KULLIYYAH OF INFORMATION AND COMMUNICATION TECHNOLOGY

FINAL REPORT FOR INDUSTRIAL ATTACHMENT AT

LUXTAG SDN. BHD.

2 NOV 2020 – 3 MAY 2021

SUHIB AHMAD ABDULLA HASAN AHMED

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BACHELOR OF COMPUTER SCEINCE
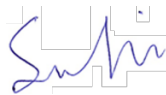
SEMESTER 2, 2020/2021

SUPERVISED BY

COMPANY SUPERVISOR: Mr. AZFAR ALSUKOR

KULLIYYAH SUPERVISOR: Dr. SHARYAR WANI

DECLARATION

I hereby declare that I carried out the work presented in this report while working for LuxTag Sdn. Bhd., and under the supervision of Mr. Azfar Alsukor. I solemnly declare that to the best of my knowledge; NO part of this report contains any sensitive or false data of the company. All contents in this report have been verified by my supervisor and approved for submission to the <u>Department of Computer Science</u> in partial fulfilment of the requirements for the degree of <u>Bachelor of Computer Science.</u>

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ACKNOWLEDGEMENT

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1. INTRODUCTION

1.1. Company Background

Luxtag Sdn. Bhd. is a 4-year-old ambitious start-up IT company located in Cyberjaya, Malaysia. Its core work is about data management and security, specialized on building IT solutions with blockchain-technology, DLT, and IoT integration. Firm's main projects are related to anti-counterfeit, business insights, and enhanced customer engagement services.

With more specifics, LuxTag services evolve around digitized certificates of authenticity for tangible products & documents, linking them to brands and owners through multi-signature smart contracts and internet of things elements. The company technology provides business intelligence through innovative means of enhanced customer engagement.

1.2. Department Background

The department assigned to is the technical department (Tech Team) of the company. It is the core of the company, as it does execute and produce the firm's projects and services, using agile and scrum methodologies. Tech team works in collaboration with projects' manager, UI/UX designer, innovate department and business development team to architect, design, build, code, test and deploy the various solutions decided to be built and provided. In other words, tech team is the team responsible for coding and building the software (mostly web applications) related to the adopted projects.

Another important part is to give the constant IT technical support to the company, which includes the maintenance of existing projects of web & mobile applications and local & remote servers. The support also involves providing any IT-related help to other departments to facilitate their work (like providing and maintaining firm's online web application of internal management like company's own email service and the self-hosted agile project management tool).

2. PROJECTS DESCRIPTION

2.1. BrandTag Project

2.1.1.   Introduction of the project

BrandTag has been the flagship project of the company since Jun / Jul 2020, and so it was the main project which own work efforts were dedicated to for most of the internship period. The project is about building an online service in a form of web application, directed to products' manufacturers whom going to provide their products to offline outlets (shops and markets). This web application is a solution to digitalize physical (non-online) shopping experience, and help protecting manufacturers and buyers of counterfeit and faked products.

Manufacturers subscribed to this online service will be enabled to feed the application with the detailed data of their products, and then to produce & attach unique QR codes for each single product (to be printed on products' packaging or on special hard cards to be combined with products). The goal is to enable buyers to scan these QR codes, which will retrieve data from BrandTag application to confirm the authenticity of the product and provide some more data about it. In a future step, more features will be provided like e-Warranty claims and product rating & reviewing system.

At the same time, QR code scanning will be recorded in BrandTag's database and provide manufacturers data about these scans (like timing, locations, viewed data, given reviews …etc) to help them improve their products, enhance their sales and up their profits. The data authenticity is assured as blockchain technology is used to store the core data of these products, which make it almost impossible to tamper with or wipe the data once it is stored.

2.1.2. Tasks Description

Whole tech team was working on developing the application. The assigned tasks were about coding, building, fixing, and modifying the many parts being developed during the internship time. All these tasks were about frontend and backend development, beside contributions to evaluate the achieved parts and plan and review the next development works designed by UI/UX before executing them.

2.1.3. Training Description

There was a four-week period between the acceptance for the internship opportunity and the actual start date, and a preparation sheet (listing all technologies to be engaged with) was given. So, there was a chance to start preparing and do self-learning before starting the internship, and that chance was dedicated to start picking up with the version control famous tool of Git & GitHub, JavaScript language and React.Js frontend framework. Working with web applications and their main concepts was not a totally new experience as there was freelance experiences on web apps before joining LuxTag. Yet there was a lot to experience and learn.

