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BSc (Hons) Computer Science, Placement Student

Summary of Professional Experience at Circle Interactive.

Contributions to personal and career development.

20/04/20 – UFCFE6-15-3 Professional Experience

UWE Bristol | University of the West of England

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1. Introduction

This report aims to demonstrate my development throughout the currently ongoing placement at Circle Interactive LTD. While working as a junior developer for 9 ½ months in the Bristol based firm.

During this time I undertook several projects and gained vital understanding of the core responsibilities of working at an organisation that engages in software development, legacy software support and provides integrated packages for clients that require consultancy, design, training, hosting, maintenance and security audits.

Having the opportunity to understand and engage with every aspect of the organisation's workflow, I gained insight into how the organisation functions on a day to day basis, and the practices that lead to a successful development cycle.

To demonstrate this progression I have documented the technologies and processes used and analyse the methodologies chosen and why they will be beneficial in the future.

This document also includes a Personal Development Plan and the latest version of my CV, which is updated to include the latest experiences from the position.

2. Placement Overview

Circle Interactive offers services to a wide variety of clients, from national health bodies, non-profits organizations, a number of trusts as well as large international membership organisations. This leads to both, a large set of requirements as well many different international data processing standards. From this I gained experience with software design, requirements gathering, different ethical practices and data processing understanding.

The main activities I was involved in during the placement include:

- Development of custom Drupal / CiviCRM applications using a hook / Object Oriented API. This includes:
  - Requirements gathering
  - Creation of user stories, tasks and epics.
  - Liaising with managers to allocated sprint time.
  - Documentation, presentation, and deployment process.
- Client Support which involves solving bugs in software and estimating quotes for larger problems as well as replication in test environments to avoid down time on live environments as well as direct communication with the client organisation. This was done by using knowledge of the framework for triaging, investigating, diagnosing, documenting and fixing issues within a constrained timeline.
- Performing software upgrades and porting in-house changes. This includes refactoring custom extensions and patching modules to ensure they function as intended when new versions of the software are released.
- Client engagement. This involved requirement review sessions where custom work was presented and clients offered feedback / requirement changes that, would then be added to the backlog and be incorporated in the next sprint.
- Research into different data and payment processing requirements in regions, such as the EU with GDPR and SCA. Implementation of high level documentation and initial requirements gathering to ensure development of compliant systems, also involved testing existing systems to ensure compliance.

3. Hard Skills & Knowledge

3.1 Software Development Methodologies

The development methodology used at Circle is described by Kettunen (2009), as being ‘more profitable’ and offering a better balance of flexibility and stability. It focuses on a small co-located team working closely with the customer to produce a cost-effective product in short sprints. This methodology fits well with the organisation and has increased productivity by 30% since it’s initial implementation 3 years ago. (Circle Interactive, 2017).

During my time at university I had adopted the waterfall model in most of my projects, since we had clear requirements and had a fixed time-scale to deliver the work. However, after starting placement my approach to this has evolved. I now understand that the best process to be used when dealing with clients that have uncertain, prone to change requirements is Agile.

Agile has also been described as being increasingly popular (Basili. et al, 2002), and has remained relevant throughout the years. From the latest data available there is still a clear trend towards an increase of agile practices, with 97% of organisations supporting the use of agile. (13th Annual State of Agile Report, 2019). It is clear from these numbers that Agile will remain in the software development world for the foreseeable future. It is extremely opportune that I now have the understanding of correct practices and am able to complete a project from start to finish while using Agile.

My organisation used the waterfall method up until a few years ago. They made it clear the reason they moved away from this method was because the client was not involved enough in the process, leading to situations where the requirements gathered and subsequently signed off by the clients were not what they actually needed. This led to expensive and time-consuming product re-development. As stated by Alshamrani, Bahattab and Fulton “it is very difficult to go back and change something that was not well-thought out in the concept stage.” (2015, p.108).

The biggest reason I have moved away from Waterfall as stated by (Alshamrani, Bahattab and Fulton, 2015),is its [waterfall] inflexibility, and the lack of customer interaction in the overall process. On the other hand the Agile method as Dingsøyr et al. (2012 , p.1213) describes it “Encourages practices that accommodate change in requirements at any stage of the development process.” This fits in well with Circle Interactive’s business model, as customers implement new requirements and change existing integrations frequently to comply with new legislation. This method also makes sense when applied to university projects and my own projects, since my own projects often have changing requirements.

