College of Engineering and Informatics

Professional Experience Programme (PEP)

Formal Report (Template)
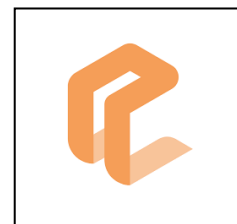
Submitted in fulfilment of the requirements for the B.E. / BSc (Hons) Degree in

Computer Science and Information Technology

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Reviewed by NUI Galway Reviewer

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Students must ensure that the authorisation process does not cause late submission of the report.

Statement of Originality

I hereby declare that this report is my original work except where stated.

Signature: _____

Name: _____Luke Gibbons_____

Date: _____07/ 07/ 2020_____

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Glossary

LO	Learning Outcomes
BSIF	British Standard Industry Federation
LMS	Learning Management System
HTML	Hypertext Mark-up Language
CSS	Cascading style sheet
URL	Uniform Resource Locator
JSON	JavaScript Object Notation

Chapter 1. **Introduction**

The completion of my placement has been of benefit to me from both a personal and skill development perspective. Over the course of the placement I have developed new skills, strengthened existing ones and was exposed to a wide array of opportunities which helped me grow as both a developer and as a person.

Having the chance to work on several different projects helped me to gain and expand on skills such as team working, time management and communication skills. This placement had not only given me a first-hand experience of life as a developer but also allowed for the improvement of my technical skills, from writing cleaner code to gaining a deeper understanding of web technologies.

This report hopes to capture my placement in more detail. The report will introduce the host company, the projects I completed and the team working and business experience I gained from my time on placement. These will be discussed in chapters 2, 3, and 4 respectively. Chapter 5 will break down the five Learning Outcomes (LO's) and how I achieved them while the final chapter, 6, outlines the support the host company provided me with during my time on placement.

Chapter 2. **The Host Organisation/Company**

2.1 Introduction

This chapter will take a closer look at the host company, EssentialSkillz.(Ref 4). It is divided into two sections with the first outlining the location, business, and markets the company is involved in, while the second will look at their products and the technologies these products use.

2.2 Location and Business

EssentialSkillz, a relatively small company, was founded in Galway, Ireland in 2001. The headquarters remain in Galway and is home to their support, content, development and finance team while their second base, in the United Kingdom, hosts both the sales and marketing team. The structure of the company is illustrated in figure 1.

EssentialSkillz competes in the eLearning market where it produces a range of courses and services with the focus of "allowing organizations to take control of their training" (essentialskillz.com). Even at its small scale EssentialSkillz has proven itself competitive in the saturated eLearning market thanks to its emphasis on the customer. This is verified by their numerous awards, the most recent being a Customer Service Award at the 2019 BSIF[1] Safety Awards.
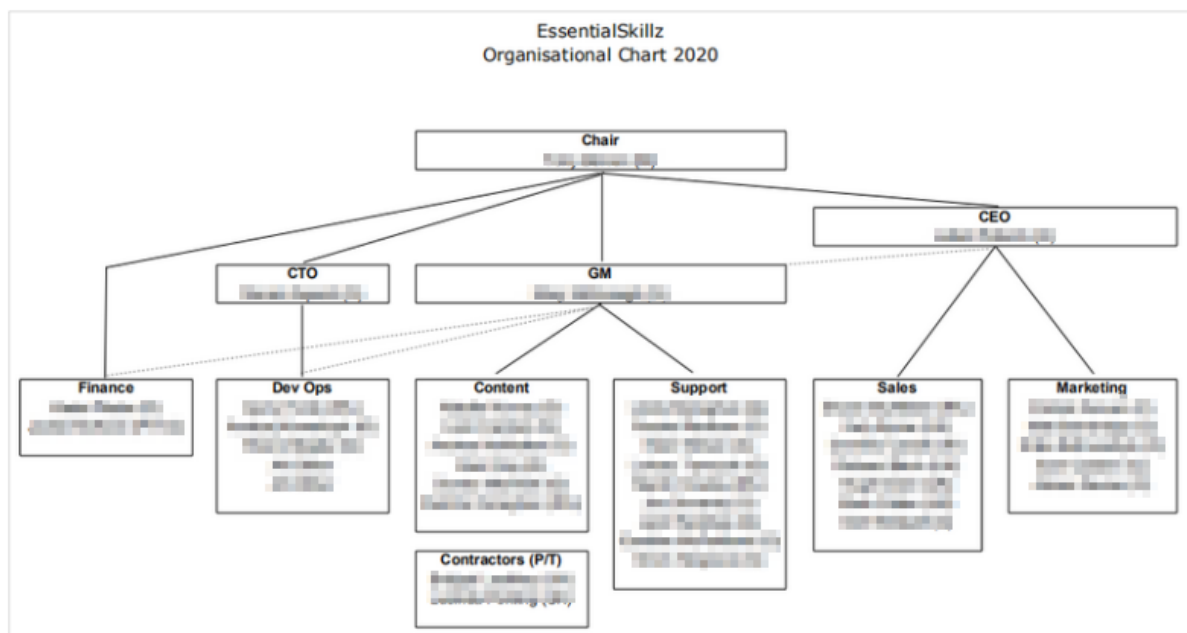

Figure 1: Company Structure – names blurred for confidentiality

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[1] British Safety Industry Federation

2.3 Products and Technologies

At the core of the EssentialSkillz business is their eLearning courses. They currently provide over 55 courses covering a range of topics such as health & safety, business protection, and wellbeing. The list of courses offered in 2019 can be seen in figure 2.