As this was the first real experience with the involved web development frameworks & environments (React.Js, Node.Js, Express.JS and PostgreSQL). A brief was given about each of these technologies along two-day period, with a hands-on help to setup the involved development environment (Docker containers). First actual tasks were given from day 3 and onwards, and there was a constant support and help by tech lead to finish these tasks along the first 5 – 6 weeks of internship.

Every once a while, a group of questions or new interesting things were gathered, and the tech lead was asked to dedicate sessions to answer and explain. That was applied to be introduced to BrandTag architecture and the get to know the essential concepts of blockchain technology.

2.1.4. Achievement

By internship end, the trail version was almost ready for launch, only very few tasks were left for the tech team to execute before the release. The table below lists the detailed tasks given and achieved along the internship period.

Agile Development Sprint	Mission	Detailed Tasks	Executed?
Sprint 4 of Phase 2	Contribute to building the data insights page	Build a filter tool end-user can apply on the data of tracking brands, based on several factors included in the system (date range, brand products, locations of uses)	Y
		Coding to show dates and times of data search results following user / browser time zone	Y
	General outlook fixes	Fixing some of the frontend code errors for several pages	Y
	System Enhancement Contributions	To brainstorm and propose an involvement of AI application in brandTag app. The use case agreed to is going to be the use of Optical Character Recognition (OCR) to read pdf files that users of brandTag app need to upload to the app. That use case to be prepared for in the time being for application in a later sprint of the project	Y

		Participate in breaking down and the tasks required to achieve the sprint goal (Building the application offered plans and subscription system)	Y
	General Outlook fixes	Fixing some of the frontend code errors for several pages	Y
	Force limitation on system features to subject for several conditions	To prevent user from generating QR code before completing self-registration & on-boarding process	Y
	Enhance the application security	Included moving some of logical operation built in the frontend to be executed in backend instead	Y
Sprint 5 of Phase 2	To reenable the user to use all system features for marketing and promoting purposes	To remove the coded limits to allow user from generating QR code before completing self-registration & on-boarding process	Y
	Lay the groundwork of serveral plans / packages subscription system	Design & create the plan DB table to populate with subscription plans to be offered	Y
		To limit the number of generated codes to the purchased plan offered codes	Y
	Enhance the system outlook and ease of use	Code frontend outlook and functions changes decided by UI/UX designers & project management team	Y

		Brainstorm and provide more analysis use cases of data collected by the application to be provided at Data Insights service of the app	Y
	Enhance the application features and service		
	Review and evaluate the sprint work	Participating in the sprint review meetings and contribute to the evaluation	Y
Sprint 5 of Phase 2	As own tasks of the sprint were executed earlier than planned, the chance was taken to execute some tasks related to later sprints	Coding the demo features of the application to enable potential users to test the system before buying a subscription. That meant to modify every subservice in the app to fetch demo content when the demo mode is activated	Y
		Coding the frontend massive outlook enhancements designed by UI/UX designer	Y
Sprint 6 of Phase 2	Planning the sprint	Participate in breaking down and the tasks required to achieve the sprint goal (to offer more customer engagement features)	Y
	To facilitate the marketing / customer service teamwork of promoting the service and helping new users	Recode the access level for unverified users to allow them to test the system before getting verified by system admin	Y
		Code the new module to manage the subscription plans for the service	Y

Sprint 6 of Phase 2	Enhance application security	Transfer some of the logical operations from frontend to backend	Y
	Enhance the application outlook	Code to fix multiple frontend errors	Y
	Evaluate progress and elevate the performance of the team	Participate in session for internal review of the progress	Y
	Enhance the alertness of the application	Alert users by emailing 10 days before on the subscripted plan expiry	N
Sprint 7 of Phase 2	Discuss the suggested UI/UX designs to be executed	Participating in the dedicated discussion	Y
	Beautify the outlook of the application and enhance the usability	Enforce the decided UI/UX changes	Y
	Evolve the customer engagement features by offering dynamic addition of informational & promotional material on the verification page of the to-be-scanned products	Code the new engagement features	Y