At my organisation the use of a Kanban board was introduced 3 months into my placement. It allows for accurately stating what work needs to be done, and when it needs to be done (Lei et al, 2017). The Kanban board had a positive impact and showed similar results to those observed by Lei et al. (2017) which were:

- It allows for prioritization of tasks.
- It helps define workflows.
- It creates more flexibility and ensures tasks are delivered.

In my opinion it provides a clear differentiation of people's responsibilities and allows managers to track developers progress without having to interact directly with them. It also improves the use of the companies ticketing system, as now issues are only addressed if they have correct information and include clearly defined outcomes to be added to the project backlog. These in turn also serve as documentation and can be shown to clients to measure progress.

3.2 Programming Languages

The languages used at Circle Interactive were chosen as part of the Drupal framework. Drupal is described by Sánchez et al. (2015, p.173) as a "highly modular open-source web content management framework implemented in PHP". It can be used for a variety of applications including internet portals, e-commerce platforms and membership systems. It makes use of Object-Oriented Principles (Drupal, 2016) as well as a hook system that allows the system to bootstrap a library of common functions (Sánchez et al. 2015). It is built using the Smarty templating engine, PHP, JS, SCSS, HTML, as well as Twig and the symphony framework.

Drupal accounts for about 3.4% market share and ranks 3 after WordPress and Joomla (Isitwp, 2020). It was chosen by Circle due to its highly active community and the amount of freely available and maintained community extensions. It is also the main development platform for CiviCRM, the customer relationship management platform that is the basis for many organisations' workflows.

Using this framework was the highlight of my time on placement. The use of existing frameworks was something that was not covered much during my time at university and I think it improved my ability in programming a lot.

Having to not only implement customer requirements, but having to implement them using the tools the framework provided while having to adhere to the best practices established by the community was challenging. I can remember a few instances when I spent a reasonable amount of time developing a piece of functionality, only to have a more senior developer point out to me that I was re-inventing a worse wheel. Learning to research the framework and having to understand existing code rather than inventing my own system was a great learning outcome, that will be used throughout my career.

The languages used were PHP, that accounts for 78.3% of tracked websites server side languages. It has seen a slight decline for several years, but still holds a large majority compared to newer innovations such as JavaScript (NodeJS) or Python (Django) (W3Techs, 2020). It is still the platform of choice for many open-source applications and is used in software engineering research (Hills, Klint and Vinju, 2017). It was a language only briefly covered at university, and It was a great opportunity to learn and practice OO principles in a language I had less than ideal experience in.

JavaScript is also employed, since it is considered the “d*e facto* standard language for client-side web programs” (Sun and Ryu, 2017). I had made use of JavaScript while at university, and this gave me a solid foundation for the use of libraries such as jQuery, React and NodeJs as an alternative to PHP in some of the experimental projects our organisation was involved with.

Overall the courses at university, such as Data Schemas & Applications gave me great insight into the direction of web-development, with the introduction of concepts such as Mash-ups, Single Page Applications, and working with API’s that I later experienced in placement. Allowing me to practice the languages and processes taught. I also used the development skills taught in Object Oriented System Development, as even though the language taught in the course was Java, the design patterns & OO principles are language agnostic.

Overall University gave me a solid foundation for the development of my programming skills on placement. It taught me proper coding standards and reinforced the importance of documentation and re-usability. These were all things expected from anyone working at Circle.

3.3 Version Control and Server setup

During the placement great emphasis was placed on the learning of server structure and interaction / deployment using the inbuilt CLI. I think this is an area where I initially struggled since Circle Interactive makes use of GNU/Linux servers and my time at university had little to no exposure to the system that powers almost 70% of servers. (W3Techs, 2020). This is something I wish I had covered in class.

The challenge allowed me to develop my skills in Bash, and I now have an understanding of the structure and underlying layers in the GNU/Linux system. I practised setting up servers and performing patches / taking backups and scheduling cron jobs as well as generally learning the almost never-ending amount of useful commands while assisting the Sysadmin team with tasks.

Version control was also heavily utilized in my placement, the use of Git or SVN was not emphasised at university. It was recommended but did not form part of assessment criteria, and I was therefore somewhat lacking in that area. However I now have confidence in implementing a complete workflow for development, and can make use of the process learnt during placement which involves a production, staging and test environment, and the use of a Git repository using Bitbucket as a remote upstream.

