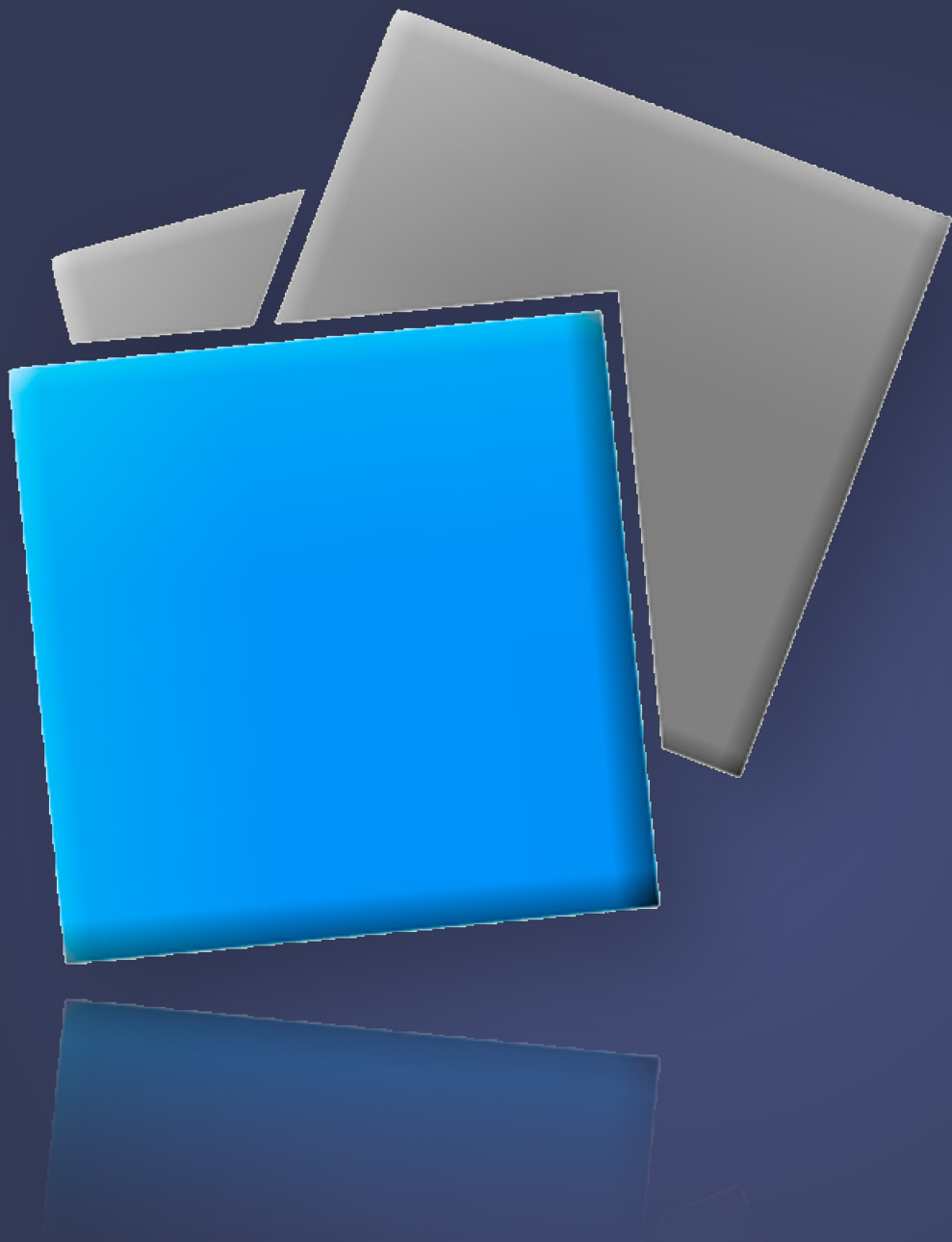


IMAIOS Internship

2018/19 Summer Term
Reflections



<i>## Thank You</i>	<i>2</i>
<i>## Reflective Journal 1: Organisation Reflections</i>	<i>3</i>
<i>## Reflective Journal 2: Team Reflections</i>	<i>4</i>
<i>## Reflective Journal 3: Business Reflections</i>	<i>5</i>
<i>## Reflective Journal 4: Customer Reflections</i>	<i>6</i>
<i>## Reflective Journal 5: Technical Reflections</i>	<i>8</i>
<i>## Reflective Journal 6: Final Thoughts and Internship Summary</i>	<i>9</i>

