1/15/2022

Portfolio

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VERSION CONTROL

Version	Date	Author	Amendments	Status
3.1	1-14-2023	V Fong	Writing Learning outcomes 1, 2, 3, 4, 5, 6, 7 & 8.	Draft
3.2	1-15-2023	V Fong	Writing the reflection and conclusion	Draft
3.3	1-15-2023	V Fong	finalizing Portfolio.	Final

INTRODUCTION

My name is Victoria Fong, and I am a recently new student at Fontys. I transferred to Fontys in the 4th semester doing my specialization in Artificial Intelligence after completing my Associate Degree at Avans Hogeschool. At Avans I acquired the skills of working with Java using OOP (Object Oriented Programming), Arduino's and developing android apps using Kotlin and Java. Further, I have worked with React and React Native using Functional programming during my internship at Avans. From Fontys, I have acquired the skills of data prepping and using baseline machine learning models (Decision trees, Random Forest, etc…) where I was able to apply it during school projects and my internship for semester 5.

Needless to say, my learning skills are not the exact same as my fellow classmates due to the different study path I chose. For example, I have never worked with C#, used code testing, and other tools they have used/knowledge of where I am not experienced.

My goals this semester besides learning new techniques and software that will be taught this semester is to learn on my own to work with C# and using code testing where I can use these skills to enhance the quality of my products. I am determined to work on these skills during the semester where I also fell under the same predicament for semester 4 of working with for example the DOT framework. I am excited and scared of the challenges this semester but know everything will be all right with the help of my teachers and fellow classmates/friends.

PROJECT DESCRIPTION

This semester consists of working on a group project and an individual project. With the help of these projects, I am able to show my contributions and skills for reaching the set learning outcomes in this semester.

Individual Project

As stated on Canvas *"The goal of the individual project is to practice your software development skills and to demonstrate that you are capable of creating enterprise software on your own" (module "Individual project: Requirements for the Project Case").*

After reading through the Learning Outcomes and the goal of the individual project, I chose to create a medicine tracker application. Due to the large amount of people that take medicine each day and some even multiple, is it hard to keep in track taken the medicine. The goal of my project is to make this task easier for people to keep track of taking their medicine. The benefits of the project for the users are that they would be able to track the medicine they take, get reminders to take their medicine, be able to leave personal feedback and for caregivers of the user to also help them keep track of taking their medicine if they wish to do so. This project also adds the learning outcomes for this semester which I am able to prove with the help of my Portfolio.

Group project

The group project for this semester my group and I am working on is based on users being able to gain insight in the amount of stress a person is experiencing. This will be calculated through various measurements from wearables devices. The data has to be extracted and normalized after which it can be displayed to an end-user. This data can also be interpreted and used to predict a user's stress level. This result is meaningful to health professional, family members of the user and for the user themselves.

The Stress Wearables web application already exists and was created by the students of the previous semester. However, no connection has been implemented between the wearables and the backend, mock-data has been used instead. The goal is for us to create a minimal viable product where a user is able to wear the device and able to see his stress level. Further, is it the goal to be able to create a project which is maintainable and usable with also adding some new features from the stakeholders. With the help of my portfolio, I am able to show the level of my learning outcomes working on this project.

GLOSSARY

MoSCoW: The Moscow method is a prioritization technique used in management, business analysis, project management, and software development to reach a common understanding with stakeholders on the importance they place on the delivery of each requirement; it is also known as MoSCoW prioritization or MoSCoW analysis.- Wikipedia contributors. (2022, August 22). *MoSCoW method*. Wikipedia. Retrieved October 2, 2022, from https://en.wikipedia.org/wiki/MoSCoW_method

Canvas: is an online platform from Fontys Hogeschool ICT to be able to provide to students the needed materials and tools they will need and work with throughout their semesters.

DOT Framework: The DOT Framework also known as the Development Oriented Triangulation framework is to help communicate and structure a research being conducted.

