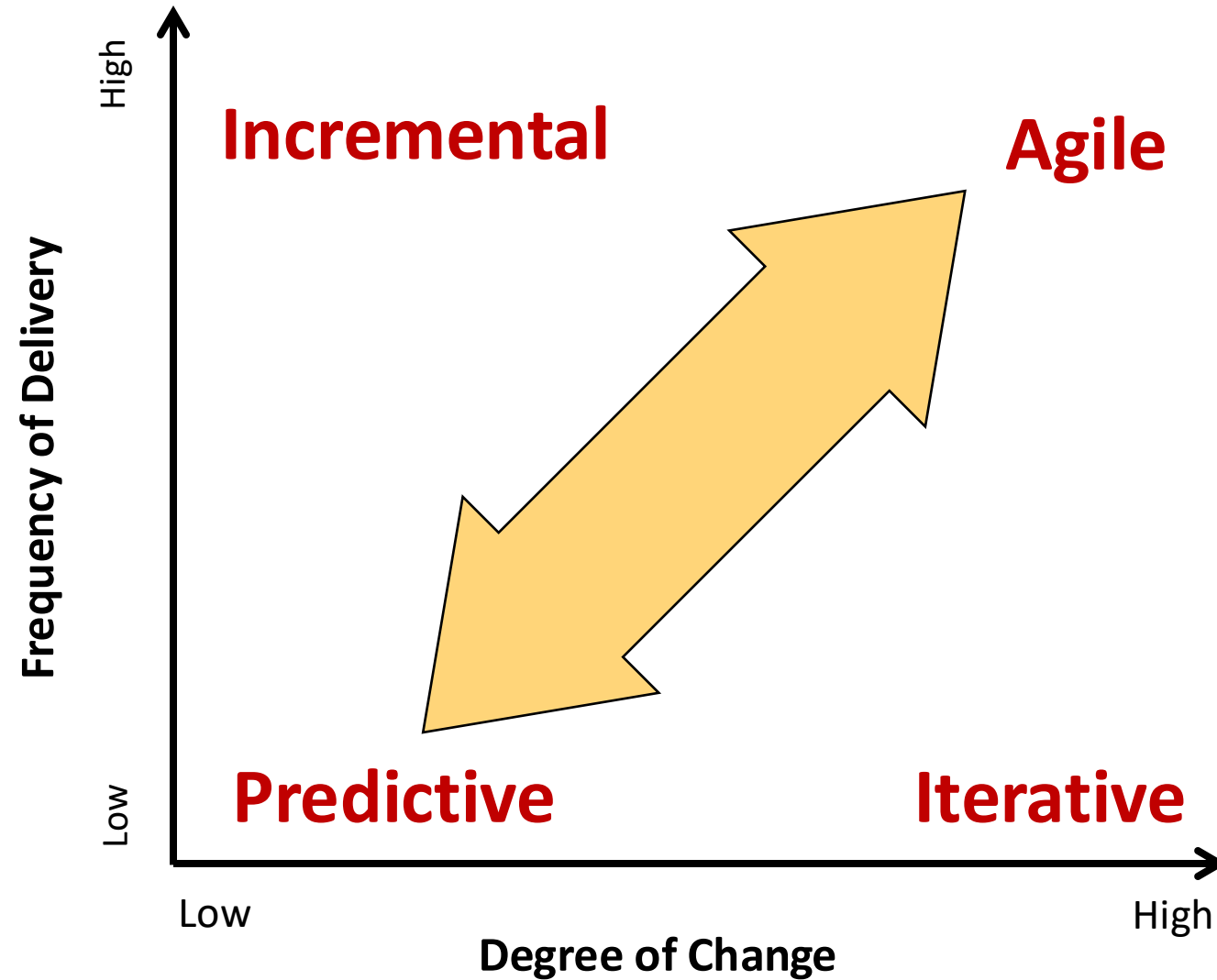


Requirements change requests

## Agile development



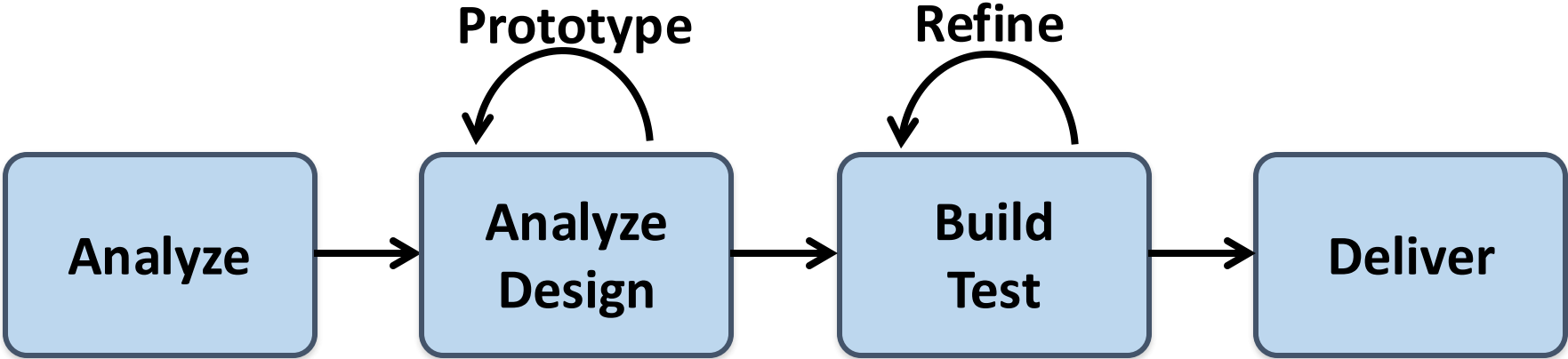
# The Continuum of Life Cycles



# Predictive Life Cycle

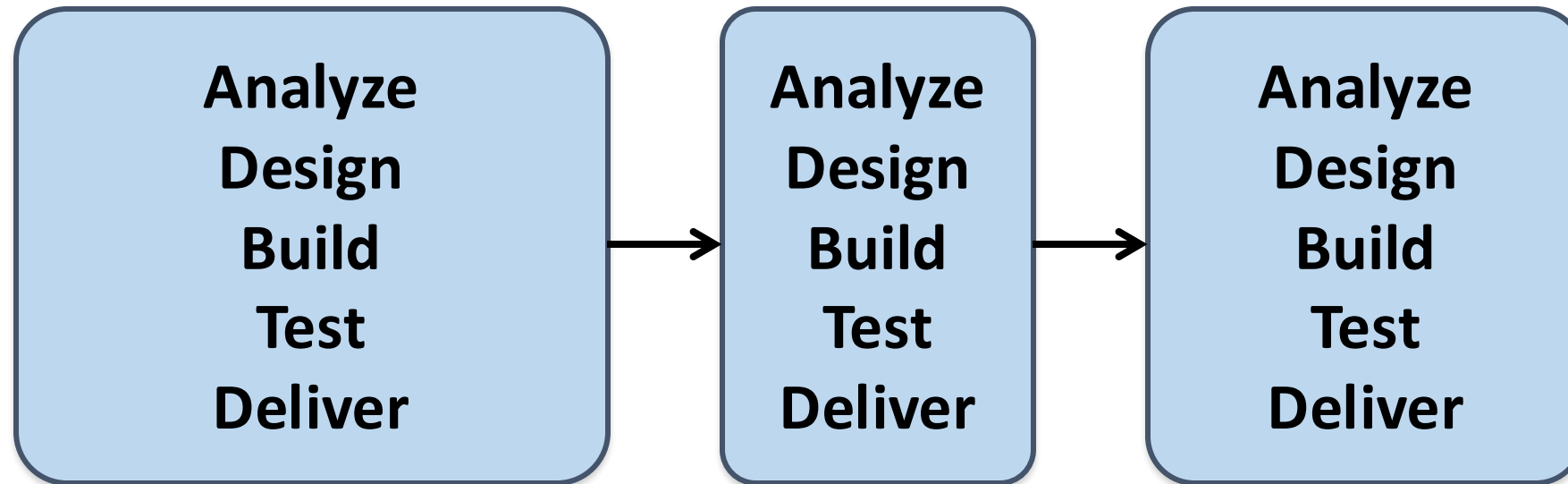


# Iterative Life Cycle



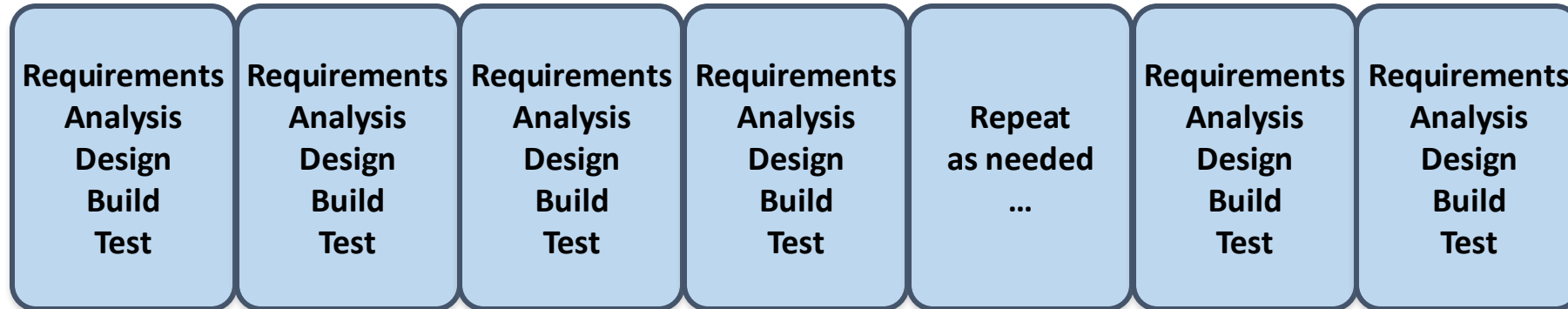


# A Life Cycle of Varying-Sized Increments

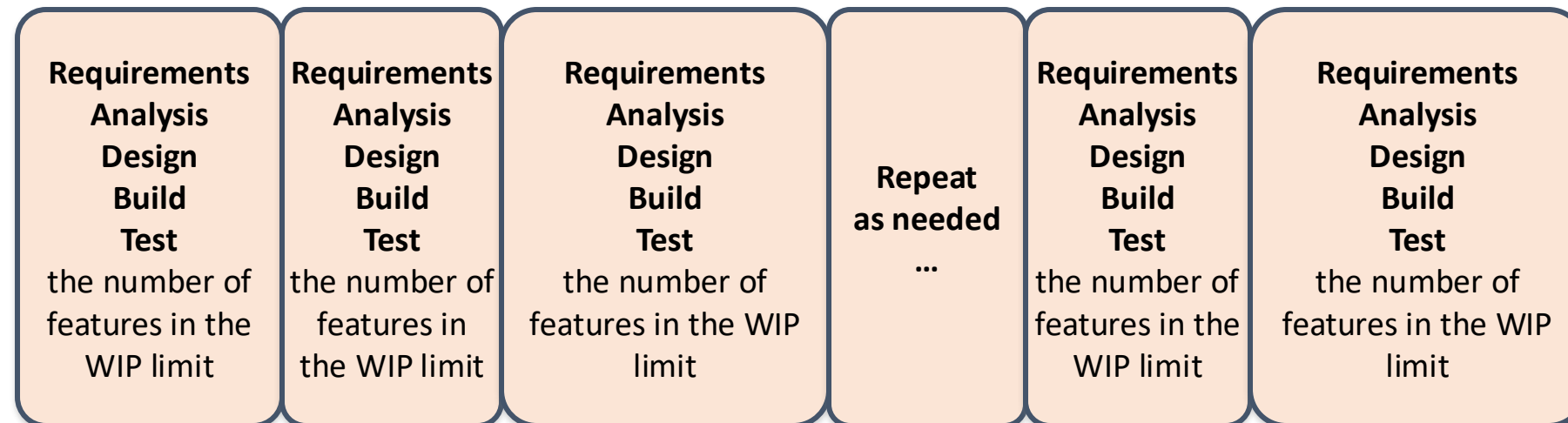


# Iteration-Based and Flow-Based Agile Life Cycles

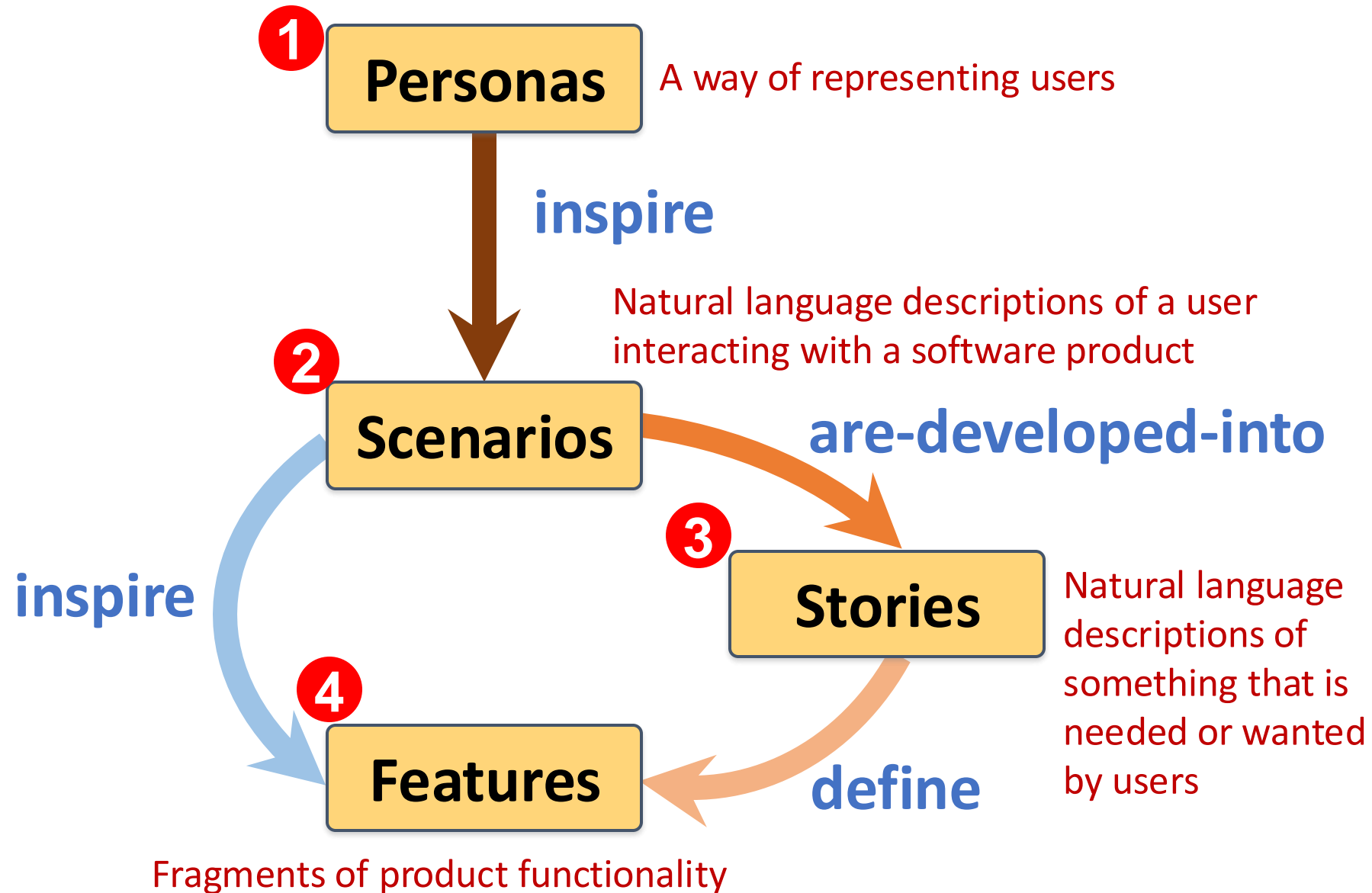
## Iteration-Based Agile



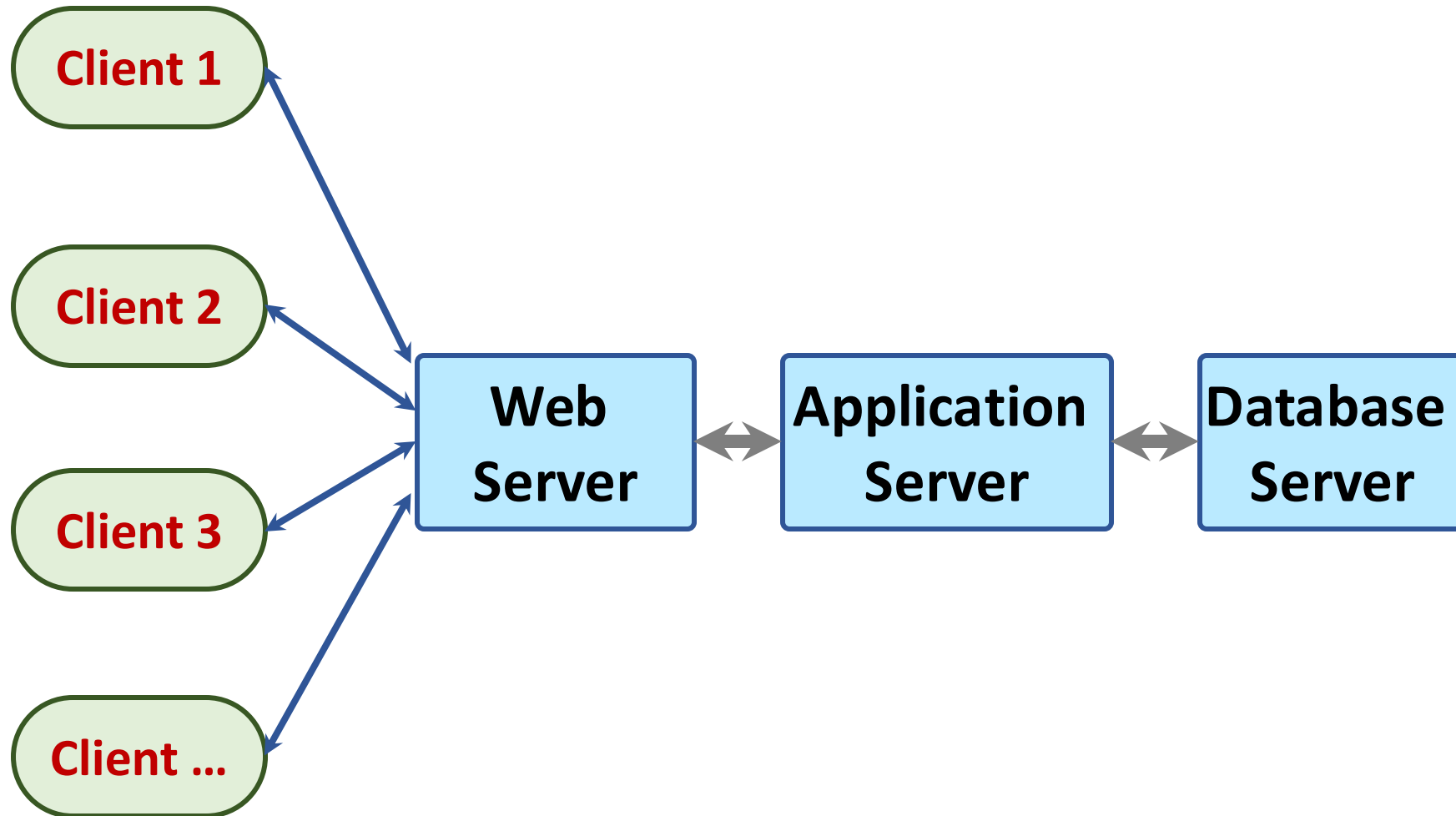
## Flow-Based Agile



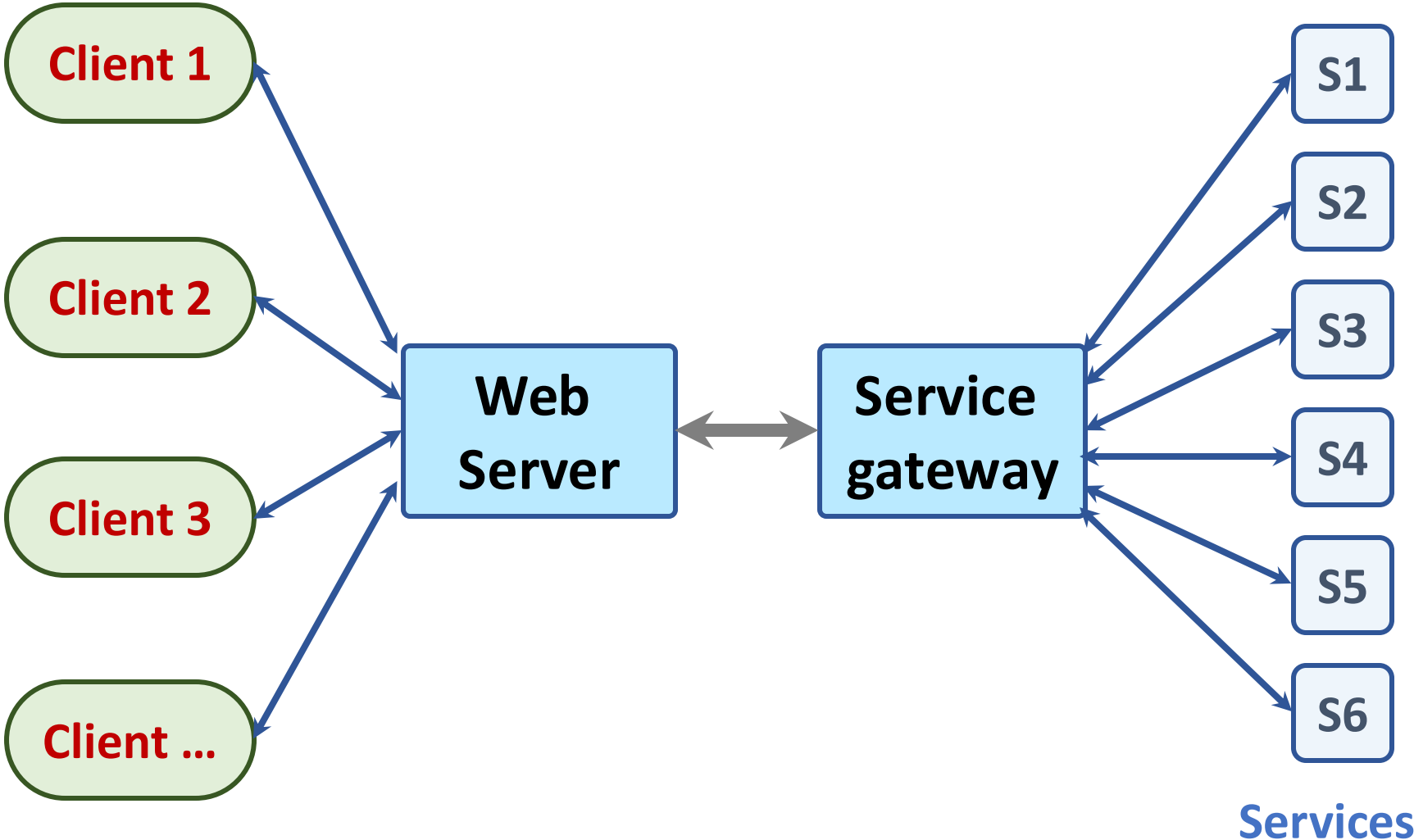
# From personas to features



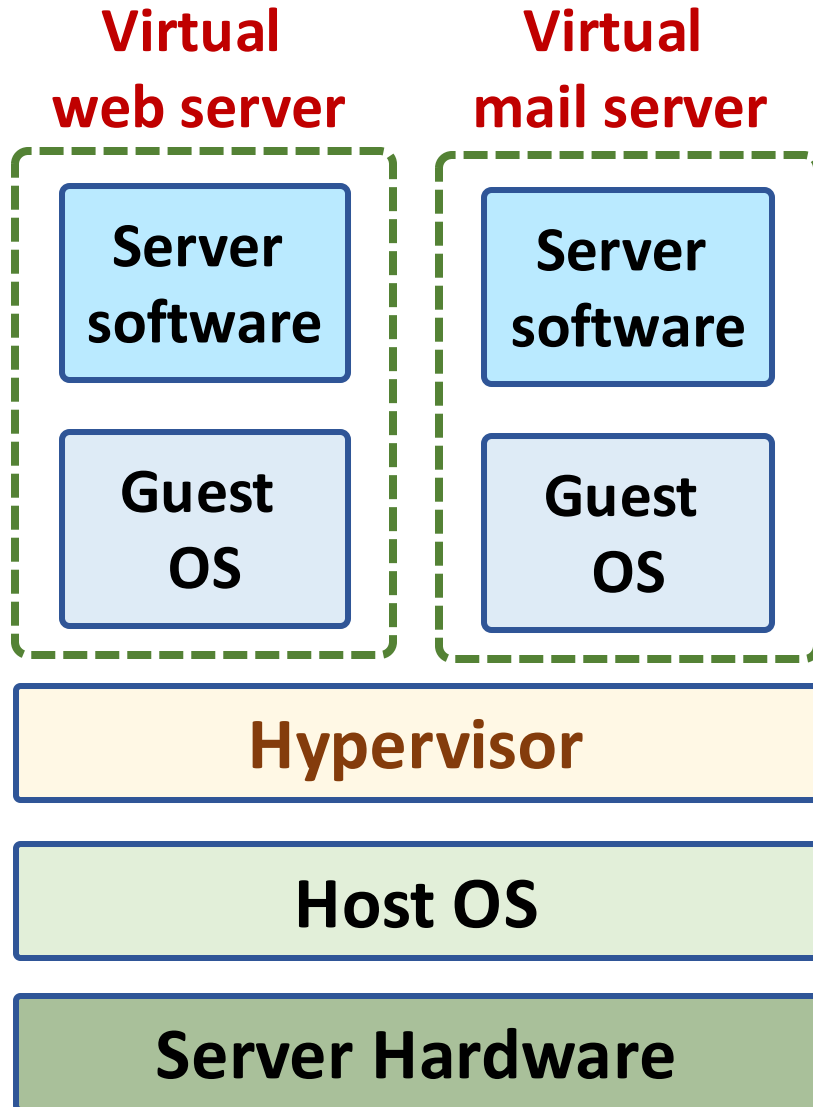
# Multi-tier client-server architecture



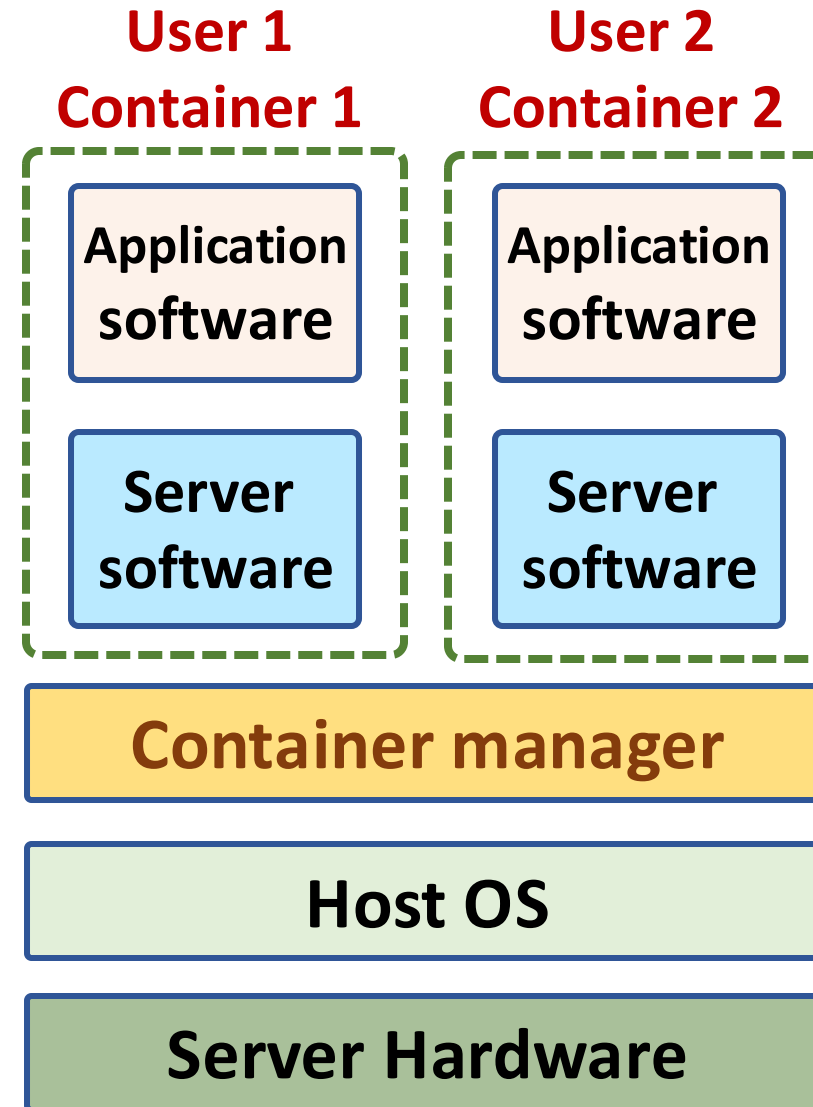
# Service-oriented Architecture



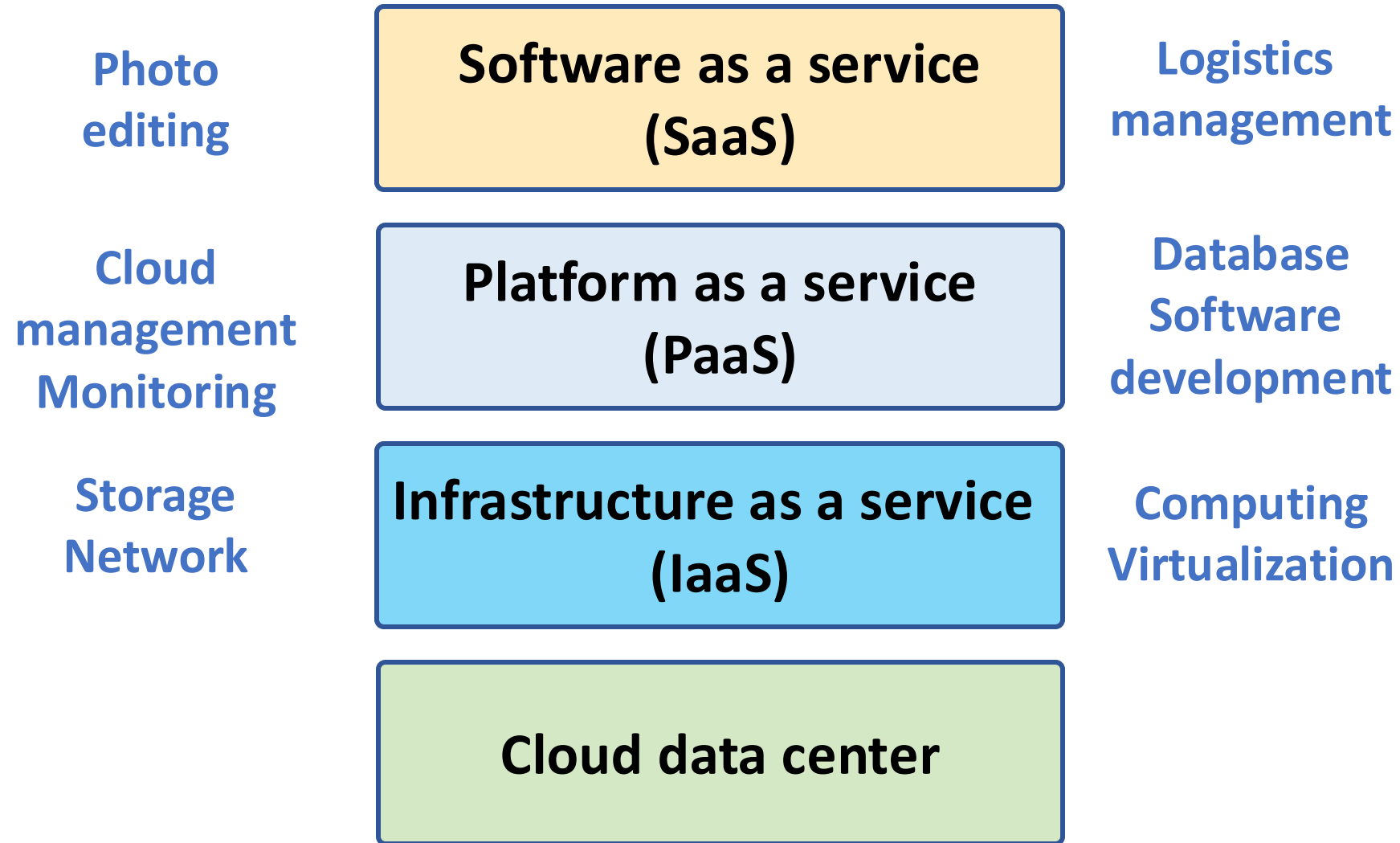
# VM



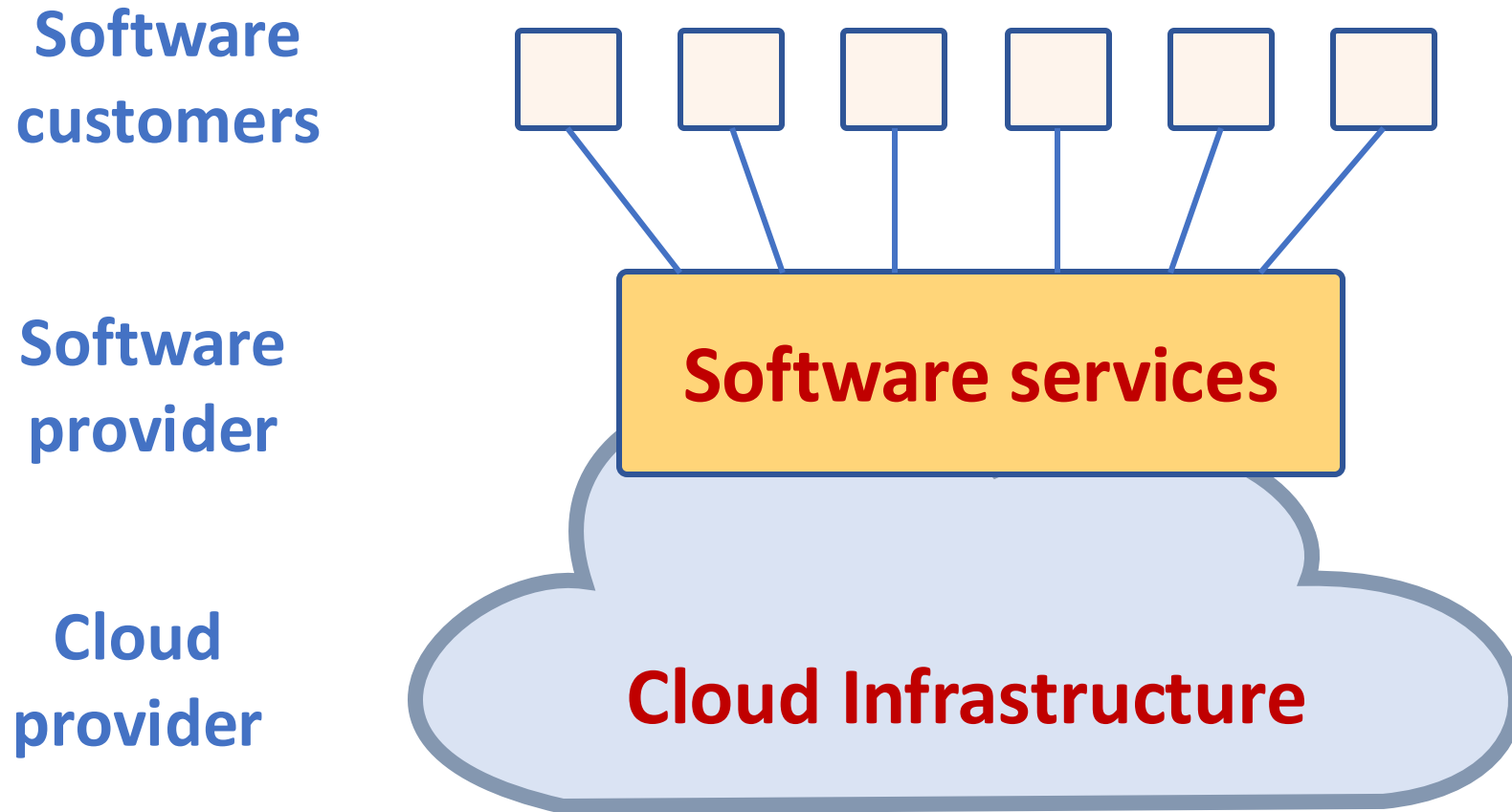
# Container



# Everything as a service

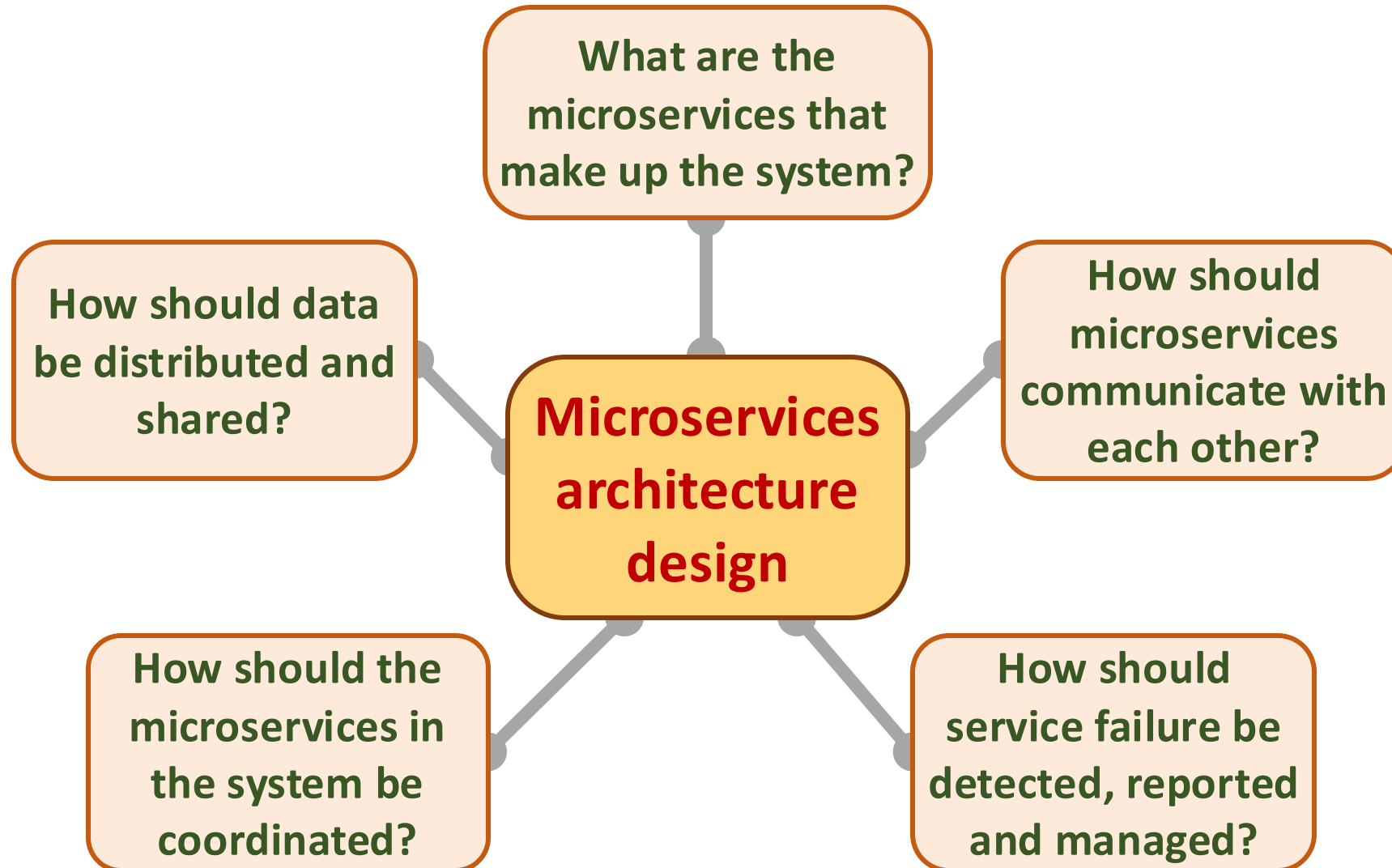


# Software as a service





# Microservices architecture – key design questions



# Types of security threat

An attacker attempts to deny access to the system for legitimate users

