

## Presentation

Our bachelor team consists of five students. These five students cover all the “Computer” courses that lie under TKD (Teknologi, Kunst og Design) field at Oslo Metropolitan University.

- Software Engineering: Håkon André Heskja, Sven Morten Hinderaker
- Information Technology: Muneeb Ahmad Rana, Tommy Tran
- Applied Computer Technology: Kristoffer Dagestad

Our supervisor is Marius Wiker Aasheim who has studied Applied Computer Technology. He is now working at Oslo Metropolitan University.

Forus Transport is in need of a new web application that can handle their more modern needs. As of today, Forus Transport has a relatively static website with basic information about the company.

We have received the task of developing the entire solution which in term means we are solely responsible for doing research, developing, testing and releasing the finished product if it meets the requirements. We will collaborate closely with Forus Transport, but as they do not have an IT-department, they rely on our knowledge, proficiency and are dependent on us to deliver a viable product.

## Bachelor Group

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## Supervisor from OsloMet

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## Forus Transport

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CEO	Helge Hestvåg	<a href="mailto:kontakt@forustransport.no">kontakt@forustransport.no</a> +47 928 91 588

## Summary

As of now, Forus Transport's online presence is solely based on their existing website which has several shortcomings. The shortcomings include lack of user-friendliness, design, speed, search engine optimization, and lackluster functionality when it comes to ordering.

The solution will be a web application consisting of two main modules. Firstly the website [forustransport.no](http://forustransport.no) will be updated to a more modern and optimized solution. Secondly, Forus Transport will get access to an admin module, e.g [admin.forustransport.no](http://admin.forustransport.no) where they have the possibility to view and edit important functions.

To do this we will use React to build an effective user interface, while a Rest API written in .NET Core will handle the backend.

## Today's Situation

Forus Transport requires a complete web application which has extended functionality to handle orders, tools for employers and employees. As of today, their website is solely for information about the company and contacts. A better web application will serve as a good marketing tool, a way for new customers to order and contact online and serve as a user interface for people in the company.

## Information

We started working on the bachelor 9th of January and will finish on the 23rd of May. We will use Oslo Metropolitan University premises for all intents and purposes.

## Aims and Frame Conditions

The group has decided to use GitHub for version control, Trello for task management, Google Docs for documentation, Discord for remote meetings and Slack for communication. This is to increase our effectiveness and simplify the administrative tasks.

The technologies we have decided to use are either those we have experience with or those which are proven to be effective for the nature of our task.

We have decided to adopt three general phases.

1. Planning Phase
2. Implementation Phase
3. Final Phase

## Database

We are either going to use MySQL or PostgreSQL. MySQL is the most used database language while PostgreSQL is more powerful.

## Backend

### C#

General purpose and object-oriented programming language, ASP.net Core is based on C#.

### Asp.NET Core

An open source and cross-platform compatible framework to develop web applications. ASP.net Core can run on Windows, MacOS, and Linux. It is optimized to build modern web applications based on MVC features/Web APIs.

### Entity Framework

Open source Object Relational Mapper (ORM) created by Microsoft. The main way of interacting between .NET applications and relational databases by simplifying mapping between objects in your software and tables in your database.

## Frontend

### React

Is a powerful front-end framework that is based on components and states and provides the necessary tools to design complex and user-friendly UI. One of the main functionality of React is to be able to update and render part of an application without the need to refresh the whole site. The main reason we chose React is that in comparison to Angular.Js and Vue.js which are two similar powerful frontend frameworks, react has a more gentle learning curve than Angular.js but more functionality than Vue.js.

### Redux

Is a Javascript library which helps with managing the different state of React components.

## Bootstrap

Open source frontend framework to create more responsive web pages. It is based on HTML, CSS, and Javascript. It provides a uniform solution to design interfaces to be able to scale based on the screen size the page is viewed on.

## Hosting

We need to use a cloud hosting service for the web application. Here our choices are not set in stone, but some examples of decent cloud services are Heroku and AWS

## Testing

There are four levels of software testing we are going to implement for this project. These are unit testing, integration testing, system testing, and acceptance testing. We are going to use Jest as our main testing tool. Since Facebook has created both React and Jest, their compatibility is quite high. In the system testing stage, we are going to use the headless browser testing method as well as Jest, but we haven't made a definitive choice of tool for this as of yet. We are looking into these different tools for headless browser testing: PhantomJS, Nightmare, Headless Chrome, and Puppeteer.

## Security

Security is vital when it comes to technology. A developer has to secure every possible weakness and vulnerability while a threat agent only needs to abuse one to achieve their goal. Hence a fair amount of effort will be made to make the web application as secure as possible. Since the web-application doesn't support transactions, the only information that will require safekeeping is the private information of the customers and the employees. We are uncertain of the tools that we will use as of yet, but the focus will be on implementing measures that are advised by OWASP.

## Progress Plan / Roadmap

ROADMAP FOR WEB APPLICATION																				
Date	7 - 13 jan	14 - 20 jan	21 - 27 jan	28 jan - 3 feb	4 - 10 feb	11 - 17 feb	18 - 24 feb	25 feb - 3 mar	4 - 10 mar	11 - 17 mar	18 - 24 mar	25 - 31 mar	1 - 7 apr	8 - 14 apr	15 - 21 apr	22 - 28 apr	29 apr - 5 mai	6 - 12 mai	13 - 19 mai	20 - 26 mai
Week	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sprint	First Sprint	Second Sprint		Third Sprint		Fourth Sprint		Fifth Sprint		Sixth Sprint		Seventh Sprint		Eight Sprint		Ninth Sprint		Tenth Sprint		
3 Phase	Planning			Implementation													Finishing Phase			
Milestones				Initial									MVP				Finished product			Finished Project

## Solution/ Alternative

The solution will consist of two parts. One web application for customers and one for the admin and the employees.

The customer page will be the standard website everyone sees when accessing forustransport.no. It will consist of things you would find on a normal website; information, FAQ, marketing. Customers will also have the option of ordering, and the price of the order will be calculated based on different factors such as distance, the weight of the order etc.

The admin page will be separate from the customer page and will require the users to log in to see any information.

Important functions will be

- Register new employees (Admin level)
- Overview over orders (Admin level)
- Overview over hours registered (Admin level)
- Editor tool for news feed (Admin level)
- Registering hours (Employee level)
- Log when something is edited

## Solution

The website will be built as an isomorphic application, meaning you get the benefits of a Single Page Application (SPA) and fast Server-Side Rendering (SSR).

One of the many faults of solely relying on SPA is Search Engine Optimization (SEO). When most of the content is rendered client side, many of the search crawlers will see an empty page, and therefore not find any content. Hence it is better to use an isomorphic application. An isomorphic application means the user and crawlers will get a server-side pre-rendered HTML filled with content, while at the same time asynchronously load all the javascript required for an SPA. Users get a snappy SPA while search engines and social media get HTML with content.

## Alternative

Creating a mobile app instead of a web application can be one alternative. This would make it easier for mobile users to access ForusTransport. However, the downside of this alternative is that computer users would not be able to access the mobile application. Since we have chosen a web application, customers from both mobile and computers can access the website, increasing the overall potential customers that access the web application

## Analysis of effects

At the current moment, Forus Transport is using traditional methods to handle their needs. Digitalizing their operations in the form of a web application will make Forus Transport a lot more user-friendly for customers. Ordering on a web application compared to traditional methods will be a lot easier. For the employees, the application will be the only platform they require for daily operations. In addition, a modern application will serve as a better marketing tool, as well as provide tools for better scalability.



