

Data-driven systems



Automatizálási és
Alkalmazott
Informatikai Tanszék

Data-driven systems

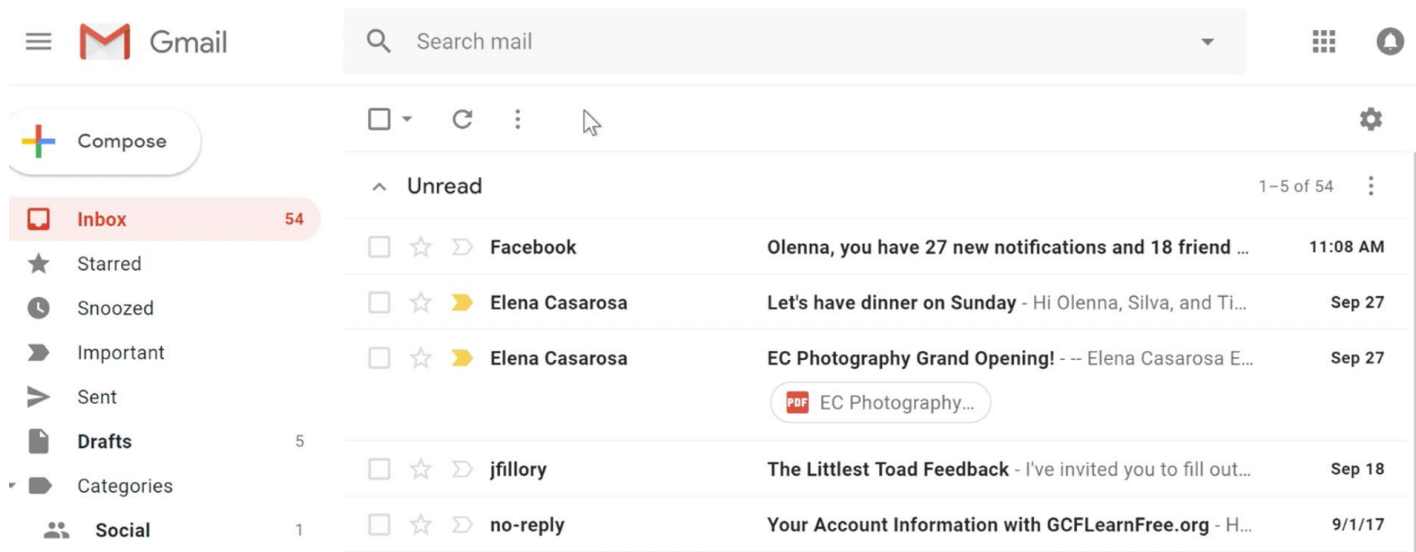


Data-driven systems



Booking.com

Data-driven systems



