
Flagship

Vision Document
Team 1

Version <1.1>

Photo management application	Version: 1.1
Vision	Date: 15.04.20

Revision History

Date	Version	Description	Author
28.02.20	0.1	Initial Draft	Lars Bråten, Karl Labrador, Mats Eide, Eivind Berger-Nilsen, Robin Vold, Arvid Kirkbakk
20.03.20	1.0	Edits and additions based on feedback	Lars Bråten, Karl Labrador
15.04.20	1.1	Minor edits	Lars Bråten, Mats Sollid Eide, Arvid Kirkbakk

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Vision

1 Introduction

This document describes the requirements for our project assignment in the course Systemutvikling 1, IDATT 1002. The group has been tasked with creating a Java application that will in many ways function as a database for images. It should be able to register and remove images from the database. Furthermore, the metadata from the images are to be stored in an external database. Finally, one should be able to create a PDF document with images chosen by the user.

The product we make will be similar to several other solutions, but will serve as an alternative to other products, which can satisfy certain users more than other solutions which are already on the market.

The aim of the project is to gain experience in working on a larger project. In addition, it will involve programming according to technologies the team is not familiar with, including programming against file systems, MySQL databases, and JavaFX.

1.2 Definitions, Acronyms and Abbreviations

Term	Definition
MySQL	A relational database management system.
SQL	Structured Query Language. Used to communicate with a database.
JavaFX	Java library for creating a GUI for our application
GUI	Graphical User Interface
Maven	Software project management and building tool.
Metadata	Text information that is embedded into an image file.
JVM	Java Virtual Machine

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1.3 Overview

In the following chapter, this document will describe which problems our solution will solve. After this, the team will describe the project goals. Later, Stakeholders and User descriptions will be presented before a product and features overview where we will discuss our product in more detail. Then we will discuss constraints, quality ranges and the order of the features we will prioritize during the production. The finishing chapters will be about other product requirements and documentation requirements the team will produce along with the application.

2 Positioning

2.1 Problem Statement

The product is a solution to a problem that has already been solved by other applications. For example, some planned features are included in apps such as Google Photos and Photos for iOS.

A feature that may be unique is the planned feature where the application will be able to generate a PDF document that consists of all images in an album.

2.2 Product Position Statement

For	end users
who	need a solution to organize images, create albums and search images with a variety of criterias.
The product	is a photo management application that runs on any computer with JVM 11 or newer
that	lets the user manage their locally saved images and filter or search images based on metadata.

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3 Project Goals

3.1 Efficiency Goals

A. Customer goals

1. Achieve 90% customer satisfaction by the end of the project.

We want to create our projects according to the timetable and specifications defined in conjunction with our customer's wishes. We should therefore endeavour to be realistic and honest towards the customer at all times. It is preferable to have a longer initial deadline than several unnecessary delays. To accomplish this, we must come prepared for any and all client meetings. Which software are we going to use, what are our current skill sets, what will we need to learn by the end of the project, and what might our client wish for.

B. Team goals

1. Stay ahead of deadlines - Prevent overbearing last minute workload - Prioritize correctly

To complete the project goals in as short time as possible we will focus on finishing tasks where we already have some form of competence or experience. While we are working on these tasks we need to identify other areas, and what the priorities for these areas will be.

2. Achieve general group experience and knowledge

Once a list of priorities is established we will split our attention between working on previously defined tasks and learning how to code/use/setup remaining systems.

Considering the fact that this is primarily an educational project, we should not shirk from hard tasks and endeavour to be as thorough as possible. Everything we learn here can be brought with us into the future.

3. Keep all members updated on new knowledge and information from each field

Whenever a module or set of modules are completed we will discuss and explain the functionality and thought-process during the next group meeting. Additionally, any unusual findings or interesting points ought to be brought up to the rest. This will ensure that every member is educated on all parts of the process.

4. Keep group morale high

This is defined in our collaboration agreement.