Thank You

IMAIOS has a proper plan for Internees from start to end with an amazing learning schedule. Unit Testing was a known term for me, but at IMAIOS, the team was very helpful in different approaches of the process.

I would like to thank the team at IMAIOS for providing me with a comfortable environment where I was able to learn passionately.

Gaining hands-on experience with professional tools will help greatly throughout my career.

Reflective Journal 1: Organisation Reflections

IMAIOS is a company whose primary focus is to enhance the learning of students and professionals in the medical industry by offering them detailed CAT SCANS, CT, TDM, MRI and other medical imagery as well as e-learning resources and exam material. The company's cofounders, Dr. Denis Hoa and Dr. Antoine Micheau, were students of medicine (specifically radiology) who both shared a great passion for digital learning and possessed the necessary skillset for computers and design when they created it as a start-up. Their detailed studies of Anatomy aided them in the beginning stages of IMAIOS to facilitate the precision points that were implemented in the digital IMAGES they were producing. The quality and precision of these scans produced by the company resulted in rapid development. IMAIOS provides a variety of modules for e-learners. However, since e-anatomy was their project subject it was not introduced to their platform till later down the company's history.

These modules include 'E-Anatomy' and 'Vet-Anatomy'. Both host a cross reference viewer that can cycle through each layer of the particular image and part of the body's anatomy you are interested in learning about. The viewer also holds many series and contrasts that show different angles of the IMAGES. IMAIOS is also dedicated to helping Universities around the globe with examination design based on specific scenarios and sample test modules to help students pass board examinations. The University or client contacts IMAIOS with specific outlines of what they want their students to learn and IMAIOS designs a tailored exam for them. Since doctors also have the need to keep learning their craft IMAIOS provides a platform called Clinical E-Learning. On their website, IMAIOS holds other practice tests and exams; a practice test suite with a viewer and randomised questions in different modules. Some of these tests include, but are not limited to the following: Qevlar: a solely question based practice quiz.

QEVILAR: core test bundles (RadCore and NuCore) that simulate actual radiology exams. The different quizzes are designed for their own specific intent. The company also conducts global exams which are uploaded directly to their website. The company offers subscription packages for individuals, groups, and institutions. They are offered these subscriptions on monthly, quarterly, half, or annual basis depending upon their specific needs. An online video learning facility is also provided by the company for better understanding of the students and views. The videos are updated regularly on the basis of new research and discoveries. Osteo-articular ultrasonography is one of those mostly watched courses available on the IMAIOS website. It offers a detailed explanation of the ultrasounds of the shoulder, elbow, wrist, chest wall, abdominal wall and thighs etc. These online courses are based on questions constructed over the years by senior professors from different institutions. The faculty of Medicines of Montpellier-Nimes is involved under the association of The SILR to prepare the students of DFASM2 and DFASM3 for i-ECN.

Relevant research papers can also be found on the website of IMAIOS for assistance. The team itself is comprised of twenty-one individuals. Each team member's unique skillset contributes to the rapid development of the company. The team includes two medical imagery specialists, four developers, two E- Learning experts, a graphic designer, an assistant director and a support technician. The office, which is conveniently located on the top floor of a building, is divided into two sections. One is for hosting developers and the other for support and E-Learning experts. The desks are adjacent to each other which makes communication convenient.