Learning Outcomes: A Student Learning Objectives is an assessment tool that allows a teacher to quantify their impact on student achievement as measured within the parameters of a particular academic or elective standard. – Wikipedia contributors. (2022b, September 27). *Student Learning Objectives*. Wikipedia. Retrieved October 2, 2022, from https://en.wikipedia.org/wiki/Student_Learning_Objectives

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LEARNING OUTCOMES

There are in total 8 learning outcomes including (Development and Deployment of Enterprise Software as a Professional, Context Based Research, Preparation for Life-Long Learning, Scalable Architectures, Development and Operations (DevOps), Cloud Services, Security by Design and Distributed Data). By each outcome, is a self-assessment given of where I believe I am by that outcome and an evaluation, reflection, and feedback to the section of why I believe I am at that level to the outcome based on received feedback.

Learning level scales

Level	Description
Undefined	You do not yet show any progression towards the learning outcome, or any progression is not clear to your teacher.
Orienting	You can explain what the learning outcome is about. You have studied the theory that supports the learning outcome, which is confirmed by your teacher. You have applied the acquired knowledge on a basic level. For example, you have studied 'Theoretical Background' and performed one or more tutorials from 'How to Apply?
Beginning	You demonstrated the ability to relate gathered theory relevant to enterprise software, but did not apply the theory in a practical context yet within the semester For example, you have discussed with your group what you have learned from 'Theoretical Background' and tutorials, and you know the relevance for your projects, but you have yet to apply the newly acquired knowledge in your individual or group project.
Proficient	You have convinced your teachers that you have mastered the learning outcome by demonstrating that you have individually applied the gained knowledge in the context of an enterprise application. The teacher has confirmed this by providing positive feedback and indicating that you are on a proficient level now. For example, you have successfully applied acquired knowledge in either your individual project or the group project.
Advance	You have demonstrated in several different situations that you deepened your knowledge on the learning outcome beyond the proficient level. This is confirmed by feedback that you received from your teacher. For example, you have shown in-depth knowledge to the teacher and your student group, and you have applied the acquired knowledge in both your individual and group project.

Table 1: "Learning Level Scales from Canvas"

There are in total 5 learning level skills including (Undefined, Orienting, Beginning, Proficient and Advanced).

The development-oriented scale above is a complete formative measure of my progress. In principle, at the end of the semester I should be able to demonstrate at least level of 'Proficient' at all learning outcomes.

Final grades are calculated using the rules below.

- 'Outstanding' or 'Good' if 4 or more (out of 7) learning outcomes are marked Advanced and all the other learning outcomes are marked Proficient; else
- 'Good' or 'Satisfactory' if 3 or less (out of 7) learning outcomes are marked Advanced and all the other learning outcomes are marked Proficient; else
- 'Unsatisfactory'.

ASSESSMENT OVERVIEW

Learning Outcome Level	Numbering
Undefined	1
Orienting	2
Beginner	3
Proficient	4
Advance	5