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3.2 Result Goals

A. Produce a finished product

The primary concern of this project is to create a working application according to customer specifications. Every other goal we have is connected to this. I.E if we complete the project in a timely manner we will increase our knowledge and expertise, as well as getting top grades.

B. Achieve grade A

By completing the project in a timely manner and showing understanding of the project process, JDK, system development and customer relations the team will be able to achieve a high grade.

C. Increase wealth of knowledge

This project will give us the opportunity to work with several different tools, development kits, programs and databases. Examples include, but are not limited to, Maven, JavaFX, JDK, JDBC, Hibernate and MySQL. Working consistently and intelligently with all the components of this project will contribute knowledge relevant to this goal. The purpose of this goal is to set a standard for learning and become better developers.

3.3 Process Goals

1. General Process
 - a. Planning - Meeting
 - b. Documentation
 - c. Implementation
2. Prevent excessive code migration by using Hibernate as ORM technology.
3. Use JDK 11 for back-end programming. Mostly to keep built-in compatibility with Maven and JavaFX.
4. Build a working database communicator
5. Create an image metadata reader with Java

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4 Stakeholder & User Descriptions

4.1 Stakeholder Summary

Name	Description	Role
Teacher	Client/Expert advisor	Advising the team during the development of the product.
The team	Developers of the product	Planning and developing the product.

4.2 User Summary

Name	Description	Development Role	Represented by
End User	End User	Sets the feature requirements of the product	Product Owner
Developer	A team member	Developing the product and decision making for the project	The team
Teacher	A lecturer for the course IDATT1002 at NTNU	Supervises the development of the product	Themselves

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4.3 User Environment

The computer system of the end user requires the Java Runtime Environment and a stable internet connection.

4.4 Stakeholder Profiles

4.4.1 Product Owner

Representative	Grethe Sandstrak, Nils Tesdal, Alexander Holt
Description	Product Owner
Type	Client/Commissioner
Responsibilities	Presenting a set of feature description and requirements for the product that has been commissioned.
Success Criteria	The project is deemed a success if all the specifications in the assignment have been fulfilled within the project timeframe.
Involvement	Reviewer
Deliverables	Documentation and MVP during the project timeframe.
Comments / Issues	No comments.

4.4.2 Teacher

Representative	Grethe Sandstrak, Nils Tesdal, Alexander Holt
Description	Expert Advisors
Type	Expert Advisors in the development field.
Responsibilities	Advising the team during the project.
Success Criteria	The project is deemed a success if the team meets the assignment deadlines and produces a finished product along with required documentation and a team report.

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Involvement	Reviewer / Advising
Deliverables	Feedback to the team.
Comments / Issues	No comments.

4.4.3 The team

Representative	Lars Bråten, Robin Vold, Karl Labrador, Eivind Berger-Nilsen, Arvid Kirkbakk, Mats Eide
Description	Product Developers
Type	Developers
Responsibilities	Developing a product and producing documentation and reports according to the client's specifications and the teacher's requirements for a successful project within the given timeframe.
Success Criteria	The team measures success according to the Collaboration Agreement, including fulfilling all requirements and specifications of the project, and meeting project deadlines.
Involvement	Involved in all aspects of the development of the product.
Deliverables	A product that meets the requirements and documentation.
Comments / Issues	No comments.

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4.5 User Profiles

4.5.1 End User

Representative	Stakeholder: Product Owner
Description	End User of the product
Type	Owner/commissioner of the product
Responsibilities	N/A
Success Criteria	All the user needs/requirements are met with solutions
Involvement	N/A
Deliverables	Feedback to the team
Comments / Issues	No comments.

4.5.2 Developer

Representative	Stakeholder: The team
Description	The developer of the product
Type	Developer/Tester
Responsibilities	Developing the product according to the assignment requirements.
Success Criteria	Optimizing/improving the product based on testing from a user perspective to meet project goals
Involvement	Developing the program, producing documents
Deliverables	The program, a user manual, vision document, meeting notices, and worklists
Comments / Issues	No comments as of yet.

