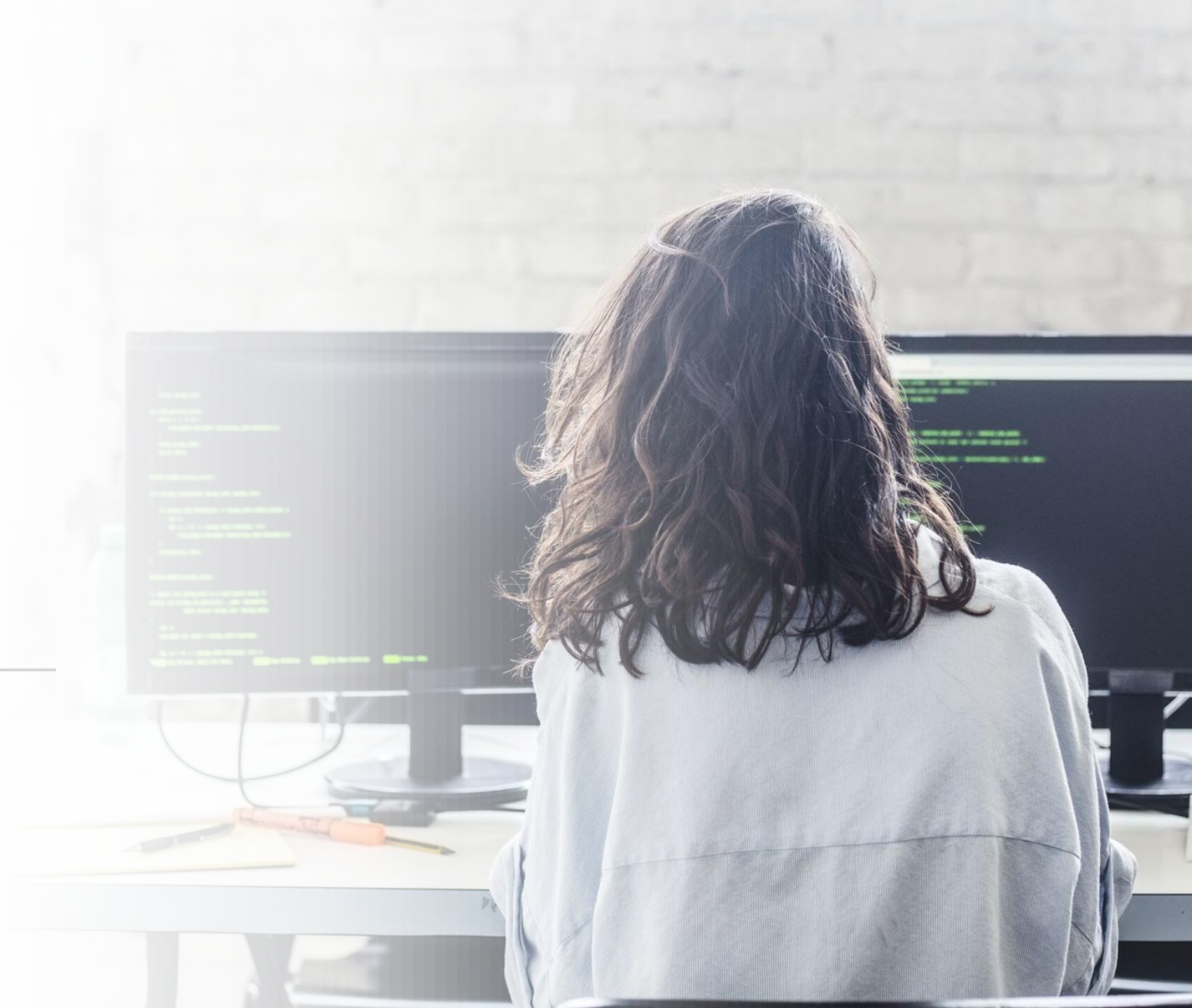
Workshop Building a GraphQL server in C#