These courses can be accessed via a third party Learning Management System (LMS) or by EssentialSkillz own products: StartMyCourse, and the WorkWize LMS.

StartMyCourse, built on the PHP framework CakePHP, is a service allowing users to purchase courses individually and is aimed at customers looking for a single use course. WorkWize, on the other hand, is the company's custom built LMS and hosts a range of features such as compliance reporting, management of users and an authoring tool allowing users to edit existing courses or create new ones. WorkWize is built on the PHP framework Laravel, while its authoring tool utilizes the JavaScript runtime environment Node.js and the JavaScript frontend framework, Vue.

EssentialSkillz future developments include a refined authoring tool along with an emphasis on responsive design so as to allow customers to use their services across a wide range of screen sizes.

Online Training
Course List 2019

Health and Safety Pack

☐ Alcohol & Drug Awareness	☐ Fire Safety	☐ Manual Handling
☐ Asbestos Awareness	☐ Fire Wardens	☐ New & Expectant Mothers
☐ Asbesots Awareness (UKATA)	☐ Food Safety - Level 1	☐ Noise at Work
☐ Contractor Safety	☐ Food Safety - Level 2	☐ Personal Protective Equipment
☐ CPR Essentials	☐ Hazardous Substances (COSHH)	☐ Risk Assessment
☐ Driver Training	☐ Health & Safety Induction	☐ Safeguarding
☐ DSE Course & Risk Assessment	☐ Home Working	☐ Slips, Trips & Falls
☐ Electrical Safety	☐ Legionella	☐ Working at Height
☐ Environmental Awareness	☐ Lone Working	
☐ Emergency Evacuation	☐ Managing Health & Safety	

Business Protection Pack

☐ Anti Bribery and Corruption	☐ Freedom of Information	☐ Phishing Awareness
☐ Code of Conduct	☐ General Data Protection Regulation	☐ Prevent Duty
☐ Cyber Security	☐ Internet, Email and Social Media	☐ Security and Terror Alerts
☐ Disciplinary & Grievance Procedures	☐ Modern Day Slavery	☐ Sexual Harassment Training (USA)
☐ Equality and Diversity	☐ Money Laundering	☐ Treating Customers Fairly
☐ Fraud Protection	☐ Pandemic Awareness	☐ Whistleblowing

Wellbeing Pack

☐ Communication in Business*	☐ Introduction to Mindfulness*	☐ Stress Essentials*
☐ Communication Skills*	☐ Introduction to Resilience*	☐ Time Management*
☐ Conflict resolution*	☐ Managing Mental Health*	
☐ Healthy Eating & Exercise*	☐ Mental Health Awareness	

To view all our courses and request a FREE trial visit www.essentialskillz.com/online-training

*Courses confirmed for 2019 release

Figure 2: The list of courses offered by EssentialSkillz in 2019

Chapter 3. **Description of PEP Technical Activities and Technical Achievements**

3.1 Introduction

This chapter presents the projects that were completed during the placement. The projects are split into 3 sections: courses, authoring, and StartMyCourse, each representing the product in which it relates to.

3.2 Courses

As mentioned in chapter 2, courses are at the core of EssentialSkillz. However, a feature highly valued in recent years is the ability to use websites and webapps across all screen sizes. This feature was previously missing from the EssentialSkillz courses and thus became my first project.
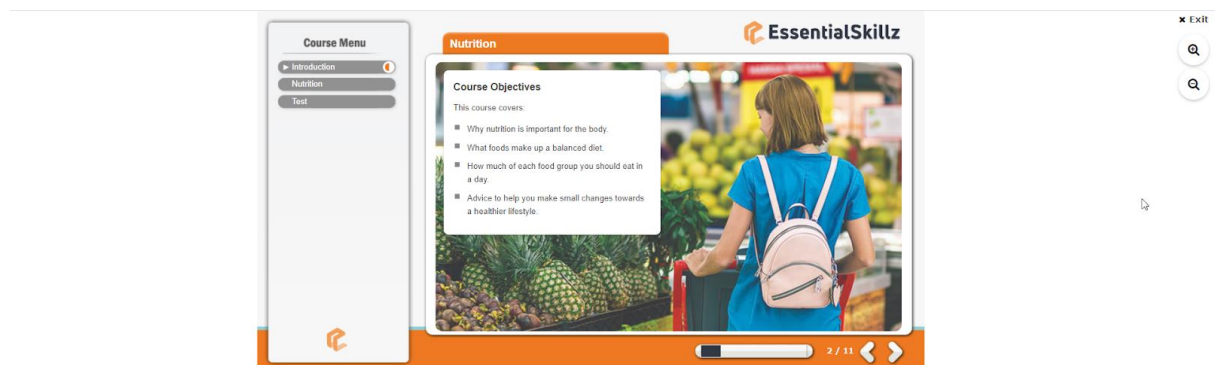

Figure 3: An EssentialSkillz course – buttons at the top right of the screen allow the user to zoom in/out

3.2.1 Responsive design

Given the designs by one of the developers I had the task of first creating the responsive frame for the courses and secondly to incorporate the existing (non-responsive) courses. As I had completed some previous work on responsive design this contributed to the project and it was only a case of reviewing the methods.

Creating the frame for the courses was relatively straightforward and used basic web development techniques. I used HTML to build the skeleton of the frame before implementing CSS to add fonts, colours, and other general styling. When this was completed, I considered adding some media queries via CSS. Media queries change the styles of certain web components when the screen width/height reaches above/below a certain inputted pixel value. An example is the navigation menu - for a larger laptop or desktop screen it remains in view to the left, however on a smaller screen it needs to be hidden as it would otherwise take up too much screen space. Once this was completed, I used JavaScript to make a functional side navigation button, allowing it to slide in and out from the right-hand side.

