**Project plan**

***<<Fall Internship>>***

*<<Fontys Engineering>>*

***<<Eindhoven>>***

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#### Version

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**Communication**

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# Project Assignment

## Context

Fontys University of Applied science has various studies available for students to choose from such as ICT, mechanical engineering, mechatronics engineering and so forth. Naturally they would want to advertise themselves to both companies and incoming students. The students are responsible for making new innovative systems and projects. Currently one of these projects is the “Flexible Automated Future Factory (FLUFFY)”.

The problem arises when Fontys wants to showcase this system. Due to its large size, it is difficult to relocate and showcase to companies. For this reason the project “Mini-Fluffy” was begun. The mini-fluffy, as the name states, is a miniature version of the FLUFFY system with only the base of the factory in place. The Mini-Fluffy is a way to showcase the main FLUFFY system because of its size making it easy to transport around. This project was a combination of mechatronics students building the system and programming it with simple functionalities and ICT students refining this program and added more in-depth logic and providing HMI functionalities.

The Mini-Fluffy system is not complete however with all of these innovations. Unlike the FLUFFY system, it lacks a robotic arm to perform simple automation tasks and showcase. The internship assignment aims to connect this robot arm to the mini-Fluffy so that it can perform automation tasks and give a better understanding of the FLUFFY system in the showroom.

## Goal of the project

The context of the assignment is to connect a robotic arm (most likely a DOBOT MG400) to the existing Mini-Fluffy system and program this again using the built-in PLC to program the functionality of this arm to make this system a better representation of the actual fluffy system. The desired finished product will have the system functional with the DOBOT arm performing automation tasks, for example, assembling components integrated with the previous Mini-Fluffy software.

## The assignment

*<<Formulate the assignment. The assignment definition itself should consist of a text that is as short and concise as possible in which the assignment is clearly formulated. What are the specific requirements/wishes of the client at the start of the project? What are the minimum (quality) requirements that the end result must meet? You may already provide a list of functional and non-functional requirements for the end product as an attachment>>*

*EXPLAIN THAT THE ASSIGNMENT IS TO figure out and CONNECT THE ROBOT, HAVE THE STOPS HAVE PARTS READY, AND THEN ASSEMBLE PIECES USING THE ROBOT.*

***Fill with requirements (functional and non-functional)***

## Scope

|  |  |
| --- | --- |
| **The project includes:** | **The project does not include:** |
| 1. Robot arm functional Mini-Fluffy | 1. HMI for the robotic arm. |
| 1. documentation |  |

## Conditions

*<< Indicate, where necessary, what the preconditions are. For example, consider technology set by the company. Note that a critical attitude remains important here!>>*

All the necessary technology will be provided by the company. This includes, an operational Mini-Fluffy system, a functional DOBOT MG400, cables, an air pump, and the software necessary to program the DOBOT MG400 with.

## Finished products

The finished product would be that the Mini-Fluffy now has an operational robot arm connected to it, performing an automated assembly task. Most, if not all, requirements are met at the end of the internship. The new source code will be cleaned up and reuploaded as the new main source code for the system in the git. A zip file of the completed new product will also be created and provided. Every relevant documentation will also be provided.

## Research questions

*<<Describe the most important research questions you want to answer during your internship. Define a main question with sub-questions derived from it. Keep in mind that you will be doing investigative work during your entire internship, and that your questions will therefore concern your entire trajectory. During your internship/graduation, more research questions may be of interest and others may turn out to be less relevant. Describe only the key research questions that will have the greatest impact on your project. Other research aspects can be elaborated in more detail during your internship and can then be explained with a short substantiation (in your portfolio or orally). >>*

# Approach and Planning

## Approach

Planning of this project will be done using a Trello board to maintain all tasks to be completed. Additionally, the usage of the **scrum method** will be implemented. The intern and the company mentor will have a meeting each week to discuss the intern’s progress. At the end of each sprint, the intern will have a meeting with the Fontys assessor to discuss their progress. The length of sprints will be 2 weeks per sprint, totalling the amount of sprint to 8 sprints.

Ideally a demo is given at the end of each sprint. The bare minimum to show is how the intern has progress and improved their learning outcomes.