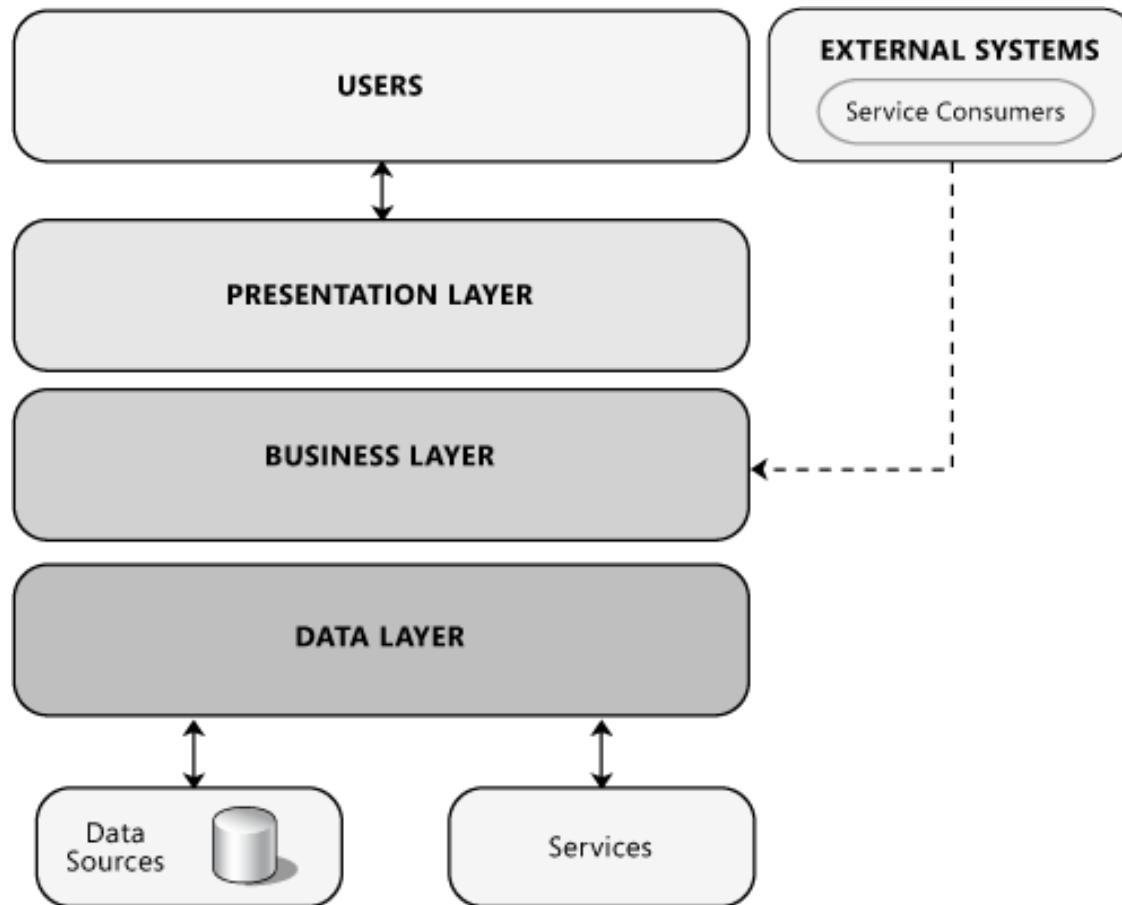
- Website
- Mobile app
- POP3 protocol
- Delay sending an email
- Attachments
- Staring
- Categorization
- Multilingual UI
- ...

What is not typically data-driven?