The second challenge was incorporating the courses. This proved difficult as the courses have a set height and width so the method to allow them to remain responsive was to dynamically zoom them in so that their height or width takes up the maximum area possible while also staying in proportion. The result of the project can be seen in figure 4 and 5.
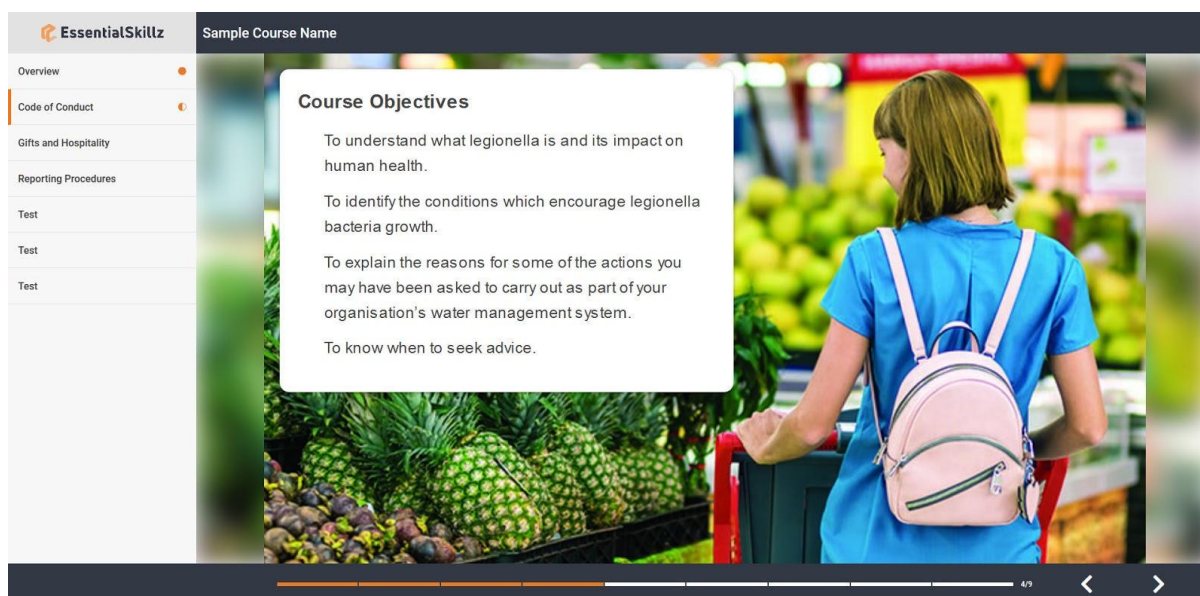

Figure 4: The responsive frame on desktop – course dynamically zooms in and out to suit screen size.
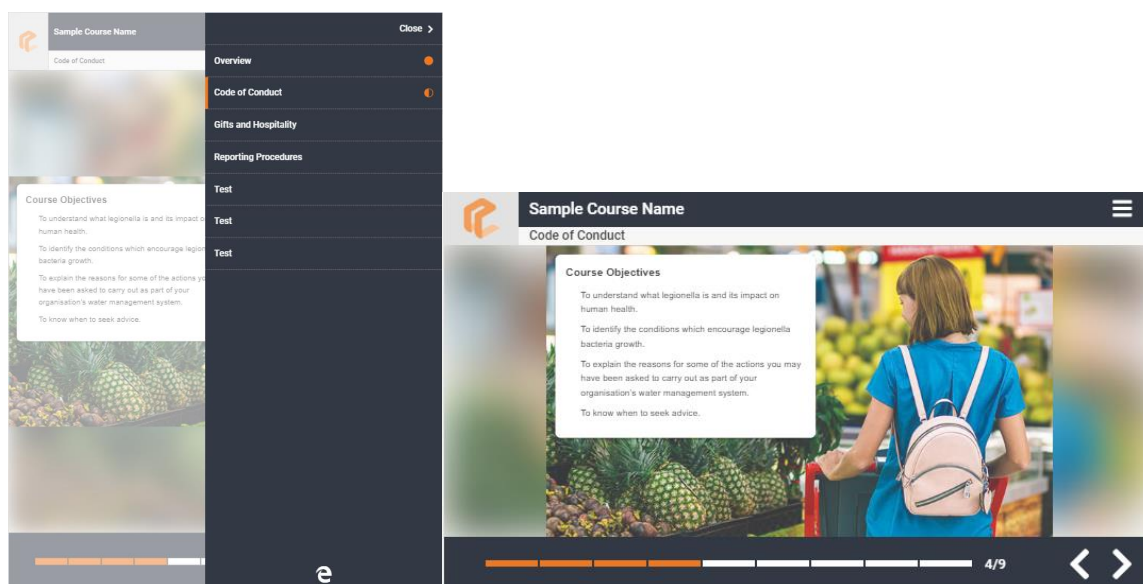

Figure 5: The view on a tablet with the side navigation opened (left) and on a phone in horizontal view (right).

3.3 Authoring

The authoring tool, allows users to create courses or edit existing ones, was where I completed most of my work. The project utilizes Node for its backend, and the JavaScript framework, Vue for the frontend.

3.3.1 Video embeds

My first project on the authoring tool required me to implement the ability to embed, both YouTube and Vimeo, videos into courses.