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4.5.3 Teacher

Representative	Stakeholder: Teacher
Description	An advisor that gives feedback on a technical level
Type	Reviewer/Advisor
Responsibilities	Give feedback to the team
Success Criteria	The team passes deadlines and completes project phases/iterations.
Involvement	Supervising the team developing the project
Deliverables	Feedback to the team
Comments / Issues	No comments.

4.6 Key Stakeholder or User Needs

4.6.1 Key User Needs

Need	Priority	Concerns	Existing Solution	Proposed Solution
Register images	High	Images	None	The user may register images to a database
Search images	High	Images	None	The user may search via a text field
See search results	High	App	None	The user is presented the search results
See/edit tags	High	Images	None	The user is presented tags based on metadata
Add image to an album	High	Albums	None	The user can tag/use a checkbox to add an image to an album

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Generate a PDF document with all images from an album	High	Albums	None	The app generates a PDF document
Automatically add tags based on metadata	High	Images	None	The app reads the metadata of the image upon image registration
Interactive map based on geolocation metadata	Medium	Map	None	The user is presented with an interactive map with geolocation pointers
See all images	High	Images	None	The app presents a grid view that consists of thumbnails of the registered images
See an image in full size	High	Images	None	The app presents the image in full size
Share an image to social media	Low	Images	None	The app presents a share button
Image thumbnails	High	Albums/Images	None	An image is represented by a thumbnail

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5 Product Overview

5.1 Product Perspective

The product will take the form of a standalone desktop application. It will communicate with a MySQL database and Google Maps to carry out some of its features, and possibly 3rd-party sharing services.

5.2 Summary of Capabilities

The application mainly offers capabilities which are already present in numerous other widespread image management applications. The main benefits will likely arise from the planned map functionality built into the app, which is an aspect that is not typically present in mainstream image applications. Table 5.2.1 presents an overview of the key customer benefits which the product provides.

Customer benefit	Supporting features
Yields a quick and easy way to browse images by area rather than by date, which may be useful if the user is unsure about the date of an image.	Images containing geolocation as part of their metadata can be shown on a map displaying where the image was taken.
The application will likely be small and lightweight.	The application will probably be focused around a limited amount of key features, and otherwise be rather stripped down.
Lets the user organize their images by different criteria.	Using the tag and search feature in combination allows for picking out a custom selection of images.
The user can directly save images in PDF format, rather than needing to go through the trouble of using an external conversion tool.	Saving albums as PDF is a key feature.

Table 5.2.1

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5.3 Assumptions and Dependencies

The product is going to depend heavily on the integration with MySQL in order to function properly. Having lasting access to the MySQL database is therefore an assumption that the entire project currently relies on. Access to Google Maps is another dependency to a key feature of the application.

5.4 Risk analysis

A number of conditions and events may cause serious issues during development, or even render the current design for the application unusable. This section contains a brief description of the difficulties that may occur, as well as an evaluation of their probability of occurring and the gravity of their consequences.

1. Problems regarding the implementation of Google Maps. Connectivity to Google Maps from a desktop Java application is something the team does not have any prior experience with. Its planned inclusion is only based on a quick internet search which indicates that such functionality is implementable. There is a wide range of potential problems concerning this connectivity.

In the worst case scenario, all communication with Google Maps fails, and the map functionality must be dropped. The rest of the application would still work in this case, seeing as the map function is an addition to the core functionality rather than part of it. Some issues regarding this risk are likely to occur, but since the planned map functionality is loosely defined, we can likely develop workarounds depending on the problems we are faced with.

2. Inability to present a user friendly file selection system to the user can occur. This problem may arise due to platform differences. If we fail to implement a proper file interface, we can always ask the user to pass in the name of the file directory instead. This would be detrimental to the user experience, but it is not going to be lethal to the product.

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3. There might be problems regarding the access to the MySQL database. This would render the application completely broken, as it is a paramount piece to the program, as well as a listed requirement for the project. This scenario appears unlikely, especially since we have already performed basic tests using a MySQL connection from a Java application.
4. There are also risks that are unrelated to the core technology utilized in the project, such as team members forfeiting the project. All six team members are currently motivated to carry through with the project, and even if a team member leaves, we still carry enough general expertise to fill the gap. Thus, such an event appears both unlikely and of milder consequence.