**Availability threats**

Distributed denial of service (DDoS) attack

An attacker attempts to damage the system or its data

**Integrity threats**

Virus

Ransomware

**SOFTWARE PRODUCT**

**PROGRAM**

**DATA**

Data theft

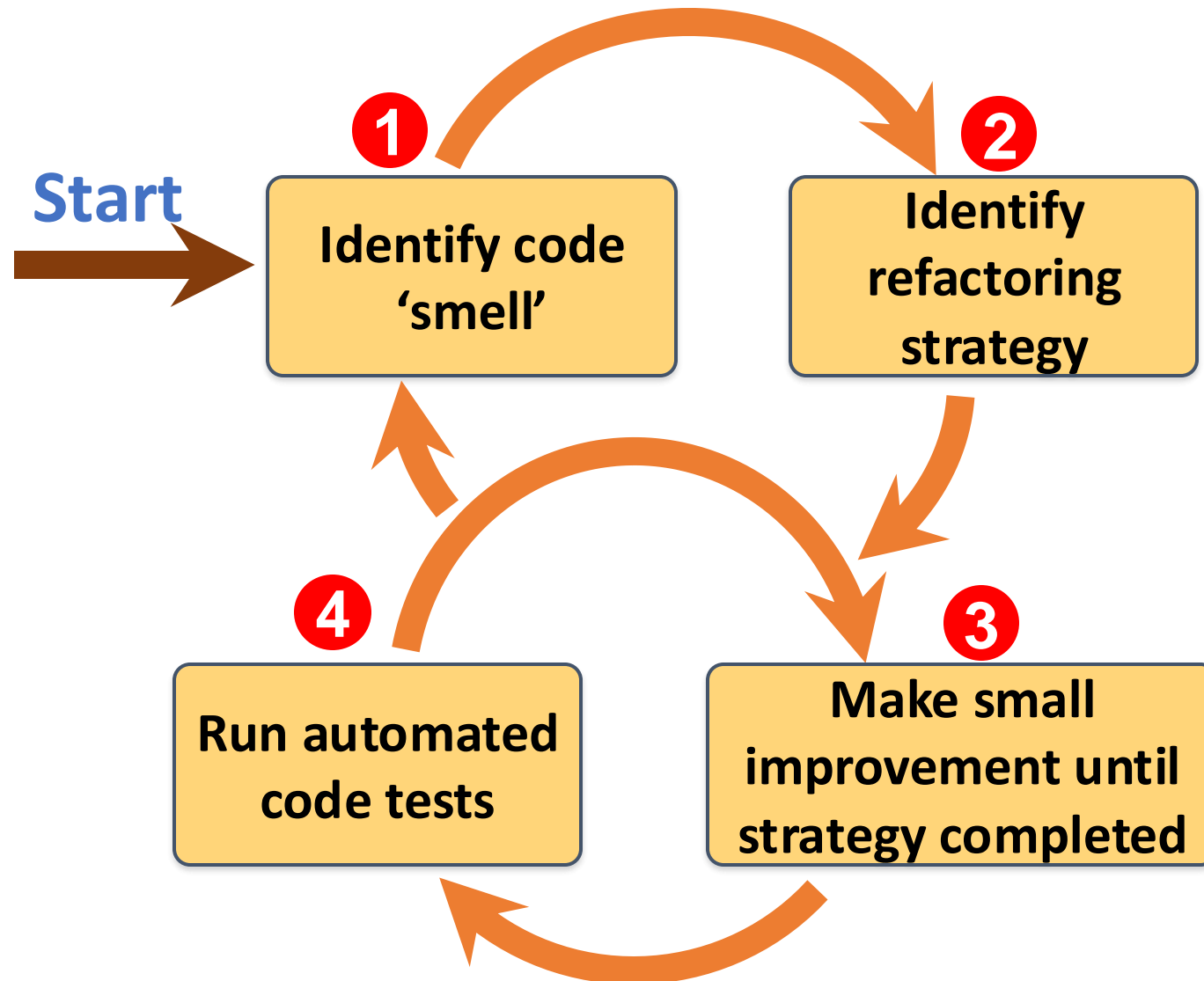
**Confidentiality threats**

An attacker tries to gain access to private information held by the system

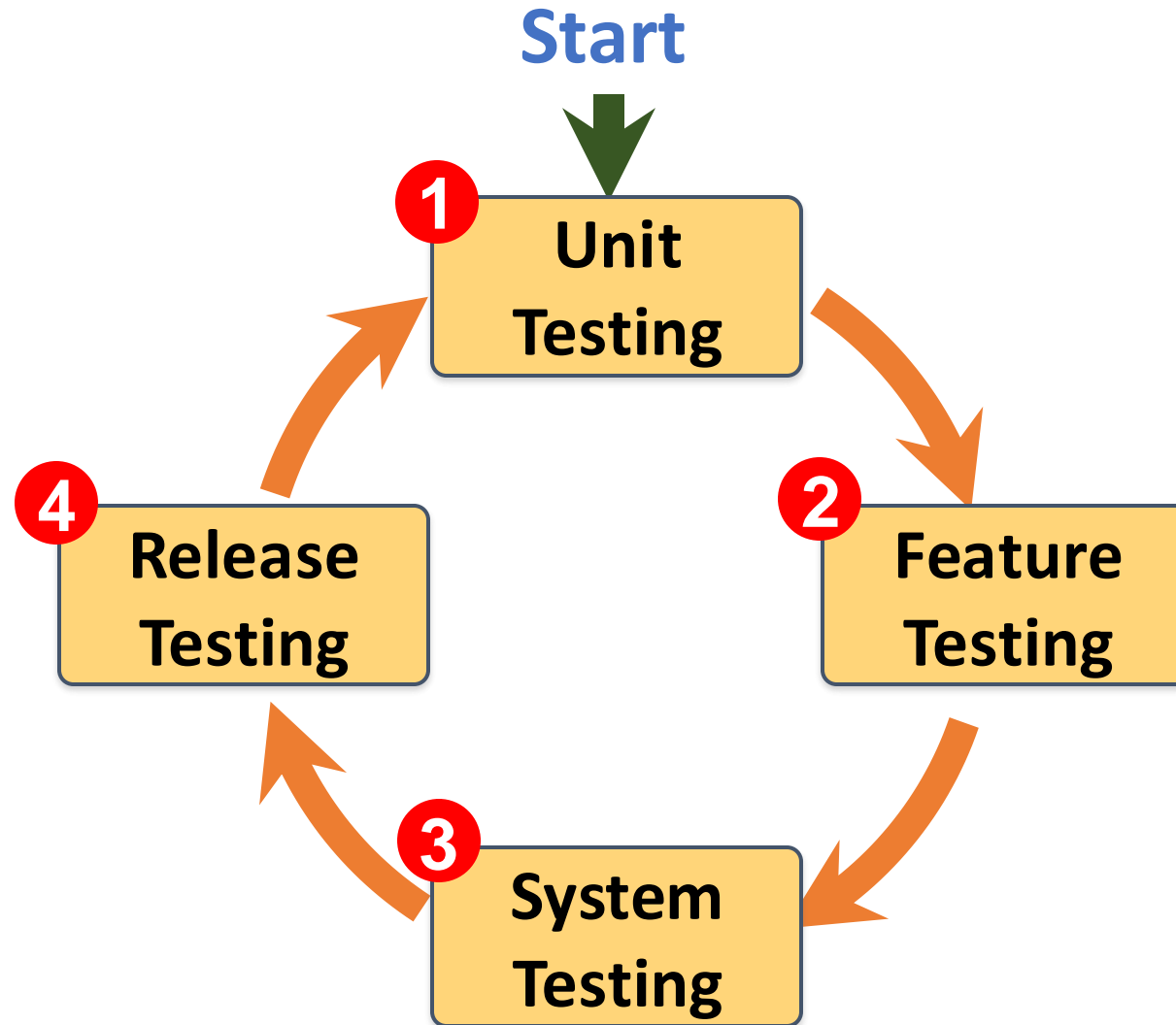
# Software product quality attributes



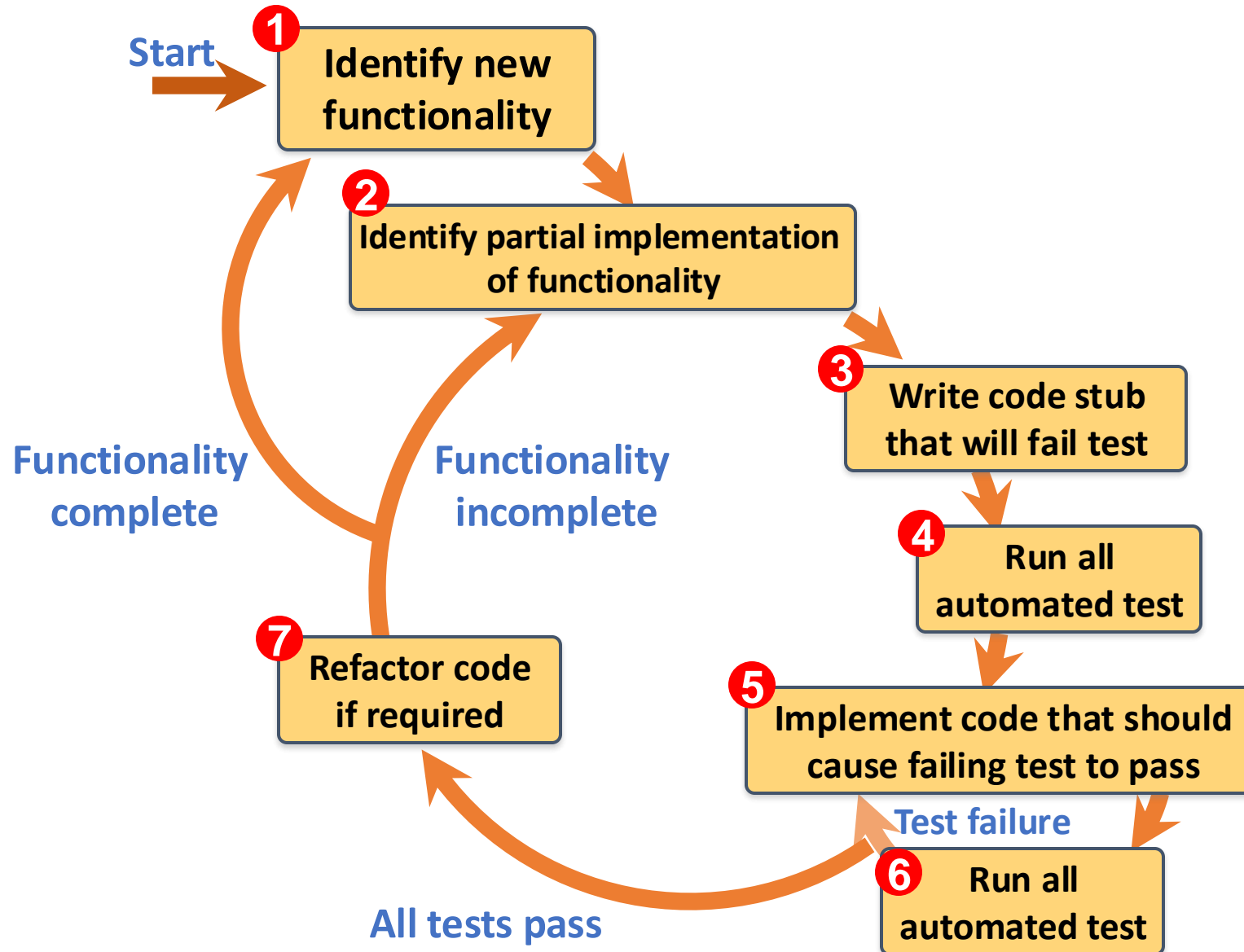
# A refactoring process



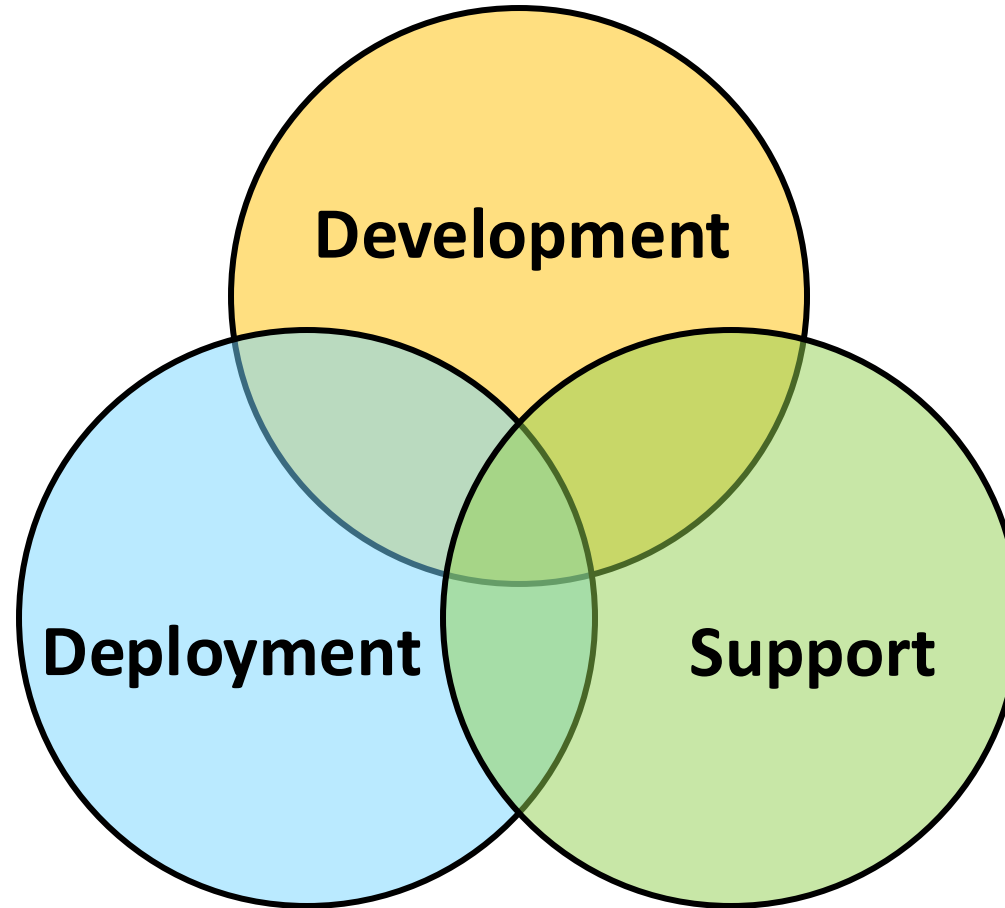
# Functional testing



# Test-driven development (TDD)

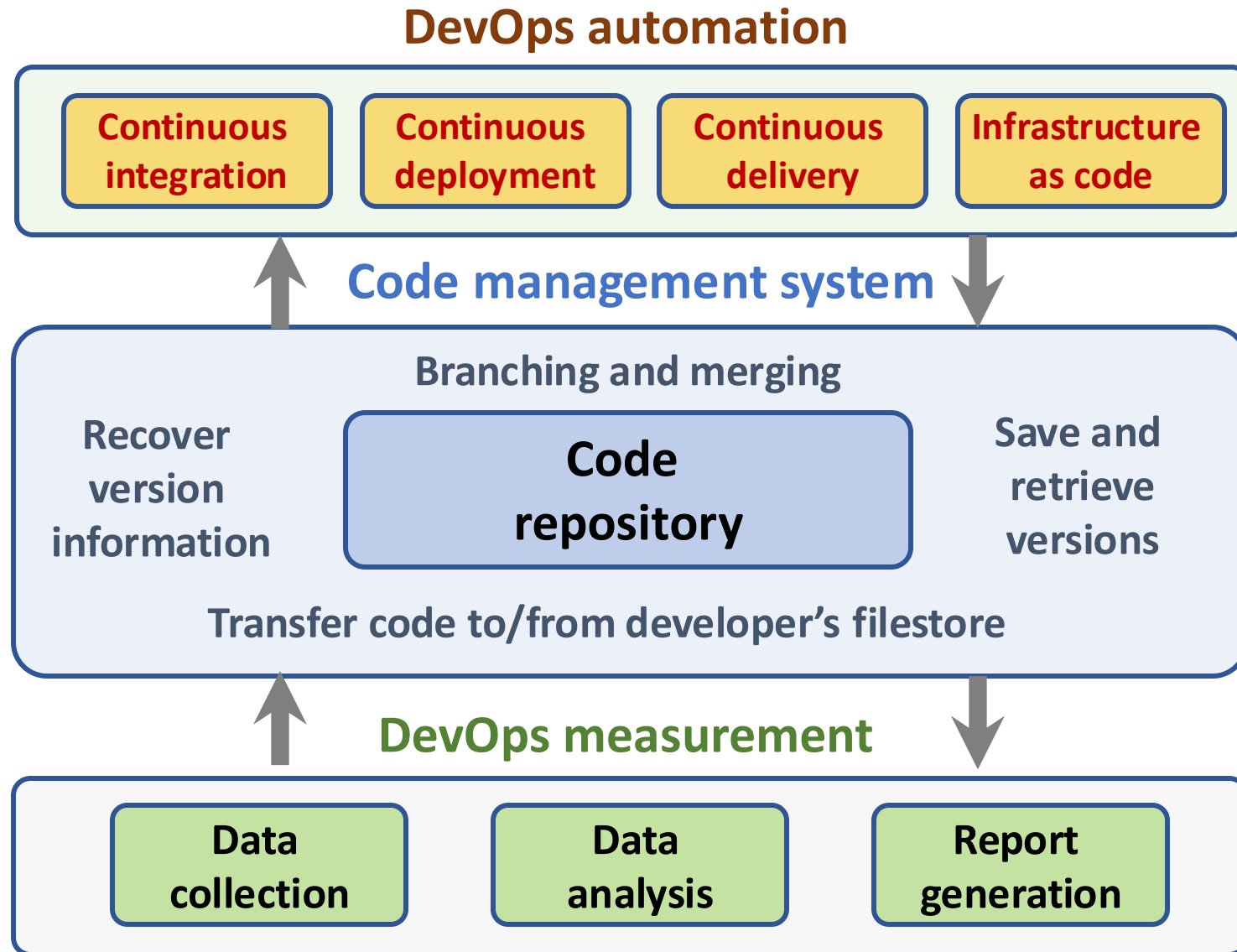


# DevOps



## Multi-skilled DevOps team

# Code management and DevOps





# Marketing

**Marketing**  
“Meeting  
**needs**  
profitably”

# Marketing

**“Marketing is an organizational function and a set of processes for creating, communicating, and delivering value to customers and for managing customer relationships in ways that benefit the organization and its stakeholders.”**

# Marketing Management

# Marketing Management

**“Marketing management is the  
art and science  
of choosing target markets  