Before beginning, I read the Vue documentation (Ref 7) to find out where to start working on the project. I started by creating a new video input component that would allow the user to enter a link. I then looked at translating the link entered into an embedded video. This was solved via use of an inline frame (or iframe), which takes a source and displays the video based on it.

My next task required adding validation to the URL so that only a valid YouTube or Vimeo link could be entered. This was done via use of regular expressions, which allows searching of a string. I was then able to extract the video ID from the string, save it to a JSON[2] file, and pass it to the iframe to display the video.

3.3.2 Text editor

The next project on the authoring tool required improvement to the existing text editor. The new editor needed to have dedicated bold, italic and underline buttons (only previously available via keyboard shortcuts) along with list and link functions.

After researching potential Vue libraries, tiptap (Ref 3) was decided upon as it had each of the features required for the project. This project was relatively straightforward and required importing the library via npm[3], creating a new Vue component, following the documentation examples and tutorials, and finally adding styling to it. The result of the project in comparison to the previous editor is outlined in figure 6.
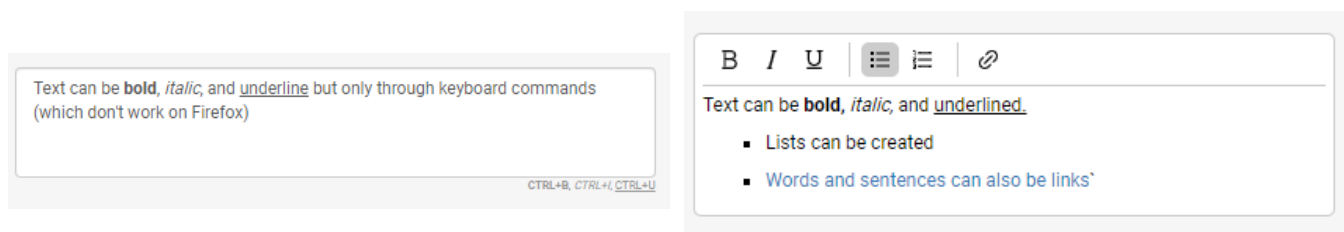

Figure 6: Comparison of the old text editor (left) and the new text editor (right)

3.3.3 Simplify design

This project required the simplification of the authoring tool. Many customers reported difficulties in using it so the aim of this project was to simplify the authoring tool, improve its user experience, and to later look at adding an advanced mode option that would contain some of the features that were removed.

There were many user interface (UI) improvements in this project which are demonstrated in figure 7, 8, and 9. The changes include the replacement of containers and an individual layout tab with three

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[2] JavaScript Object Notation (JSON) is a standard text-based format for representing structured data based on JavaScript object syntax.

[3] A package manager for the JavaScript runtime environment Node.js

set layouts: left-right, top-bottom, and full screen, the addition of a swap button to quickly switch the content in two containers, and the removal of the gradient background option. Working through each of these allowed me a better understanding of Vue and JavaScript as a whole.
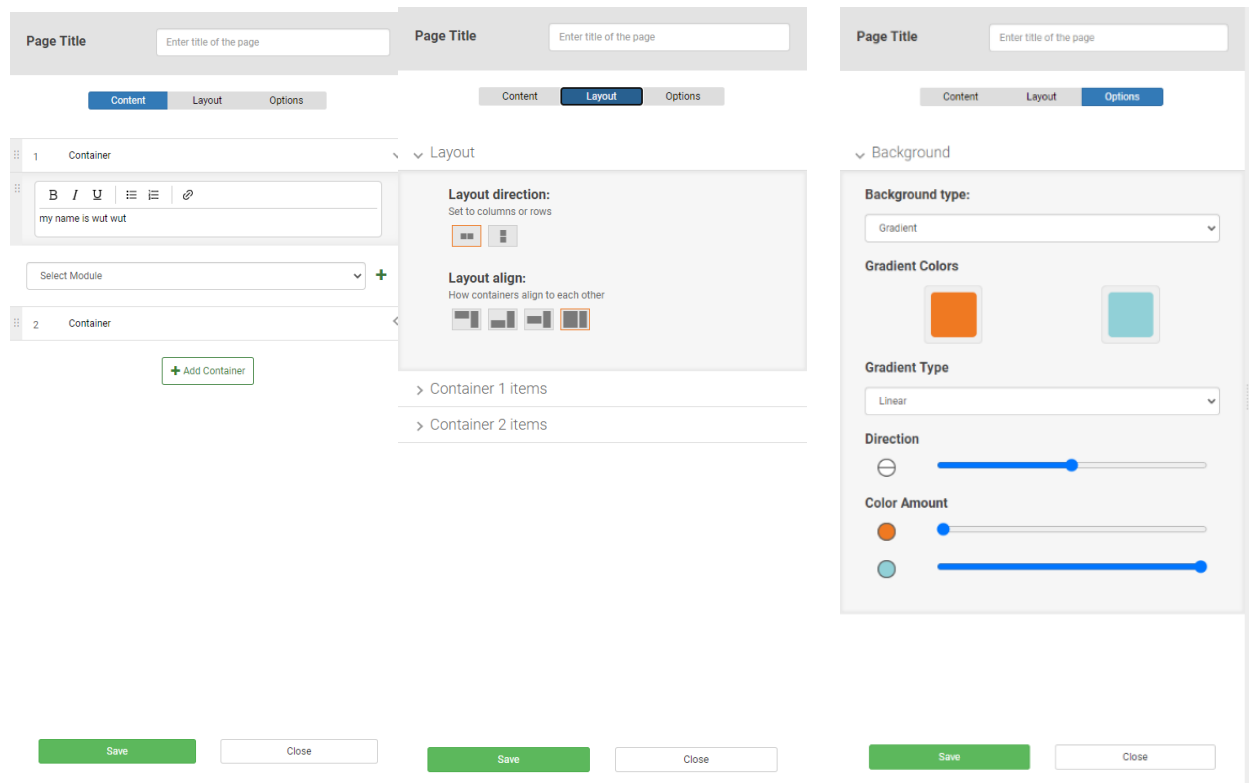

