Portfolio

Semester: 6 - Software

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Class: RB04

1 VERSION MANAGEMENT

Version	Date	Author(s)	Changes	State
0.1	14-02-2022	Mickey Krekels	Added the main structure of the document.	In progress
0.2	16-03-2022	Mickey Krekels	Added the first Evaluation chapter	In progress
0.3	18-03-2022	Mickey Krekels	Fixed grammar-related issues	In progress

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3 SHORT INTRODUCTION

3.1 ABOUT ME:

My name is Mickey Krekels and I am currently in semester 46 as an IT student at Fontys University of Applied Sciences. Before Fontys however, I studied Game development at the MBO SintLucas, which gave me a good understanding of programming and UX design. During my specialization on Fontys, I studied the subject of AI with the main focus set on neural networks.

3.2 THE DOCUMENT CONTENT:

In this document, I describe my findings and research results based on the learning outcomes of semester 6. For every result, I depict the meaning of the learning outcome, and based on that information I will show the current state of my progress this will include: self-assessment and learning process description with a personal reflection added. And at the end a short retrospect and conclusion.

4   LEARNING OUTCOMES

In this part of this document, I will describe and grade myself for each learning outcome, based on the outcome levels(see picture below). I will also provide proof in the form of pictures and examples of what I have learned so far.

LEVEL	DEFAULT DESCRIPTION	PDR DEMONSTRATES
Undefined	You have not yet undertaken activities to demonstrate the learning outcome.	You **have not finished** a ⊘ Basic level activity yet, and/or did not receive or reflect on feedback.
Orienting	You have made a start and explored the possibilities to demonstrate the learning outcome.	You **have finished 1 or more** ⊘ Basic level activities and/or **started** with ⊘ Normal level activities, and your reflection on the received feedback shows that you know how to improve your work and how to progress your studies.
Beginning	You have taken the first steps and carried them out which contribute to demonstrating the learning outcome.	You **have finished 1 or more** ⊘ Normal level activities and the received feedback is leaning to the positive side, your reflection makes it clear that you realise that you are doing fine, yet still see opportunities for improvement in further activities.
Proficient	You have shown several times that you have created a basis to demonstrate the learning outcome. You will demonstrate the learning outcome at a sufficient level, if you continue your development in this way.	You **have finished multiple** ⊘ Normal level activities and the received feedback together with your reflection make a compelling argument of having acquired the knowledge and skills as defined in the learning outcome.
Advanced	You have shown several times that you have been working on this learning outcome with good results. You have performed above expectations and are focused on continuous improvement. You will demonstrate the learning outcome at a more than sufficient level, if you continue your development in this way.	You **have finished 1 or more** ⊘ Expert level activities and the received feedback together with your reflection clearly shows how you progressed beyond the knowledge and skills as defined in the learning outcome.

4.1 DEVELOPING ENTERPRISE SOFTWARE AS A TEAM EFFORT

4.1.1 Clarification:

Enterprise software is used in the context of companies that use large-scale distributed software, with many types of users, and substantial amounts of data. In such a context, you will develop software and software-related products (for instance software design, test setups). All of this should be transferable to the current stakeholders, and software engineers who work on the software after you leave. Together with your team, you agree upon a way of working that is considered professional in a large IT software organization. This software development process should be agile to accommodate future changes (for instance scrum). Your behaviour supports the chosen way of working. You consistently share technical knowledge and experiences of the software development process both inside and outside the team. Besides requirements needed by direct stakeholders, you also take other viewpoints into account which are relevant (for instance GDPR, ethical & legal issues). It is your job that all your results can be verified, validated, and transferred to others

4.1.2 First Evaluation:

This semester started with the group assignment of Globe-Protocol. The goal of the project is to create a survey management tool where the user has the option of changing their consent. The product owner of this project is Teun Hendriks, we meet him every week (1) on Teams to discuss our work. Together with our team, we made a project plan document with the functional and non-functional requirements. This knowledge was then used to create the issues, epics and stories on the Jira-Software planning tool. This work was discussed and validated with the product owner.

With these steps done we started working on the product itself, a Github organizations page was created and each of the team members started working on the sprints. My work was mainly done on the "Data-Export-Service" and "Consent-Management-Service" in the back-end of the application.