IMAIOS uses different platforms to communicate. 'Slack' is a tool that is used to send or receive messages and update each other from our workstations. 'Asana' is a task management service shared by everyone. A staff member can share, assign work to and collaborate with another member to complete a specific task quickly and effectively. Tags are often used to find different types of tasks. The company has also built a technical infrastructure that offers a comfortable and efficient working environment for the team. Company employees do not have to exert extra effort on daily routine jobs like marking attendance as there is an automated attendance system for the ease of employees.

Reflective Journal 2: Team Reflections

It is necessary for the running of any company that each member of the team is placed in a role that suits their individual skillset. This is even more important when it comes to software companies like IMAIOS. At IMAIOS, the company strives to hire people based on a combination of two qualities. The first one is how likely you are to integrate into the culture and mesh with the colleagues in the company. This is a crucial factor when becoming part of a new team. The new employee is analysed by their various interactions, behaviour and the way they progress in a group environment. The second factor that the CEOs seek's out is a person's initiative and skillset. As a new member of the team, I was placed with a tutor who assigned specific tasks mainly involving the testing of their software and services. This entire process has challenged my independent programming abilities, self-driven work, flexibility and what I was able to bring to the table as an intern with new ideas in board meetings.

Each team member at IMAIOS brings their own skillset to the company upon joining and therefore, are assigned a specific role. Throughout my time I have seen how team members are required to be flexible with these skills and are expected to participate in the expansion of new roles in order to utilise all facets of their knowledge and help the company's progress. For example, an IOS developer at IMAIOS took the initiative to perform numerous UX tasks when required even though this is not part of his job description. He demonstrated this ability throughout the presentations in our meetings. When the opportunity of advising new team members of a new product we were launching came up, he was invited to demonstrate the inner working of the application to

the group. His knowledge combined with the new member's skillset contributed greatly to the efficacy of the product.

Another example of this was the ability of my tutor to dive into and understand the metadata within the format of our medical images and then demonstrate it to our peers. As a programmer without a notion of (DICOM) images used specifically in the medical field, Quentin Phillippot took the initiative to extend his understanding of programming with the help of the development team who were familiar with the image format, with the learning of medical images he was able to increase and process the meta-data of these images within our application. This showed his willingness to learn in a way that helps merge both the medical and tech fields without just completing the tasks directed at him.

This flexibility is much more necessary and achievable within a small team and is beneficial for quality and work-learning balance for the team members and CEOS. As a worker at IMAIOS, it helps everyone feel that they can participate in multiple facets of the application. Making the exchanging ideas more creative and open as well has encouraging friendlier interactions among colleagues and helping to fuel the speed and quality of particular deadlines in the work environment.

As a CEO that deals with management, deliveries, and operations of each sprint, the ability to assign various different roles to one team member releases workload and potential stress in his day to day duties.

Reflective Journal 3: Business Reflections

At IMAIOS, our customers vary on a large scale. We design and tailor multiple platforms and tools according to the needs of our target audience and what they are trying to accomplish. For a relatively new and growing business, it is essential to pull out all the stops in order to ensure quality and client satisfaction. IMAIOS and the tools we produce and use mainly deal with the areas of Anatomy, Imaging and Exam Preparation.

Undergraduate Medical Students visit our website to prepare for examinations using our sample test suite and those who use our services are most likely to go on to attend or pursue postgraduate placement in top universities.

Many experienced Doctors, GPs and radiologists etc. also consult our website which is informative and categorised to gain more knowledge about the new discoveries related to their individual areas of medical expertise. IMAIOS also provides online interactive courses for any person interested in learning and exploring new things about the human body. These courses can take time, but they are informative, thorough and worth trying for a wonderful learning experience from the comfort of your own home. E-cases (Real samples of clinical cases from the past) are observed and stored in the database for all the registered members of IMAIOS. Users of IMAIOS can upload their cases as well in order to diagnose the skill set. These cases help the members to improve the accuracy of their own diagnoses.