## Research methods

*<< Describe (per research question and for the entire project) which methods (see ictresearchmethods.nl or cmdmethods.nl) you will use to answer the most important questions within your project (= how you will substantiate the most important choices). Do not only mention the method, but also briefly explain how you will use it (e.g. who will you interview and for what purpose?). Of course, your approach can still be adjusted during your internship.>>*

## Learning outcomes

The internship is met with learning outcomes that the intern needs to progress in. The progress for each learning outcome must be described in a personal portfolio of the intern. The learning outcomes and their descriptions are the following:

1. **Professional Duties:** You carry out the **professional duties on a junior bachelor** level resulting in **professional products in line with the IT-area** you are working in.

**Professional duties on a junior bachelor level** = All or a subset of the activities Analysis, Design, Realize, Advise, Manage & Control. As a reference use: 1) the HBO-I framework on proficiency level 2, 2) the level as required in OE3 or OE4.

**Professional products** = end products and intermediate products as a result of the professional duties.

**In line with the IT-**area =  You deliver professional products that are characteristic for the IT area of your project. As a reference use: 1) the HBO-I framework on proficiency level 2, 2) the professional products required in OE3 or OE4.

1. **Situation-Oriented:** You **apply** your previously acquired knowledge and skills in an **authentic** **context** to deliver **relevant** results for the project and company.

**Apply** = You work in a methodological and structured way, adapted to the processes and way of working of the company.

**Relevant**  = Your work is relevant for one or more persons.

**Authentic** **context** = you are embedded in an IT environment and work on a given IT problem with multiple stakeholders.

1. **Future-Oriented Organization:** You explore the **organisational** **context** of your project, make **business**, **sustainable** and **ethical** **considerations** and **manage** **all** **aspects** **of** **the execution** of the project.

**Organisational context** = you identify the business domain and stakeholders of the project and know its business legitimisation

**Business, sustainable and ethical factors**= you take into consideration business, sustainable development and ethical aspects in your judgement process using standards or methods/tools (e.g. TICT).

**Manage execution** = you create a project plan and monitor your project including the research activities, time, money, risks and the quality of the solution which is valuable for the organisation.

1. **Investigative Problem Solving:** You take a critical look at your project from **different perspectives, identify problems**, find an effective approach and arrive at **appropriate** **solutions**.

**Identify problems** = Throughout all phases of the project, initially by identifying the problem/opportunity of the client, defining the main scope of the project and formulating the related research questions, and during the project by identifying newly encountered problems/challenges and formulating more in-depth or detailed research questions.

**Different perspectives and effective approach** = you use a variety of research strategies, methods and activities (reference: [https://ictresearchmethods.nl/The\_DOT\_FrameworkLinks to an external site.](https://ictresearchmethods.nl/The_DOT_Framework) ) in a structured way in order to find justified answers to your research questions.

**Appropriate solutions** = you use the results from your research to create valuable solutions and validate these with the relevant stakeholders.

1. **Personal Leadership:** You are **entrepreneurial** around your projects and personal development, you **pay attention to your own learning ability** and keep in mind what kind of IT professional and/or what type of positions you aspire to.

**Entrepreneurial** = you take the lead in your own project, both planning as well as content wise.

**Pay attention to your own learning ability** = you can reflect on your own actions, ask and receive feedback on your actions and look for further opportunities and possibilities that flow from that feedback and that you are aware of your development as an IT professional.

1. **Targeted Interaction:** You determine which **partners** play a role in your project, collaborate constructively with them and **communicate** **appropriately** to achieve the desired impact.

**Partners** = the different stakeholders in the project to which you pay attention to and whose interest in the project are clear to you.

**Communicate** **appropriately** = you make sure that your communication has the right impact and execution.

## Breakdown of the project

The internship will be split between 8 sprints. Each sprint has 2 weeks. Each sprint’s focus will be different or more or less the same. These will be described below when appropriate.

**Sprint 1:**

Plan the internship out as much as possible. Set the requirements and the definition of done regarding the internship project.

Get acquainted with the Dobot MG400.