Version control is considered by the IEEE (2005) as “the single most important tooling improvement you can undertake”. Developing within a well controlled organisational workflow has improved my ability to plan out projects and will improve my collaboration skills when at university, it makes working with a team much easier than sharing a remote folder.

4. Soft Skills & Experience

4.1 Reflective Learning

The Graham Gibbs' reflective cycle published in the book Learning by Doing' (1998) was utilized during the placement to provide reflective practice. It provides a series of questions that encourages the user to reflect on the different aspects of an activity and allows them to formulate a clear plan going forward. Every stage focuses on a separate question:

- Description / Feelings – What happened? How did you feel?
- Evaluation – What was good / bad in this experience?
- Analysis – What can you learn from the experience?
- Conclusion – What else could you have done?
- Action Plan – How will you act if this happens again.

Implementing Gibbs (1998) reflection and action planning allowed me better understanding of the tasks and technologies in my environment, it allowed me to learn from my mistakes and put in place plans to improve when deadlines were not met.
Furthermore, it also allowed for better communication with project managers as it summarised what went well and what areas I had to Improve during projects. It was used on a weekly basis and provided a list of areas for improvement.

4.2 Communication

During my time in placement I learnt how to best communicate issues to the team and I practised communication with real clients that did not possess technical skills while also learning how to specify requirements. I also learnt the skill of expectation management by attending several initial requirements gathering sessions with clients and got to see first-hand how product leads, and project managers interact with clients. They do so by being clear about what is and isn't possible within a time frame and/or monetary budget. I learned communicating with clients will be extremely useful in the future.

4.3 Time Planning

Throughout placement time estimation was very important, communicating accurately with the Project Managers about time required for tasks was a daily activity. Knowing how to balance uncertainty and experience to create an estimate that is accurate but accounts for possible changes in complexity is a skill that is useful beyond software development, it extends to management, product estimation and workload planning. I improved my ability to estimate how long a task would take to complete, I learnt not to over promise and under deliver and

more importantly not to undervalue time spent on documentation, deployment, git as well as time for research and being blocked.

5. Other discoveries and possible projects

While at Circle Interactive I was involved with their R&D projects. Here I was exposed to aspects of software development which interested me a great deal, and appear to be growing in popularity.

I had the opportunity to contribute towards my company's efforts to introduce a new DevOps workflow with the use of containers in the form of Docker and Composer. These have changed the way I think about simple deployment and I am likely to continue my research outside the workplace and into a 3rd year project.

It was also during placement that I was exposed to a number of ethical dilemmas, that caused me to rethink the importance of data gathering and data privacy, such as research into fingerprinting and ever-cookies and companies that introduce predatory advertisement and aggressive data gathering.

6. Conclusion

Overall placement has allowed me expand my understanding of software development practices, methodologies and experience. I improved not only my technical knowledge of programming and development styles, but also my soft skills and my work ethic. I will return to university with an expanded set of skills and knowledge of subjects I otherwise would not have. I intend to make use of the skills I developed in placement for the rest of my career.