Three-tier architectures

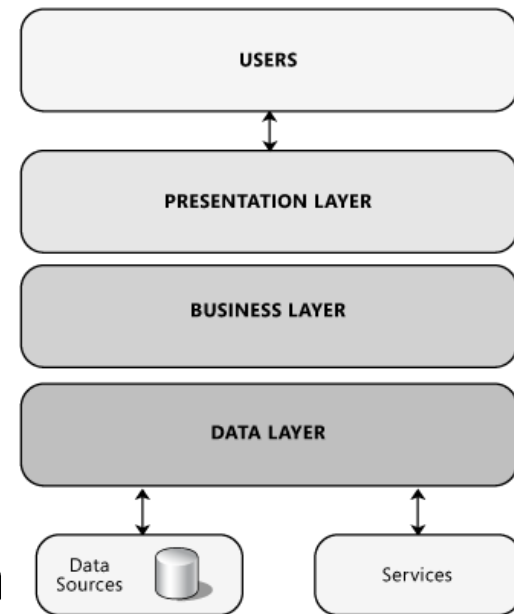
Three-tier architecture



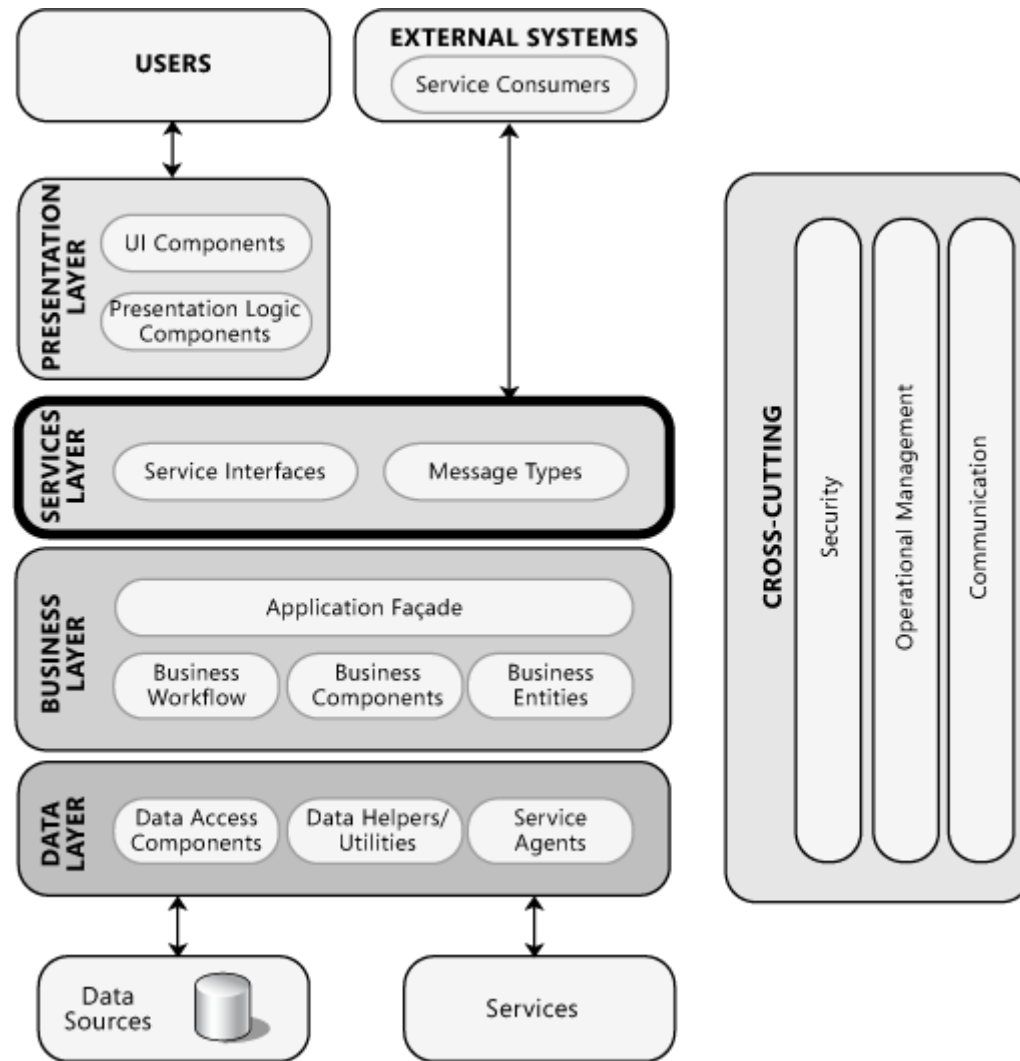
Microsoft Application Architecture Guide, 2nd Edition
<https://docs.microsoft.com/en-us/previous-versions/msp-n-p/ee658109%28v%3dpandp.10%29>

Layers and tiers

- Logical layer
 - > Separation of responsibility
 - > Horizontal / vertical
 - > Interface - replaceable implementation
- Physical layer: tier
 - > Network infrastructure, topology
 - > Performance
 - > Security boundaries
 - > Scalability