Figure 7: The previous authoring tools editor. The three tabs can be seen above: Content, Layout, Options (from left to right)
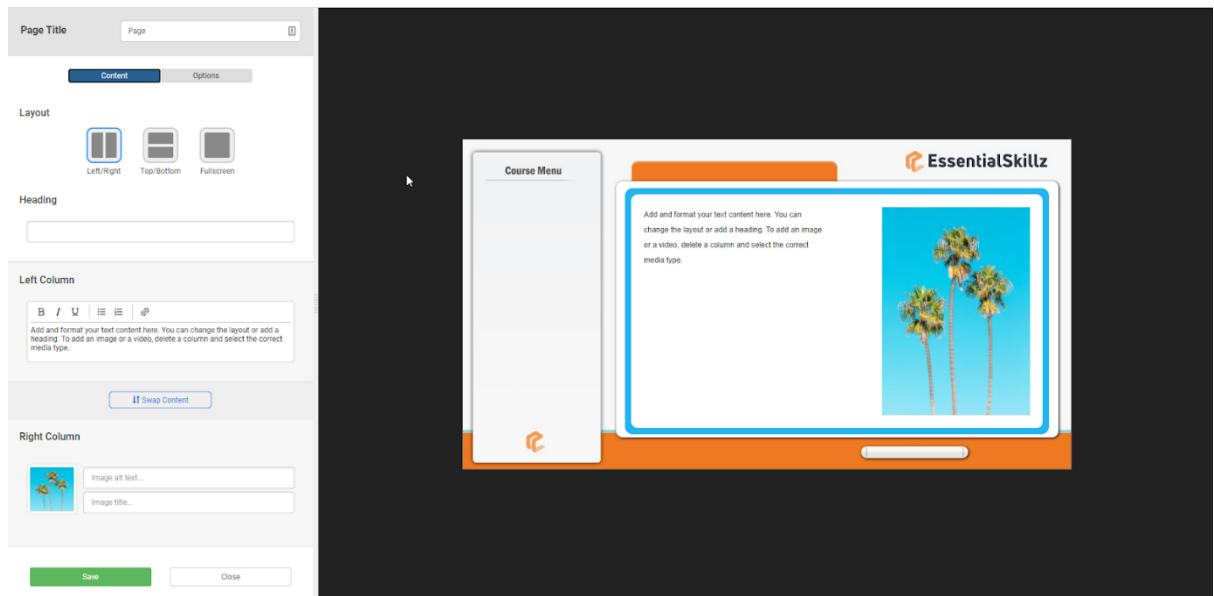
Figure 8: The simple authoring tool showing both the editor and preview area.
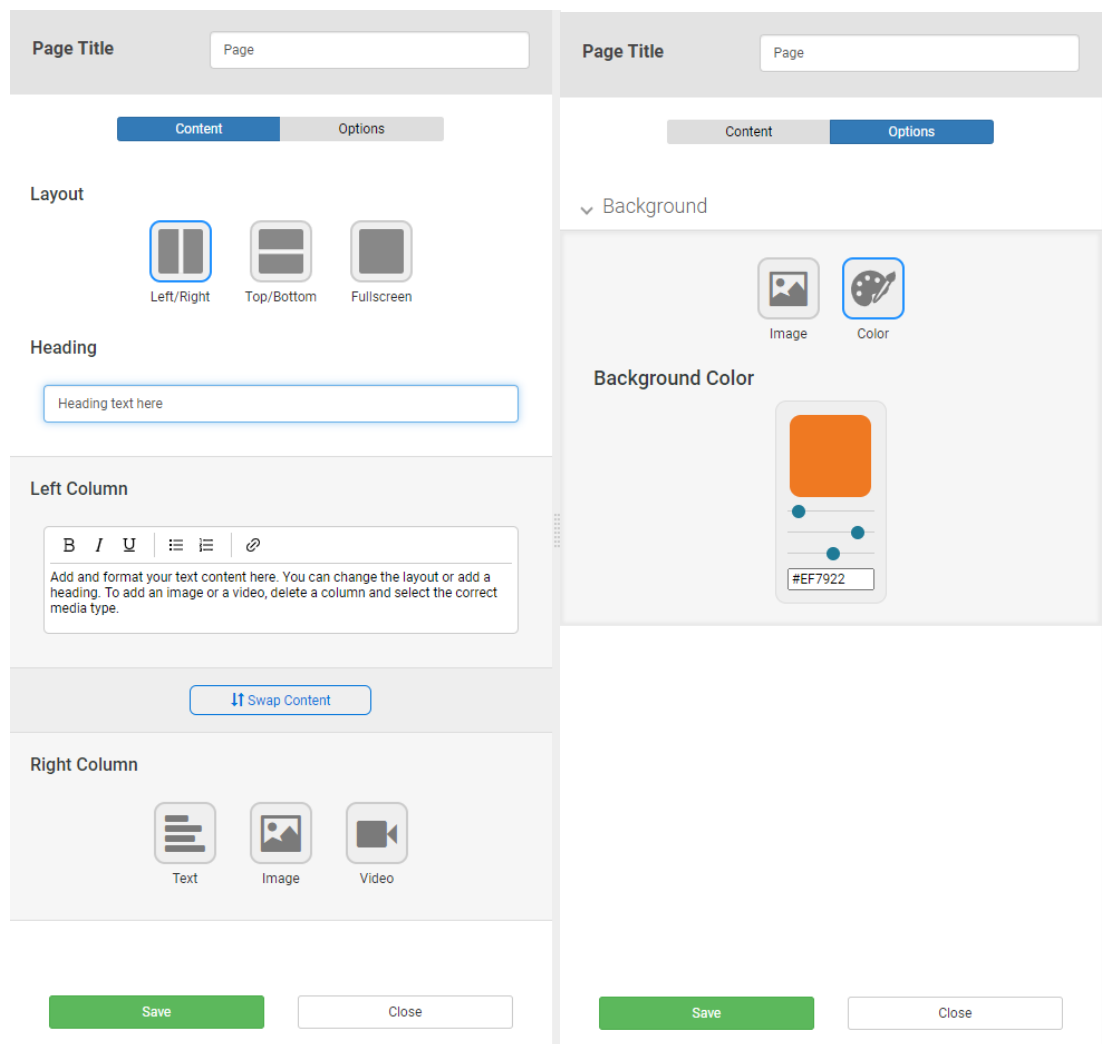
Figure 9: A view of the simple authoring tools editor tabs: Content (left) and Options (right)