Table 1: BrangTag Assigned Tasks

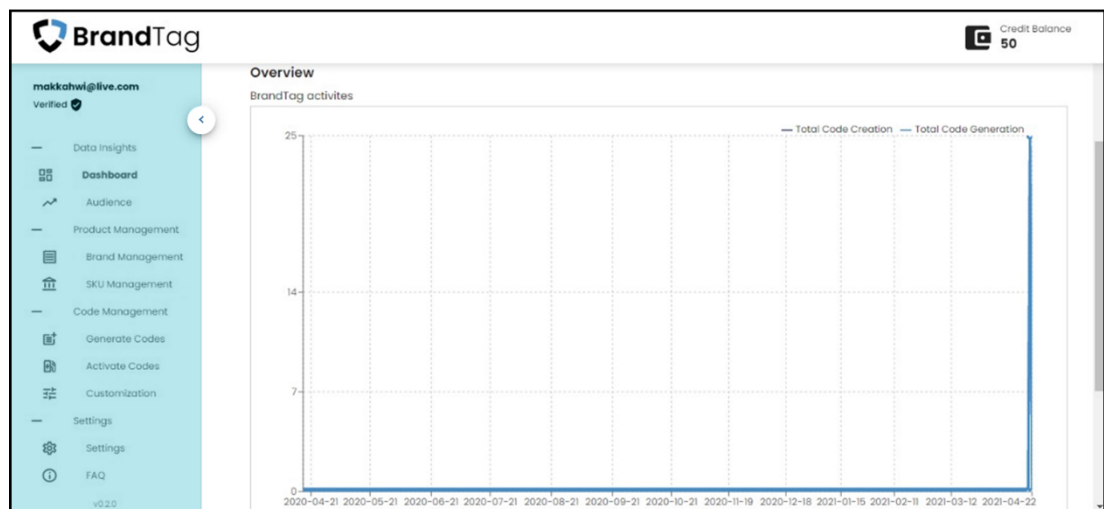Also, you may see below screenshots for some of the achieved tasks of BrandTag project.
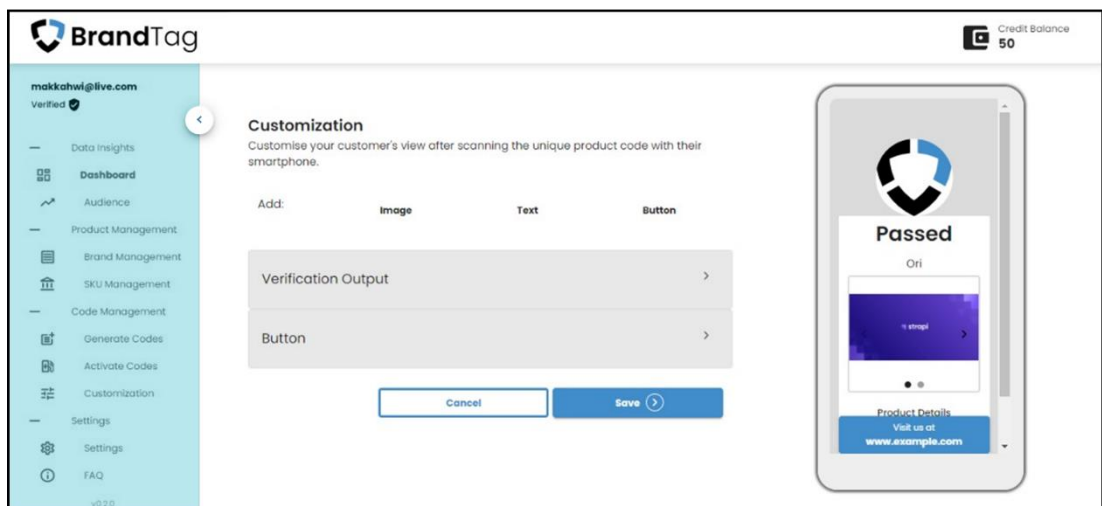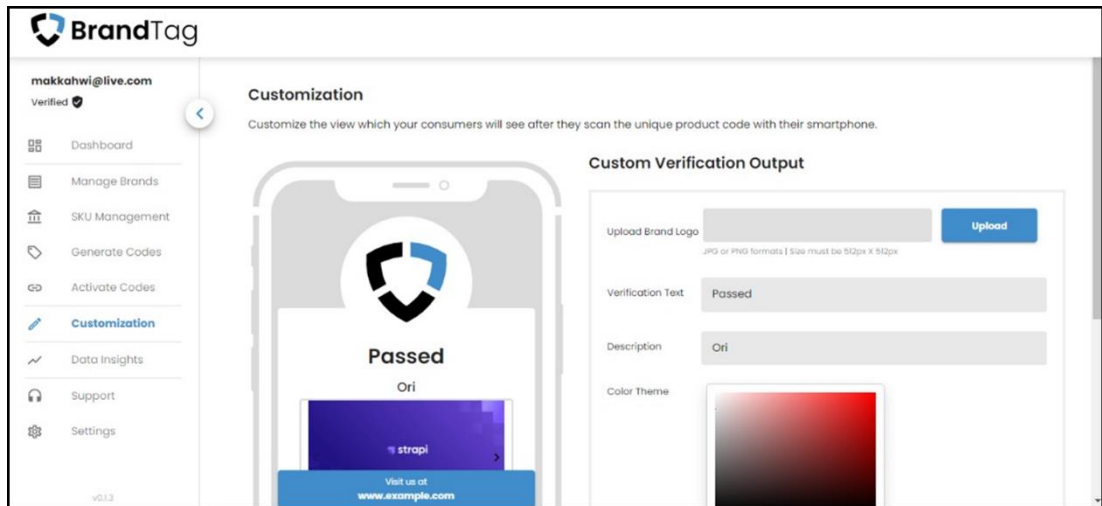