Johan Smarius



Who am I

1 Experienced Developer

I've been developing software for > 25 years

2 Passionate About .NET

3 Work

Former lecturer Avans University of Applied Sciences

Consultant/Trainer JMAC Software Solutions

Lead Microsoft Development Consultant

BERGLER ICT

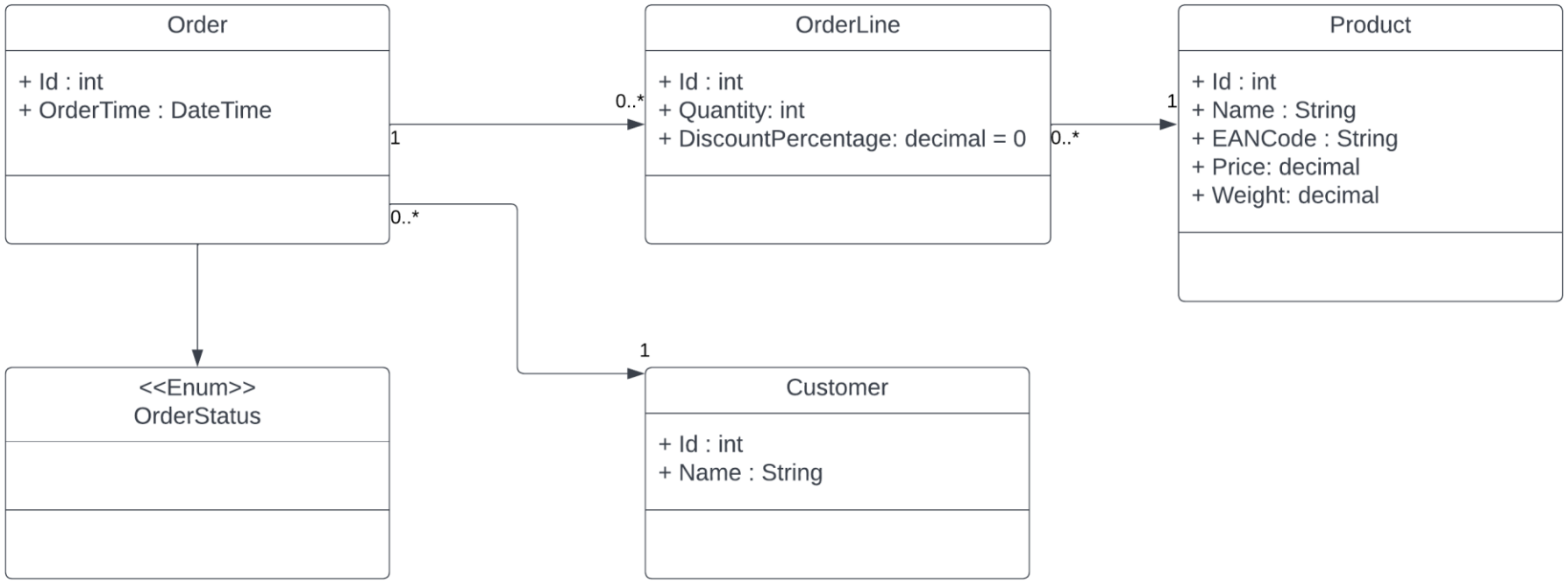
4 Here to help

Blogger, YouTube, Udemy, Speaker, Writer, Teacher, MCT, MVP

Goals

- Create a GraphQL server with query options.
- Create a basic GraphQL query to query the server.
- Connect the service to a database.
- Prevent overfetching of data from the database.
- Add filtering to the service.
- Add sorting to the service.
- Add paging to the service.
- Add mutation to the service.