3.3.4 Advanced mode mock-up

For this project I was required to create a mock-up design for the advanced mode. I decided to use the application Figma (Ref 5) to create the designs as it looked to be the easiest to use while containing all the features I needed.

After drawing up a list of required features I began working on the designs and prototyped many different variations while discussing with my team leader on the best approach. Using the software was a great choice as it allowed me to try out many different solutions without writing any code. A prototyping software was also something I have been looking to learn for a while and this project helped to achieve that goal. The result can be viewed in figure 10.

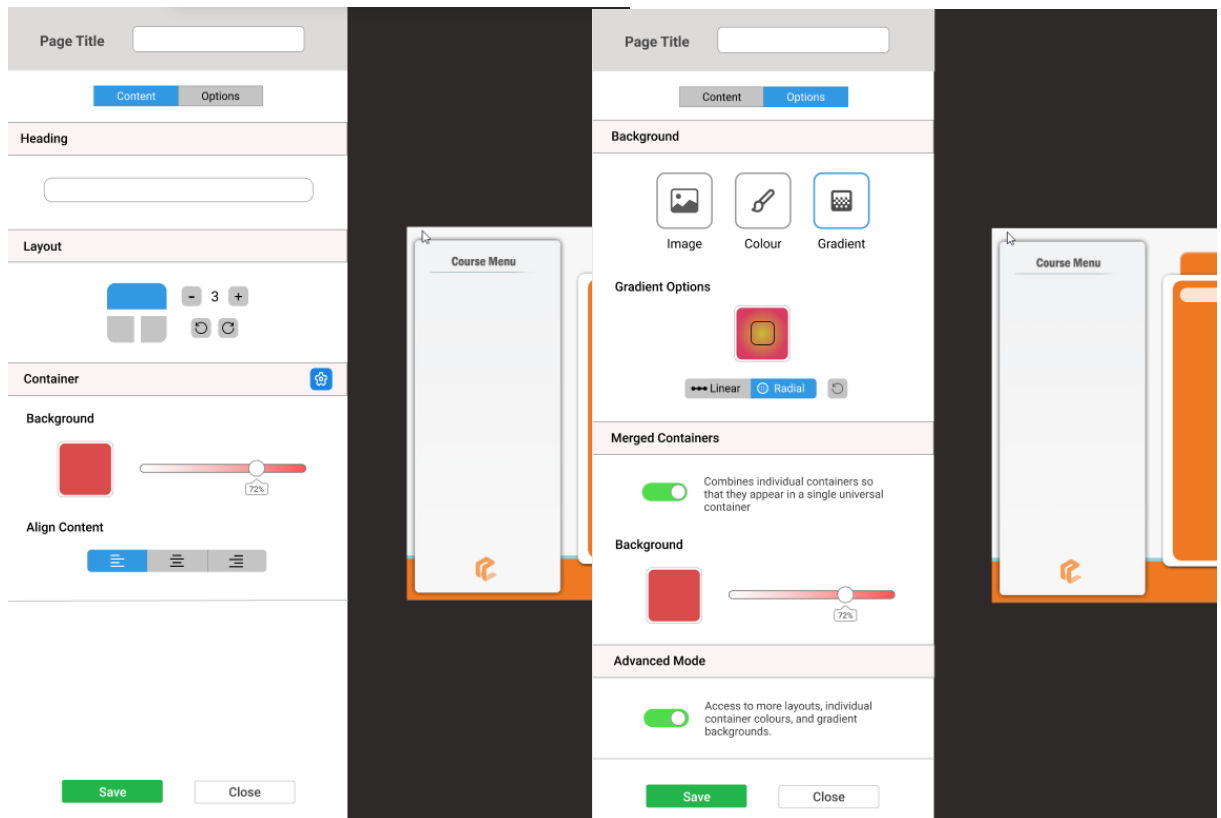*Figure 10: The mock ups created for the advanced mode. 'Content' tab is on the left while 'Options' can be seen on the right.*

3.4 StartMyCourse

As discussed in chapter 2, StartMyCourse is the product allowing users to buy individual courses. Admins are given access to a dashboard, seen in in Figure 11, in order to manage all of their courses.