Figure 1: Outlook Enhancements

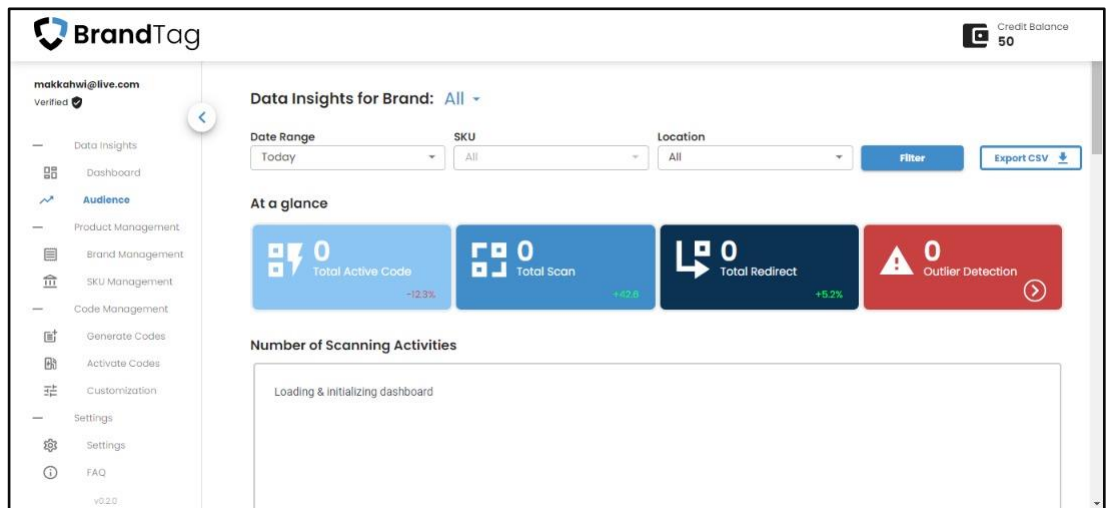Figure 2: The Coded New Engagement Features Dynamic Additions
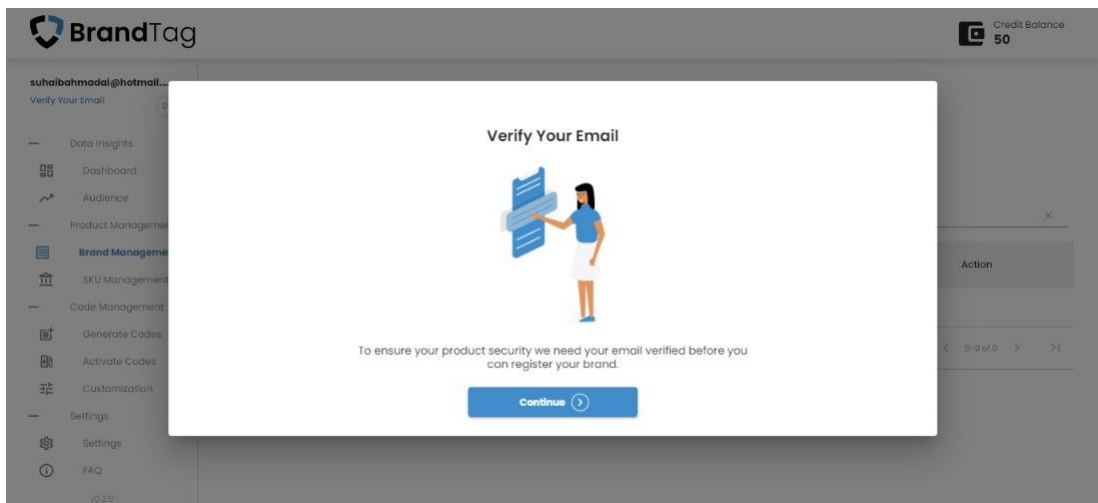
Figure 3: Coded Data Insights

