

Architecture Style vs Architecture Pattern

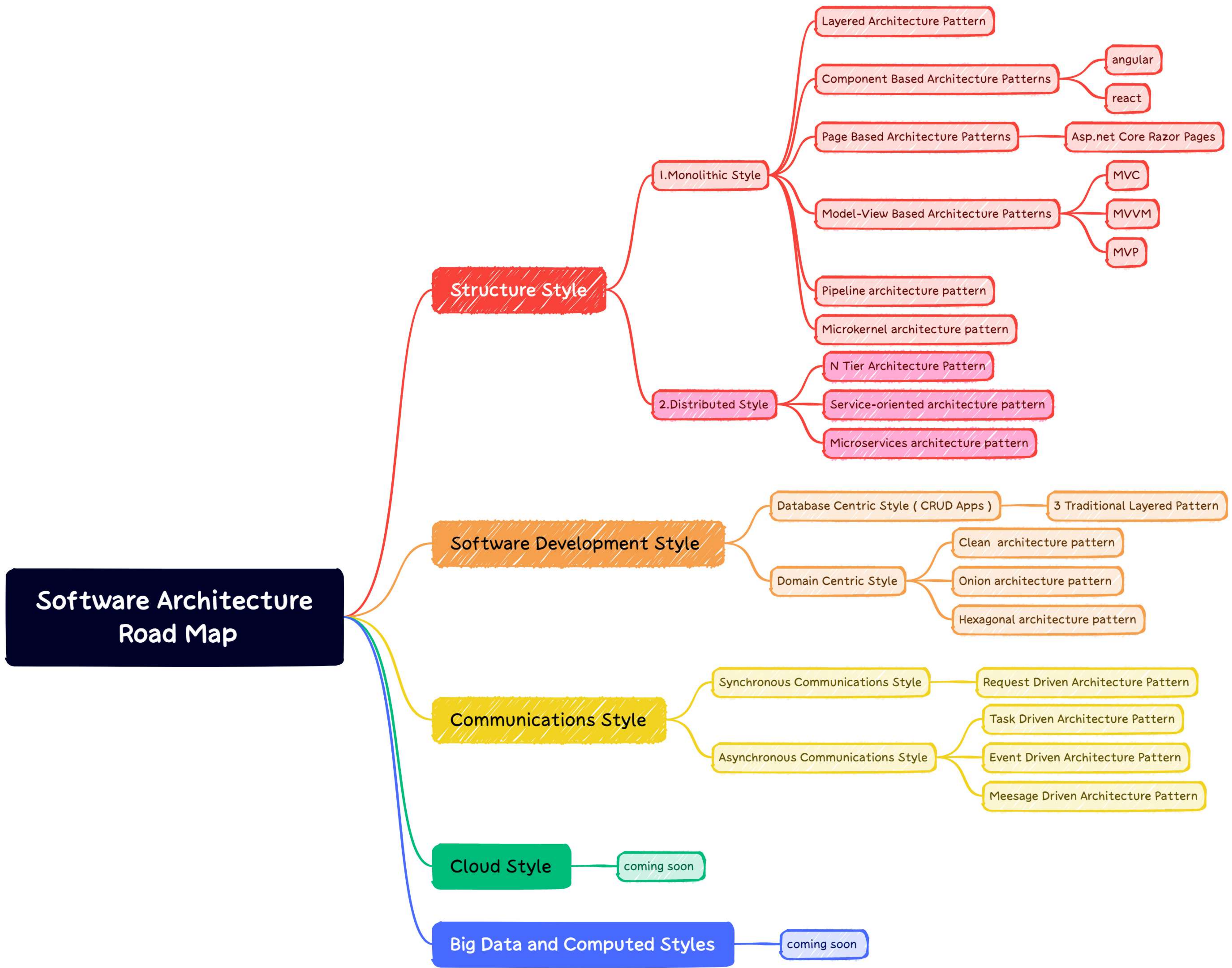
Architecture Style

Set of General Principles and Rules That Solve Specific Problem.

Architecture Pattern

The General Principles of Software Architecture Style Can be Implemented in Different Ways or Solutions , Every Way is Pattern.

Software Architecture Style is a Family of Software Architecture Patterns



**Can One System
Contain More Than
Architecture Style
Or Pattern ?**

Yes.