Problems	Possible solutions
Difficulties implementing Google Maps	Develop workarounds. Google Maps is not essential for the project's success, thus the team can look for other solutions if need be.
Inability to present a user friendly file selection system	This would be detrimental to the user experience, and therefore would also impact our grade. Should we not be able to present a user friendly file selection system, we would have to move all our resources into finding a suitable solution.
MySQL database connectivity issues	Although unlikely, it is important to get this working as good as possible. The team has already completed some basic tests using a MySQL connection, so we are confident in saying it will work. Should this not work, the team must immediately seek the expertise of a study assistant or lecturer, as this is a vital part of the application.
Losing team members	Since we have several team members with similar skill-sets, this would not be detrimental to the project.

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Each of the discussed risks are displayed in the diagram shown in figure 5.4.1. This diagram visualizes the probability versus the severity of each risk. The top right of the diagram contains risks which must be taken into careful consideration as early on as possible, while the risks towards the lower left are of lesser concern.

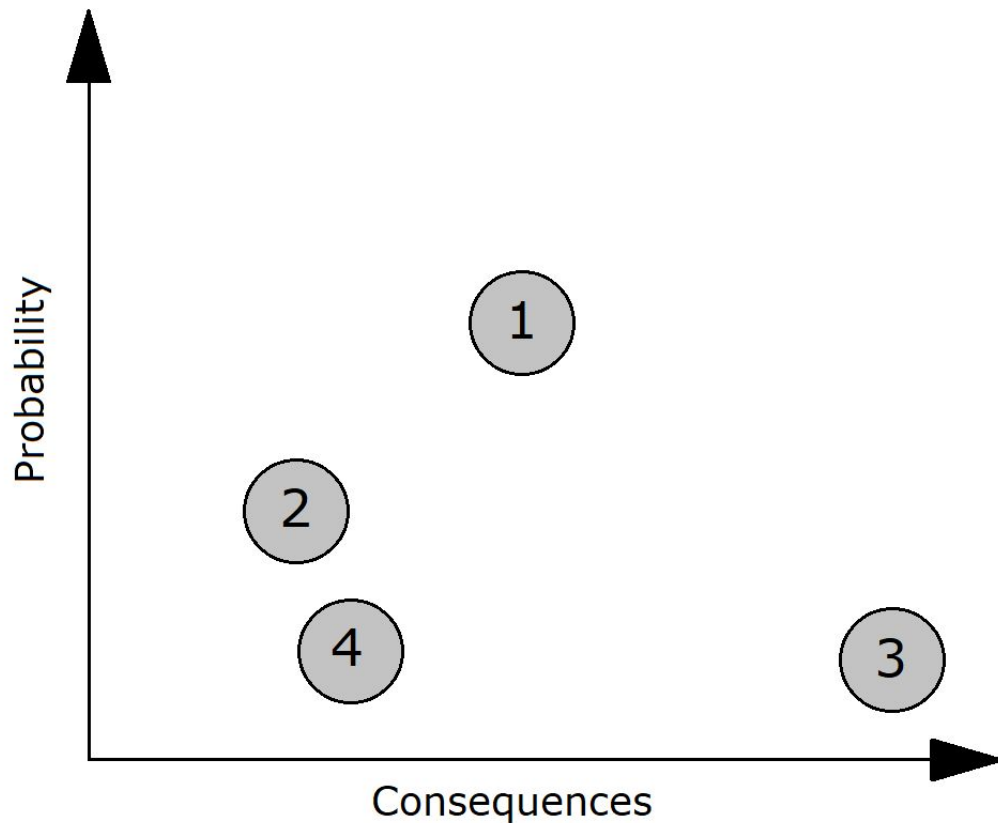


Figure 5.4.1

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5.5 Licensing and Installation

The installation of our application is only going to include a single .jar file. No external programs will be required in order to enjoy the full usability of the application. The exception to this is the Java virtual machine, but seeing as this is already installed on most machines, it will not be bundled with the installation of our application. Given the nature of the Java virtual machine, the installation process will be similar regardless of the platform.