Figure 11: The StartMyCourse Dashboard before project

3.4.1 Php User Interface (UI) update

To begin this project, I had to attain a basic understanding of Docker and get it running on my computer. This allowed me to boot up the docker containers and create the environment on my device.

I then turned to learning CakePHP (Ref 2), the php framework in which the project is based on. After getting a grasp of the framework I began utilizing SQL queries in order to add the new 'Started' filter.

Once the backend PHP work was completed I used CSS and JavaScript in order to style and change the UI of the components. The result can be seen in figure 11.

Figure 12: The StartMyCourse dashboard after project

Chapter 4.   Teamwork and Business Experience Acquired (Max 500 words)

4.1 Introduction

Throughout the placement I had the experience to learn about the different aspects that exist within a business structure as well as build upon my teamwork skills through working alongside other developers. In this section I will illustrate both the teamwork and the business experience I have gained.

4.2 Teamwork & Team Procedures

As I worked alongside developers that had years of experience, it allowed me to grasp an understanding of how to write clean and readable code while also enabling me to comprehend complex systems. I had the chance to contribute to the company's products and take part in testing meetings, where I was able to actively listen and communicate amongst the team in order to clear up any issues. Each of these gave me a sense of being in a team and helped to develop my team working skills.

The team procedures start at a Kanban board (Ref 1) which is hosted online and can be seen in figure 12, this will sort tickets (features, bugs, projects) into five sections: *Ready, In Progress, For Approval, In Testing, and For Release*. Each ticket must go through each stage.

The team leader adds tickets to the Ready section and assigns a team member to complete the task. The team member, at the beginning of the ticket, moves the ticket to the In Progress where it will remain until completed. Once the developer has finished it, they create a pull request which allows the team leader to review their code. From here, the team leader can either reject it, where it is sent back to in progress, or accept the ticket where it will then move to the In Testing section. The team leader would then assign a tester along with some acceptance criteria for the ticket. Having tested the ticket, the tester either accepts the ticket and it is sent For Release, or works alongside the developer to clear up any bugs or issues. The tickets will then remain in the For Release section until the next release, which occurs every three months.   A graphic of this workflow is demonstrated in figure 13.
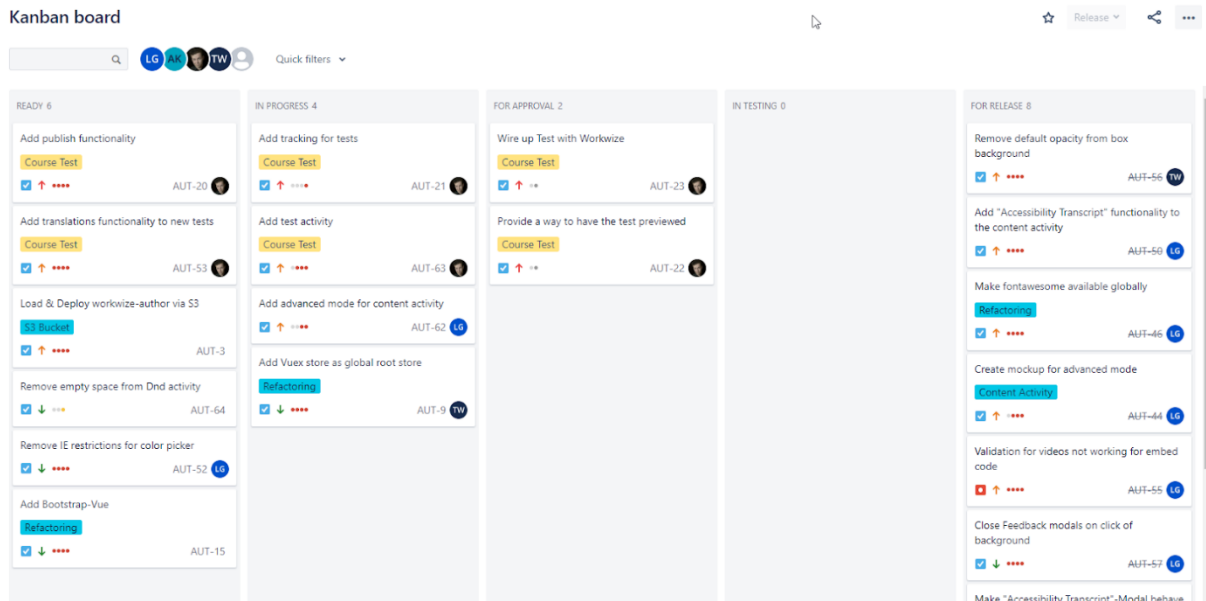
Figure 13: The Kanban Board for the authoring tool.
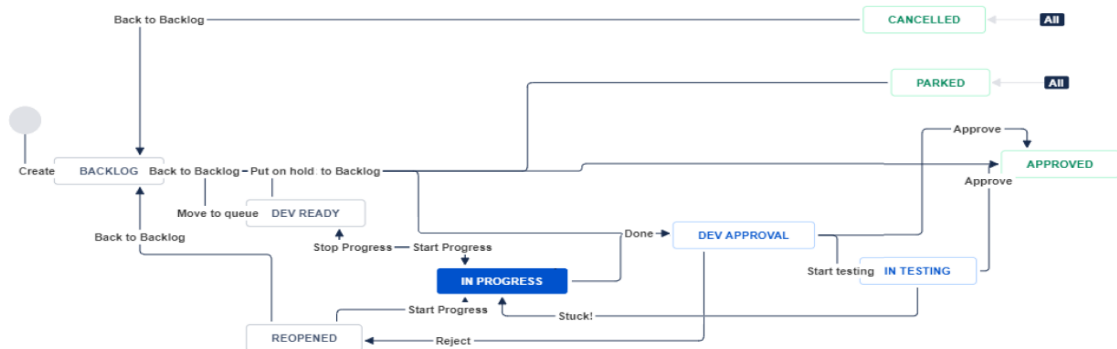
Figure 14: A diagram illustrating the workflow

4.3 Business Experience

Working in EssentialSkillz was an ideal environment to gain business experience. Due to its small size, all the teams were located on the same floor in an open planned office which allowed for fluid interactions between them. It allowed me to grasp a great understanding of the workings of a business and I found myself picking up useful pieces of information from the different teams. For example, being near the support team I was able to experience their use of intelligent communication and methods used to treat customers with care.