This is Are Of The Architect ,
To Design Best Architecture
That Meet Business
Requirements

monolithic style

User Interface Layer

Business Logic Layer

Products
Module

Orders
Module

Payments
Module

Shipping
Module

Data Access Layer

Database

what is the monolithic style ?

One Code Base For All Modules or Components on The System.

The Whole Code is Exist on One or Single Machine.

The Code of All Modules or Components is Developed , Built and Deployed Together.

any line change on the code , the whole application must be rebuild and Deployed again.

Advantages and Disadvantages of monolithic Style

| | Topic | Advantages | Disadvantages |
|---|--|---|--|
| 1 | Communications Performance and Latency | <ul style="list-style-type: none">- connections between different modules is done at same the machine or code base and this more faster than distributed or microservices architecture which Need to make network call. | |
| 2 | Deployment | <ul style="list-style-type: none">- easy and simple | <ul style="list-style-type: none">- any line change on the code , the whole application must be rebuild and deployed again.- slower : when the size of project increase , the time of deployment increase. |
| 3 | Development | <ul style="list-style-type: none">- easy to understand when : developer easy to understand the business and code when the project is small. | <ul style="list-style-type: none">- complex to understand when : developer has a lot of complexity to understand the business and code when the project is large specially when there are a lot of coupled code and intercommunications between modules or components. |

Advantages and Disadvantages of monolithic Style

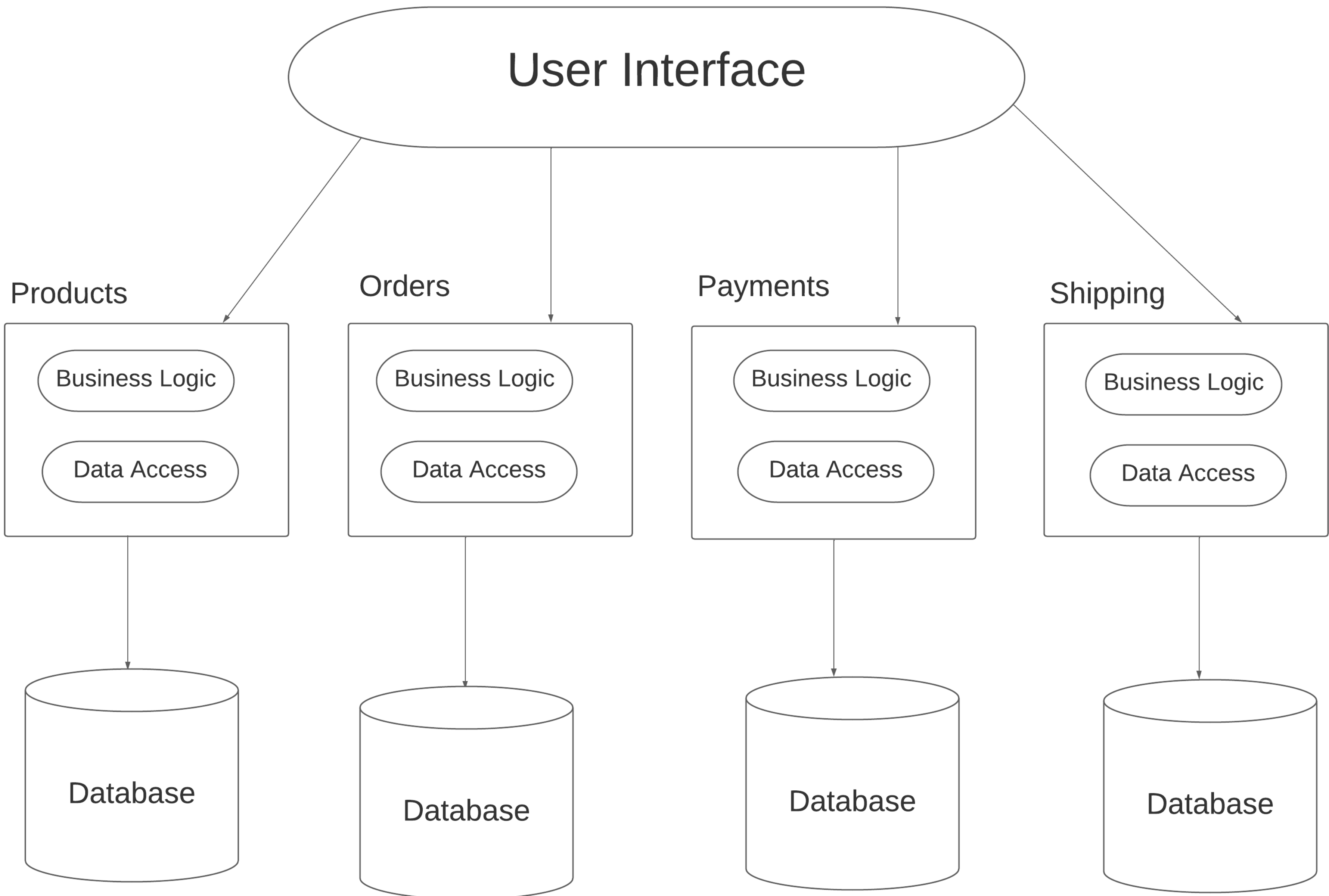
| | Topic | Advantages | Disadvantages |
|---|------------------|------------|--|
| 4 | Scalability | | <ul style="list-style-type: none">- can't scale individual componentsfor ex if orders module has a lot of traffic and load than other modules , we can not scale orders module only , we must copy the whole application on another server. |
| 5 | Availability | | <ul style="list-style-type: none">- If there's an error in any module, it could affect the entire application's availability |
| 6 | Technology Stack | | <ul style="list-style-type: none">- Usually Single Technology Stack (one programming language - single database - ...)- very very difficult and complex to adopt any new technology which is well suited for a particular functionality as it affects the entire application, both in terms of time and cost.- for ex : |