For Windows, we may wrap the jar file in an exe file in order to display a custom application logo.

Due to the narrow, academic scope of the project, there are currently no plans regarding licensing of the product.

5.6 Estimated Costs

The project assignment allows the team to spend approximately 150 hours per team member, with the possibility of going above or below this number by 10%. Each team member's hourly rate is NOK 1470. As the team consists of six members, the estimated cost of the project is NOK 1 323 000.

6 Product Features

6.1 Picture management

The foundation among most features included in this application is heavily tied to the pictures provided by the user. The purpose of this product is solely to organize provided pictures, and then output them back to the user in a more pleasing manner. To be more specific, the application should provide importing capabilities to retrieve only the metadata of selected pictures, then organize them with respect to their attributes. Then provide user-friendly ways to review them.

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6.2 Picture overviewing

6.2.1 Map view

The user shall be presented with two different viewing layouts. By incorporating geodata residing in the picture metadata, the application will be able to plot and overlay imported pictures on a map grid. This provides an intuitive way to keep track of photos with respect to their location data.

6.2.2 Grid view

While providing a map view may afford benefits when location is key, the user may not always care about this attribute. Map view inherently constrains the space for thumbnails, or rather the content of the pictures themselves. Grid view provides an overview of imported pictures with clear thumbnails, allowing the user to rapidly skim over their content instead.

6.3 Picture sharing

The user may possess cloud storage, social network services, photo editors or any photo-capable software in general, and maybe require a quick way of transferring pictures to these services. The feature “Picture sharing” interfaces with compatible software in order to make this as easy as possible.

6.4 Exporting images to a PDF

The application provides PDF exporting capabilities.

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7 Constraints

Hardware limitations:	Legacy hardware may not support JVM 11, or be too slow, rendering it incompatible.
Software limitations:	Software is written in Java 11, making it incompatible with older versions.
Server downtime:	SQL server downtime renders the program unable to retrieve metadata. As no local copy is maintained, this will affect the whole application. Secondly, our application uses Google Maps as a map host. However unlikely downtime may be, it is still a contingency which may affect the usability of the software.
Java/JavaFx limitations:	As most, if not all team members are novices in full stack, certain features may prove challenging to implement. The coding languages may also be subjected to limitations which we are unaware of.

8 Quality Ranges

To ensure maximum usability for the end user, the team will as much as possible apply the principles of WCAG (Web Content Accessibility Guidelines).

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9 Precedence and Priority

The requirements given in the project assignment take precedence over the features the team has established on their own. Among the given requirements, the ones that are essential for the core functionality will be prioritized during the workflow of the project. Self-established features will be prioritized according to their level of impact on the impressiveness of the application. By these factors we outline the following rough list of feature priorities.

1. Saving image metadata in the MySQL database. This is the key feature which the project builds upon.
2. Adding/deleting images. The program is unusable without this central feature.
3. Grid view. This feature is vital for the usability of the program.
4. Searching for images. Improves usability a lot.
5. Tagging images. A feature that corresponds well with the searching feature.
6. PDF album generation. A useful feature which can be further polished with features of its own, but the application is also perfectly usable without it.
7. Map view. This is our most ambitious feature and important in order to give the application usage which spans beyond what competing programs can do.
8. Sharing images. A practical feature, but not the most exciting.

10 Other Product Requirements

10.1 System Requirements

Since the program will be written in Java, an installation of the Java virtual machine is required in order to run the bytecode. The system must also have the ability to connect to the internet, so that the application can connect with the database, among other necessities. The hardware requirements are expected to be low, as the program is not expected to feature advanced graphical or computational demands.

