COMP2511

Tute09

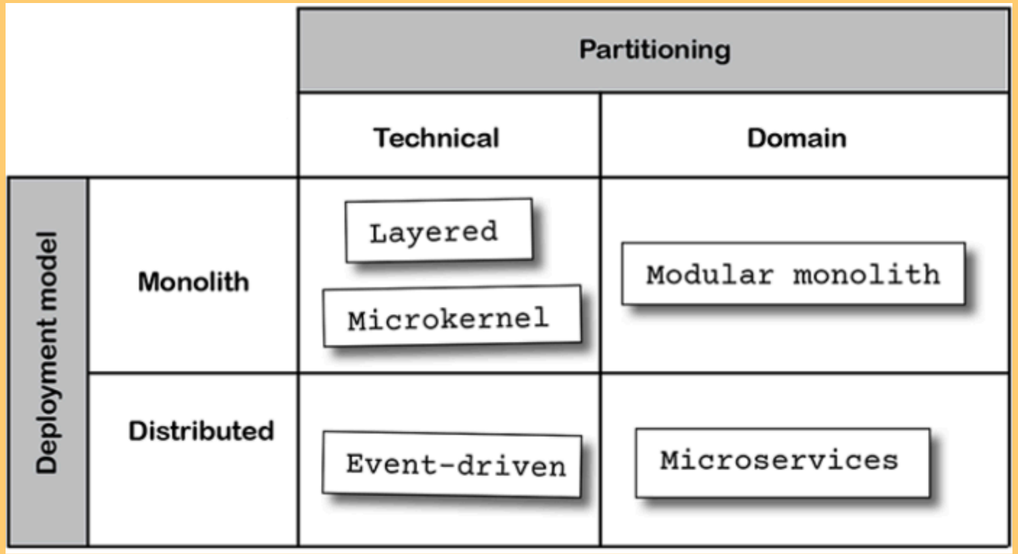
Agenda

- Architectural Styles
- Architectural Characteristics
- Architecting 101 - Discussion
- Assignment ii

Architectural Styles

Why do buildings have different architecture? How can you tell them apart?

Categorising Architecture



Partitioning: separation of code

- Technical: functional roles (frontend, backend, database)
- Domain: problem areas (catalogue, transactions, stock)

Deployment: how code deployed

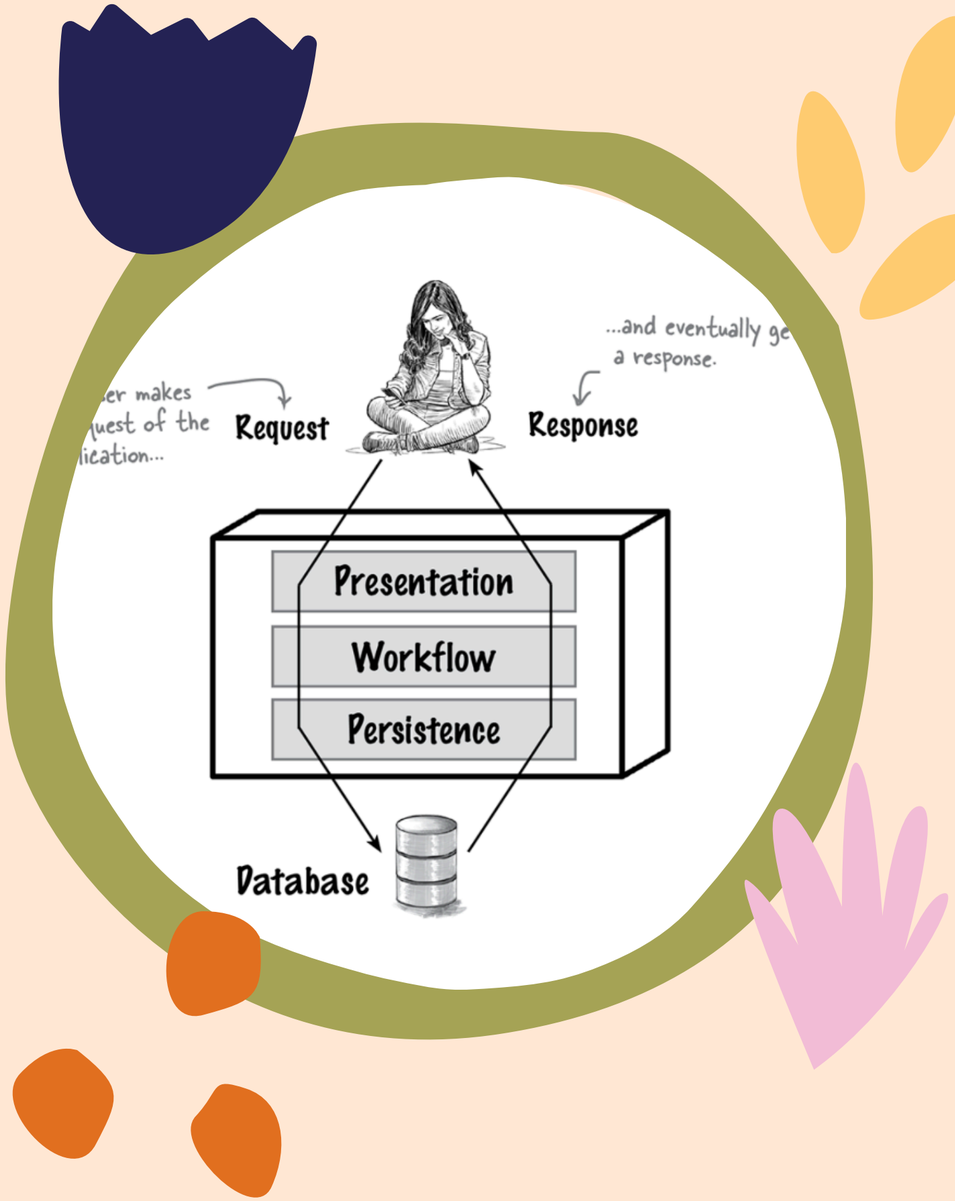
- Monolithic: single unit
- Distributed: multiple units communicating over network