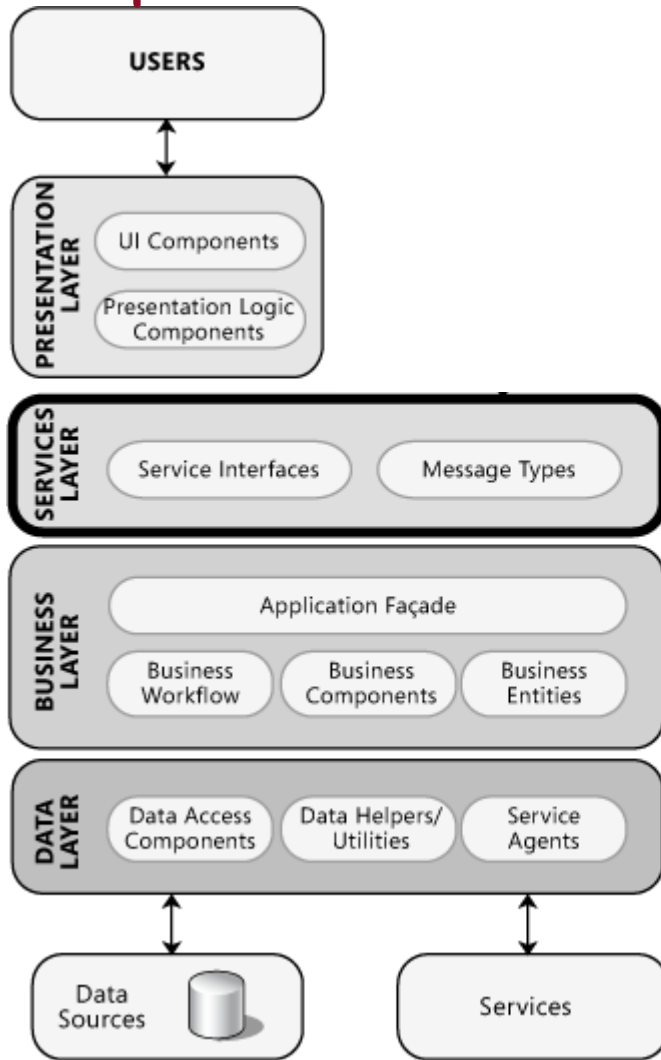


N-tier architecture



Microsoft Application Architecture Guide, 2nd Edition
<https://docs.microsoft.com/en-us/previous-versions/msp-n-p/ee658109%28v%3dpandp.10%29>