and getting, keeping, and growing  
customers through  
creating, delivering, and communicating  
superior customer value.”**

# Marketing Management

- 1 Understanding Marketing Management**
- 2 Capturing Marketing Insights**
- 3 Connecting with Customers**
- 4 Building Strong Brands**
- 5 Creating Value**
- 6 Delivering Value**
- 7 Communicating Value**
- 8 Conducting Marketing Responsibly for Long-term Success**

**Agentic AI**

**for**

**Agile AI Software Engineering**

# NVIDIA Developer Program

<https://developer.nvidia.com/join-nvidia-developer-program>

## NVIDIA

## Deep Learning Institute (DLI)

<https://learn.nvidia.com/>



# Join the NVIDIA Developer Program

take one of the  
complimentary  
technical self-  
paced courses  
(worth up to \$90)

8 hours

## Getting Started With Deep Learning

Explore the fundamentals of deep learning by training neural networks and using results to improve performance and capabilities.

2 hours

## Modeling Time-Series Data With Recurrent Neural Networks in Keras

Explore how to classify and forecast time-series data using recurrent neural networks (RNNs), such as modeling a patient's health over time.

4 hours

## Deploying a Model for Inference at Production Scale

Learn how to deploy your own machine learning models on a GPU server.

8 hours

## Building Real-Time Video AI Applications

Gain the knowledge and skills needed to enable the real-time transformation of raw video data from widely deployed camera sensors into deep learning-based insights.

2 hours

## Introduction to Graph Neural Networks

Learn the basic concepts, models, and applications of graph neural networks.

4 hours

## Introduction to Physics-Informed Machine Learning With Modulus

Learn the various building blocks of NVIDIA Modulus, which turbocharges use cases by building physics-based deep learning models that are 100,000X faster than traditional methods and offers high-fidelity simulation results.

2 hours

## Get Started With Highly Accurate Custom ASR for Speech AI

Learn to build, train, fine-tune, and deploy a GPU-accelerated automatic speech recognition (ASR) service with NVIDIA® Riva that includes customized features.

2 hours

## Integrating Sensors With NVIDIA DRIVE

Find out how to integrate automotive sensors into your applications using NVIDIA DRIVE®.