Figure 4: Coded User Limitations

2.2. Blockchain Platform Transformation

2.2.1. Introduction of the project

LuxTag used NEM platform (http://nemplatform.com/) for the blockchain-related parts of its software and applications. But NEM was going to be rebranded and relaunched into a new platform called SYMBOL (https://symbolplatform.com/). So as LuxTag had thousands of NEM accounts related to their web apps & app users, it was required to put a plan to prepare and do this platform transformation (Opt-In).

2.2.2. Tasks Description

The plan decided by tech lead and management was consisting of the following assignments:

- Extract the addresses and private keys for LuxTag owned NEM accounts (executed by tech lead).
- Build a coded software to retrieve (from the blockchain platform) and list the balances of each NEM account.
- Provide that list to tech lead and management to decide which accounts to involve in the process.
- Extend the coded software to perform XEMs (NEM currency) transfer.
- Run the code / Execute the transfer of XEMs of the chosen accounts (4000+ accounts) to one account (Hot Wallet) to do the opt-in for it.
- Do the required-by-NEM-and-SYMBOL opt-in steps for the Hot Wallet.
- Redistribute / Refund the XEMs back into their original accounts after SYMBOL was launched.
- Follow up with SYMBOL launch and confirm the opt-in success.

2.2.3. Training Description

In BrandTag case, the blockchain was introduced by theory and as a showcase only. But this was the hands-on experience in working with blockchain. So, a chance was given by tech lead to go through the documentation of NEM and SYMBOL documentations to catch up and perform the necessary transactions related to the

transform the process and even to understand the actual integration method between the company's application and blockchain platforms. So, the basic training was by self-learning, but accompanied by supervision and guidance of tech lead throughout the process and progress.

2.2.4. Achievement

By Dec 2020, most of the process was done, and it was hanging on the delayed launch of SYMBOL to do the rest. By second week of Mar 2021, the new platform was officially released, the process was fully executed and the report / documentation of the executed steps and used coded was built and submitted.

2.3. Building Proposals for Multiple Third-Party Projects

Along the internship period, there was three major third-party projects which they were proposed to be taken and executed by LuxTag. None of these projects was taken by April 2021, but there were contributions related to the proposing process.

2.3.1. Introduction of the project

First project was about building a web-application like company's BrandTag and eScroll apps for a governmental department in Malaysia. It was about building a system for the department to generate their certificates using blockchain technology to secure and confirm the certificates' authenticity.

Second project was to take the contract offered by another governmental organization. The proposed system was going to also be like LuxTag's eScroll, aiming to unify the issuance of marriage-related certificates nationwide, to centralize the certificates' authenticity checking process and prevent fraud and faked certificates passage, so blockchain technology was offered to be part of the data storage and recall operations. The system was to be built in partnership with another corporation, where they get to build the web application, and LuxTag to build the blockchain integration coding and setup the blockchain network.

Third and last project was to build an eCommerce platform for a private company to promote and sell its products. It was going to involve the basic web application requirements without blockchain involvement.

2.3.2. Tasks Description

For the first governmental body's proposal, it was required to help the UI designer of LuxTag to finish the modification of the proposed system designs. It involved rebuilding some parts of the Adobe XD file and restyling some of it before a tight deadline to submit the designs inside the proposal to the government department.

As LuxTag role into the marriage-related system was about the blockchain integration parts, it was required to go through the system requirements list and pick up the parts of where blockchain could be engaged. Based on this vetting process, a micro-service architecture was built beside an explanation on the methods and benefits of integrating the proposed system with blockchain technology. That was provided to the project partner in a presentation form to introduce them to the blockchain proposed uses, and in a written form to be included in the proposal to be submitted to the public organization.

