Advanced Software - Spring 2024

# Reading Guide

*Contains the reading guide for this section and miscellaneous evidence.*

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# **Introduction**

The purpose of this portfolio reading is to outline my work during the Advanced Software semester. The portfolio will be split into several sections that will focus on different parts of my developments and achievements during this semester.

## **Personal introduction**

My name is Mihail Vasilev, I come from Bulgaria and I am decided to study at Fontys because I saw a great opportunity for achieving my personal goals to becoming a computer science professional. So far, Fontys has allowed me to gain a significant amount of knowledge and experience and I believe that my studies will play an important part in my carrier. After I finish Fontys I want to pursue a Masters degree in the TU/e.

As a more personal note, I am interested in a lot of subjects different from computer science as well such as sports, music, games, movies and travelling. I practice martial arts such as karate and aikido. I love going on hikes in the mountains and travelling abroad. I have been playing computer games since I was very young and going to the movie theater has been a major part of my life. I also have been learning to play the guitar for some time now.

## **Technical knowledge**

**Proficient in the programming languages:**

* Java, C#, Python, React, HTML/CSS, Javascript, Typescript, C, C++, Elm, SQL and MySQL, PowerShell

**Proficient in the following technologies:**

* .Net WinForms, .Net Core Razor Pages, Java Spring Boot, Axios, RESTful API, Git, Atlassian Bamboo

**Software development standarts and methodology:**

* Waterfall methodology
* Agile methodology
* Scrum methodology
* Test planning and QA
* Requirement Documentation
* Complex problem-solving
* SOLID design principles
* CICD development
* Jira

## **Goals and what I want to improve**

**Technical knowledge**

* Learn how to use microservices
* Learn how to deploy on the cloud
* Learn how to test and develop applications that can handle big loads of users
* Improve my knowledge on security

**Soft skills**

* Improve my abilities to plan my tasks accordingly
* Improve my abilities in terms of communication to the stakeholders
* Improve my writing skills
* Improve my research abilities

# **Projects**

In this section I will explain briefly the projects that I will be working on. During this semester I will be working on two projects: Individual project and Group project.

For more detailed information, please refer to the respective documents inside the Learning outcomes deliverables.

## **Individual Project - HeardIT**

## **Context**

HeardIT is a music sharing platform where you will be able to discover, listen and learn how to play to your favorite songs from a plethora of indie bands. The website focuses on small to medium music creators and people interested in learning how to play the songs on their instruments. The application provides several features that allow users to have an interactive experience combining the listening and learning aspect in one easy-to-find place.

Songwriters will have the ability to upload their tracks, the chords/tabs, lyrics and any other information that will allow their fans to be able to not only listen to the songs but also learn to play them.

Fans will be able to experience these features easily through the interactive user interface and will be able to leave comments, likes and make playlists with their favorite songs.

This way HeardIT will be a place where music creators and fans will have the opportunity to interact, share their experience, learn and get closer to the art of music together.

## **Goal of the project**

The goal of the HeardIT music sharing application is to provide its users with a place where they can share, enjoy and learn their favorite music. The application will occupy the niche of being a music sharing platform where users can not only find the tracks from their favorite artists but also the chords and lyrics that they can learn so that they can play/sing along with the songs.

In technical terms, the main goal of the project is to create a scalable, reliable and user-friendly web-application that follows the established enterprise standards for developing mainstream software services. The project will focus on delivering a working solution capable of passing the modern requirements for software solutions. The application will follow the modern principals of software developing, utilizing the most suitable technologies, software architecture principles, the best practices and methods of testing. HeardIT will be a modern application that lives up to the high standards of the modern IT world.