Many customers request the e-Anatomy feature that we have on our website. This presents the detailed variety of labeled anatomy images that we have available to them. It comprises of thousands of diagrams, 3D images, MRI and CT scans etc. This platform unites all the researchers, universities, and professionals of this field allowing them to explore and use an award-winning anatomy atlas. This can all be done using mobile devices as well. Both iOS and Android are compatible with the interactive atlas of human anatomy. The importance of movability with the utilisation of a company's resources is huge nowadays with most people travelling and on the go more needing instant access across the world. It is for this reason that IMAIOS keeps a tight and regular update on the functionality of the applications and website for its daily users. Besides all other activities on the platform, contact support features are also provided for the users to help IMAIOS improve the quality of its services and to add more information by the time as it gets refined. The clients help IMAIOS as much as it can help them draw on the knowledge of all the experts linked to the site.

Along with human anatomy, the vet-anatomy feature is also provided as an interactive atlas. This is used to study any animals anatomy in detail for veterinary doctors and researchers. In the MRI imaging category, there is a feature called e-MRI, which enables the members to learn to carry out a step by step interactive course on magnetic resonance imaging. There are multiple sections in this particular field which explain in detail information about signals, instruments, precautions and several other related concepts.

IMAIOS is rapidly becoming a well-known company for making e-Anatomy applications based on the interactive atlas of anatomy, mainly of humans, which provides ease for users to learn from our facilities. Finally, there is a game (Anatomy Ninja) based on an illustration of medical imaging and concepts. It illustrates the 3D images, CT, MRI, and radiographs for those students and other clients who want to learn while also having fun. Customers have given the company great praise for the quality of what we do, and we hope to continue to satisfy them in the future.

Reflective Journal 4: Customer Reflections

IMAIOS is working on building wider and stronger relationships with its customers. For all successful business', it is essential that the customer's needs are satisfied. In the case of IMAIOS, this broad range of customers includes groups of medical professionals, medical students and other individuals who are simply interested in the field. IMAIOS provides several services related to the medical field that are not readily available on the other online platforms. These services are proving to be extremely profitable for the business as the demand for them is high and the novelty of having access to such things is very beneficial for the Anatomy field. People regularly visit the site or the application to avail the services or to learn from the information provided. The success of the company is

mostly generated from the ability of our team to fulfil the customers requirements for particular tasks. When satisfied, he/she will avail of the service again in future.

If our customer recommends our services to others, it also increases the usage, which subsequently increases the overall revenue. Therefore, when we provide more advanced services like further interactive courses, reference books and papers, and concept animations for better medical student understanding, the use of website will gradually increase. Similarly, when these advanced interactive courses are added, it will open a gateway for IMAIOS to introduce more subscription packages for students.

This will result in more sale; meaning the amount of revenue generated per year can be maximised. The more resources that are provided, the more necessary it becomes for the business owner to keep a check on the site and/or employ other workers to keep it up to date. IMAIOS provides outstanding customer services. For customer support, the site has a section which aids users by outlining all the requirements necessary to access the e-Anatomy features, such as browser and downloading instructions for mobil applications (Android or IOS).

The support section also answers all Frequently Asked Questions related to the site. Moreover, the customer can register any complaint or suggest new services by contacting us. This ease of contact with the customer helps in enhancing the business. Quite clearly, if the support team does not have enough knowledge about the field, it may not be able to guide the customer appropriately. That is why our support team is equipped with up to date knowledge about the field. Expertise related to the medical field is essential for the employees at IMAIOS.

As IMAIOS is always working for collaborators, authors, researchers, experts and different organisations to provide new content for quiz questions and study material for students, it becomes mandatory for a few employees to have knowledge related to the field to identify whether the data provided is authentic or not. Which if there are issues, questions are redirected towards the creator of the content. If the business owner or employees are not experts themselves, this can lead to a drastic loss of business. Customers become aware that the information they are receiving is incorrect. Recommendations of the site to others will also reduce, which will lead to a decline in activity on the website as well as the applications (Android/ iOS). My role in the team includes testing all the applications making sure that they work correctly for the team. Another task that I carry out is to go through their services to quality check them. I also manage the site constraints.