# NVIDIA Deep Learning Institute (DLI)

Self-Paced Course

**Generative AI Explained**

Free  
2 hours

Self-Paced Course

**Getting Started With Deep Learning**

Certificate available  
\$90  
8 hours

Instructor-Led Workshop

**Fundamentals of Deep Learning**

Certificate available  
\$500  
8 hours

Self-Paced Course

**Introduction to Transformer-Based Natural Language Processing**

Certificate available  
\$30  
6 hours

Self-Paced Course

**Building RAG Agents With LLMs**

Certificate available  
Free  
8 hours

Instructor-Led Workshop

**Building RAG Agents With LLMs**

Certificate available  
\$500  
8 hours

Self-Paced Course

**Generative AI with Diffusion Models**

Certificate available  
\$90  
8 hours

Instructor-Led Workshop

**Generative AI with Diffusion Models**

Certificate available  
\$500  
8 hours

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## Monthly Activity

Skill Points	0
Time Spent	
Courses in Progress	9
Courses Completed	8

## Skills

## Certificates



Introduction to Transformer-Based Natural Language Processing



Building RAG Agents with LLMs



Building RAG Agents with LLMs

## Completed Courses

View more

<p>Self-paced</p> <p><b>Sizing LLM Inference Systems</b></p> <hr/> <p>100% Completed 03:00</p>	<p>Self-paced</p> <p><b>Augment your LLM Using Retrieval Augmented Generation</b></p> <hr/> <p>100% Completed 01:00</p>	<p>Self-paced</p> <p><b>Building RAG Agents with LLMs</b></p> <hr/> <p>100% Completed 08:00</p>	<p>Self-paced</p> <p><b>Generative AI Explained</b></p> <hr/> <p>100% Completed 02:00</p>	<p>Self-paced</p> <p><b>Introduction to Transform Based Natural Language Processing</b></p> <hr/> <p>100% Completed 06:00</p>
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## Certificate of Completion

This certificate is awarded to

**Min-Yuh Day**

for successfully completing

**Building RAG Agents with LLMs**

A handwritten signature in black ink, appearing to read "Greg Estes", written over a horizontal line.

**Greg Estes**

Vice President, NVIDIA

Issue Date: : December 8, 2024

Certification ID: ed-qOCIMQatzU8SNUNxgw |

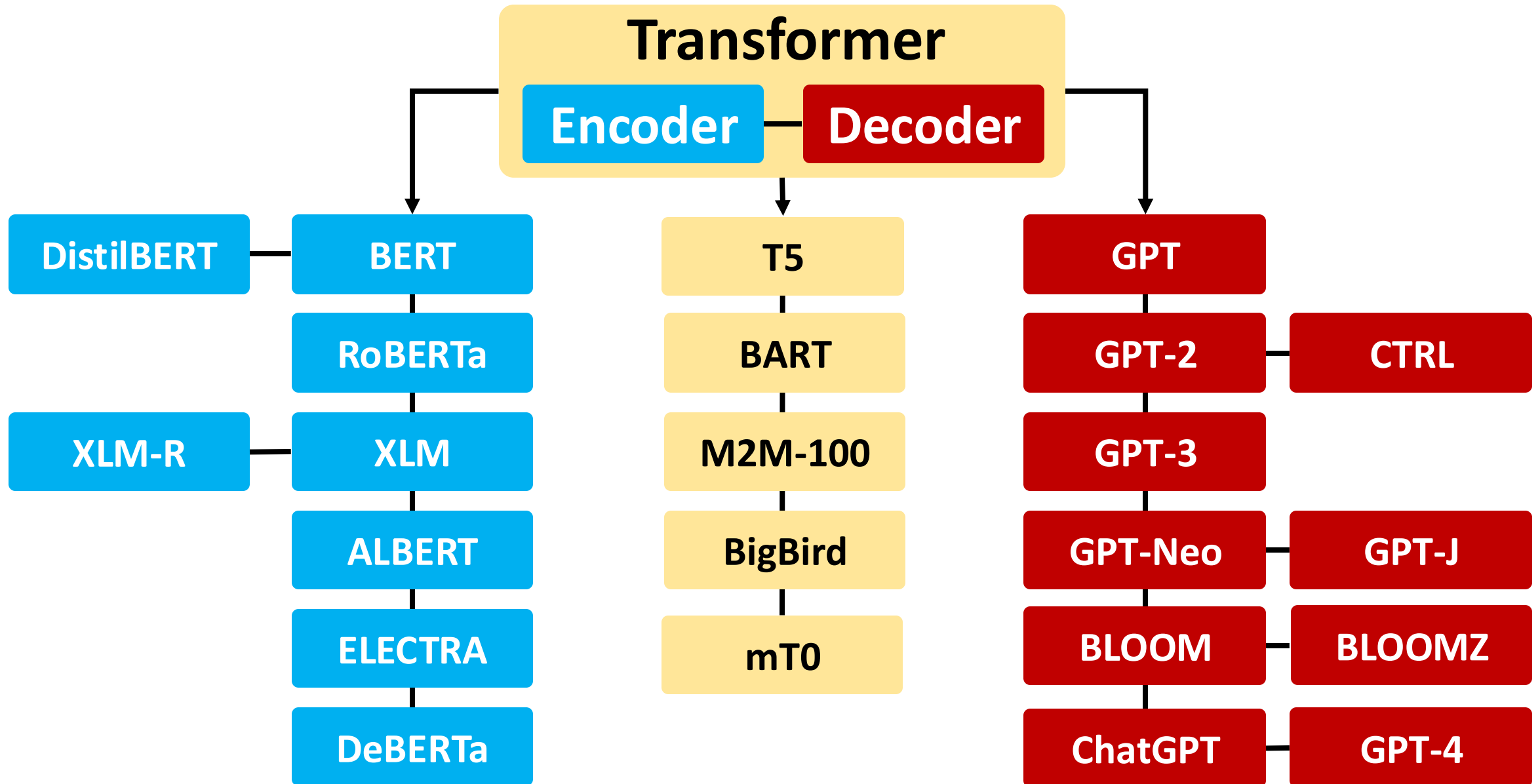
[https://learn.nvidia.com/certificates?id=ed-qOCIMQatzU8SNUNxgw/courses/course?course\\_id=course-v1:DLI+S-FX-15+V1](https://learn.nvidia.com/certificates?id=ed-qOCIMQatzU8SNUNxgw/courses/course?course_id=course-v1:DLI+S-FX-15+V1)

<https://learn.nvidia.com/certificates?id=ed-qOCIMQatzU8SNUNxgw>


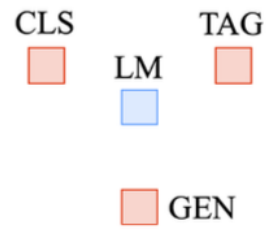
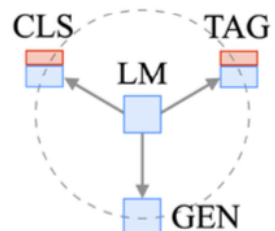
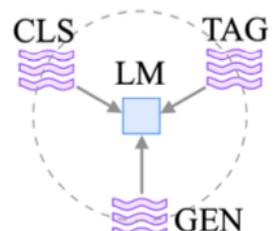
# Generative AI

**Text, Image, Video, Audio  
Applications**

# Transformer Models

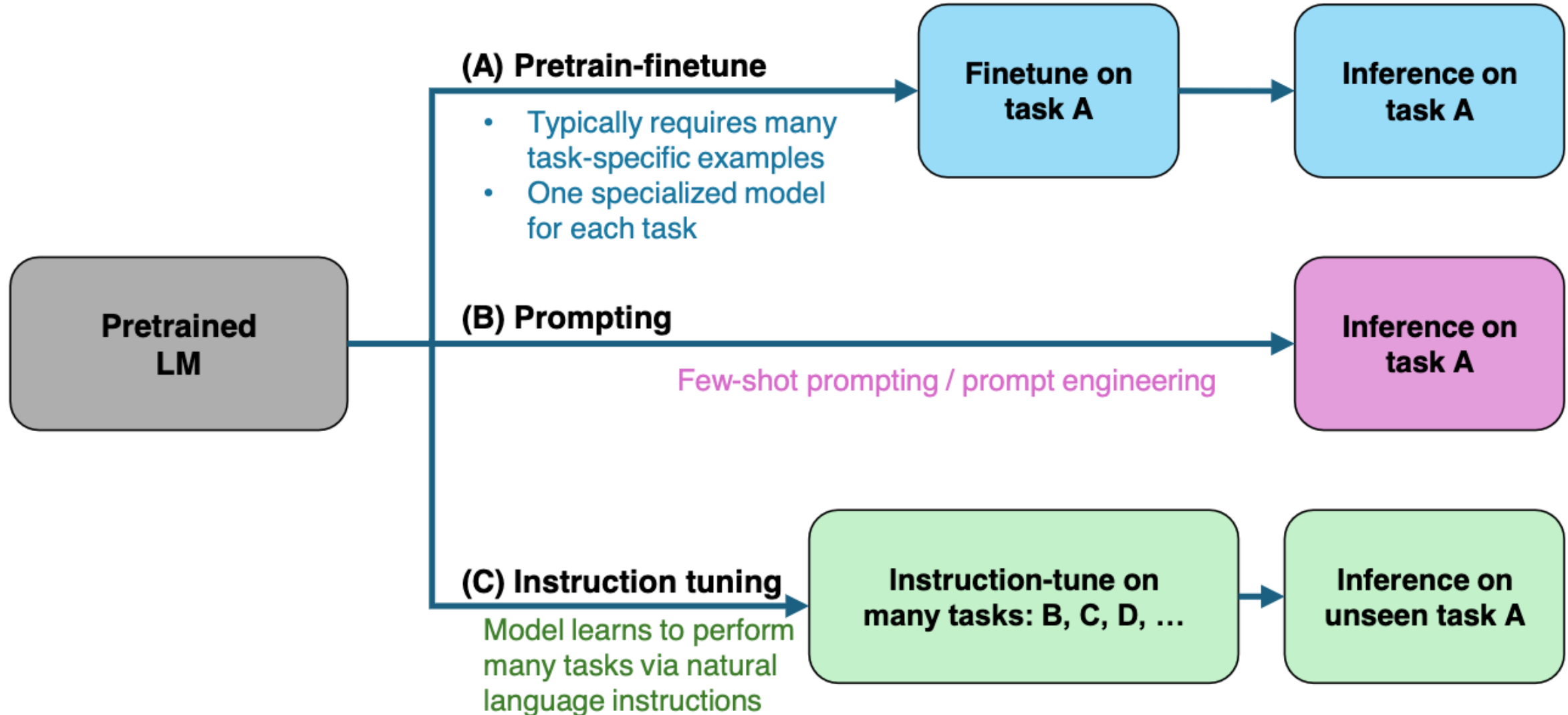


# Four Paradigms in NLP (LM)

Paradigm	Engineering	Task Relation
a. Fully Supervised Learning (Non-Neural Network)	Feature (e.g. word identity, part-of-speech, sentence length)	
b. Fully Supervised Learning (Neural Network)	Architecture (e.g. convolutional, recurrent, self-attentional)	
<b>Transfer Learning: Pre-training, Fine-Tuning (FT)</b>		
c. Pre-train, Fine-tune	Objective (e.g. masked language modeling, next sentence prediction)	
<b>GAI: Pre-train, Prompt, and Predict (Prompting)</b>		
d. Pre-train, Prompt, Predict	Prompt (e.g. cloze, prefix)	

# Large Language Models (LLM)

## Three typical learning paradigms

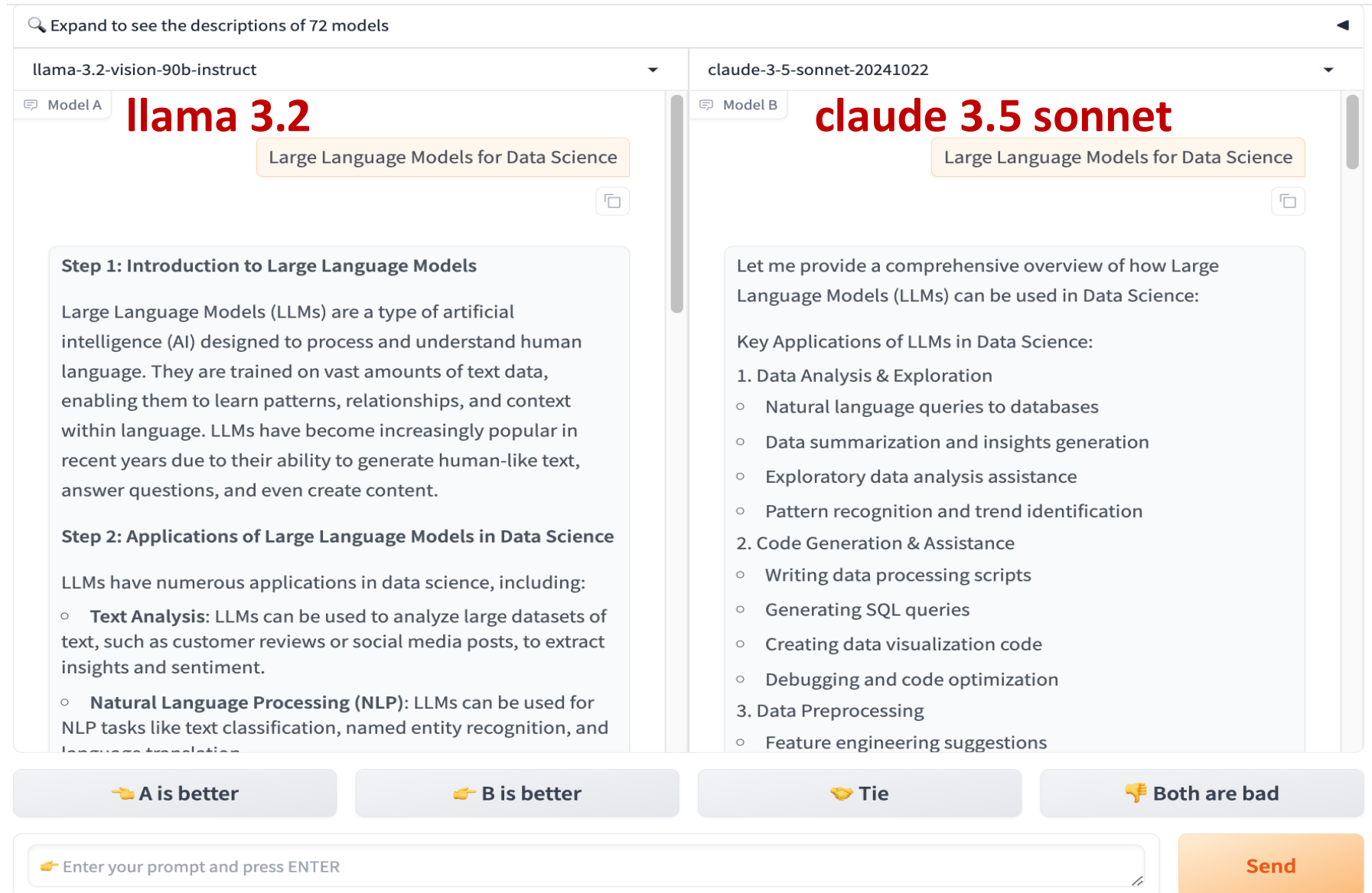




# Popular Generative AI

- **OpenAI ChatGPT (GPT-o1, GPT-4o, GPT-4)**
- **Claude.ai (Claude 3.5)**
- **Google Gemini**
- **Meta Llama 3.3, Llama 3.2 Vision**
- **Mixtral Pixtral (mistral.ai)**
- **DeepSeek**
- **Chat.LMSys.org (lmarena.ai)**
- **Perplexity.ai (Perplexity Deep Research)**
- **Stable Diffusion**
- **Video: D-ID, Synthesia**
- **Audio: Speechify**

# Chat with Open Large Language Models: Chatbot Arena



The screenshot shows the Chatbot Arena interface with two models being compared. The prompt is "Large Language Models for Data Science".

**Model A: llama 3.2**

**Step 1: Introduction to Large Language Models**

Large Language Models (LLMs) are a type of artificial intelligence (AI) designed to process and understand human language. They are trained on vast amounts of text data, enabling them to learn patterns, relationships, and context within language. LLMs have become increasingly popular in recent years due to their ability to generate human-like text, answer questions, and even create content.

**Step 2: Applications of Large Language Models in Data Science**

LLMs have numerous applications in data science, including:

- **Text Analysis:** LLMs can be used to analyze large datasets of text, such as customer reviews or social media posts, to extract insights and sentiment.
- **Natural Language Processing (NLP):** LLMs can be used for NLP tasks like text classification, named entity recognition, and language translation.