10.2 Performance requirements

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The application will need to run at a smooth and stable framerate in order to secure a pleasant user experience. While the program is performing time-consuming tasks which momentarily prohibits active use of the program, such as on startup, the user must be presented with loading screens or similar solutions which make for a more seamless experience. The startup process of the application may not exceed ten seconds. Additionally, the program should never crash by the means of regular use of the application, although crashes caused by more unpredictable factors may not always be prevented.

10.3 Non-functional requirements

The project's data storage solution is required to use ORM technology, such as Java Persistence API (JPA). Our project will be using the Hibernate framework to use JPA, and use IDI's MySQL server to host the database.

All classes need to have JUnit tests. User Interface drafts (Wireframes) and iterations will need usability tests.

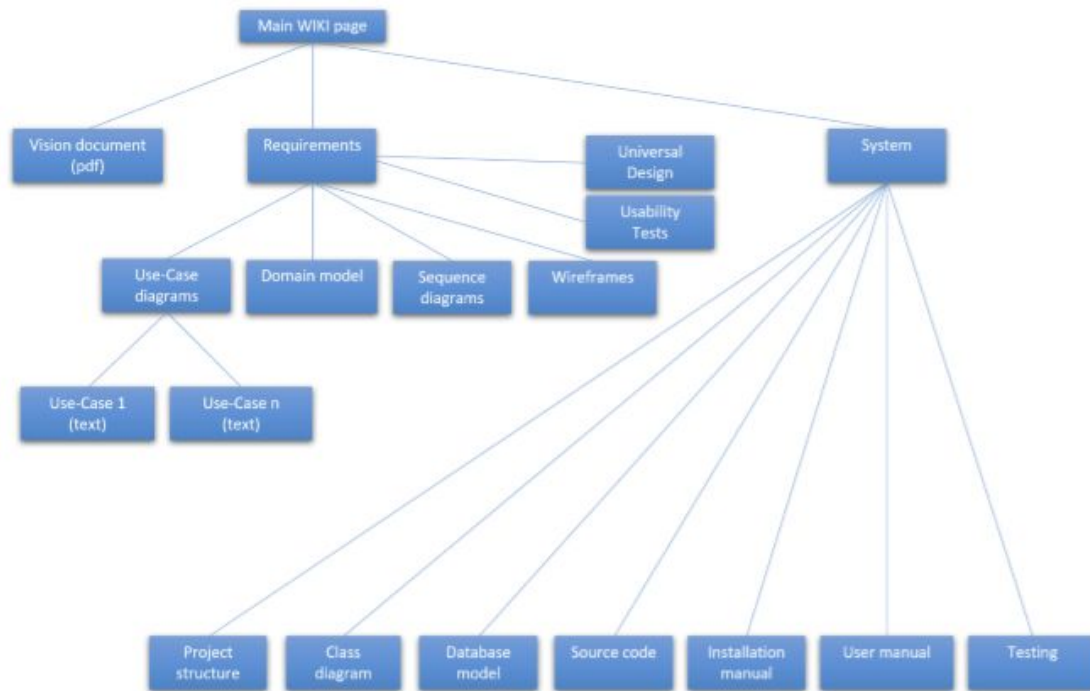
To achieve universal design, the team will design the application according to WCAG 2.1 principle 1 - Perceivable, while simultaneously relating to Don Norman's principles of interaction design which are based on visibility, feedback, constraints, mapping, consistency and affordance.

Delivered documents when the project is over:

- Main Report
- Collaboration Agreement
- Project plan in the form of a Gantt-chart
- Timesheets with status reports for each team member
- Meeting invitations and minutes
- Vision Document
- Link to GitLab Wiki, with content based on requirements

The Gitlab Wiki will be based on the following structure as stated in the project assignment:

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All text documents are required to be merged into one PDF file named idatt1002_2020_team1.pdf.

11 Documentation Requirements

The User Manual for the application will include simple instructions and descriptions of the product features and will be published on the project's GitLab Wiki as an article.

The Installation Manual for the application will include straight forward instructions in a tutorial style and will be published on the project's GitLab Wiki as an article.