## **Conditions and technologies**

**Technologies include:**

* Back-end and services: Java SpringBoot
* Front-end: ReactJs
* Git
* Database: MySQL
* Deployment: Docker, Kubernetes

**Work strategies include:**

* Agile
* Scrum

### **Repositories:**

Back-end services and documentation: <https://github.com/Jumorto/HeardIT>

Front-end: <https://github.com/Jumorto/HeardIT-FrontEnd>

## **Group Project - Build a YAML code generator to deploy an application on Kubernetes**

## **Context**

SUE is a prominent Cloud Native Solutions organization based in the Netherlands and recognized as one of Europe's largest in its field. SUE specializes in Cloud and IT services and focuses on ensuring the smooth and seamless interaction between applications, services, and processes with its Cloud Native Framework. The team of certified Cloud and IT engineers is committed to providing a comprehensive range of services and solutions making them one of the leaders in businesses seeking Cloud Native solutions.

A major component of the modern Cloud based solutions is the use of containerization. Using technologies like Docker and Kubernetes allows for more efficient resource use, faster deployment, and better scalability. Creating and deploying the Kubernetes YAML configurations can be a long and time-consuming process which requires a significant learning curve. An interactive and user-friendly web interface that allows users to develop and apply these configurations, simplifies the processes, and lowers the barrier to entry for inexperienced users.

## **Goal of the project**

The goal of the project is to implement a web-based, interactive application tool for defining and applying Kubernetes YAML configurations to a cluster. The main advantage that this application will provide is the ability to simplify the otherwise cumbersome process of creation of the YAML configuration files that are needed for the creation of the Kubernetes clusters. The current process of creating such files requires significant learning curve and knowledge and a way to instead generate these files through a web-based application would benefit SUE’s customers.

To achieve this goal, an investigation of the process of creating and applying Kubernetes YAML files will be performed. An interactive user-interface will be created and implemented using the appropriate technologies and the application will be connected to the official Kubernetes API. Once the web-based application is created, proper and up-to-standard testing will be performed to ensure the quality of the product.

## **Conditions and technologies**

**Technologies include:**

* Back-end and services: Golang
* Front-end: ReactJs
* Git
* Docker and Kubernetes

**Work strategies include:**

* Agile
* Scrum

### **Repositories:**

k8s-api-spec: <https://projects.fhict.nl/s6-rb/spring-24/rb04/sueyamlgenerator/k8s-api-spec>

quartermaster-frontend: <https://projects.fhict.nl/s6-rb/spring-24/rb04/sueyamlgenerator/quartermaster-frontend>

# **Learning outcomes**

In this section I will focus on the learning outcomes. I will explain my self assessment as well as point to specific deliverables to prove that I have achieved the appropriate level for each of the learning outcomes. The exact products and deliverables will be available inside the **Evidence** section in my portfolio. This section will be split into **Sprints** so that my progress can be observed easily.

## **Self assessment**

1. Professional Standard - **Proficient**

* What I need to prove? -
  + Evidence:
    - Individual project: Project Pitch, Project Plan, Research Plan, User requirements, Sprint 1 review presentation
    - Group project: Project Plan, SUE - project requirements
  + Reasoning:
    - Sprint 2 -
    - Sprint 1- The main reasoning for self assessing with **Proficient** for this LO is for the reason that I have already completed several projects that required similar approaches in order to finish them. Over the past several semesters I have gathered a lot of experience into how to research, communicate with stakeholders, develop and deliver applications up to the modern standards and requirements and produce real working solutions. All these factors apply to show why I feel confident to put **Proficient** for this LO.