Design

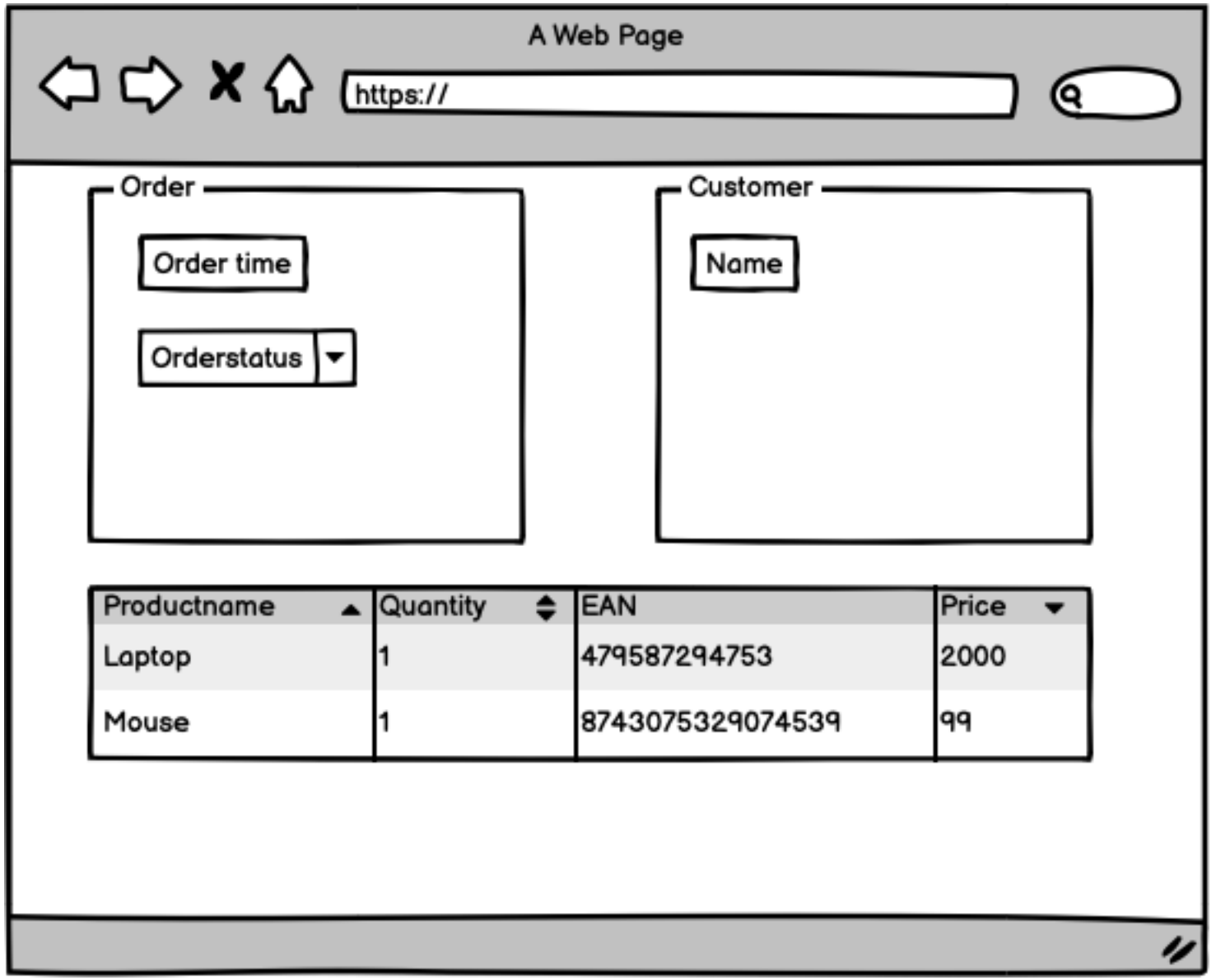

Order
+ Id : int
+ OrderTime : DateTime
1
0..*
0..*
OrderLine
+ Id : int
+ Quantity: int
+ DiscountPercentage: decimal = 0
0..*
1
Product
+ Id : int
+ Name : String
+ EANCode : String
+ Price: decimal
+ Weight: decimal
<<Enum>>
OrderStatus
1
Customer
+ Id : int
+ Name : String

Rest Ful approach

Resources

- Order
- Orderline
- Customer
- Product

User interface



Retrieving information the RestFul way

- /order/1
- /order/1/orderline/1
- /order/1/orderline/2
- /order/1/orderline/1/product or via /product/1
- /order/1/orderline/2/product or via /product/2
- /order/1/customer or via /customer/1

Downsides approach

- Many endpoint needed
- Many calls
- Unneeded information ‘over the wire’
- Can be solved using query parameters

What if?

- Just one call
- Able to specify fields

GraphQL

- Designed by Facebook
- Maintained by GraphQL Foundation
- Query language for API’s
- Supported by many frameworks and languages
- Server needs to supply metadata to client
- GraphQL Schema

Specifications

Prerelease	Working Draft	Thu, May 1, 2025	
Latest Release	October 2021	Tue, Oct 26, 2021	Release Notes
	June 2018	Sun, Jun 10, 2018	Release Notes
	October 2016	Mon, Oct 31, 2016	Release Notes
	April 2016	Thu, Apr 7, 2016	Release Notes
	October 2015	Thu, Oct 1, 2015	Release Notes
	July 2015	Thu, Jul 2, 2015	Release Notes

Source: https://spec.graphql.org/

Current specification

https://spec.graphql.org/October2021/#

.NET Support

- No native support
- Open source projects
  - GraphQL.net
  - Hot Chocolate
  - https://dotnet.libhunt.com/compare-graphql-dotnet-vs-hotchocolate

HotChocolate

- Specification October 2021
- Works together with ASP.NET Core via middleware

Approach

- Implementation-first
- Code-first
- Schema-first

What are you going to build?

Workshop time

https://github.com/JohanSmarius/WorkshopGraphQL

Retrospect

- Create a GraphQL server with query options.
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- Add mutation to the service.

But there is a lot more...

- DataLoaders
- Advanced query’s
- Subscriptions
- Authentication/authorization
- Schema stitching/federation

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