Advantages and Disadvantages of monolithic Style

| | Topic | Advantages | Disadvantages |
|---|---------------------------|--|---------------|
| 7 | Simplified testing | Since a monolithic application is a single, centralized unit, end-to-end testing can be performed faster than with a distributed application | |
| 8 | Easy debugging | With all code located in one place, it's easier to follow a request and find an issue. | |

Distributed Style

Type something



what is the distributed style ?

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graph LR; A[what is the distributed style ?] --- B[The System is Divide To Set of Subsystems or Services or Components Based on Some Business or Technical Concerns.]; A --- C[The Code is Distributed Over Different Machines Or Servers]; A --- D[Every Subsystem or Component or Service is Built , Developed and Deployed , Scaled independently from other services.];
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The System is Divide To Set of Subsystems or Services or Components Based on Some Business or Technical Concerns.

The Code is Distributed Over Different Machines Or Servers

Every Subsystem or Component or Service is Built , Developed and Deployed , Scaled independently from other services.

Advantages and Disadvantages of distributed style

| | Topic | Advantages | Disadvantages |
|---|--|--|---|
| 1 | Communications Performance and Latency | | - More Slower Than monolithic : Because There are a networking Call Between Different Services Because Every Service in Different Machine. |
| 2 | Deployment | - more complex than monolithic | - faster : when any line change on some service , the system rebuild and deploy only this service , no need to rebuild or redeploy the whole system as monolithic. |
| 3 | Development | - Every Team Will Focus Only on Specific Business and Subdomain. | Developers Will Face Challenges Like : - Integration Between Different Services. - Distributed Transactions. - Consistency. |

Advantages and Disadvantages of distributed style

| | Topic | Advantages | Disadvantages |
|---|------------------|--|---------------|
| 4 | Scalability | Every Service Can Scaled Independently Based on its Traffic Without Needing To Replication The Whole System as Monolithic Architecture | |
| 5 | Availability | if one service is down , the others services is still working without any problems | |
| 6 | Technology Stack | Every Service Can Have Different Programming Language, Frameworks , Database , Architecture Pattern | |

Advantages and Disadvantages of distributed style

| | Topic | Advantages | Disadvantages |
|---|-----------|------------|---|
| 7 | Debugging | | <ul style="list-style-type: none">- More Complex single business process can run across multiple machines or services , further complicating testing. |
| 8 | Testing | | <ul style="list-style-type: none">- More Complex single business process can run across multiple machines or services , further complicating testing. |