The testing that I do ensures 24-hour accessibility and quality for the customer which in turn ensures that customers can navigate through the site with ease and efficiently.

I regularly attend meetings with the team where we go through our progress for the week and discuss what each team member is working on. I feel as though this process is necessary for employee satisfaction and for team members to feel heard. I certainly feel

as though my work for IMAIOS is recognised and appreciated. As you can see from the above, domain expertise is certainly critical to my role in the company.

Reflective Journal 5: Technical Reflections

Working as an intern at IMAIOS has been an eye-opening experience for me. The teamwork element of the position can be compared to the collaboration and assigning of tasks we had during class and group projects throughout the academic year. Our Distributed Systems module prepared me with the skill of using a tool which centralises data usage among different collaborators. The hardworking team at IMAIOS has been helping me to become familiar with using the latest technologies and frameworks. During the academic year, there were multiple modules that seemed less relevant for me personally in the workplace, but this idea has changed for me in practice. The industry is teaching me new things every day that are expanding my knowledge of the use of stacks in Data Structures, software engineering, deep dive into design pattern, nodeJS programming and async programmatic inheritance to web architecture for example. Previously, I viewed stack as just an array with a last-in-first-out property.

Now, from a practical perspective, its use is changing and impacting our workflow for the better. Currently, I am working under the supervision of the testing team. Testing teams play a vital role in developing a bug-free, high quality product for the client and therefore, repeating multiple test cases is highly necessary. With time, the teams have discovered an automatic system, using scripts, which only requires test-cases. The script generates a CSV spreadsheet file with a pass/ fail result for test-cases. Testing is not only about testing the conditions and parameters being used in the application but also the user experience. Looking over notes and material from the UXD module helped a lot in improving the UXD testing work I am doing at the moment. The interface should be extremely user friendly for users to access information on the application.

website. Recently, we have been assigned some miscellaneous tasks which had to be completed over the internet using remote servers. Here, the concept of Cloud Computing helped in using the remote servers to manage and manipulate data over the internet.

Git has also been used extensively throughout the project as I have been performing unit testing. A tested module is uploaded on the repository with a Pass/Fail comment, and the other collaborators may view it if any revision is required. This process requires working on distributed systems so that others can coordinate, and all components can come together to achieve the overall goal. Another module that I have used throughout my internship is 'Mobile App Dev', testing of 'QEVULAR Radiology app' was conducted which involved breaking the app into several basic components and features and making each component free of bugs and logical errors. Testing updates on one of our Anatomy features also required the use of the knowledge I had acquired from the Mobile App Dev module. All things considered, I do not regret any of the modules I chose as they have all

helped me in the role that I am in, but I would have enjoyed learning more about Big Data.

Big Data helps the organisations to grow, and it helps in examining patterns and trends. The primary goal of IMAIOS currently is business expansion. This can only be done by meeting the needs of customers through the analysis of all new products. These products can then be provided according to the trend, which would subsequently help in increasing company revenue. The consistent use of big data tools sentiment analysis helps in getting customer feedback, which can aid in improving the online presence of the business. To conclude, I have had ample opportunity to use my expertise with regard to theory and technology that I gained from modules in both semester 1 and 2.

Reflective Journal 6: Final Thoughts and Internship Summary

During the Summer Internship Program 2018/19, I got recruited at IMAIOS as an Internee. I was there to help the company in testing their website and look for any bug possible. The three main tools used were Ghost Inspector, Light-house by Google, and Run-scope. Like every other fresher, I also had a great motivation to learn and get my hands on new different technologies being used in the industry. I wanted to get familiar with the latest tools and frameworks regarding my areas of interest. At the beginning of the internship, it was difficult to get familiar with the different aspect of the company's function. I believed that I would achieve a good understanding of how a technology company worked. This turned out to be very beneficial in enhancing my skills.