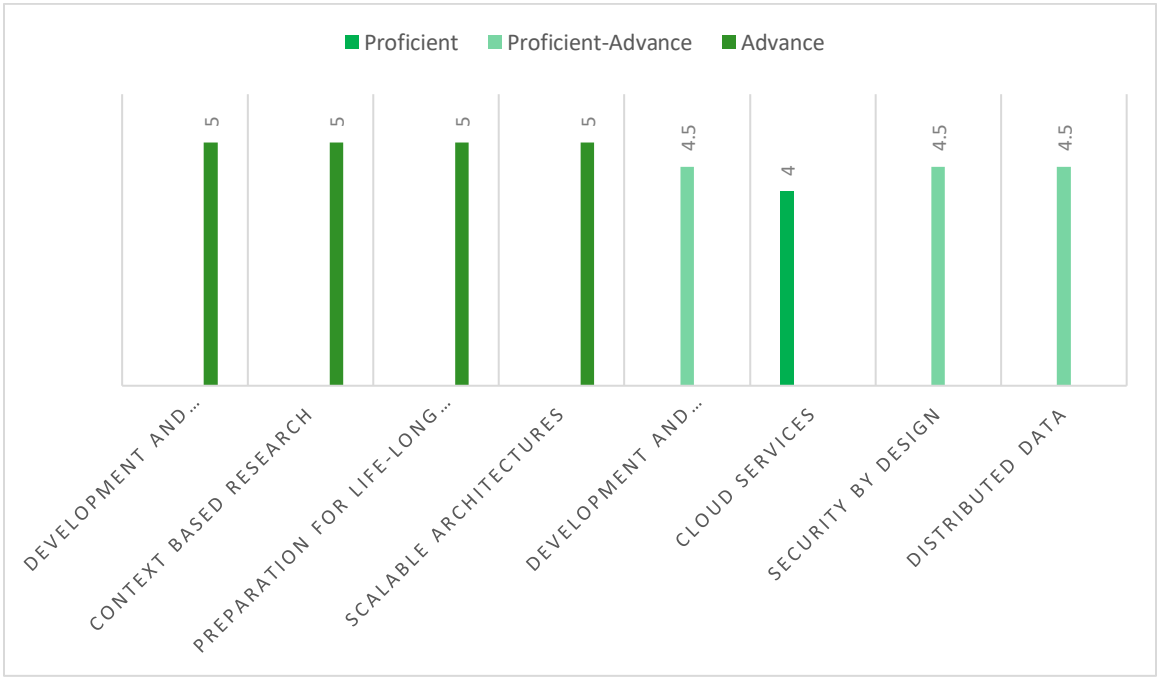

Table 2: "Table showing an overall self-assessment for the learning outcomes"

1. Development and Deployment of Enterprise Software as a Team Effort

Context

Development and Deployment of Enterprise Software as a Team is seen as how I can work with others in a team while working on a project. Working individually, you are responsible for your own work and the results of it whereas working in a team, not only do you have to take responsibility for your own tasks but also have to learn your group mates and how to communicate with them. Further, another important aspect that is learned and established in a group project are setting your own boundaries to when something is too much such as taking too much responsibility for others.

Self-assessment by learning outcome Development and Deployment of Enterprise Software as a Team Effort

I would say that the Learning Level scale I am at for this learning outcome is Advanced which I will argue on further.

Motivation & Reflection

For each sprint, the tasks that I have taken upon myself, I have always delivered on time and presented on the level that needed to be on. Here are some examples:

- Research into wearables: I have gone into deep research where I have contacted companies of the device, looked into and tried out projects received from the stakeholders, read online sources of thesis's and projects of other people that have used the device to be able to try and contact the device to the project. In spite of doing all this research to realize that to connect the device there needs to be a connection to an android device have I taken it upon myself to start documenting all the research I have done to make it easier for the next group to take upon this task with useful sources.
- Caregiver Dashboard: One of the tasks that I took upon was creating the Caregiver dashboard. That week I had fallen ill but to make sure that the product was ready for my group to work with of realizing how they would need it the following week to work further on their tasks, I finished the product in my own time in the weekend to make sure they could work further on their tasks.
- Feedback Service: I have constructed and adapted the service to how other services of the project have been built for coherency. For example, in my individual project I work with .net 5 and have a different file structure to where the group project work with .net 6 and uses a different file structure. I have therefore adapted their style to make it easier for my group mates to work with.
- Tactical Feeling Approach: From realizing how stressful we have made it upon ourselves as a group of putting too much pressure and too many hours on our group work, I have thought of an idea which I hope to work to our benefit as a group and ourselves. This approach is to discuss our stress level at each standup and discussing how working on the task(s) makes us feel. This is to see to make sure someone is not feeling stressed out to the point where they will feel demotivated and cause a big dip in their work and mental health.

But I have also taken responsibility on other tasks that were not assigned to me. An example is:

- Taking Test cases and Preparation for FHP students: the week of meeting with the FHP students to test our dashboard and to discuss future requirements and functionalities that can be added to the project I had fallen ill. I was not able to do much group work and wanted to focus on taking care of myself by visiting my GP and having to travel to take an x-ray of where the pains had lie. During this time, I was available for online meetings with my groupmates to see what I can do and to update them on my end. The day before the meeting with the FHP students instead of taking care of my health, the tasks that needed to be done such as the test cases and the project being able to work on their laptops were not yet completed. I was worried and felt responsible and therefor written the test cases and presentation for the FHP students and had to also attend because the project was only at the time working on my laptop and not theirs. Only the morning of the meeting did they get theirs working with the help of another group mate who was at the time also ill,

and did I feel mentally drained after the whole experience where I did not have the time to take care of my health.