Example Gmail



HTML, CSS

Android components

REST interface

Search within emails, starring, delayed sending

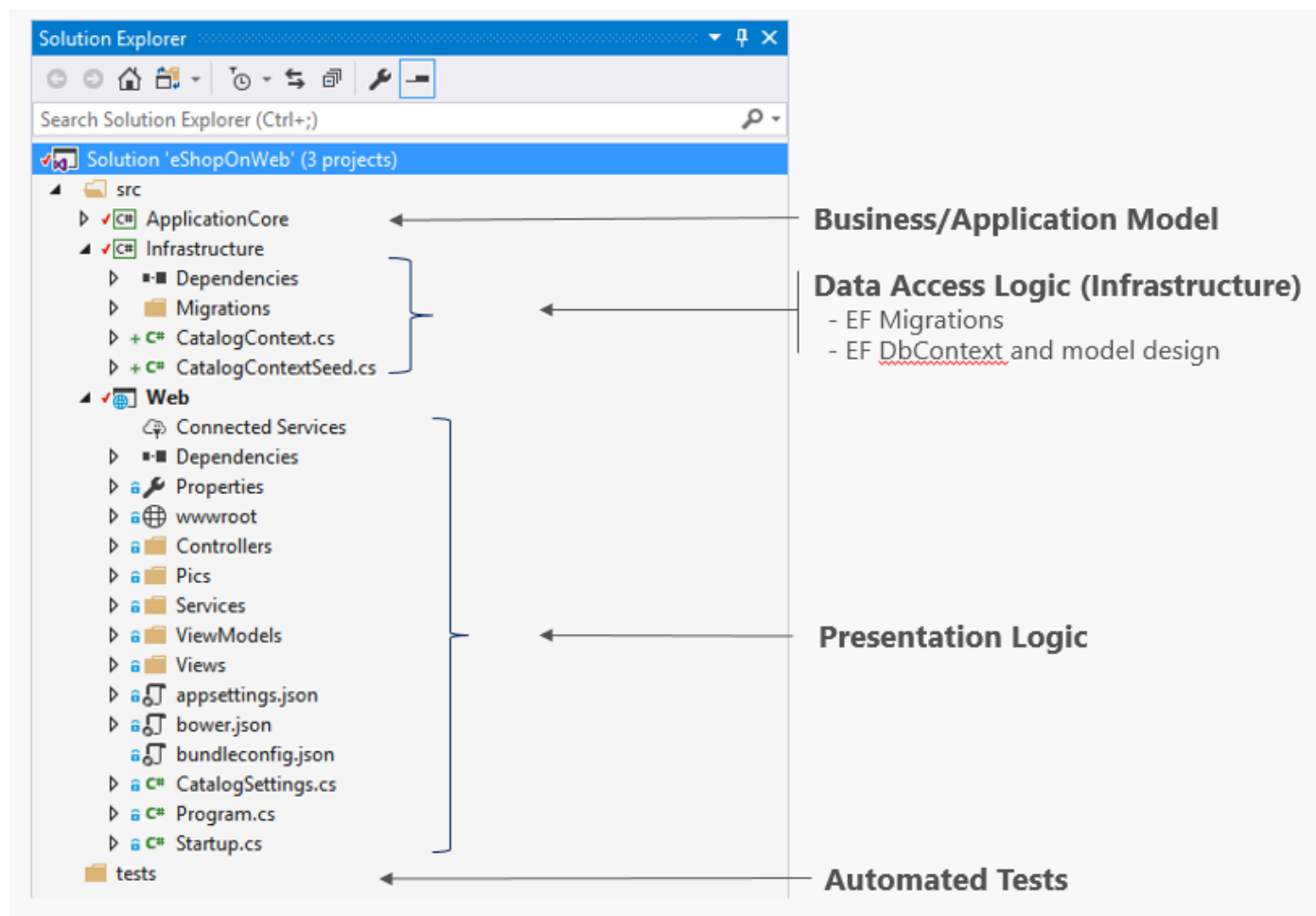
Message, attachment

Database

Google Drive attachments

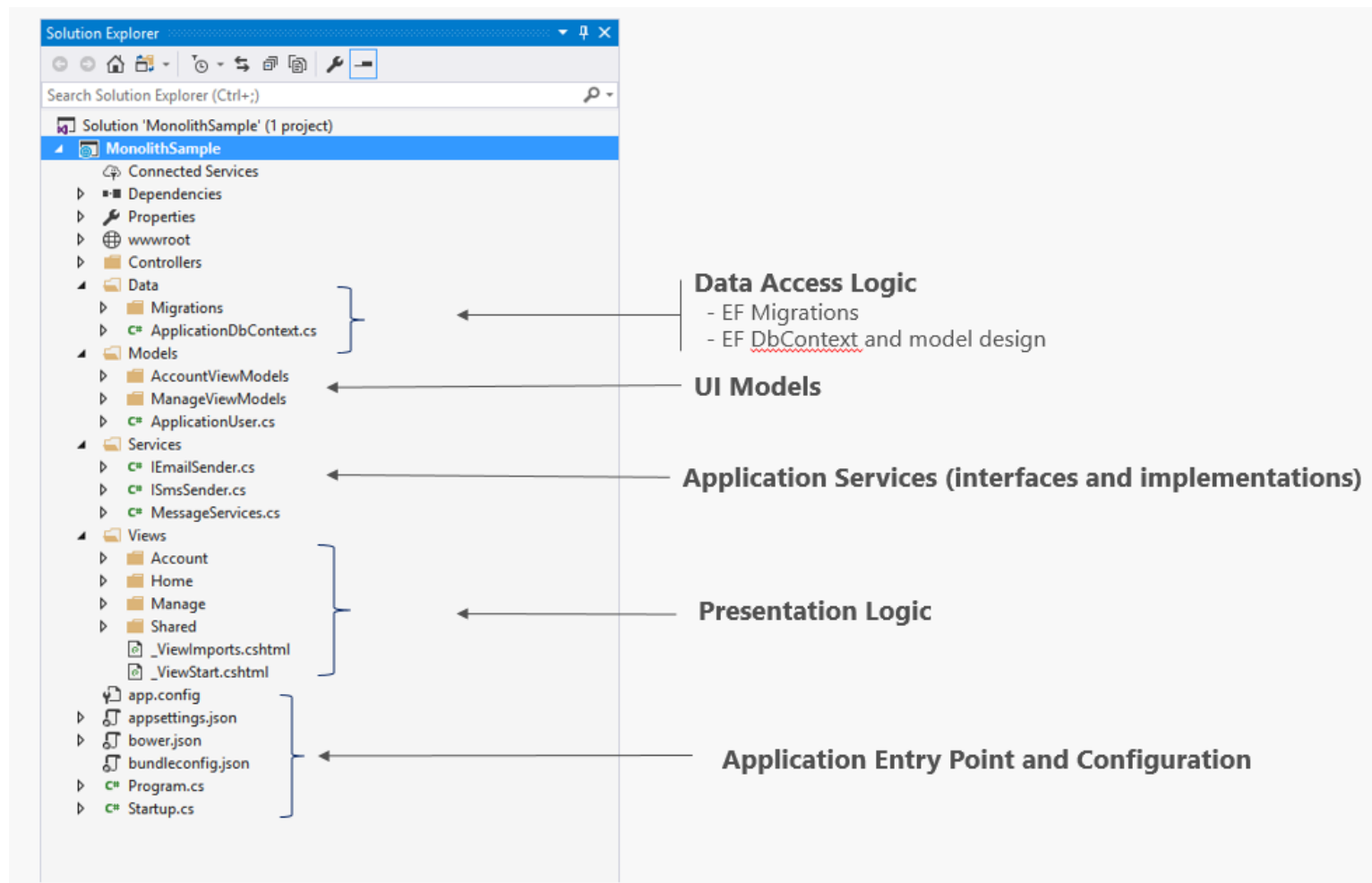


Layered source code structure / 1