As for the eCommerce project, the task was to communicate the customer representative to build a system requirements list, system use-cases, functions and to finally construct the technical part of the proposal with system architecture and initial design. That work was passed by tech lead and CTO to be presented to G-Innovations within the project proposal to be considered and discussed.

2.3.3. Training Description

For the UI designs, it was not a new experience to build such designs or to work with Adobe software. But it was a first try to work Adobe XD, which was very easy and smooth for self-learning as its functionality is similar to the more-familiarized-with other adobe products of photoshop, Illustrator and InDesign. For the contributions to proposals' building, both group discussions and following the old LuxTag's project proposals were enough to understand on how to propose and explain potential projects and brief on technologies to be adopted in the systems.

2.3.4. Achievement

Each one of the projects above was delivered successfully in time, and they eased submission and the discussion process with third parties.

2.4. Constant Support for Tech Lead

Along the internship period, various assignments were given by tech lead for the purpose of helping on tight deadlines or to enhance the internship experience. Only two of those tasks will be introduced below.

2.4.1. Introduction of the project

One of the tools used to document the works the follow the progress by tech team and projects management is YouTrack of JetBrains. It is a self-hosted open-source service which could be modified / edited to meet specific requirements and needs. The relevant assignment was to code a plugin to facilitate using LuxTag's YouTrack for specific use cases.

Another task was given is to help the Tech Lead to brief / explain the technical work environment of the company whenever that is needed and tech lead for some reason will not be able to do.

2.4.2. Tasks Description

The YouTrack-relevant assignment was to program a plugin to add big numbers of tasks to the software by the teams, instead of using the built-in one-by-one tools. That was an essential tool for the products' manager to be used when a sprint of a project is planned, and the individual assignments and tasks need to be fed to YouTrack so assignees would get them and start executing and reporting progress. The solution was to build a CSV template for the data to be inserted at, and a JS-based code to parse the CSV file and do publish the tasks from the local machine to the online tool of JetBrains.

As for the technical introductions' help, and beside what was mentioned earlier of technical briefs to potential customers / projects' partners, there was two major occasions where it was required to do a technical brief / explanation.

The first was a 2-day long help onboarding the lately hired programmer (because the tech lead was on leave), who was a fresh graduate with relatively limited experience on web applications' development. That help included preparing a list of video-based briefing on the involved technologies of LuxTag. It also involved a hand-on sessions help to set up the needed work environment and tools and fix the errors and conflicts while setting up. Lastly it involved an introduction to the company projects, products and services and the code structure of the flagship project of BrandTag. The following is a list of technologies and tools introduced by the videos, theoretical explanation and the hands-on…

- The basic principles of web applications development (Frameworks, Frontend, Backend)
- The work environment related to our projects (VS Code, NodeJs, Docker Containers, Git & Github, Blockchain Tech, Nem Platform, WSL, ReactJs, ExpressJs)

Second occasion was to prepare and conduct a session to introduce the technologies used to the whole non-technical staff of LuxTag. It was a 2-hour session with the attendance of tech lead, CEO, a director, projects manager, business development team, and marketing ream. Unlike the sessions with the new programmer hire, this was less of technical and detailed explanation and more of a conceptional and set-basic talk. In involved an introduction to the following technologies…

- Static Websites VS Dynamic Website (Web Applications).
- Frontend VS Backend in a web app.
- Walkthrough samples of frontend, API & Backend codes of some of LuxTag apps.
- An introduction to the company's two major projects (BrandTag & Papyrus) and how they should be used, interacted with, and introduced to the potential customers, investors …etc.

2.4.3. Training Description

There were no real dedicated training efforts, this was a natural result of the experiences, efforts and works with the company projects along the past months. The only part close to a training / qualification was made is to discuss the brief tech lead or the CTO on the detailed data to be presented and the approaches to be used while introducing the technologies.

2.4.4. Achievement

Every task was delivered on time, with feedbacks – in some cases – on better practices / technics to enforce and execute, but not major disappointments or failures were reported after submissions.