To reflect on other events such as the one discussed above, I have created a separate document that is linked to the professional products.

Link to relevant professional products

Professional Product	Description
Research into Wearables (group)	Research documents that have been worked on by Marinda and I to how to connect the heartrate Movensense wearable to a web application. Movensense data folder: By me Wearable API folder: By Marinda and I
Feedback-Service (group)	Link to the Feedback-Service on GitHub.
Reflection document on working in the group (individual)	This document reflects on how the group project went and how I handled certain situations that I had a different opinion on.

Self-assessment & Next steps

The next steps/goals I will set for working in my next group are:

- Setting boundaries for myself into how much hours, responsibility, and stress I put on myself to tasks that have and have not been assigned to me.

2. Context Based Research

Context

This learning outcome is focused on being able to apply critical thinking, investigating with relevant, validated and valuable evidence for a specific context that has been structured with a well-known mythology such as the DOT framework.

Such products that can be expected is a research planning using a structured planning tool to be able to prove and justify decisions made throughout the projects.

Self-assessment by learning outcome Context Based Research

For this learning outcome can I say that I am at a learning level scale of Advanced.

Motivation & Reflection

I have worked for the group project as well as the individual project on the Research Plan.

Individual

I have conducted research into understanding docker and unit testing with as well trying out tutorials of practicing the acquired knowledge. Further, I also did research into System Testing and End-to-End Testing, due to time constraints I was not able to do any hands-on exercises. But with the knowledge I have acquired from learning to work with docker and unit testing, I have applied it in my project. I have created Docker files to where the images can be built in a docker compose folder. Further, I have applied workflows on GitHub for building these Docker files to make sure they are functioning. Next, I have created Unit tests on my controller and using workflows on GitHub, I check that these tests pass before merging can occur. From using this knowledge, I have applied also applied unit testing and docker in the group project and its workflows to make sure of the functionalities before merging.

Group

The group project's research is based on researching how to get live data from the movesense heartrate wearable to showcase in our web application. This research was conducted by a fellow group mate (Marinda) and I where we researched the wearable device, how to set up a project to connect device, other online sources as well as contacting the company. From our research have we concluded that it is possible to connect live data from a wearable to the application but with a mobile device where we had little knowledge of. Our solution to this was to mock the data and that the research we have conducted and sources we found helpful to be able to setup live data to an application is to document this for future groups.

Link to relevant professional products

Professional Product	Description
Research Document (individual)	Research into understanding docker and Unit testing
Research Documents (group)	Research documents that have been worked on by Marinda and I to how to connect the heartrate movesense wearable to a web application. Movensense data folder: By me Wearable API folder: By Marinda and I
Unit testing for individual research (individual)	Showcasing research into understanding Unit testing on GitHub.
Applying Unit testing and Docker (individual)	Link to individual project showcasing applying unit testing and docker with also using workflows to make sure of these checks before merging.
Applying Unit testing and Docker (group)	Link to Feedback-Service in the group project showcasing applying unit testing and docker with also using workflows to make sure of these checks before merging.

Self-assessment & Next steps

The next steps/goals I will set for myself are:

- Trying out System Testing and End-to-End testing in my free time to gain the experience needed for future projects.

3. Preparation for Life-Long Learning

Context

Preparation for Life-Long Learning is regarding acquiring skill required for my future career. Finding out my ambitions and what role I would like to be in the coming future, I can start orienting myself to the right path such as finding minors or graduation assignment that fir my ambitions.

Further, creating code or writing documentation, which is written for future developers or stakeholders, fall as well under this learning outcome.

Self-assessment by learning outcome Preparation for Life-Long Learning

For this learning outcome can I say that I am at a learning level scale of Advanced.

Motivation & Reflection

Individual

For life-long preparation in regards induvial impact, I have investigated master programs where I am interested in. Not only have I done research into these programs, but I have also gone to open days and reached out to people to see my possibilities. I have written a document regarding comparing the master programs I am interested in and emailed one of the programs regarding admission and talking to students who have entered the program from Fontys to see what steps they had to do to be able to be accepted.