Word count: 2,497

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8. Appendices

8.1 Personal Development Plan

Priority	Skill	Current Proficiency	Target Proficiency	Development opportunity	Success Criteria	Date to be Completed
1	Programming	• Can develop systems that utilize some OO principles and can implement 10 of the 23 software design patterns. • Can create systems that integrate back end and front end using Java and HTML, can perform connection to simple MySQL databases and can create static HTML sites. • Able to use XML and X-Path to traverse the DOM and modify page content on the fly. • Experience in Java, Python and C, mostly non-web based languages.	• Able to implement design, implement and test systems using the OO approach and make use of all 23 software design patterns. • Capable of implementing dynamically generated Single Page Applications that make use of AJAX and being able to connect them to different types of database, including MongoDB. • Able to use new frameworks for front end, such as React and Angular. • Use of jQuery to modify the DOM client side. • Use of other Programming languages such as PHP and GO.	• My placement will offer me the opportunity to practice most of the items on this list. • They provide an OO framework for development of their applications and made of use of: ◦ PHP ◦ JS / jQuery ◦ SCSS ◦ React ◦ MongoDB • They cover full-stack development and their developers integrate both front end and back end knowledge	• Learn at least one new language and implement a project in a fully OO fashion making use of at least 5 new design patterns. • Utilized at least one new library or framework for development of an application • Learn how applications can be connected via the use of an API.	• 31/12/2019 • Succeed
2	Version Control	• Little to no knowledge of version control options or software. • Rely on well maintained folder structure to create manual backups at key stages of the process. • No remote access to any files, so important documents are saved on a portable hard-drive	• Implement a local and remote version control system that allows me to work on separate devices with minimum overhead. • Make effective use of either Git or SVN as this skill is widely used in industry and is considered a standard skill when applying for many jobs, like the ones I applied for during placement	• My Placement makes use of Git and I can probably learn once I start working. • I can implement a personal repository to serve as a backup to my projects • I can do reading on books about effective version control	• Able to implement a fully functional environment every time I setup a new project, without having to reference the instruction manual and with little effort.	• 01/09/2020 • Succeeded
3	Time Management	• I am able to plan time for university projects and stick to them mostly. • I am able to concentrate for 4-5 hours a day, but often spend any time after that getting close to no work done.	• Able to create a detailed plan with detailed targets every week, therefore measuring performance with ease. • Able to concentrate and stay engaged for a full working day, taking breaks but getting back on track effectively	• Placement will offer an environment conductive to proper time management, with clear supervision and targets. I will also be constantly engaged with learning and will develop a sit/learn habit.	• Being able to work on a project for 7-8 hours while taking breaks, but always returning and then focusing to the work at hand. • Completing a university project 2 weeks before the deadline	• 01/09/2020 • Good progress, can consistently focus up to 6 hours a day on personal projects
4	Effective Communication	• Able to convey important points, and put across what I am doing, have done, and will work on.	• Be able to use correct terminology when talking with clients and performing requirements gathering.	• Working with industry experts will force me to be clear in my word choice and learning their lingo will help	• Be mindful of the words I use, ensuring I always use correct terminology.	• 04/04/2020 • Good progress raising issues with manager

		• Explain workflows and highlight tasks that I think will be difficult. • Raise concerns to managers to avoid problems down the line.	• Be decisive when faced with a problem I don't have the skills to resolve, instead of wasting time feeling embarrassed, raise the question and get help • Be able to communicate thoughts about development strategies and be understood by professionals and less technical people alike.	me use correct terms. • Working with a manager as someone I have to constantly engage with will cause me to become more open with my difficulties and seeking help.	• Never operate on assumptions of what is creating the problem, have a clear set of steps to troubleshoot / reproduce an issue before asking for help. • Read documentation on any projects I work on to ensure I use correct terms	and asking for help
5	Referencing & Writing	• Good use of available sources and incorporating them into my papers. • Able to write well in 1st person, and about my experiences • Can write research papers and system documentation	• Able to write consistently in 3rd person as this is the tone used in academic journal and for research papers. • Ability to write clear system documentation and to comment on code without being redundant. • Consistent speed when writing a paper.	• The Professional Experience module will involve lots more research and writing, I can practice my skills on these papers and can make the effort to document everything I do at work properly.	• Produce high quality reports that get above 70% with plenty of references and good grammar / 3rd person where necessary.	• 04/04/2020
6	Team working	• Am able to work with a team, and lead if I am the most capable individual • Contribute in a timely manor and to the best of my abilities • Stay in communication with members of my team • Do not always seek help if I am stuck, nor do I offer to help others if it is easy.	• Able to set up an manage a team by setting clear goals that are appropriate for every team member • Ensure every team member is comfortable with their role and is contributing as much as possible • Be proactive in offering assistance and incorporate an Agile methodology in projects	• Working in an organization with other developers with help me to better understand how to separate work and what the best attitude to have is. • I will observe how my managers ensure everyone is contributing and happy	• Manage a product from start to end, with a team of at least two people where work is separated equally and fulfilled on time, • Have the project handed it on schedule and be accepted.	• 01/01/2021 • Had some practice in placement, will do better in year 3 group project.
7	Customer Service	• Able to serve and listen to a client that is angry and needs to served. • Able to gathered customer requirements and to do basic system planning from communicating with clients	• Be able to lead and conduct meetings with groups of clients while maintaining everyone engaged and gathering requirements effectively	• I will communicate directly with clients and observe how my managers do requirements gathering to learn from them	• Perform a support ticket process on my own and communicate with the client to figure out the issue	• 31/12/2020 • Done many times while on support
9	Working from home	• Able to concentrate, but not perform repetitive strenuous thinking without distraction.	• Perform at the same level of thinking and efficiency as while in the office	• The latest events have given me the opportunity to practice and perfect it.	• Work a full day without any major distractions	• 20/05/2020 • In Progress