**Sprint 2:**

**Sprint 3:**

**Sprint 4:**

**Sprint 5:**

**Sprint 6:**

**Sprint 7:**

**Sprint 8:**

**Final sprint:**

# Project Organization

## Team members

|  |  |  |  |
| --- | --- | --- | --- |
| **Name + Phone + e-mail** | **Abbr.** | **Role/tasks** | **Availability** |
| *Johnson Domacasse,* [*j.domacasse@fontys.nl*](mailto:j.domacasse@fontys.nl)*,*  *+31 644 551296* | - | *Intern* | *Monday-Friday from 9:00 to 17:00* |
| *Omar Idoum*  [*o.idoum@fontys.nl*](mailto:o.idoum@fontys.nl) | - | *Company Mentor/Product Owner* | *Upon request.* |
| *Sachin Bhardwaj*  [*s.bhardwaj@fontys.nl*](mailto:s.bhardwaj@fontys.nl) | - | *Fontys Assessor* | *Upon request* |
| *Paul Aretz*  [*p.aretz@fontys.nl*](mailto:p.aretz@fontys.nl) | - | *Internship Coordinator* | *Upon request* |
| *Agnes Berendsen*  [*agnes.berendsen@fontys.nl*](mailto:agnes.berendsen@fontys.nl) | - | *Adaptive Robotics Lectoraat Leader* | *Upon request* |
| *Randy Kertjens*  [*r.kerstjens@fontys.nl*](mailto:r.kerstjens@fontys.nl) | - | Backup Company Mentor | *Upon request* |

## Communication

The agreement with the **company mentor** is that there is a **weekly** meeting between them and the intern. The date and time of the meeting may vary. The agreement with the **Fontys assessor** is that there will be a **bi-weekly** meeting between them and the intern. The date and time of the meeting may vary. Each meeting will have an agenda available 24 hours prior for the attending parties. After the meeting has concluded, the minutes will be composed and are made available for all parties to access as well.

Additionally, there will be two dates that are set by the intern which the Fontys assessor will visit the company. One to discuss/approve the project plan of the student and evaluate the internship grounds. The second to present the final results and so the company mentor can give the grade indication for the intern.

Only in emergency circumstances, will the Adaptive Robotics Lectoraat Leader and the Backup Company Mentor be contacted.

## Test environment

*<<omit this section if not applicable>>*

*<<Describe what the test environment looks like. A picture generally gives the best overview. Also record to what extent you use a CI/CD environment (self-developed or using an existing system)>>*

*<<Describe which products are included in the test environment. These can be products that the project produces, but also external products that are necessary to perform the test approach (e.g. computers) .>>*

***To be determined.***

## Configuration management

The code that will be written for this project will be kept within a repository that is available at all times to all Fontys assessors as well as the company mentor. Additionally, a backup zip file including everything in the code base will be zipped and provided to all the above mentioned parties.

Git will be used in this project to facilitate version control regarding the project. Additionally, the project will be zipped and named different versions for every milestone that is achieved as a backup.

# Finance and Risks

## Cost budget

(currently all know hardware is available.)

### Internship Allowance

The current internship here at Fontys has agreed to pay the person doing the internship a total sum of **€500**. This amount corresponds to a 9:00 to 17:00 workday.

## Risks and fall-back activities

Below are the risks that can occur during this project. The plans for prevention along with fall-back activities is provided for each risk.

|  |  |  |
| --- | --- | --- |
| **Risk** | **Prevention activities included in plan** | **Fall-back Activities** |
| 1. The company mentor gets sick for more than 5 days. | Arrange for a backup mentor in his place. | Contact Fontys assessor about the situation. |
| 1. The Fontys assessor gets sick for more than 5 days. | Continue working on the project. Contact internship coordinator about the situation. | Contact internship coordinator about the situation. |
| 1. The Dobot has a malfunction on one of the days. | Treat it carefully and have a backup Dobot in place. | Have video recordings and backup files to replicate the process on a different Dobot. |
| 1. The Mini-Fluffy has a malfunction | Treat it carefully. | Contact company mentor to have it fixed as soon as possible. |
| 1. Time shortage | Have a good planning on which days what will be done and continuously update the Trello board with tasks to be done. | Plan to come in early or stay extra hours on work days. |

# Other

*<< Describe here everything that is relevant but that you cannot put elsewhere in the document.>>*