(The Jira page and the Github repositories are private, therefore here are the screenshots made during the process of the Jira (2) and the Github (3) workflow)

Because of these steps made in the group project, I think that I proved that on "Developing Enterprise Software as a Team Effort" I am on the level of **Orienting**!

Self-evaluation table		
Evaluation version	**Grade**	**Date**
1	Orienting	16-03-2022

4.2 CONTEXT BASED RESEARCH

4.2.1 Clarification:

You apply critical thinking in your day-to-day work. In your planning, you can divide your work into questions that need investigation. Each investigation has a goal that can be validated and is relevant and valuable for your specific context. You use a well-known methodology (for instance the DOT framework) to structure your investigation. The result of the investigation is validated by you and shows the quality and value of the result. The result of your investigation can be justified and presented by you, both verbally and in writing. Others can validate the results, making the results transferable to others. One of the ongoing investigations is: keeping an eye on the current state of development of your products (for instance using the Technological Readiness Level).

4.2.2 First Evaluation:

For the assignment "Emerging Trends Research: Plan" of the canvas course, I chose the topic "Artificial Intelligence and Machine Learning". In this research, I want to find out how music can be generated using AI and neural network technology. With this document, I make use of the DOT framework structure and use sub-questions to answer the main question.

(this research plan can be found in the canvas course under "Emerging Trends Research: Plan" or at my public repository (4))

In the next evaluation, a lot of work on the main research documents will have started, but currently, there is only the research plan. Therefore I believe that I am on the level of **Orienting**!

Self-evaluation table		
Evaluation version	**Grade**	**Date**
1	**Orienting**	16-03-2022

4.3 Preparation for Life-Long Learning

4.3.1 Clarification:

Career paths within ICT are plenty and will differ per student. To be able to choose a path, you will find out your current skills and ambitions first. You search for roles and careers that fit you in the future. You can explain which skills you need to develop for these careers, and you can organize the activities needed to develop them (for instance by finding minors or graduation assignments that fit your ambitions). You apply those activities by applying for a minor or finding a graduation project.

4.3.2 First Evaluation:

In the field of IT, there are lots of topics and branches to learn from. Besides school assignments, I follow courses on varied software subjects. For this, I mainly use LinkedIn-Learning which provides me with information and a certificate on completion. This certificate will be added to a list named "Licenses & Certifications" (5) where companies can see what topics I have experience with. The career path that I want to choose is still a bit difficult to pinpoint. But by widening my skills the options for different paths stay open.

For now, my main ambition is on "artificial intelligence and machine learning".Therefore the evaluations I want to find out which of the minor or graduation projects fit that description. Because of these reasons, I believe that I am on the level of **Orienting**!

Self-evaluation table		
Evaluation version	**Grade**	**Date**
1	Orienting	16-03-2022

4.4 SCALABLE ARCHITECTURES

4.4.1 Clarification:

You investigate architectural patterns and scalable architectures that perform well in enterprise contexts. Your chosen architecture should support relevant quality attributes from this enterprise context (for instance robustness, performance, availability, and responsiveness). Your architecture consists of independently running parts (for instance microservices), which need to be deployed independently and communicate asynchronously (for instance using messaging). You investigate which performance indicators you will need to measure and monitor those independent parts while they are running. You validate that your application automatically scales using your indicators while having realistic loads. Your choice of technologies for the scalable parts should fit the quality requirements of the architecture. You use techniques during analysis and design, which help in creating scalable architectures (for instance Event Storming). Your development process and platform should support the design and deployment of your scalable architecture. You use industry standards (for instance C4 model, UML) to communicate and justify your architectural choices to stakeholders and your own team.

4.4.2 First Evaluation:

For the group project, architecture diagrams needed to be created, this made sure that the architectural overview was clear for us and the client. The models were created by me and a team member(Manoah Somers), the schematics include the C1 model, C2 model, dataflow model and sequence diagrams of the group project.

(These models can be found on Teams under group 1 files, or at my public repository (6) on Github)

For my own project "Micflix" (a Netflix clone), I worked on the technical design document. Within this document, the schematics C1 and C2 models are currently available.