Layered

Separates technical responsibilities into distinct layers

- Technically partitioned, monolithic
- Divides system into manageable, logical parts

Why choose layered architecture?

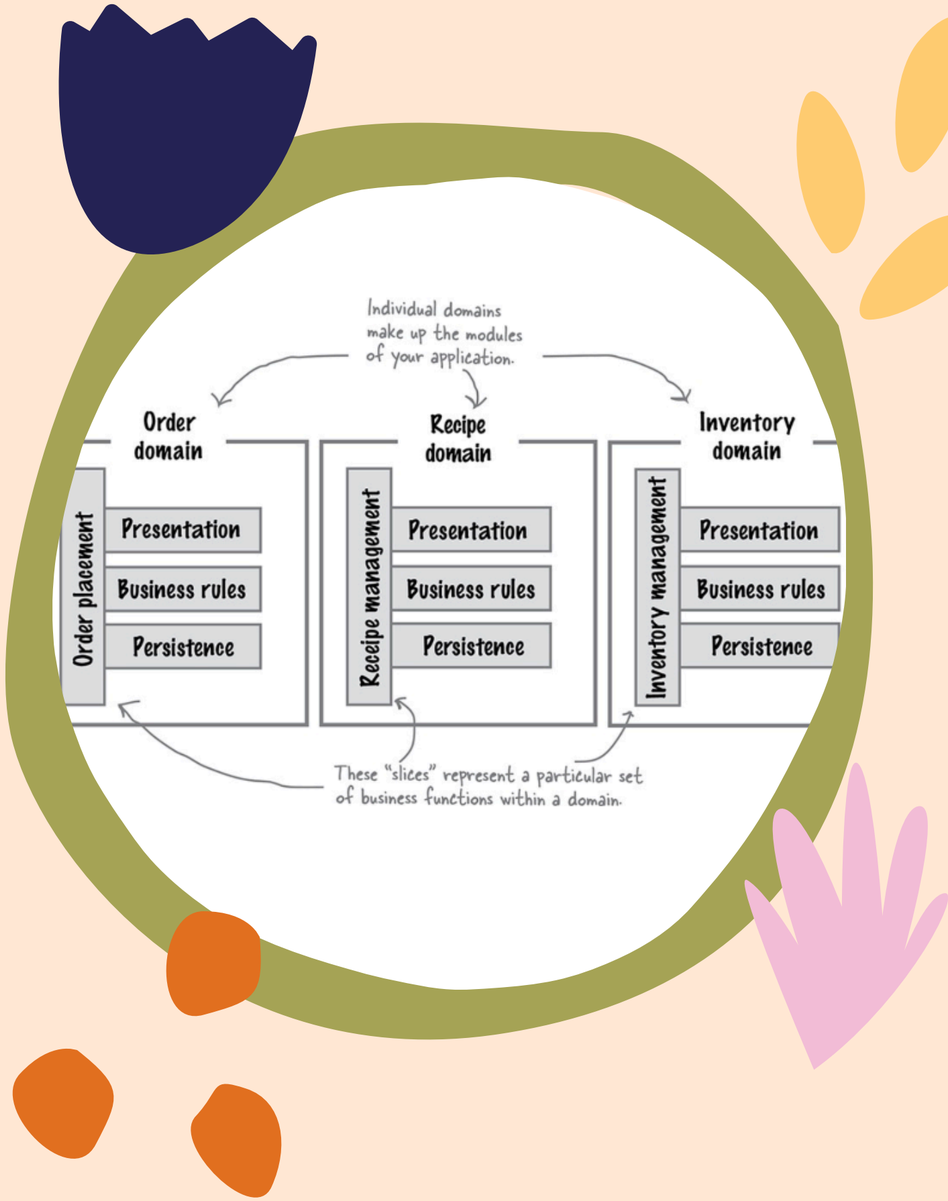


Modular Monolith

Separates domains into modules

- Domain partitioned, monolithic
- Aligns code and teams around business capabilities

Why choose modular monolith architecture?