**Model B: claude 3.5 sonnet**

Let me provide a comprehensive overview of how Large Language Models (LLMs) can be used in Data Science:

**Key Applications of LLMs in Data Science:**

1. Data Analysis & Exploration
  - Natural language queries to databases
  - Data summarization and insights generation
  - Exploratory data analysis assistance
  - Pattern recognition and trend identification
2. Code Generation & Assistance
  - Writing data processing scripts
  - Generating SQL queries
  - Creating data visualization code
  - Debugging and code optimization
3. Data Preprocessing
  - Feature engineering suggestions

At the bottom, there are four buttons for voting: "A is better", "B is better", "Tie", and "Both are bad". A text input field with a "Send" button is also present.

# Perplexity.ai



Anonymous Like



New Thread



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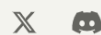
Sign Up

Try Pro

Upgrade to Claude-2 or GPT-4, boost Copilot uses, and upload more files.

Learn More

Download



## Large Language Models for Data Science

### Sources

What Is a Large Language Model and What Can...

snowflake · 1

What are Large Language Models? | NVIDIA

nvidia · 2

Catch Up On Large Language Models | by...

towardsdatascien... · 3



View 3 more

### Answer

Large Language Models (LLMs) are advanced AI systems designed to understand human language intricacies and generate intelligent, creative responses to queries <sup>1</sup>. They are deep learning algorithms that can recognize, summarize, translate, predict, and generate content using very large datasets <sup>2</sup>. LLMs are trained on enormous data sets typically measured in petabytes, sourced from books, articles, websites, and other text-based sources <sup>1</sup>. They are dynamic tools that are continuously updated and refined as new data becomes available <sup>1</sup>.

In the field of data science, LLMs can potentially transform how teams source, manage, and analyze data <sup>1</sup>. They are used in numerous data science applications, and their ability to process and interpret vast amounts of text data has made them an indispensable part of m

Ask follow-up...

Copilot



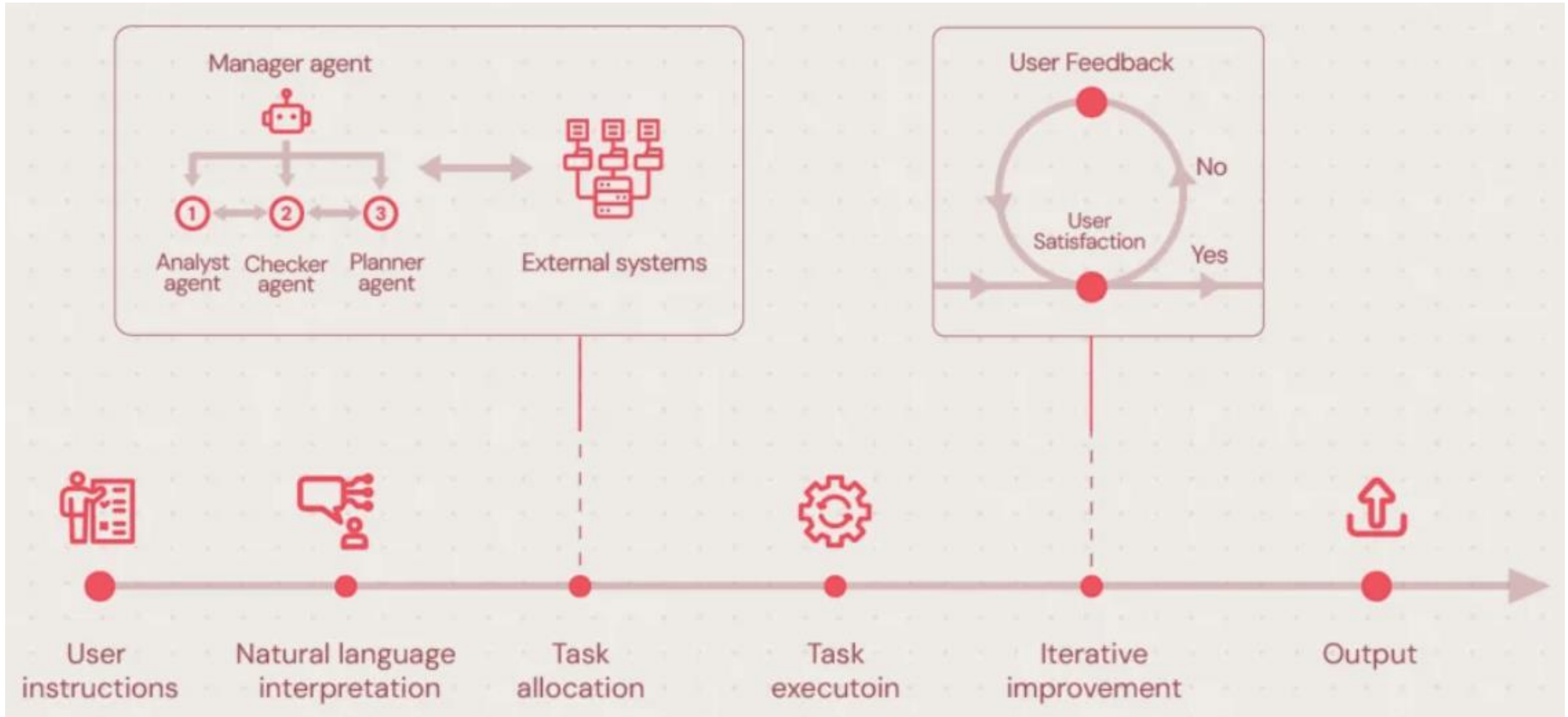
social media posts or customer reviews, to determine whether the overall sentiment is

<https://www.perplexity.ai/>



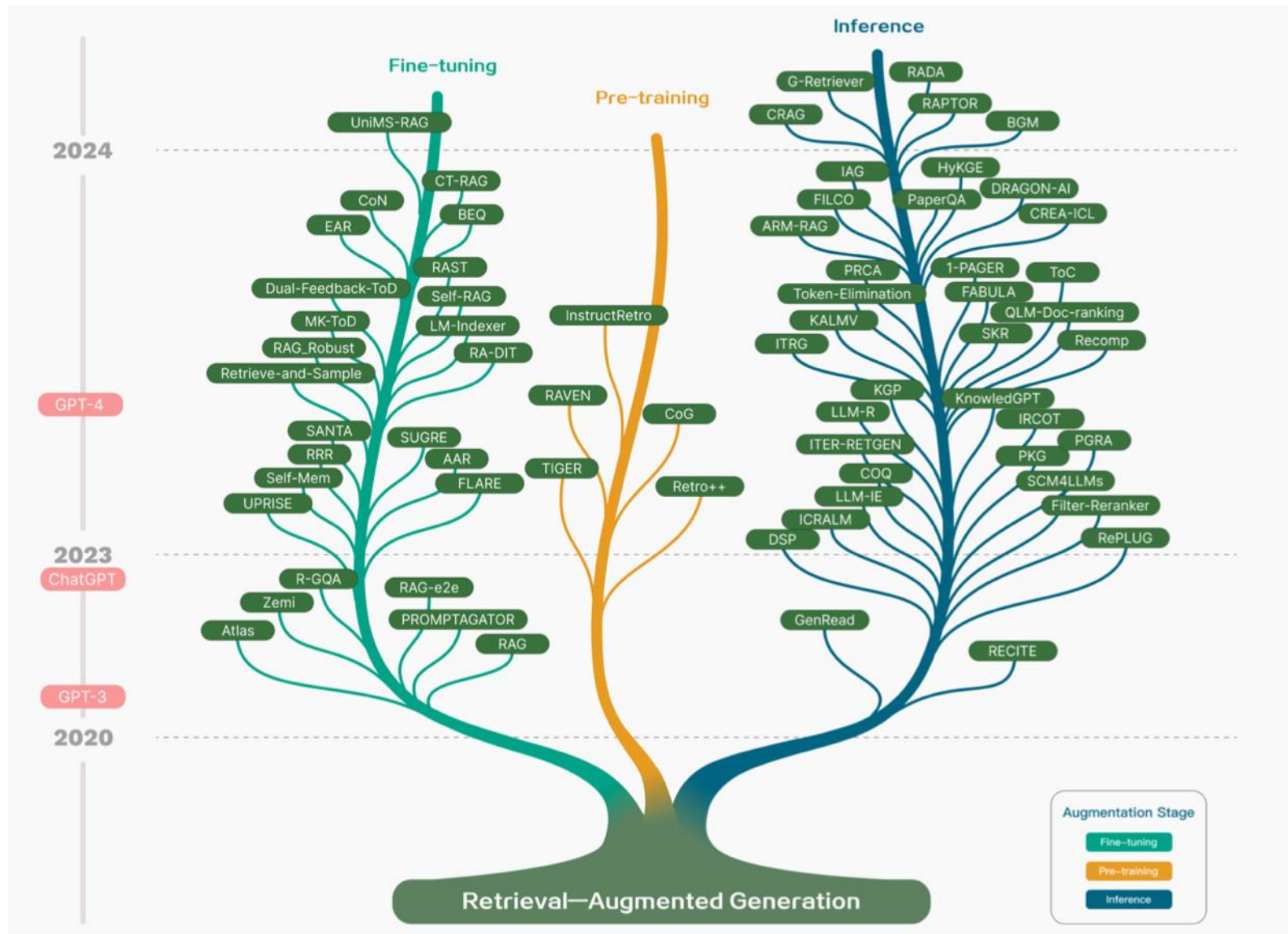
**Agentic AI Systems**  
**RAG Agents with LLM**  
**Dialogue Systems**

# Agentic AI Systems

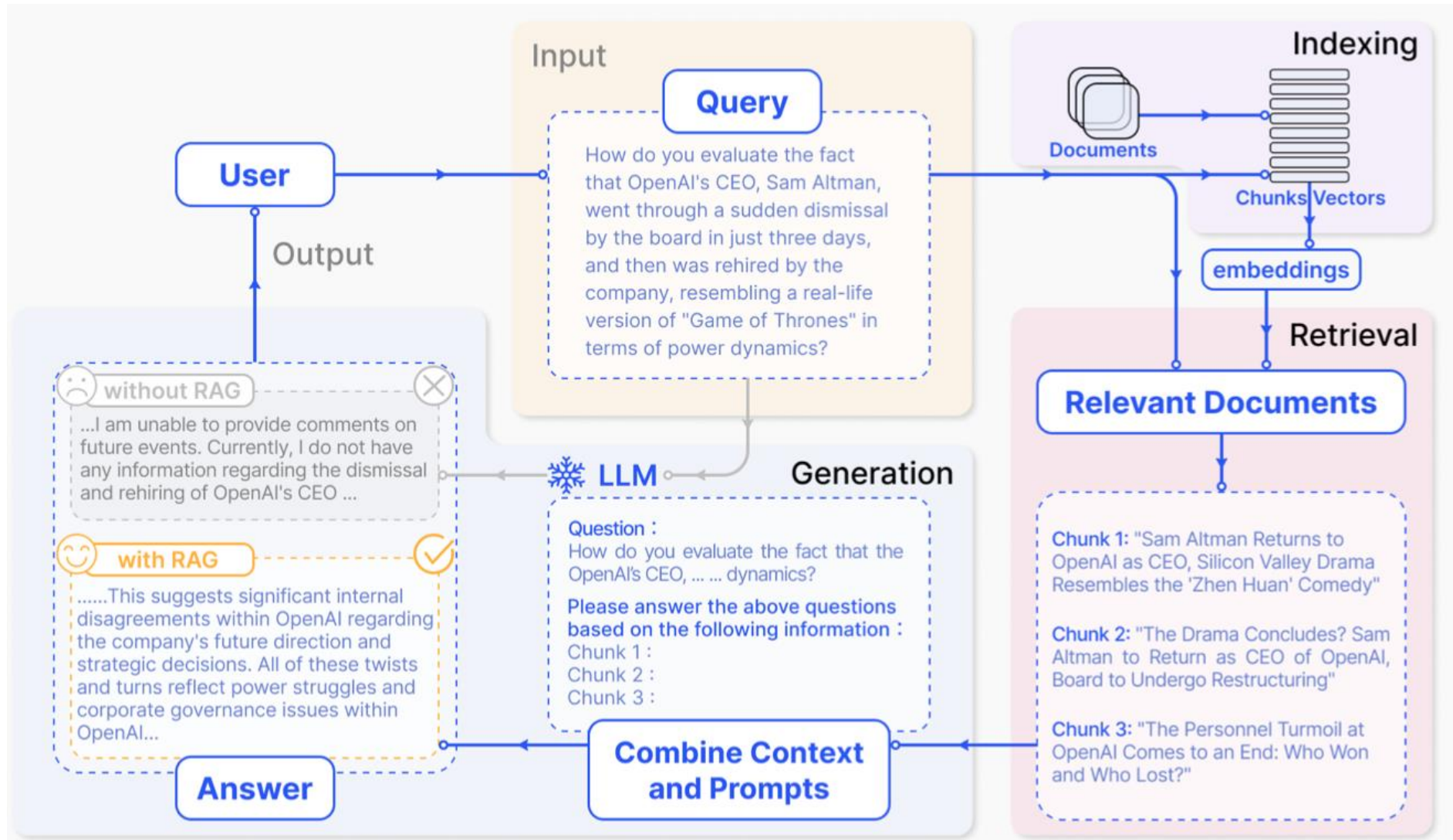


# Technology Tree of RAG Research

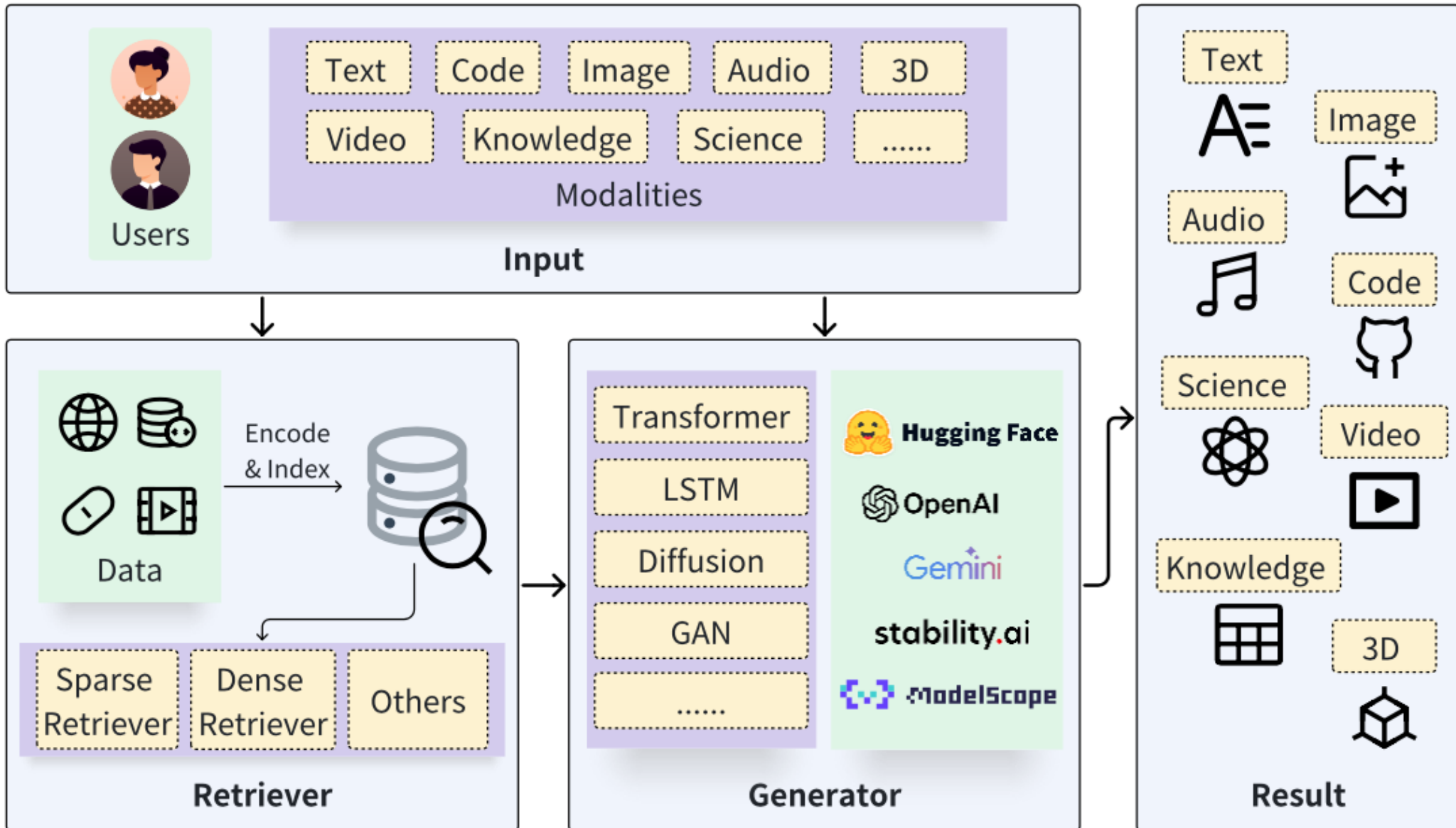
## Retrieval-Augmented Generation (RAG) for Large Language Models (LLMs)