Group

Regarding group work have I written documents and code to which will help future people that will take on the project. Such examples are:

- Research into wearables: from the research I have done into the wearables, I have written what sources are useful to integrate the device to the project with detail explanation. This is to make it easier for the next group to take it on or anyone who is interested into setting up the device for real time data to the system without having to waste too much investigation into sources.
- Feedback service: The feedback service I have written is based on adapting the structure of the previous group's layout for consistency for others to work with. Further, I have written a detail read me file explaining how to run the service, locally and on docker, with also describing the end points and lastly how to run the service if changes are made.
- Future requirements / Features: after discussing feedback and features that can be added to the caregiver dashboard with the FHP students. I have summarized and created a document with detail explanation to different categories to future adaptation and additions that can be made to the project.
- Workflow description: I have created a detail explanation to how the workflows have been set up for each service and dashboard, what the workflows cover, and what occurs when a pull request is made.

Link to relevant professional products

Professional Product	Description
Research into master's program (individual)	Research into master's programs I am interested in at the Tilburg university and JADS.
Research into Wearables (group)	Research into sources (graduated projects, online sources, messages to the companies, online articles/documentation to using the wearables and other thesis's and projects from others) that are useful for future people who are interested into implementing the feature for the device to give real-time data.
Feedback Service (group)	For my individual project I work with .net 5 and a different structure to the group project regarding not using layers as in the controller and service layer. By working to this structure, I have made it easier for others to work on and realized the benefits.
Future Requirements / Features (group)	Summarizing and creating a document for the next group or developers that will / could implement such requirements & features suggested by our test group.
Ci/Cd Description Document (group)	Description of the GitHub pipeline for the frontend and backend.

Self-assessment & Next steps

The next steps/goals I will set for myself are:

- Trying to see if there is any possibility to following the university program I would like to follow and if not find a suitable internship place where I can stay at after my studies.

4. Scalable Architectures

Context

The Scalable Architectures learning outcome is based on developing an enterprise model that architecture can support quality attributes such as instance robustness, performance, availability, and responsiveness.

The architecture will need to consist of independently running parts by using microservices which need to be deployed independently and communicate asynchronously.

These independent parts will need to be measured and monitored while running by performance indicators.

Defining non-functional requirements and design/implementation ideas that are beneficial and suite the project is important for any project. Demonstrating what added value these implementations/designs have in reaching the set requirements show the results of the goals of the project.

Self-assessment by learning outcome Scalable Architectures

I have already created an architectural design for my individual project but because both projects (individual and group project) are in the beginning stage, I would say that my learning level of Advanced.

Motivation & Reflection

Individual

I have designed a set of non-functional requirements which I find are important to the project. Based on these requirements such as being scalable, up-to-date, and more. I have implemented these requirements in the project such as designing the microservices in a way where they only handle what data they are meant to and save cached data from other services that are necessary for them and not the entire data of the service where it is hard to see a separation between services. The services have been designed to function that when one service is down but the other service needs to be aware of a certain values that have been added, that these are published to a message broker and the subscribed services are up to date with this data when they are back up and running for consistency and reliability of data. I have discussed the design process multiple times with my teachers to have some input into aspects I have not seen and that can be added or changed to the design such for maintainability and functionality purposes.

Besides writing the non-functional, functional and security requirements to how my individual project should include have I already implemented some of these functionalities. Such functionalities are what data each microservices should include, performance of when services are down are the newly added data stored directly when the services are running again with asynchronous call and lastly, researching which message broker and databases is best suited based on the needs of the application.

Further, there are several design diagrams of the architecture including the UML-Class Diagram, Architectural Diagram and C4 diagrams where a document has been made describing each diagram.

Lastly, has this learning outcome already states, scalability is added to the project. The project has been uploaded to Azure Kubernetes Service where I have tested if the platform could scale. I did this with the help of a scalability tool named K6. Here I tested out various of tests (smoke, load, stress and soak) and on different use cases such as a request with a small JSON body in comparison to a bigger body to evaluate the difference.