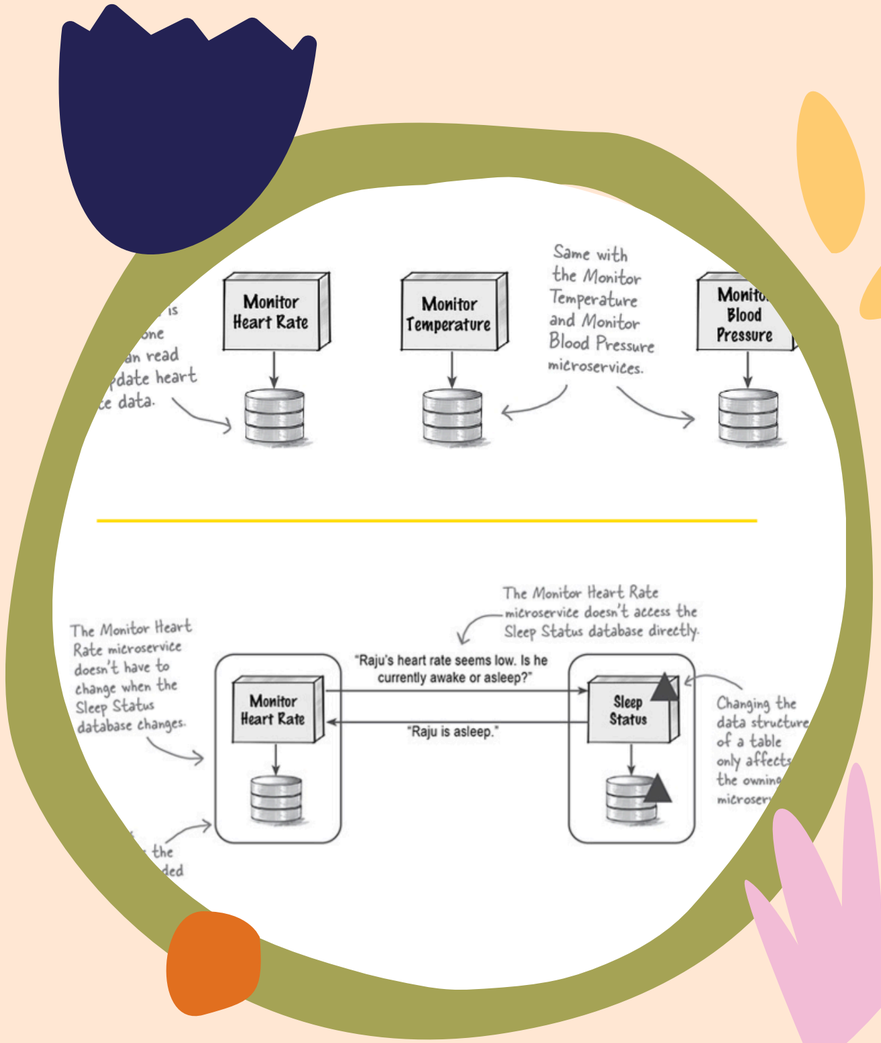


Microservices

Single-purpose, independently deployed units

- Domain partitioned, distributed
- Each microservice performs one specific function exceptionally well

Why choose microservices architecture?

