Personal Development Report

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Smart Industry and IoT Specialization Semester 4

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Document update history

Update Date	Version	Comments
23/02/2024	0.1	Personal information
08/03/2024	1.0	Modules Chosen
28/03/2024	2.0	Orienting Progress

Contents

1. Persona

Hi there. My name is Johnson Domacasse. I am a student at Fontys university of applied science. I am currently in my 4th Semester. In this section I will tell you a bit more about myself.

My hobbies include spending time with my friends. Usually this is in the form of video games. Otherwise, we spend time with each other personally.

Before this study I did Mechatronics for one year at Fontys Engineering. This was because I have a lot of love for electronics and all that come with them. The reason for the change was because at the time, I didn't like the direction the physics part of the study was going. I changed to ICT and chose technology because in short, its basically Mechatronics without the physics. I do miss the application of mechanical skills to projects.

My skills range from both technical and professional. My technical skills include everything I have done so far in my school career at Fontys. I will list the ones that come to mind but there may be some I may have missed.

Technical Skills:

- Knowledge in both C and C++ (object-oriented) programming
- Knowledge in embedded register programming in C (STM32)
- Knowledge in communication protocols
- Knowledge in microcontrollers, actuators and sensors
- Minimal knowledge in 3D modelling
- Knowledge and affinity for 3D printing

Professional Skills:

- Knowledge in proper documentation of projects.
- Strong leadership skills within a project.
- Minimal experience in being a scrum master in the group.
- Knowledge in researching topics.

2. Smart Industry & IoT Context

What I understand from smart industry is that it mainly deals in industrial machines, manufacturing and production processes. A simple example of this is a factory that produces a product. Currently we are experiencing industry 4.0 because of the technology that is incorporated within this industry. This specialization for me aims to teach us as much about the current industry 4.0 as possible to prepare us for the potential coming of 5.0. In doing so, we as the future engineers are better prepared for new jobs that may come up in the future.

For now, my opinion on this study is that it will teach me a lot. Not just about the technical side of things but also other parts of an entire operation that I would typically neglect. These Include data that is being processed and used for different appliances. Another, would be the business side of the entire operation.

(rewrite what I think about what this specialization is all about when I have more experience and a better understanding within this domain).

3. Orientation

I would be lying if I said from the start I knew which modules I wanted to do. I did have a rough idea but I was not completely certain. Orientation gave me a chance to start the process of elimination for the five modules. I knew for certain I wanted to pursue the **module of M2M** simply because anything that has to do with hardware excites me. The second module was open for choices however I was leaning towards the **IoT module**. When I got the **data and machine learning module** I will admit, it was very interesting to me how data can be manipulated to do different things. How you can process it. How you can make it predict an event. How you can store it. I chose not to pursue this module because although it was interesting to know, it was very boring. When doing the first challenge, it would easily getting boring for me. To the point where the a 1 day assignment turned into 3 days of procrastinating. When I got the first class of the **HMI module**, I was not as interested in the topic as I thought I would be. There was only one subject that interested me and that was “Digital Twins” and how the technology is used in todays world. Aside from this I didn’t like the module. The challenges themselves were fine, but it is not something for me. The intelligent management module interested gave me a bit more interest compared to the HMI class solely because I personally like the idea of leading a team to success. It was one of the choices I was considering because with some management knowledge and skill that this course could provide me I could get further in my career. Finally, I decided to chose **IoT module** solely because the teachers assured me that IoT is not just a topic for hobbyists. I chose this one because it makes more use of hardware then the intelligent management class.

3.1 My ambitions this semester

As described in section 1 of this PDR, I am someone that has a strong affinity for electronic system in general. Almost every aspect of it intrigues me as to how they work and how it can relate other concepts I have learned throughout my lifetime.

With this specialization I hope to gain more knowledge in hardware programming in general and how this can work in the industry. I hope to maybe even use this knowledge in a potential project at some

point in the future. I want to gain more experience with working with a company on a project so I can understand how they work a bit better.

Since all of my semesters from here on out are going to be research based, I hope to get more knowledge in how I can apply myself in certain situations when I am met with a topic that I have minimal to no knowledge on.

Finally I am here to find out what my passion really is. I am interested in electronics, but also embedded programming to some degree. C and C++ programming as well. There are a number of things I am interested in but not one that I truly want to do for the rest of my life. I hope to have a better understanding of what that is at the end of this semester.