Link to relevant professional products

Professional Product	Description
Requirements Document (individual)	The Non-functional and user stories of the system.
Research into message broker (individual)	Research into which message broker to use for my individual.
Summary of Messaging Module on Canvas (individual)	The summary was to give myself a deeper understanding of the Messaging Module.
Architectural design Diagram (individual)	Design of the Architecture of the Microservices.
Architectural design Document (individual)	Describing the designs of the Architecture.
Relationship between services (individual)	Design of the relation between each service.
C4 diagrams (individual)	C4 Diagram going in depth of the web application with stopping at a C2 diagram.
UML – Class Diagrams (individual)	Sequence of updated diagrams after receiving feedback to how they can be better designed which you can over each up dated diagram.
Feedpulse Feedback from teachers (individual)	Check point 5 & 6 on feedpulse on canvas.
Scalability Testing Document (individual)	Document describing the scalability tests carried out on the application.

Self-assessment & Next steps

The next steps/goals I will set for myself are:

- Playing more around with other use cases for testing out the scalability of the project.
- Trying out other scalability tools to see which ones are best suited for which use cases.

5. Development and Operations (DevOps)

Context

Development and Operations consists of being able to define how to support all stakeholders needs with also considering changes to the application such as instance reporting, Service Level Agreements, changes in requirements, releases, end user wishes.

Further, the application must be independently deployable, tests be automated, and quality of the application be measured (such as code coverage, security assessment, support monitoring) with also thinking about the SDLC process to run the project more smoothly.

Self-assessment by learning outcome Development and Operations (DevOps)

For this learning outcome am I at the learning level of Proficient - Advanced.

Motivation & Reflection

Group

For the group project, I have done research into GitHub actions that can be used for security vulnerabilities and code scanning. Currently, I have added to the pipeline GitHub Actions workflows that build, tests (using the unit tests made for each service), build a Docker file, analyzes the code with SonarQube for security vulnerabilities, and Dependabot for security updates. I have created a document describing the pipeline for the project and what it all entails for both the front end and the back end.

Individual

For my individual project I have used the research and knowledge I have learned from the group work in my individual project. I have as well build my pipeline using GitHub actions to build, test, build a Docker file, using Sonar Cloud to analyze code vulnerabilities and Dependabot for security updates. These workflows are to make sure that the code / project is functioning based on the requirements and is secure and analyzed.

Further, from the security check list based on the SDLC I have created, I have integrated the set security requirements to the Development and Testing phases of the SDLC.

Link to relevant professional products

Professional Product	Description
Research Plan (individual)	Research plan for trying out Docker & testing.
GitHub Actions Tutorials (individual)	GitHub Action Tutorials on GitHub Here I have created a readme file for the trying tutorial out for implementing GitHub actions.
Microservices on GitHub (individual)	User-Medicine-Inventory-service : This microservice holds all the medicines belonging to a user. Medicine-Inventory-service: This repo is based on the service of holding all medicines in its inventory. Care-Frontend: This repository is the frontend of the Care web-application. Infra : The Infra service is to be later setup to dockerize the entire microservices. Care.Common : This repository is to create NuGet packages used for the Individual project for all microservices.
GitHub actions (group)	Proof of adding workflow and its functionality to feedback-service I worked on in the project.
GitHub actions (individual)	Proof of adding workflow and its functionality to the project.
Security Document (individual)	The security document which includes the SDLC check list set for the project.
Ci/Cd Description Document (group)	Description of the GitHub pipeline for the frontend and backend.

Self-assessment & Next steps

The next steps/goals I will set for myself are:

- Doing more research into adding more security checks for example Dynamic Application Security Testing to the pipeline.
- Integrating the Continuous Development to the pipeline for example deploying new images to Azure when the main repo has been updated.

6. Cloud Services

Context

The Cloud Services learning outcome entails understanding what a cloud platform provider is and can deploy (parts of) the application(group/individual) to a cloud platform. For example, of how this can be integrated to the application is serverless computing, cloud storage or container management. Lastly, the values of the integrated chosen cloud services must be able to be validated.

Self-assessment by learning outcome Clous Service

For this learning outcome am I at the learning level of Proficient.