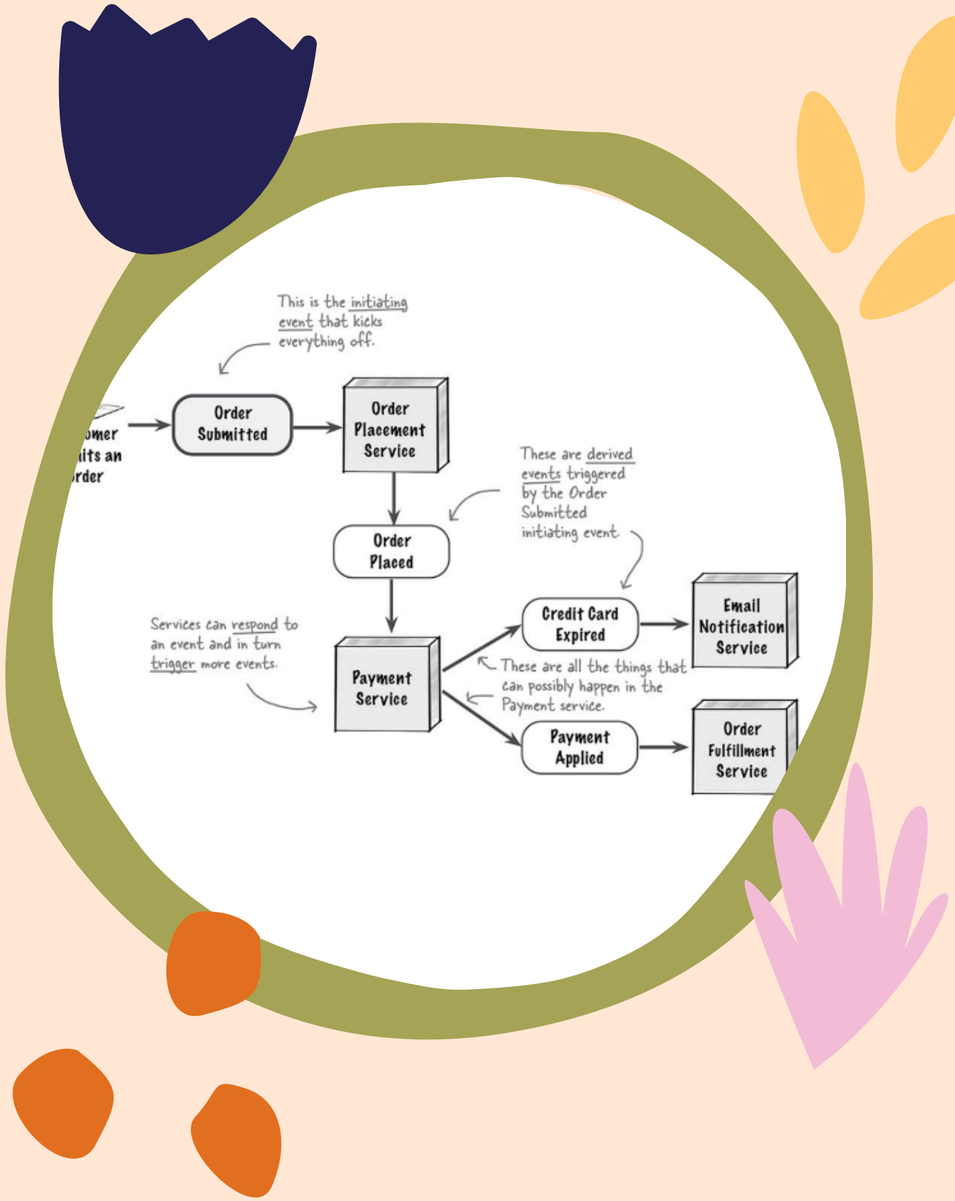


Event-Driven

Structures systems to respond to events (something that happened and carries data about it)

- Events are immutable and often used as triggers
- Events don't expect a response
- Messages demand a response

Why choose event-driven architecture?



Architectural Characteristics

Qualities that describe how well a system performs its functions.

- Security: ability to protect data and operations from unauthorised access or attacks.
- Performance: speed and responsiveness under load
- Scalability: capacity to handle growth in workload or users

How suitable is each architecture style for each characteristic?

Architectural Characteristics

Why are architectual characteristics as important as functional requirements?

Business Influence

Aside from requests from stakeholders, what other business drivers affect architectural characteristics?

Trade-Offs

What are trade-offs? Provide examples.

Documentation

Why do we need to document chosen architectural characteristics and their prioritisation?

Monolith vs Microservice

How do components communicate in Monolithic vs Microservices architectures?

Risks of Event-Driven

What are the potential risks of using an Event-Driven architecture in a mission-critical system?

Risks of Microservices

Give one real-world scenario where Microservices would be a poor choice. Explain why.

Building Microservices

Why might a team choose a Modular Monolith as an intermediate step before adopting Microservices?

Consistent Architecture

Which architecture for a system requiring strong consistency across components? Justify.

Pros & Cons

Provide the 2 most important pros and cons for each architectural style.

Architecture Decisions

Scalability

Is it better to optimise early for scalability or until it becomes a problem?

Modularity

Can a modular monolith achieve the same team autonomy as microservices?

Event-Driven

Are there systems where event-driven arhitecture causes more harm than good?

Microservices

Should every modern application aim to use Microservices?

Maintain vs Performance

How do you decide whether to prioritise maintainability or performance in an architecture?

ASSIGMENT ii!!!

- Patterns - if you're unsure if you have structured/applied a pattern correctly, check the Lecture Slides or Refactoring Guru!!!
- Refactoring - refactoring all suggestions = 6, identifying and refactoring roughly the same amount as the suggestions (in terms of difficulty) = 6.
- Due: Week 10 Wednesday, 3pm!!!