8.2 Updated CV

MICAH HOBBY **Micah.Hobby@gmail.com**
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EDUCATION & RELEVANT QUALIFICATIONS

- *June 2019 – Present:*
  Junior Software Developer, Circle Interactive - Bristol
  Development & Support of International membership organisations using Drupal.
  - **Activities included:** Object Oriented Systems Development (PHP), Requirements gathering, Software Upgrades and Server Management, Documentation and Deployment within a Git workflow, Agile/Kanban development.
  - Worked as part of a full-stack development organisation specialized in CMS & CRM's
  - **Languages/Frameworks:** PHP, JS, jQuery, MySQL, SCSS, Bash, Symphony, Git

- *Sept. 2017 – Present:*
  BSc (Hons) Computer Science, University of the West of England
  - **Modules include:** Computer & Network Systems, Object Oriented Systems Development, Software Engineering, Data Structures & Algorithms, Data Schemes & Apps, Intelligent Sys.
  - **Grades:** 92% overall marks, Dean List Award Y1 & Y2.
  - Accredited by the British Computer Society

Other Technical skills include:

- **SQL –** Maintenance, design and use of system's using MySQL and MariaDB.
- **Javascript -** JSON manipulation, retrieval of API's, jQuery and React apps.
- **PHP –** Smarty, Twig templating engines. Used within the Drupal framework.
- **C -** Main language learnt during first year. Used for most assignments & coursework.
- **Java -** Used for most of 2nd year coursework, solid fundamentals of OOSD.
- **HTML -** Implementing responsive designs using Bootstrap and integration with AJAX.
- **Python –** Implementing OO and traditional system's for coursework.
- **Git –** Knowledge and understanding of Version Control and remote workflow.

1. **December 2015 - June 2017, SAT(Standardized knowledge test)**
   USA College Board certified
   Grades: Top 20% Percentile.
   Evidence-based reading/writing: 610/800
   Mathematics: 580/800

2. **March 2009 - December 2015, I.E.P Promesa**
   A-Levels Equivalents
   Ranked 1st Place in class.
   Head school Prefecture.
   Units included: Math, Computing, Physics, Science, English, History
   Grades: 18.2/20 **Distinction**,

3. **March 2014 - Foundation degree**
   Extra-curricular fully accredited art foundation degree
   Units: Design principles, art & business, basic graphic Design
   Grades: Pass – Pass/Fail basis.

SUPPORTING EMPLOYMENT

- **PAL Support scheme (Level 2 Award – Mentoring) – 2 Years experience**

Role providing educational support for first year students. In charge of planning and executing weekly peer-assisted learning sessions, helping students with course related programming tasks and activities. Reinforced knowledge of subject matter as well as programming skills, helped students with planning and studying skills. Developed mentoring and team management skills while learning how to lead and manage small groups sessions. Took on responsibility to ensure first year students better meet intended learning outcomes.

- **Crew Trainer (Area Leading/Crew Development Program) – 3 Years experience**

Developed skills to support and enhance the performance of Crew Members at the workplace. Undertook further training to perfect leadership skills, to better support my employer by improving the coordination of people, products and equipment.
As an area leader I am in charge of Production and the people working in those stations. Managed to maintain and increase performance during busy £2000+ hourly sales periods.

- **Student Representative – 2 Years Experience**

Further developed my communication skills by taking on the role as representative for student opinions on campus, worked with fellow representatives to raise issues brought to us by classmates. Developed skills clearly and democratically working with our faculty leaders to improve the experience for everyone in our course. Allowed me to better develop public speaking and to better communicate ideas and projects to higher ups.

- **School Prefect – 2 Years Experience**

During my time in school I was chosen by the headmaster to become the head prefect for the entire school. During role-call or school events me and my team of prefects worked with teachers and with students to ensure that order was maintained and that student voices were heard. We also had functions within the school and teachers would use us to delegate tasks such as attendance or note/money keeping.

OTHER EXPERIENCE

FreeUnlocks.com Online e-commerce site
Worked as a content provider for a large online phone services provider, in charge of planning managing and executing media used for exposure and advertising. Self made and advertised. Created pieces that received over 500K views on Youtube, worked on a freelance basis.