Architecture document

**Table of Contents**

1. Introduction
2. System Context (C1)
3. Containers and tech choices (C2)
4. Components (C3)
5. UML (to be added)

**Introduction**

This document aims to describe the software architecture, delving into its functioning and the rationale behind the design decisions. It provides a detailed walkthrough of the C4 model, offering insights into each segment.

**System Context (C1)**

**A blue sign with white text

Description automatically generated**

**Containers and tech choices (C2)**

A diagram of a software application

Description automatically generated

The Ordina Website platform is built upon **three primary tiers** – Front End (FE), Back End (BE), and Database (DB). **Here are a few reasons for that**:

1. It gives you the ability to update the technology stack of one tier, without impacting other areas of the application. For example, if we need to change from React to Angular the Backend and the Database will still work for the new frontend.
2. You can scale the application up and out. A separate back-end tier, for example, allows you to deploy to a variety of databases instead of being locked into one particular technology. It also allows you to scale up by adding multiple web servers.
3. It adds reliability and more independence of the underlying servers or services.
4. It provides an ease of maintenance of the code base, managing presentation code and business logic separately, so that a change to business logic, for example, does not impact the presentation layer.

For the FE, we opted for React. This decision was influenced by React's component-based code organization, which enhances readability and simplifies the process when dealing with numerous files. Additionally, the vast selection of libraries available and the supportive community further enrich its development capabilities. React's beginner-friendly attributes also played a role in this choice.

Opting for Node.js as the API layer in a React-based application offers several benefits. It ensures a cohesive JavaScript environment, simplifying development across the front and back ends. Node.js is known for its impressive performance, thanks to non-blocking I/O and asynchronous processing, which is particularly effective for high-traffic and real-time applications. The platform also enjoys robust community support, providing an abundance of resources and libraries, similar to React.

Choosing MongoDB as the database for a Node.js and React project offers numerous advantages. Its JSON-like data format (BSON) aligns seamlessly with the JavaScript ecosystem, simplifying data handling and manipulation across both Node.js and React. MongoDB is known for its scalability and flexibility, capable of handling large volumes of data and high throughput, which is essential for growing applications. It also provides high performance in read and write operations, crucial for real-time data processing, and features a rich query language for complex data operations. This compatibility extends to the MERN stack (MongoDB, Express.js, React, Node.js), a widely adopted industry standard that facilitates efficient full-stack development. Additionally, MongoDB's strong community support ensures a wealth of resources and continuous tool and extension development, enhancing its functionality and ease of use in diverse applications.