# Retrieval-Augmented Generation (RAG) for Large Language Models (LLMs)

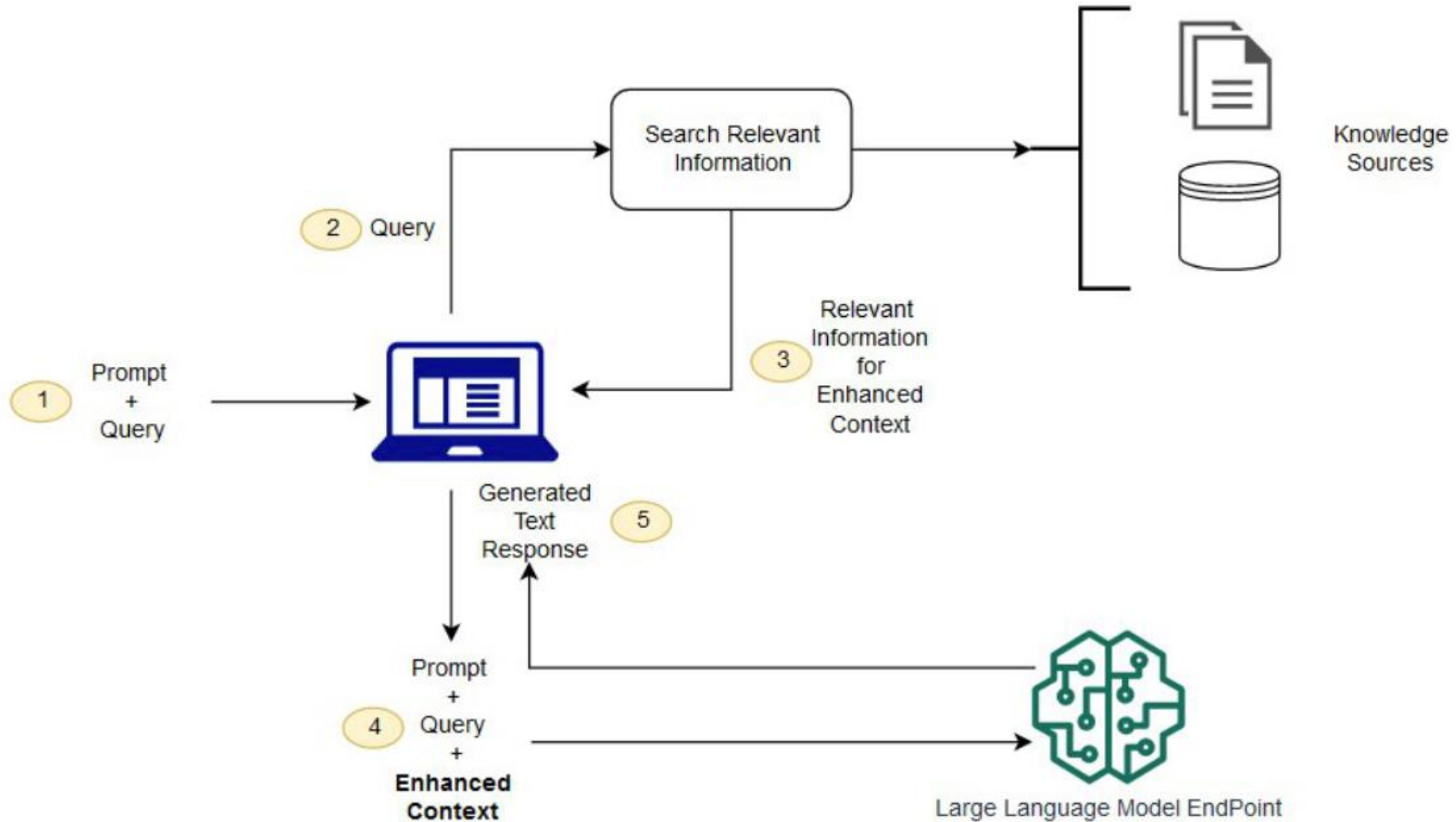


# Retrieval-Augmented Generation (RAG) Architecture

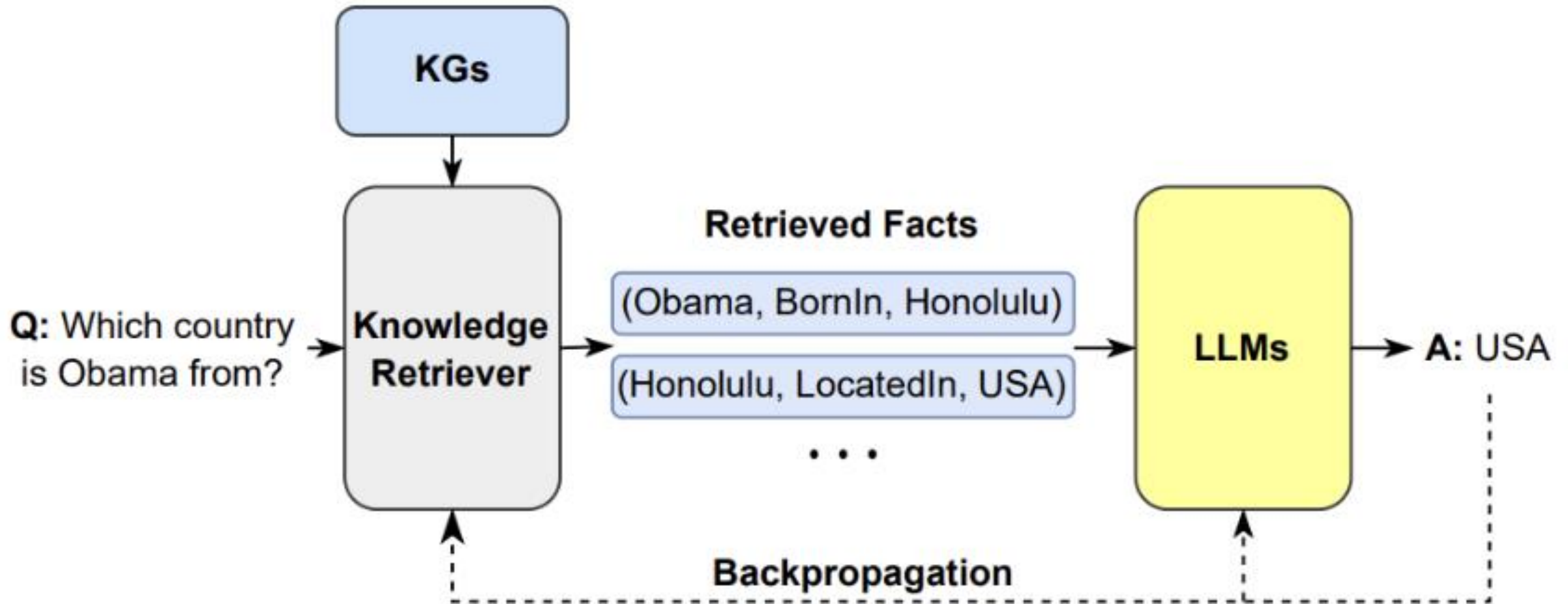




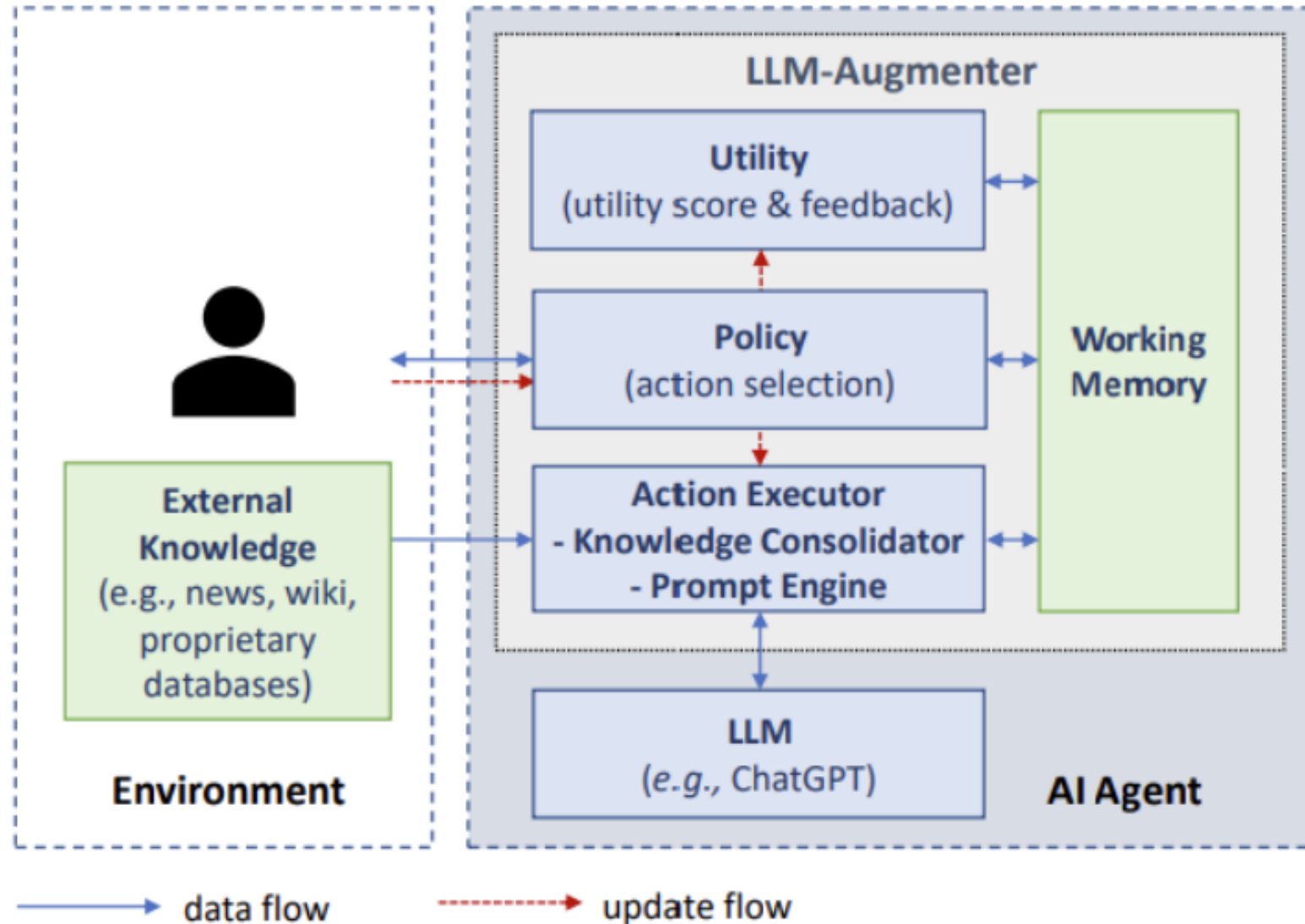
# Synthesizing RAG with LLMs for Question Answering Application



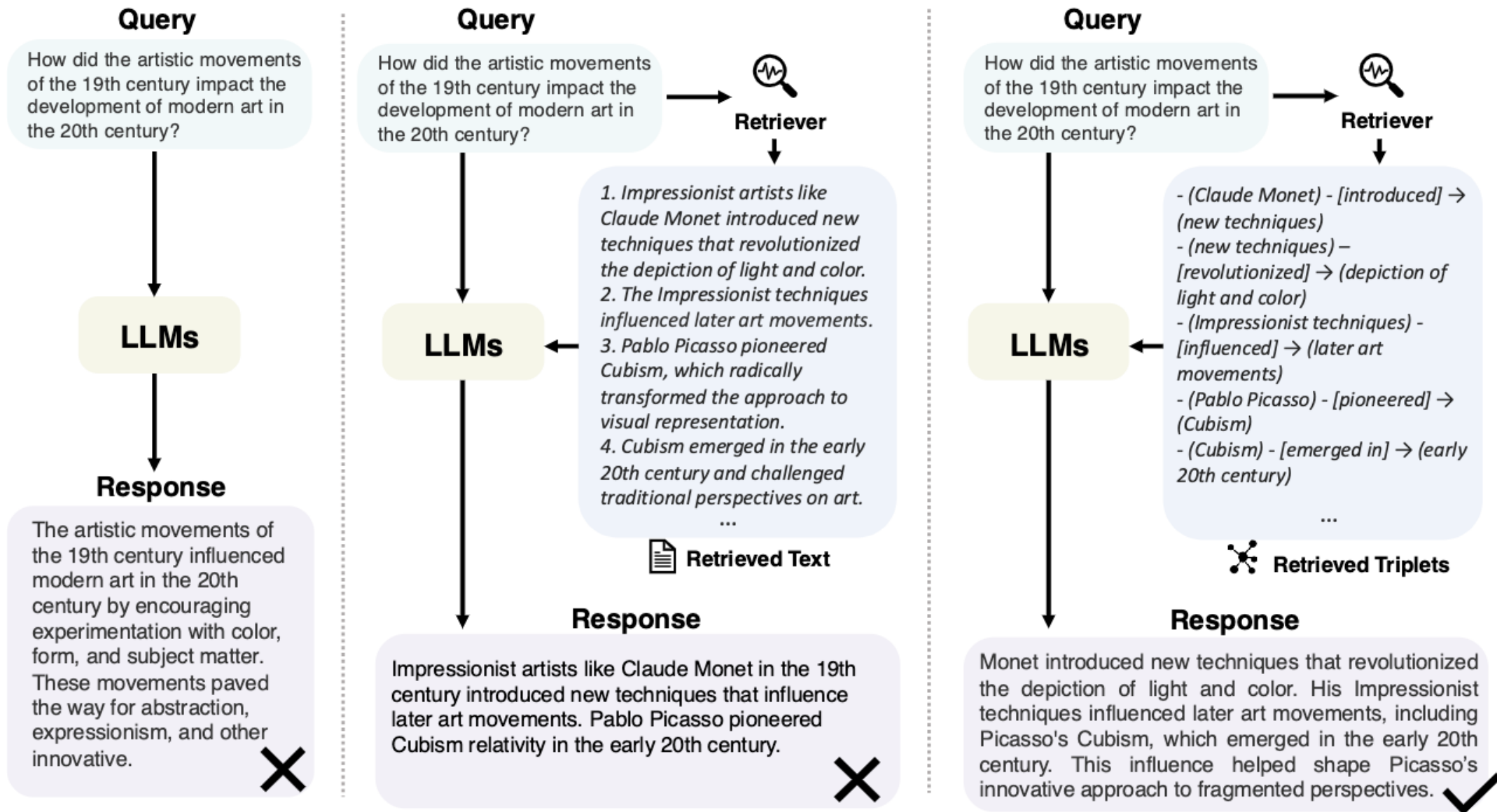
# Synthesizing the KG as a Retriever with LLMs