Kép forrása: <https://docs.microsoft.com/en-us/dotnet/architecture/modern-web-apps-azure/common-web-application-architectures>

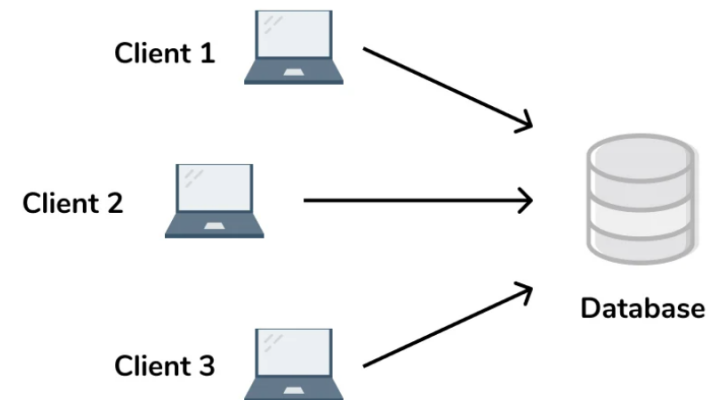
Layered source code structure / 2



Kép forrása: <https://docs.microsoft.com/en-us/dotnet/architecture/modern-web-apps-azure/common-web-application-architectures>