4.1 Module A : M2M Interaction and Control

My reasoning for choosing this module is because it aligns with my interests. As mentioned, I chose mechatronics previously because I enjoyed seeing big, and even smaller, industrial projects come to life. I made the change for personal reasons but I still miss the idea of seeing these projects come to life. In choosing M2M I feel like I am one step closer to what I love while still maintaining some distance from the physics. I enjoy coding projects. I enjoy having to come up with the idea on paper, implementing it, debugging it and re-implementing the new working version. The challenges given to me in orientation weeks were fun for me and when I asked, I was reassured that if I choose this module, then this would be the style I would be working with for the remainder of the semester.

As the semester evolves, you keep track of the knowledge you have gained in the field of this particular module. Keep it short and focus on the gained knowledge and not on delivered work (see also section 7).

4.2 Module B : IoT Communication and Infrastructure

My reasoning for choosing this module is because it aligns with my knowledge. Like the previous module, my interests also peak when I simply hear the name of the module. In semester 3 I already gained some knowledge on this topic however just the first lesson made me realize how much I don't know about this topic. This intrigues me and makes me want to learn more about it. On top of that, I always thought that this topic mostly applies to hobbyists. There is some truth in this case, however I underestimated how this topic can be applied in the industry. This makes me want to learn this topic to potentially pursue a career in it. This applies to the previous module as well. For these reasons I chose this module.

As the semester evolves, you keep track of the knowledge you have gained in the field of this particular module. Keep it short and focus on the gained knowledge and not on delivered work (see also section 7).

5. Industry project Mini-FLUFFY.

I chose this project out of the many because of a few key reasons. Some of these reasons can be applied to other projects as well but this project ticked all of the boxes for me.

To begin with it covers hardware. Specifically PLC programming. This seems to be one of my biggest interests this semester. So when looking at all of the projects, it was between this and the factory within the technology lab. Since both offer some type of PLC programming. The second reason is my background. I always had an interest in the mechanical, electrical and software side of projects. This project enabled me to be closer to my initial mechatronics study while maintaining the programming aspect. Compared to the smart factory, there are certain topics that are discussed here such as 3D models and digital twins that I am interested in. It also offers me to see a project being programmed from nothing to something in industrial automation.

I expect to learn more about PLC logic, programming, error-handling and both the structured text and ladder languages. Next to this I also want to improve my documentation skills, so on the side I am looking into making my documents on overleaf using the LaTeX format. Since no one likes to do documentation (but I do), I expect myself to be putting in a decent amount of work here while also maintaining the basic skills I mentioned above.

As the semester evolves, you keep updating the short summary of the knowledge and skills you are gaining, the work you are doing for the project, your own contribution, products or parts of a product, research, reports, documents you have delivered, etc. Make clear what your **own contribution** has been. Find a good balance between making a good short summary of your work supported by links and references to the work you have done and delivered.

6. Evidences Learning outcomes

During the semester you collect evidence which show your progress on the learning outcomes. You summarize the evidence per learning outcome and you indicate in which context (a module, a project or other context) it took place. You do that in the given table below which displays the LO's and their (general) description. Note that you can add as many as you like/need evidences and the three examples which are given in the template are only examples. Also make sure that you provide evidences from the different modules and the project, as the learning outcomes need to be demonstrated in different contexts and more than once.

Learning outcome	Evidence	Module/Industry Project /other	Self-evaluation
Analysis	Challenge 1: Bluetooth Low Energy. https://fhict.instructure.com/courses/13417/assignments/229840?module_item_id=994057 In this challenge I acknowledge that I did an excellent job analysing the concepts that revolve around this topic. I spent a lot of time researching what this concept was and fully understood it. When I finally reached the implementation phase, I could understand almost every little detail of what was happening.	Module B	Orienting
. .			
Design	Orientation Challenge: Tuning a P-Controller for a linear servo Control. https://fhict.instructure.com/courses/13417/assignments/229883?module_item_id=994008 In this challenge I will acknowledge that I did a fantastic job designing a state machine to make sure the program runs both efficiently and error free. This proves to me that I am able to sit down and think of different ways to make a system robust.	Module A	Orienting
. .			
Implementation	Challenge 2: LoRaWAN to The Thing Network. https://fhict.instructure.com/courses/13417/assignments/229837?module_item_id=994060 In this challenge I think I did a pretty good job of taking a project with quite some troubles to set up managed to get it working weeks before it is due. I did one of the extra assignments that prove that I am still capable of using the knowledge I have gained in the past.	Module B	Orienting
. .			
Professional Development			
Future orientation	Project: Mini-Fluffy. https://fhict.instructure.com/courses/13417/assignments/229892?module_item_id=994086 Not much can be said here other than us preparing to work on the actual project. Due to holidays there was not much to be done, however at home, I decided to look a bit further into the documentation. I also asked Oswald to see what a standard siemens S7-1200 was and he clarified some doubt I had with the project as well.	Project	Orienting
Investigative problem solving			