Initially, I was assigned the task to work as a unit tester with ghost inspector. I was not familiar with this program at first. Through analysing different ways of using the dev tools and inspecting the source code from IMAIOS, I was able to make javascript functions to test a couple of modules in the system, automating their pipeline during their deployment stage. These functions helped the company to increase their testing library on this platform.

Another platform used was Light-house by Google, which generates an average score based on the quality of the website, i.e. how fast the servers are accessible and overall performance of each urls of the website given to the software. The third platform I had the chance to use was Run-scope; it helps in identifying issues with the overall web requests. It quickly creates tests to monitor signals coming into the server and out. This ensures that the website is returning authentic information and helps the company find any fraudulent issues. After working on all these three platforms, I wrote a proposal enlisting what I learnt.

I wanted to construct a single platform for IMAIOS where testers could generate quick tests by first coding manually. This would permit testing specific parts of their websites by simply changing variable names. I wrote command line-based code wrapped in javascript which involved multiple NPM libraries, this integrated well with platforms like ghost inspector, lighthouse by google and Run-scope. All these modules were connected into a single UI platform which was developed using Web-Sockets and EJS.

The final module involved the use of different technologies. For the ease of the software testers, I ensured that perimeters in the config files were easily changeable. This would help them in view their output according to the format of their own choice. I gathered test cases and created user stories with the use of Mocha JS to create different scenarios specific to our website.

Throughout my internship I also had the chance to work on designing an email template that would be received by the companies customers. The email included all details regarding the modules offered. My role here was to make an invitation email which each customer will receive once they had subscribed via the web application. This email was designed using table technologies since simple HTML div based format reduced the chances of receiving a correctly formatted email.

The Internship at IMAIOS provided me with the hands-on experience which I needed to polish my skills. Starting from the recruitment process, I wanted an internship that would prepare me for my career. Quentin, my tutor at IMAIOS, is my constant friend and we met through a website called 'Supper Prof'. Quentin and I were having a lot of discussions since the start of my school year, and he knew how motivated I was towards achieving my goals in computer science. I asked him about internship vacancies available at IMAIOS. After submitting my CV, I got a positive response within a few days.

An internship provides real-life experience and exposure and helps in grooming you up before you step into professional life. I worked for the testing team. In unit testing, my role was to break down the program into small chunks and test each part individually, whether it works according to expectations or not. If the program did not work accordingly than the test needed to be changed. Ghost inspector was a good tool to make proper unit test metrics, which with my new module, fetching and accessing results became easier. I learned to use lighthouse by google, which is an automated, open-source tool which aids in improving the quality of websites. Using Run-scope, API performance testing, debugging, and monitoring of web services was carried out. Later on, I was asked to combine these three modules into a single UI platform, which I created using EJS and Web-Sockets technologies.

Conclusively, I built enough confidence in myself and go through the process of coding interviews. After the recruitment procedure, the professionals at IMAIOS polished my basic skills. They allocated me some different tasks and guided me further for more

research on that particular skill. I got familiar with multiple frameworks of Web like Web-Sockets.

It was a new thing for me to learn and develop. I also got familiar with ASANA and software use, which helps in extensive team project management. Our team keeps every tasks that are built with the use of tags to organise priorities and the categories of each of these tasks. It keeps a track on the activities done by each developer. Asana also marks the deadlines and discussions among the teammates. I only used APIs briefly in my school modules. However, at IMAIOS, I was able to perfect my skills in the usage of APIS.

By Gregoire Cousin

Quentin Philippot

Responsible of Gregoire Cousin at IMAIOS

Date: 08/14/2019

~~Philippe~~

A large, stylized handwritten signature in black ink, appearing to read 'Gregoire'.

Date 08/14/2019