Motivation & Reflection

I have read through the Cloud Service module and know the basics of Cloud service terms used. I have used the module on "How to apply Cloud Services" as an aid in researching different cloud service providers that can be beneficial to use for my individual project. I have created a research document regarding evaluating different cloud providers and coming to a conclusion on using Azure, specifically Azure Kubernetes Service.

Further, I have been able to deploy my individual project to Azure Kubernetes Service where I am able to run it. I have tested out if other can reach the site with also testing if the application scales with some scalability tests I have set up.

Lastly, I have also attended two Cloud Platform oriented lectures that discusses working with a functional app. One with Azure and the next with AWS where I created both a concept of which I have learned from the lecture.

Link to relevant professional products

Professional Product	Description
Research into Cloud Services (individual)	Research into which cloud service provider is best fit based on the requirements of my individual project.
Scalability Testing Document (individual)	Document describing the scalability tests carried out on the application.

Self-assessment & Next steps

The next steps/goals I will set for myself are:

- Doing more research into what else can be done with the cloud such as creating a functional app and the benefits from starting on the cloud instead of locally.

7. Security by Design

Context

Security by Design learning outcomes entails that I, the student, am able to investigate how to minimize security risks for the application (individual/group). By incorporating common techniques and practices to implement into the application, this can prevent common security breaches.

Topics that fall under this learning outcome that have to be considered are “what can go wrong in the application regarding security”, “what misuse cases can you think of that can come fort in the project”, “look for inspiration of the OWASP TOP 10 that can be seen in your project”, “consider these risks in your requirements and design of the project” and “think about how you will validate the results of security and what tools can be used”.

Self-assessment by learning outcome Security by Design

For this learning outcome am I at the learning level of Proficient - Advanced.

Motivation & Reflection

I have read through the Security Module on Canvas where I have not only read and investigated which security risks are the most common with the OWASP top 10 but also created a Security Requirements document to what security requirements I would like to implement into my individual project for a more secure application. Based on these security requirements, I have also created user stories and misuse cases to how attackers can harm the system. These requirements have been integrated and documented to how they can be integrated in the security document I have created.

Next, when trying to connect the backend to the frontend I came across CORS issues while running docker. The reason to why and how I figured out to use my backend in my frontend without using something like Nginx is that the hyperlink uses http instead of https where I had to fix which links were allowed to be used to connect to my backend for safety reasons.

Further, I have also added dependabot to my individual and group project. After hearing about it from one of my group mates (Milan) to the benefits of the framework where it finds and fixes vulnerabilities in the dependency of the project. The framework also keeps dependencies up to date with the latest version.

Additionally, I have also integrated Sonar Cloud, CodeQL and Security Code Scan for Static Application Security Testing to the pipeline to look for any code vulnerabilities.

Also, I have added Azure Active Directory for authentication to the application. Currently the authentication has been configured for only my account and locally due to safety regulations for the project running on Azure Kubernetes Services. But can the authentication be configured for more safety-oriented authentication.

Lastly, I have attended the security lectures where we have learned about web application security, learning to be aware of potential attack vectors, how to protect your web application, modern application frameworks that provide security features and with hands on practice how to hack certain security vulnerabilities of the Juice Shop website with using Burp Suite.

Link to relevant professional products

Professional Product	Description
Dependabot Proof (group)	Proof to adding dependabot and its functionality benefit to the project.
Dependabot Proof (individual)	Proof to adding dependabot and its functionality benefit to the project.
Security Document (individual)	The security document which includes the security requirements and how they have been integrated into the project.

Self-assessment & Next steps

The next steps/goals I will set for myself are:

- Researching more security tests and tools such as adding Dynamic Application Security Testing.

8. Distributed Data

Context

The learning outcome Distributed data entail that I am aware of specific data requirements for the enterprise system. I can apply best practices for distributed data during the whole development process, both for non-functional and functional requirements. Investigating which solutions are suitable for real-time and persistent data storage and which solutions for the architecture of the project. Lastly, being able to apply legal requirements in the design and implementation and being aware of ethical issues of the data design must be considered.