(These models can be found on my project documentation repository (7) on Github)

Because of these reasons, I believe that I am on the level of **Orienting**!

Self-evaluation table		
Evaluation version	**Grade**	**Date**
1	Orienting	16-03-2022

4.5 DEVELOPMENT AND OPERATIONS (DEVOPS)

4.5.1 Clarification:

You define how you are going to support all stakeholders' needs in your software development process, especially regarding inevitable changes involving the application (for instance reporting, Service Level Agreements, changes in requirements, releases, end-user wishes). You define environments that will be used by developers in the development and creation of software (for instance test and production environments). These infrastructure environments are defined using 'Infrastructure as code' principles. You make parts of your application independently deployable (for instance using containers). You support automatic testing and measurements which prove the quality of the application (for instance code coverage, security assessment, support for monitoring). You automate all the above as much as possible (for instance using CI/CD principles).

4.5.2 First Evaluation:

For the Personal project, I am going to use Docker containers in combination with Kubernetes to set up my back-end project structure. To automate the deployment of this process, Github actions is going to be used as a CI/CD Pipeline.

The initial research into these topics is already done, the videos "Building Docker containers with GitHub Actions" (8) and "Docker Tutorial for Beginners" (9) have given me a basic understanding of the technologies themselves.

Because of this research, I believe that I am on the level of **Orienting**!

Self-evaluation table		
Evaluation version	**Grade**	**Date**
1	Orienting	16-03-2022

4.6 CLOUD SERVICES

4.6.1 Clarification:

You can explain the reasons why cloud platform providers exist and demonstrate that you can develop applications that are completely or partially implemented by using cloud services (scalable databases, container management, logging & monitoring, cloud storage, authorization, and autoscaling). You also demonstrate that non-functional requirement of your system are still met when cloud services are used. You explain the impact (the number of cloud resources needed, best fitting cloud platform provider and the budget needed to host the alternative solution based on cost estimation) of using cloud services as an alternative solution for parts of your application used in your architectural decisions.

4.6.2 First Evaluation:

As I explained in the previous evaluation 4.5.2 for the overall structure of this project I am going to use Kubernetes. For the initial research on this topic, I watch the playlist "Kubernetes development guide for beginners" (10) on youtube and the course "learning Kubernetes" (11) on Linkedin-Learning. These tutorials/lessons taught me how it can be useful for an Enterprise project and the basics of how to implement it.

Because of this research, I believe that I am on the level of **Orienting**!

Self-evaluation table		
Evaluation version	**Grade**	**Date**
1	Orienting	16-03-2022

4.7 SECURITY BY DESIGN

4.7.1 Clarification:
You investigate which security risks are most common (for instance OWASP top 10) and you investigate which best practices are used to prevent security risks for all steps in your software development process. You use common techniques (for instance misuse cases, trust boundaries) in the analysis and design of your architecture. You implement common techniques (for instance authentication and authorization) which prevent common security breaches. You also design for, and test steps to mitigate breaches when they still occur.

4.7.2 First Evaluation:
To research this topic, I visited the official OWASP website (12) and their youtube channel (13). This provided me with information that could be used to improve the overall security of my personal project. For example, the topic "A07:2021 – Identification and Authentication Failures" suggest *Limiting or increasingly delaying failed login attempts* (14) , with this addition in my project a brute force attack can be easier detected.

Because of this research, I believe that I am on the level of **Orienting**!

Self-evaluation table		
Evaluation version	**Grade**	**Date**
1	Orienting	16-03-2022

4.8 DISTRIBUTED DATA

4.8.1 Clarification:
You apply best practices in translating non-functional and functional requirements into specific data requirements. You investigate which solutions are suitable for real-time and persistent data storage, and which solutions fit your architecture. You apply legal requirements in your design and implementation (for instance GDPR), and you are aware of ethical issues of your data design. Steps needed for developing with distributed data in mind will be incorporated by you in your current software development process.

4.8.2 First Evaluation:

Self-evaluation table		
Evaluation version	**Grade**	**Date**
1		

5 PEER REVIEWS

(this chapter will be added at a later date)

6 RETROSPECT

(this chapter will be added at a later date)

7 CONCLUSION

(this chapter will be added at a later date)

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