I was also given the opportunity to present two topics to the team, one on my responsive design project, and the other on progressive web applications. This experience and the confidence gained from it will prove vital for my future career as presentations are a large part of business.

Chapter 5 **Achievement of Learning Outcomes and Programme Outcomes**

5.1 Introduction

This chapter will be broken into 5 sections, each one detailing the achievement of each Learning Outcome (LO) from the PEP.

5.2 Information Skills

From the very start of the placement I developed my information skills. It began with the internal training on the WorkWize system where I had gathered, interpreted and stored information through the presentations and demos which I received. Later in the placement when I was working on my projects, I turned to several different sources on the internet to find answers. Websites such as StackOverflow.com provided me with specific coding problems other developers had come up against. Reading and understanding technical documentation on Vue and Docker as well as completing tutorials and courses on CakePHP helped to understand the complexity.

5.3 Personal Management and Project Planning Skills

Both my personal management and project planning skills were developed by completion of projects. Before beginning a project, I would analyse the information needed to complete it. If I felt that I was lacking in any particular piece of knowledge I would turn to my information skills to further my development. This helped me to complete projects to the best of my ability. I would then form a schedule for my projects, breaking it down into sections which would be the main goal for that day. I found focusing on one main goal to be highly beneficial for my focus and was not something I had implemented until a couple of projects in.

Tools such as the Kanban board, as mentioned in chapter 4, allowed me to easily keep track of my project stages and to keep myself organised. For example, I only started a project once the previous one passed the code approval stage allowing me to keep focus on one task.

5.4 Analysis, Interpretation and Problem Solving Skills

Each project I completed on my placement allowed me to increase my ability to analyze, interpret, and problem solve.

When an issue or a bug came up, I would analyse it. This allowed me to track down and find the place in which the problem occurred. I did this through the help of the console which would display the errors and give a brief overview of the problem.

Interpretation skills were mostly developed when starting projects. The project ticket would be placed on the Kanban board where I would need to interpret the problem and go about solving it via my problem-solving skills.

I would carry out experiments to solve problems via the use of console logs to assist me, discuss the problem with the other developers and create prototypes of designs in which I could modify quickly in order to test different solutions.

5.5 Opportunity Awareness and Decision-Making Skills

I had to make a variety of decisions during my time in EssentialSkillz. These usually came as design and coding decisions. When a decision-making moment arose in a project I would analyse the options

and gather relevant information via the internet or discussions with other team members. When it came to the design decision, I found that the most efficient approach was to use a prototyping tool, such as Figma discussed in section 3.3.4, to determine the best approach to take.

When it came to opportunities, I was always open and looking for them which greatly helped my awareness. For example, when I noticed that I was doing a lot of front-end projects I took the opportunity to ask my team leader if there were any potential backend projects that I could work on. This allowed me to work on the StartMyCourse ticket which helped me to achieve a goal of learning more about full stack development and also helped me realize that my preference lies in the front end.

5.6 Communication Skills

My communication skills improved immensely over the period of the placement as I had a number of opportunities to develop upon them when working through projects. Before beginning a project I had to fully understand what was required, if I was ever unsure I would discuss with the team leader to clarify. When submitting my code for review I had to write detailed and clear documentation which helped me to be precise when describing technical details and to also express ideas better via the written word. Presenting my project and lightning talk improved my public speaking and my confidence in speaking in front of my peers.

Chapter 6 **Support Provided by the Company (Max 200 words)**

6.1 Introduction

EssentialSkillz provided many methods of support which helped me to get the most out of my placement. This chapter will discuss these in two sections: training, and mentoring.

6.2 Training

The initial two weeks of my placement I was trained on all aspects of the WorkWize system. This began with the core functionalities and slowly progressed into the deeper features of the system allowing me to learn more effectively and grasp a better understanding of the system.

I also completed several internal training courses that ranged from Equality and Diversity to Code of Conduct helping me to understand the company's ethical guidelines and allowed me to develop professionally.

EssentialSkillz provides their employees with access to Lynda.com, a website that hosts a wide range of courses from categories such as design, business, and programming. I took advantage of these courses completing sections in both the Vue, and CakePHP courses.

6.3 Mentoring

I was provided with a mentor upon my start in EssentialSkillz which helped me to settle with ease as I felt I could ask questions and get help with anything when needed. I also had bi-weekly meetings with my Team Leader, this allowed me to gain better awareness of my performance and progress, as well as giving me the opportunity to bring up issues or areas of development I would like to work on.

6.4 Covid-19

In March EssentialSkillz temporarily closed their offices and shifted the team to a remote working situation. There were a number of methods taken to ensure the wellbeing of the employees such as online social events and frequent company meetings.

References

[1] Atlassian Agile Coach available at https://www.atlassian.com/agile/kanban February 2020

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