Self-assessment by learning outcome Distributed Data

For this learning outcome am I at the learning level of Proficient - Advanced.

Motivation & Reflection

Individual

When designing the microservices for my project, it was an agile process. From designing to feedback to implementing feedback to redesigning to implementation to redesigning after coming to better ideas after realizing ideas during implementing. From this process, the Care web application architectural design is built out of 5 different services. Each of these services handle their own data with their own database and only store cached data that is useful to know for the frontend. But besides that, the design is built with the idea that each service can function without the next, handles its own data, and if some data is needed from a next service, there is a message broker to handle publishing of new data from services that are subscribed to certain data information.

Further, after having a clear idea and design of the architecture of the services, I have created and based my requirements on the data of the project with detailing the categories it falls under. This is to give myself and other a clear view of what is really needed of the project its goals.

Next, I have researched and created a document for which database(s) I would use for the project with as well researching the GDPR and how to apply it to the project.

Lastly, the design of the architecture is based to be scalable for the future when a service needs to handle more than another service. I have integrated this functionality into the platform after deploying it to Azure Kubernetes and tested it with the help of the K6 tool that I have documented.

Group

As a group we discussed and investigated ethical issues that can occur in our group project. This was during the TICT Ethics game we played as group conducted by our teacher Georgiana. During this game we used the Tarot Cards of Tech to discuss how to set requirements to meet our ethical requirements.

Further, are legal requirements discussed during developing the web-application with our stakeholders such as what data should and should not be allowed.

Link to relevant professional products

Professional Product	Description
Ethical Design Document is on canvas (group)	Summary of the requirements we have set as a group. After discussing the ethical sides of the group with an exercise by our teacher.
Security Document (individual)	Holds the functional and non-function requirements of the individual project.
Data Requirements (individual)	The requirements of the project where they have been categorized.
Architectural Design (individual)	The architectural design of the microservices of the project.
Architectural Design Relations (individual)	The relationship between the services.
C4 diagrams (individual)	C4 Diagram going in depth of the web application with stopping at a C2 diagram.
UML – Class Diagrams (individual)	Sequence of updated diagrams after receiving feedback to how they can be better designed which you can over each up dated diagram.
Research into Database Microservice (individual)	Research into deciding which database is best to use for my individual project.
General Data Protection Regulation (individual)	Research into how to apply the GDPR to my individual project.
Scalability Testing Document (individual)	Document describing the scalability tests carried out on the application.

Self-assessment & Next steps

The next steps/goals I will set for myself are:

- Diving deeper into the GDPR and how I will apply it to future projects.

REFLECTION

To reflect, before starting this semester, I didn't have any knowledge regarding Docker, Kubernetes, correct way of using GitHub, any code testing, security with online tools and any cloud services experience.

From coming from a whole other school with a whole other background than my fellow classmates, I was terrified if I would actually pass the semester.

Knowing of how much extra effort I would have to put in just get the "basic knowledge" to start of the semester with I was stressing. After calming down, I finally set out a plan to how I would approach to learning this "basic knowledge". I started of with discussing my starting point with my teachers to give awareness and to seek advice to how I can begin this process. They directed me that the best approach is to talk with my fellow group mates to get a better standpoint from them.

After discussing what knowledge, tools and advised they had, I was able to have a start to my plan. I started with learning docker, then to learning about testing with also learning about git. It was quite stressful because I am a person that likes to figure stuff out on my own but when I went over my set time box, I did seek out help from my fellow group mates.

At the end, I can say that this semester was the most stressful one for me, but I can also say that I learned a lot from completing this semester. This ranges from communication skills to technical skills.

If I would get the option to do the semester over again, I would say that I would follow the same approach I did with a bit less stress on what I don't know about yet.

CONCLUSION

To conclude, this portfolio is used to be able to show what I have achieve so far in the semester regarding the eight learning outcomes set. With the help of my individual and group project, I have shown what I have achieved so far for each learning outcome. To each learning outcome, I give a personal self-assessment to which learning level scale I believe I am at which I motivate with proof. Lastly, is the goal to reach a high learning level scale for myself, on my paste, where I suggest steps that I will take that will benefit me in reaching these set goals.