1. Personal leadership - **Proficient**
   * What I need to prove? -
   * Evidence:
     + Project Pitch, Project Plan, Research Plan, User requirements, Sprint 1 review presentation
   * Reasoning:
     + Sprint 2 -
     + Sprint 1 - The reasoning for self assessing with **Proficient** for this LO also stems from the reason that I have already completed several projects in the past that required similar approaches in order to implement them. Over my previous assignments I have gained significant experience and I feel confident in my abilities to personally lead my projects forward. These factors apply to show why I feel confident to put **Proficient** for this LO.
2. Scalable Architectures - **Beginning**
   * What I need to prove? -
   * Evidence:
     + Individual project: Project Plan - 3.4 Architecture design section
   * Reasoning:
     + Sprint 2 -
     + Sprint 1 - My reasoning for this LO is that I have started doing some first research and working on creating the first architecture diagrams for my individual project. However, there is a lot more to be done and for this reason I believe that **Beginning** is suitable at this stage of the project.
3. Development and Operations (DevOps) - **Beginning**
   * What I need to prove? -
   * Evidence:
     + Individual project: Project Plan - 3.3 Configuration and Test environment, CICD yaml file and Dockerfile in the Git repo
   * Reasoning:
     + Sprint 2 -
     + Sprint 1 - My reasoning for this LO is that I have created the CICD set-up and I already have some tests in place and a part of the deployment. My goal for the first sprint was to have one service of my project working so that I could create the CICD part of the DevOps environment now. However, there is still a lot to do this is why I have decided to put my level on **Beginning** at this point.
4. Cloud Native - **Orienting**
   * What I need to prove? -
   * Evidence:
   * Reasoning:
     + Sprint 2 -
     + Sprint 1 - I have started reading and doing some initial research on this topic, however, I have not completed any products or documentation specifically related to it at this point.
5. Security by Design - **Orienting**
   * What I need to prove? -
   * Evidence:
   * Reasoning:
     + Sprint 2 -
     + Sprint 1 - I have started reading and doing some initial research on this topic, however, I have not completed any products or documentation specifically related to it at this point.
6. Distributed Data - **Orienting**
   * What I need to prove? -
   * Evidence:
   * Reasoning:
     + Sprint 2 -
     + Sprint 1 - I have started reading and doing some initial research on this topic, however, I have not completed any products or documentation specifically related to it at this point.

# **General reflections**

In this section I will explain my general reflections on the process and the projects. I will give my insights into the development stage, how far I have progressed and what needs to be done next. This section will be split into **Sprints** so that my progress can be observed easily.

## **Sprint 2**

**Individual project**

Current state: My current progress of my personal project so far is that I have one of my services created and it is tested. I have established the main architecture approach and the main structuring of the project has been done so far. I also have a CICD pipeline that can build, test and create a docker image of my application. I have also created the Project Pitch, Project Plan, Research Plan and User requirements. Establishing the structuring of the documentation such as this reading guide of my portfolio has also been a big part of my personal work so far.

Next steps: The next steps that I want to focus on are mainly to do with creating the first needed researches and adding more to the current HeardIT application. I want to properly establish the needed databases, services and other back-end related activities, some improvements to the front-end and finishing the CD part of my pipeline.

**Group project**

Current state: My current progress of the group project has been mostly related to establishing the initial requirements and exploration activities. I have been involved into creating the Project Plan, establishing the user requirements, communicating with the stakeholders, establishing the tools that my team uses such as Jira, Teams Chat and so on. I have been a part of the creation and presentation of the sprint review and project introductions that we have done so far. I have also been learning how to use Golang and I have spent a significant amount of time getting to understand the handover project that was given to us.

Next steps: The next steps that I want to focus on about the group project is creating the generation of the Kubernetes YAML files since this will be a major part of the project. In terms of communication I believe that proper interactions between team members and the team and the stakeholders takes time so I will be spending some time getting to know my team better and improving both the internal and external communications.

## **Sprint 1**

**Individual project**

Current state: My current progress of my personal project so far is that I have one of my services created and it is tested. I have established the main architecture approach and the main structuring of the project has been done so far. I also have a CICD pipeline that can build, test and create a docker image of my application. I have also created the Project Pitch, Project Plan, Research Plan and User requirements. Establishing the structuring of the documentation such as this reading guide of my portfolio has also been a big part of my personal work so far.

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# **Conclusion**

To conclude my portfolio reading guide, I have established the main structure of it and the main sections that will be a part of it. During the semester this portfolio will be continuously updated so that it reflects the current status of my projects and my progress related to the learning outcomes.