School of Computer Science & Statistics (SCSS)

Faculty Science, Technology, Engineering, and Mathematics (STEM)

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Do2Day

A TODO Application built using a CI/CD Pipeline

Overview

The aim of this project was to build a simple TODO application using proper software engineering methodologies including building the application using a CI/CD pipeline in which the application is built, tested and deployed continuously.

Our client made clear that the actual application features was secondary - the primary focus was to use software craftsmanship standards present in industry today.

The Application

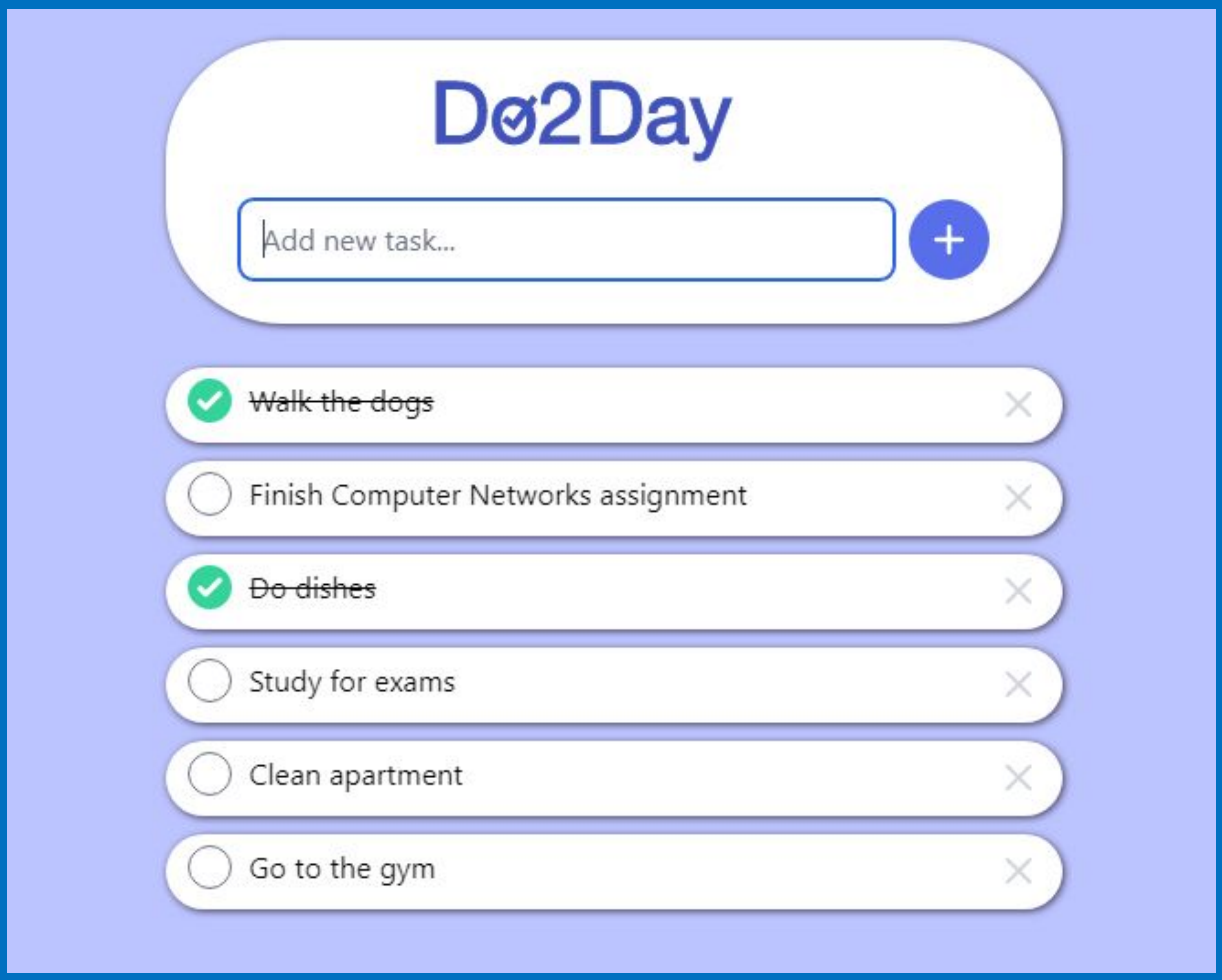
Our application is made up of three components: a React frontend, a node.js backend and a MongoDB database.

Through some guidance from our client, we found that implementing these components as microservices and only having them communicate via a well-defined API was best practice. This separation enabled us to decouple dependencies between the various components.

The Pipeline

The pipeline was the main focus of our project and it enabled us to automate the building, testing and deployment of our application.