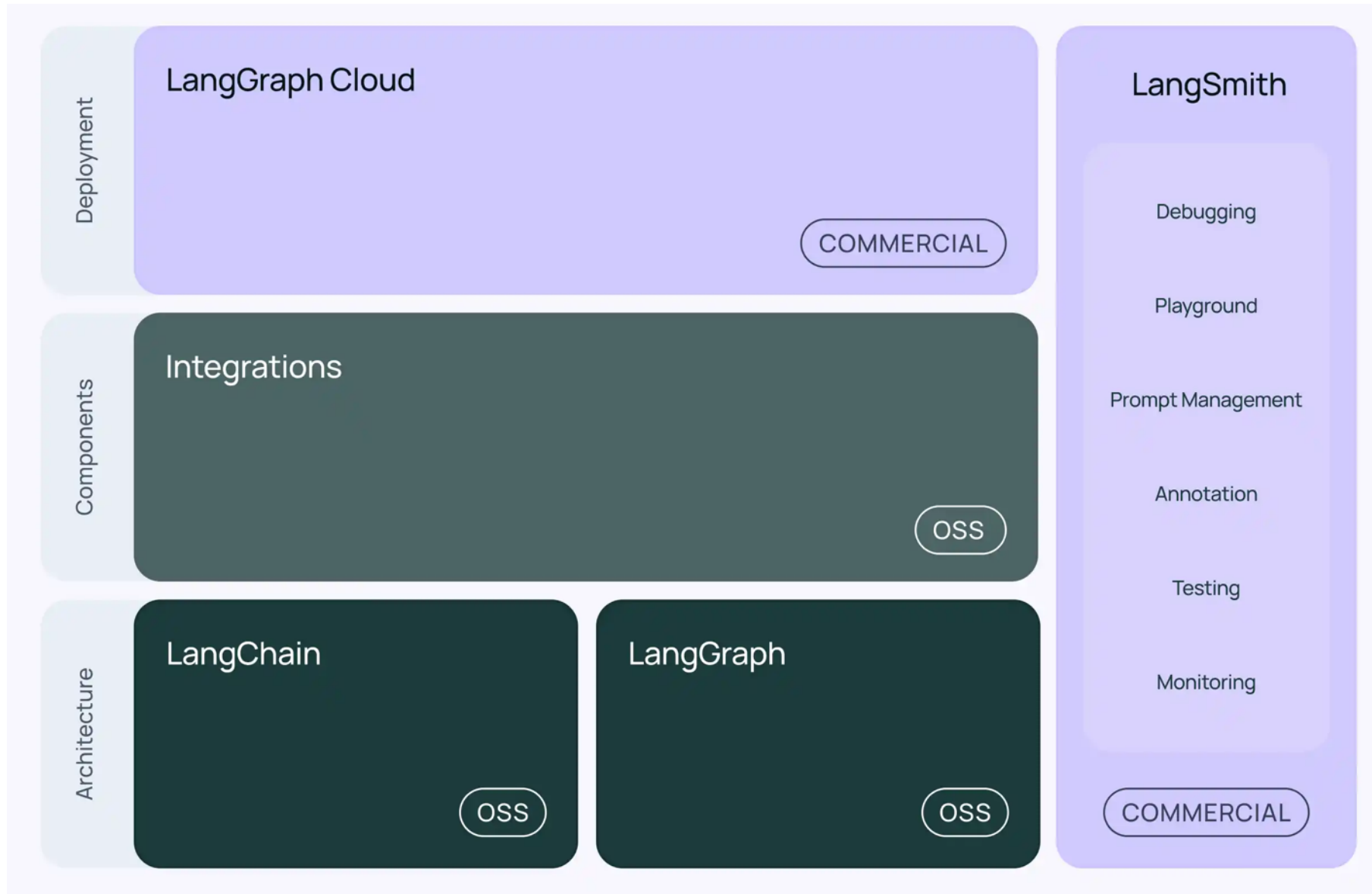
# A LLM-based Agent for Conversational Information Seeking



# Direct LLM, RAG, and GraphRAG

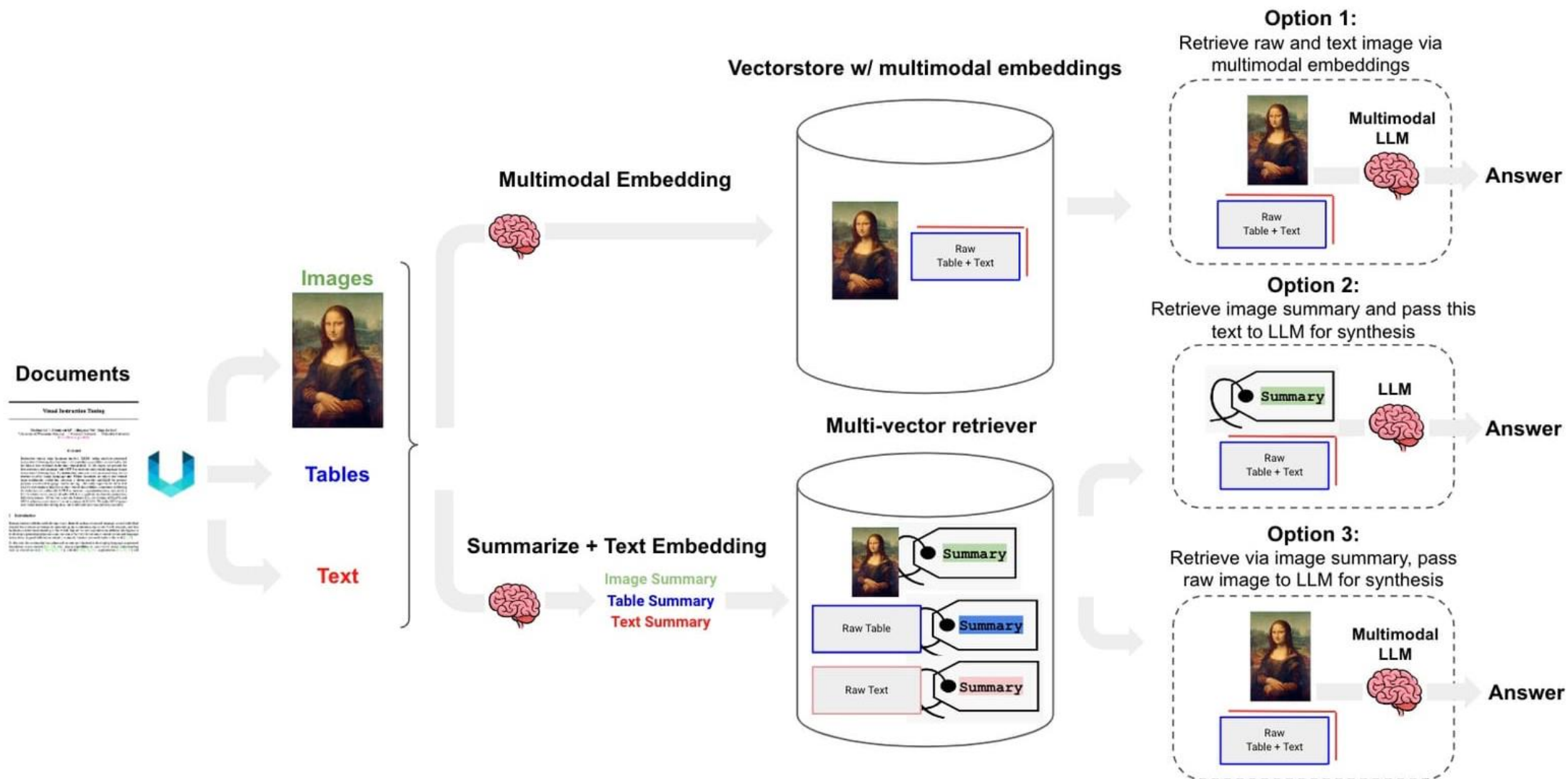


# LangChain Architecture



# Multimodal LLM RAG

## Multi-Vector Retriever for RAG



# Evaluating RAG with Ragas Metrics

## ragas score

generation

### faithfulness

how factually accurate is  
the generated answer

### answer relevancy

how relevant is the generated  
answer to the question

retrieval

### context precision

the signal to noise ratio of retrieved  
context

### context recall

can it retrieve all the relevant information  
required to answer the question

# Teaching



- **Generative AI Innovative Applications**
  - Spring 2025
- **Artificial Intelligence in Finance and Quantitative**
  - Fall 2021, Fall 2022, Fall 2023, Spring 2025
- **Software Engineering**
  - Fall 2020, Fall, 2021, Spring 2022, Spring 2023, Spring 2024, Spring 2025
- **Artificial Intelligence**
  - Spring 2021, Fall 2022, Fall 2024
- **Sustainability and ESG Data Analytics**
  - Spring 2024, Fall 2024
- **Big Data Analytics**
  - Fall 2020, Spring 2023, Spring 2024
- **Artificial Intelligence for Text Analytics**
  - Spring 2022, Fall 2023
- **Python for Accounting Applications**
  - Fall 2023, Fall 2024
- **Foundation of Business Cloud Computing**
  - Spring 2021, Spring 2022, Spring 2023, Spring 2024

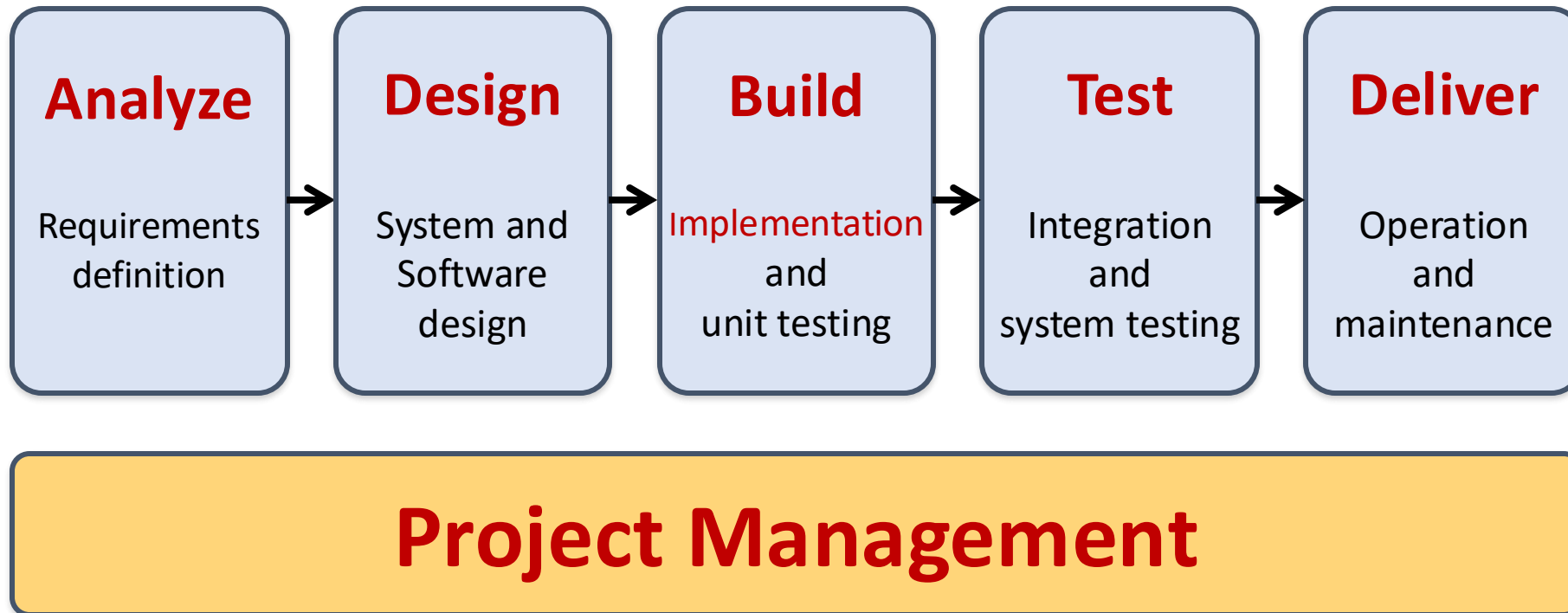


# Research Projects



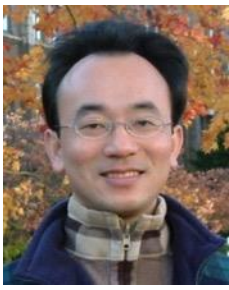
1. **Digital Support, Unimpeded Communication: The Development, Support and Promotion of AI-assisted Communication Assistive Devices for Speech Impairment (2/3).**  
**Multimodal Cross-lingual Task-Oriented Dialogue System for Inclusive Communication Support**
  - NSTC 113-2425-H-305-002-, 3 Years (2023/05/01-2026/04/30) Year 1: 2024/05/01~2025/04/30
2. **Research on speech processing, synthesis, recognition, and sentence construction of people with language disabilities. Multimodal Cross-lingual Task-Oriented Dialogue System**
  - NTPU, 114-NTPU\_ORDA-F-004, 2023/01/01~2025/12/31
3. **Development of a Deep Learning for Dental Implant Detection in Panoramic Radiographs,**
  - USTP-NTPU-TMU-114-02, 2025/01/01~2025/12/31
4. **Metaverse AI Multimodal Cross-Language Task-Oriented Dialogue System**
  - ATEC Group, Fintech and Green Finance Center (FGFC, NTPU), NTPU-112A413E01, 2 Years (2023/05/01~2025/04/30)
5. **Establishment and Implement of Smart Assistive Technology for Dementia Care and Its Socio-Economic Impacts (3/3). Intelligent, individualized and precise care with smart AT and system integration**
  - NSTC, 113-2627-M-038-001-, 2024/08/01~2025/07/31

# Software Engineering and Project Management



# Summary

- This course introduces the **fundamental concepts, research issues, and hands-on practices of software engineering.**
- **Topics include:**
  1. Introduction to Software Engineering
  2. Software Products and Project Management: Software product management and prototyping with Generative AI
  3. Agile Software Engineering: Agile methods, Scrum, and Extreme Programming
  4. Features, Scenarios, and Stories
  5. Software Architecture: Architectural design, System decomposition, and Distribution architecture
  6. Cloud-Based Software: Virtualization and containers, Everything as a service, Software as a service
  7. Cloud Computing and Cloud Software Architecture
  8. Microservices Architecture, RESTful services, Service deployment
  9. Security and Privacy; Reliable Programming
  10. Testing: Functional testing, Test automation, Test-driven development, and Code reviews
  11. DevOps and Code Management: Code management and DevOps automation
  12. Case Study on Software Engineering



# Software Engineering



2020 Cohort



Accredited  
Educator



Solutions  
Architect  
Associate



Cloud  
Practitioner

## Contact Information

**Min-Yuh Day, Ph.D.**

**Professor**

[Institute of Information Management, National Taipei University](#)

Tel: 02-86741111 ext. 66873

Office: B8F12

Address: 151, University Rd., San Shia District, New Taipei City, 23741 Taiwan

Email: [myday@gm.ntpu.edu.tw](mailto:myday@gm.ntpu.edu.tw)

Web: <http://web.ntpu.edu.tw/~myday/>