3. LESSON AND EXPERIENCE LEARNT

3.1. Knowledge Gained

- Strengthen the market-direction understanding and the awareness on what skills needed to be earned to meet the common demands of most required jobs related to software development industry.
- Enhancement of realization on the software development industry and the many concepts, concerns, aspects, and operations involved in the process. E.g., the systems & servers mirroring concept was introduced, beside the main programming tools to be involved in the concept application.
- Expand the experience on general work-place related environment, culture, and exercises.
- Understand the nature of blockchain technology, and its main concepts of Mining, harvesting, data storage, data-conflict resolutions, all beside the current and expected future status of the technology.
- Knowledge on the practical skills and requirements needed to build / start own company like providing an added value / unique service, building a network withing the industry, testing the potential firm's products / services, and convincing invertors and capital owners to support and contribute to the potential business idea.

3.2. Skills Gained

- Generally, a better teamwork practises, but specifically a better cooperation on coding and building software & applications as groups. That includes adopting a more clear and readable coding style, reading & applying the content of online designing & prototyping using the tools of Zeplin & Figma, and working with the version controlling system of Git & GitHub.
- Interacting with and making uses of the blockchain technology for data storage and security's sake.
- Programming with JavaScript, using the frameworks and environments of React.Js, Vue.Js, Node.Js, Express.Js, and PostgreSQL. It was a totally new

experience working with stated languages and tools, as the pre-internship experiences were around HTML, CSS, jQuery, MySQL & Laravel PHP.

- Building isolated web apps' environments using Docker Containers.
- Designing UI/UX using Adobe XD instead of Adobe's Photoshop & illustrator.
- More exercising and practicing for communication & presentation skills, including the preparation and interactive engagement with the attendees / audience.
- Better adaptation skill, to follow up with the technologies used, align with the firm's rules and approaches, and to go beyond fulfilling assigned tasks and start conversations to suggest better methods, approaches, programming languages and tools for the company to adopt and start using.
- Improve the constant reporting & communicating skills with usage of web-based tools like YouTrack of JetBrains, Trello, and Teamup.

3.3. Reflection

LuxTag do not believe in the traditional idea of making the most of their hires by putting the highest workload, but to be just and reasonable and provide an equal two-direction benefits exchange with respect to boundaries and out-of-office hours. It also does not apply the strictest methods of following discipline like clock-in and clock-out systems and do tolerate some indiscipline as long as the job is getting done and no delay is caused to works or to fellow team members. All that did offer a healthier environment, as it resulted to have way less sense of being forced to work and enhanced the self-discipline sense and to be self-committed and motivated to finish the job. Which is believed to be a reason for a better productivity and to deliver better results.

It is recommended to do internship with a start-up company instead of a big corporation, because they provide sort of wide angle and less deep knowledge & experiences in comparison to big companies. A small-team firm gives a better chance to communicate with other departments and get to know more about related works to the position assigned to, which is estimated to be more suitable in an early work

experience like internship. That offers an introduction to many relevant aspects of an industry before making a choice and going deep into one.

In this experience it was beneficial having one-month period between the hire confirmation and the actual start date. That gave a chance to get prepared before making the transformation and starting such new experience, and to do some self-learning and exploring, especially as the internship company provided a list of technologies and tools to be used in order to start familiarizing oneself with them.

4. CONCLUSION

When internship started, it was required to learn and absorb the technologies involved in the company's projects, which was done in the first few weeks. As soon as that stage was finalized, the main effort was directed to build the BrandTag web application till the end of the internship.

Working on such a big scale for quite long time made a huge leap in terms of realization of a lot of parts of the process. Building proposals, communicating customers, doing presentations, and the constant discussions and informing on the industry's nature and expected future was no less important and not to be missed.

Almost every single assignment whether mentioned in this report or not was successfully delivered. In some cases there was some lateness, in some other someone else like CEO, CTO or tech lead had to revise and make a bit of changes due to a little misunderstanding or shortcoming. But along the six months, there were no major failures of delivering or submitting works, and there was no major disappointments or failures were communicated.

No doubt on how fruitful and rich the experience was working with LuxTag over the internship period. The firm provides a real help to newcomers and interns to adapt and enhance their experiences, knowledge, and awareness on the industry. That help was in forms of briefings or extensively explaining sessions on any new knowledge, giving time to adapt and learn, graduating with the level of assigned tasks, and providing help and guidance along the way and while doing the actual work. For these reasons and more, LuxTag Sdn Bhd of Cyberjaya is absolutely a highly recommended destination for fellow university students (from various faculties and programs) to do internship with or get trained by.

All in all, internship is a very crucial part to the learning and qualifying process, and having it for six-month period is not long, it might be even shorter than it should be. And if someone made it a goal to embrace the chance and make the most of it, it could be a unique life-altering experience.