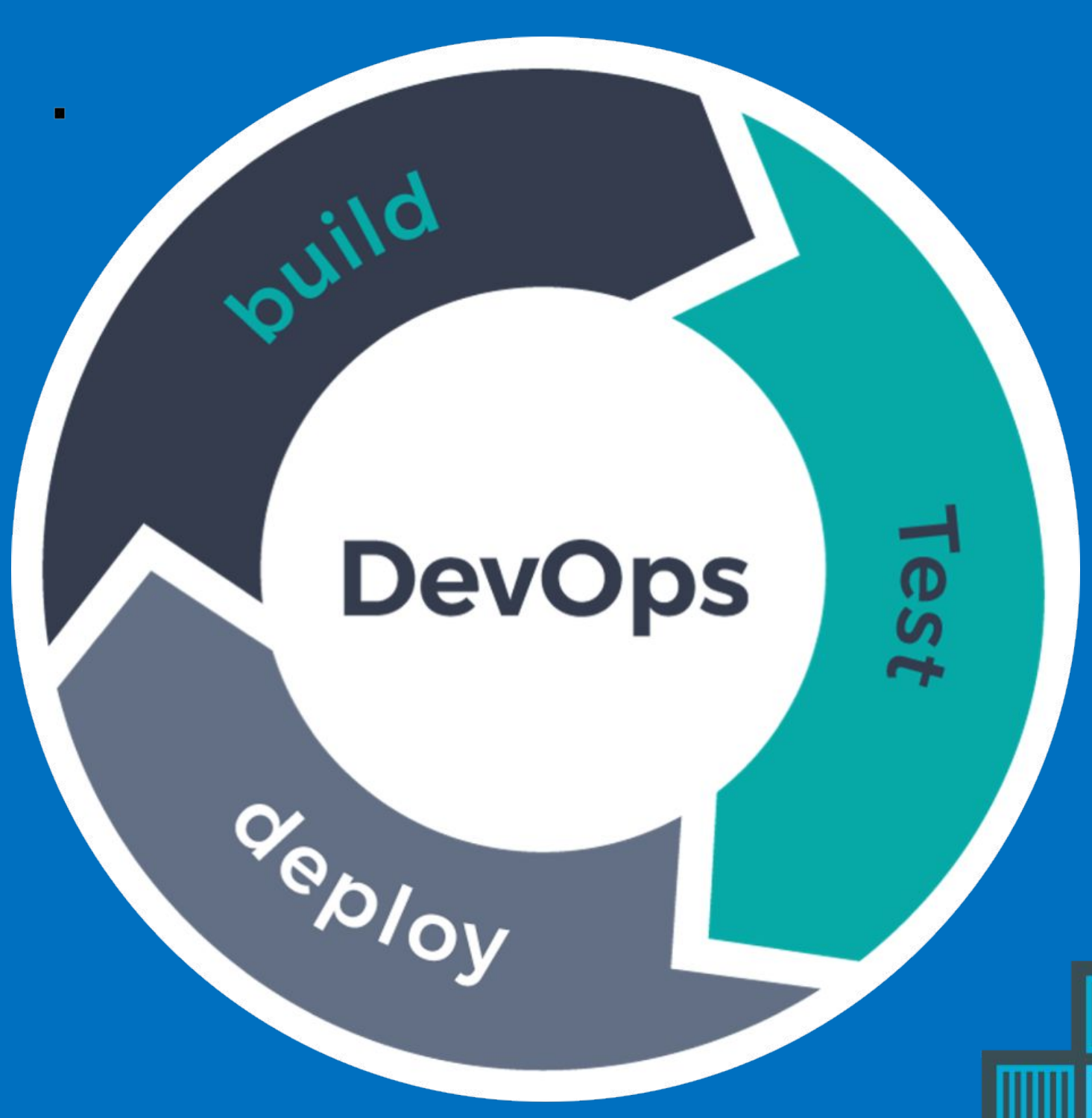
Using GitHub Actions, we were able to configure workflows to automatically assign issues and manage our kanban boards, unit test and build our application into containers and push them to a container registry, deploy these containers to OpenShift, and perform static analysis of our codebase.



Do2Day

Add new task... +

- ✓ ~~Walk the dogs~~ ✕
- ○ Finish Computer Networks assignment ✕
- ✓ ~~Do dishes~~ ✕
- ○ Study for exams ✕
- ○ Clean apartment ✕
- ○ Go to the gym ✕



What We Learnt

Coming into the project, we all had very little knowledge of proper software engineering practices and ultimately how to craft good software. Even as we began the project, we found ourselves immediately jumping into what “features” our application should have. However, our clients, IBM, made us realise that without the proper foundations in place, it is not possible to build truly great software.

From test-driven development, code reviews and creating comprehensive documentation, to using a CI/CD pipeline and taking adequate time to consider architectural decisions, we have learnt that **building great software requires a lot more than good programmers - it requires great software engineers**.