Personal leadership	Project: Mini-Fluffy (grades) https://fhict.instructure.com/courses/13417/assignments/229892?module_item_id=994086 Again not much can be said here about my personal leadership in the first few days. I think I did a pretty good job in maintain myself to the deadlines by working on my assignments decently early. So I am working on my own personal set goal of time-management. I think this is a good example I can give right now of my personal leadership.	Project	Orienting
Targeted interaction			

7. Sprint retrospectives of your total activities and work

Every three or four weeks (see the weekly planning) you will have a review/delivery/demo moment for the modules and for the industry project. For the modules these will be done with your module teachers, and for the industry project with the problem owner and your semester coach. After every sprint you will have a retrospective. You will reflect on **YOUR** progress, achievements, process, gaining knowledge, study load and study discipline, working method and the communication with your teachers, project group members and the clients. Include a summary of each retrospective in this document.

7.1 Semester Sprint 1 (wk4-wk6)

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7.2 Semester Sprint 2 (wk 7 - wk10)

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7.3 Semester Sprint 3 (wk11 – wk 13)

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7.4 Semester Sprint 4 (wk14 – wk 17)

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7.5 Semester Final delivery

8. Evaluation and Reflection

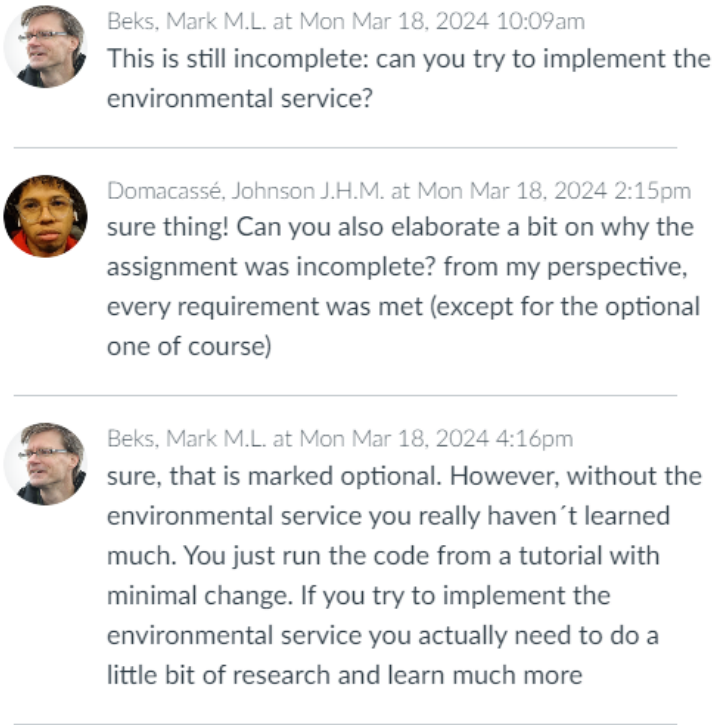
Add an evaluation and a reflection of your whole Smart Industry and IoT semester. Your evaluation describes what went good and bad during your process and how you dealt with that. Your reflection describes how **you** have grown as a person, and what **you** will take with you in your further professional career. In the reflection you should also shine a light on the following aspects:

Gaining technical knowledge

Improving professional skills

Problems solving capabilities

9. Feedback and Feed pulse



Here I receive feedback from my IoT teacher stating that the assignment I delivered was not complete. In the assignment itself it stated that one section was optional. This was an issue that was based on canvas and the GIT. I added the additional feature while also remaking my document to fit the “research” style documents. From here I just made it a standard for myself that if there was an “advanced” section In the assignment, that I would just make one or two.