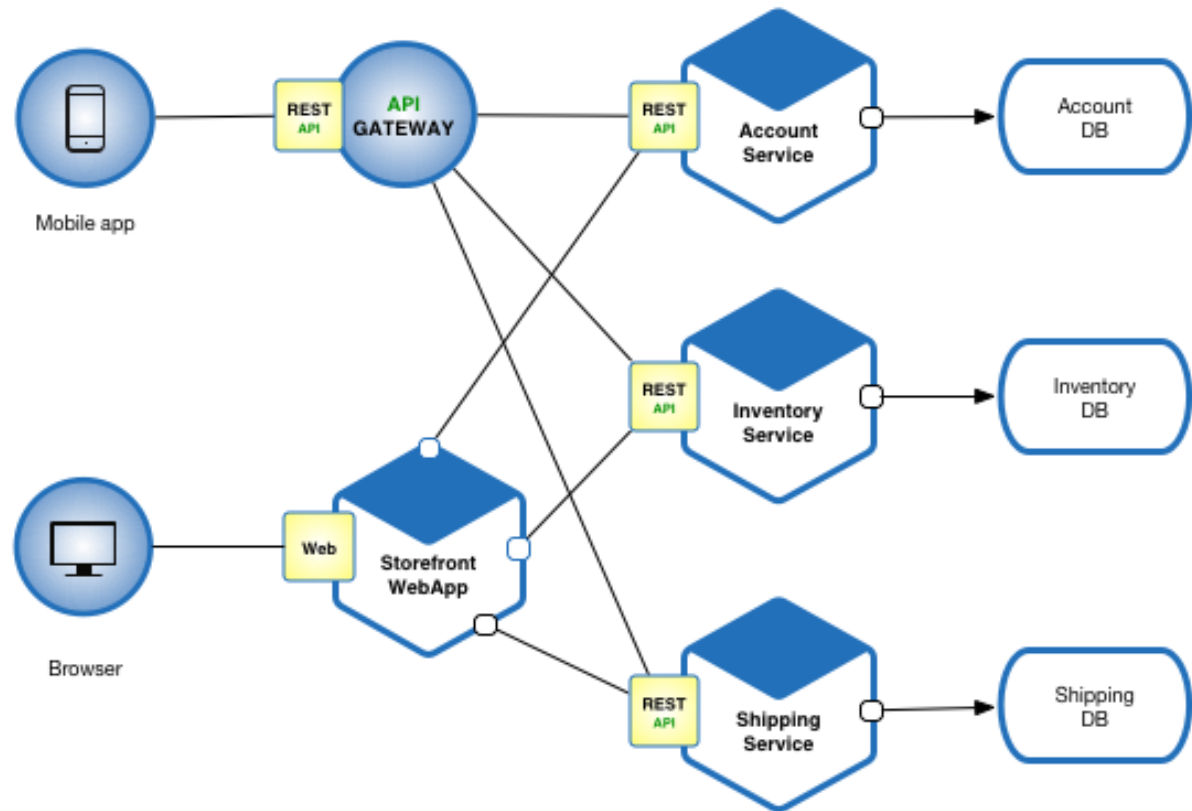
Two vs. three layer/tier architectures

- Two layers
 - > The logic is in the UI and/or data layer
 - > No logical separation ☹️
- Different
 - > Authentication/Authorization
 - > Scaling
 - > Performance
 - > Security
 - > ...



Microservices

- Loose coupling, strong vertical cut
- It can be installed and versioned independently



Semester overview

Data Layer

- MS SQL Server
- MongoDB
- Concurrent transactions
- Platform specific programming
- Query optimization
- Semi-structured data (XML, JSON)

Data Access and Business Logic Layer

- Data Access Layer
 - > Java, .NET
- OR mapping
- LINQ, Entity Framework
- JPA, SpringData
- SOAP, REST
 - > ASP.NET Core Web API

Seminar (laboratory class)

1. Transactions
2. Programming MS SQL Server
3. Entity Framework
4. Working with MongoDB
5. JPA
6. REST WebAPI

Sample database

- Retail web application (selling toys)
- Inventory
- Product categories in a hierarchy
- Customers and shipping addresses
- Orders and their status
- Invoicing

Data model

