

A Critical Review of Today's Technology Education for Young girls aged 11-17

A critical look at the tech education system for girls, girls of colour, trans girls, and girls+ in the UK

Tags: Girls+ In Tech, Gender Gap In Tech, Secondary Tech Education for Young Girls 11-17

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Abstract

With this literature review, I will take a look at the different research surrounding technology education for young girls+. I will demonstrate the stark differences between genders when it comes to careers in technology and attempt to pinpoint an overarching issue. I will explore what prevents girls+ from exploring their potential with a technology based setting post-school, the All-Party Parliamentary Group (2020) carried out an extensive review and found stark inequity within STEM based subjects at school and beyond. I will look at the varying influences for the young girls+ of today and propose a potential resolution to go some way in combatting gender stereotypes, while devising a plan to engage female and non-binary future pioneers in technology.

Contents

Acknowledgements	1
Abstract	1
Figures & Tables	3
Introduction	4
Review of Current Resources and Literature	4
Existing Research and Literature	4
Overview of Problem & My Approach	5
Why are teachers important in the development of skills and potential in students?	5
What approach could encourage more Girls+ in tech based subjects at school?	5
Does early intervention to combat gender stereotypes create a stronger bedrock for girls+ to engage further in tech-based learning?	5
What impact does a disadvantaged background have on girls+ education and future prospects?	6
Existing Resources Review	6
Resources for Young Girls+	6
Conclusion	6
Bibliography	7
Technical System Description	Error! Bookmark not defined.
System Design & Documentation	9
CyberX Courses	12
Course one	12
Course two	12
Course three	12
Course four	12
System Users & Use Cases	12
Indicative Test Plan	16
Scope of Testing	16
Type of Testing	16
Risks & Issues	16
Actual Tests	Error! Bookmark not defined.
Test Plan 1 – Functionality:	Error! Bookmark not defined.
Test plan 2 – Process	Error! Bookmark not defined.
Test plan 3 – Database	Error! Bookmark not defined.
Test plan 4 – Code	Error! Bookmark not defined.
Implementation Report	20
Technical System Design & Documentation References	22

Figures & Tables

Contents.....	2
Table. Existing Resources.....	6
Table. Depicting what will be used when creating my web app.....	9
Figure. Front End System Design.....	10
Figure. Database ERD Examples.....	10
Figure. Back End System Architecture.....	11
Figure. Visitor Journey.....	13
Figure. Member Journey.....	14
Figure. Admin User.....	14
Figure. Diagram showing front end and back end.....	15
Figure. UML Depicting Access for CyberX Users.....	15
Figure. Test Plan Attributes To Consider (Vivek, G. 2022).....	16
Table. Testing Scope.....	16
Test Plan 1 – Processes:.....	17
Figure. Test plan 4 – Code.....	20
Figure. CyberX Logo (Canva, 2022).....	21
Table. Sprint Backlog.....	21

Introduction

The very real and world-wide issue of the gender gap within technology is not a new problem, it has been apparent for decades with only little steps to a more equitable system that demonstrates appreciation for both genders within the technology industry. This research paper will take a look at the different and varying factors involved in preventing girls+ to pursue a career in technology. (Department for Education and CooperGibson Research, 2021) carried out a Tech Education report looking into the varying aspects of what today's TechEd looks like, although the figures are more generalised and not gender focused, it still shows what potential barriers there are for to fully engage in TechEd, citing barriers as, access to technology and connectivity, and digital skills of parents and students, another noteworthy barrier was surrounding the costs, quality and availability of hardware and software for students. In another section it brings focus to the fact that it's not just students who struggled through the pandemic with tech based learning, educators also struggled with many of the same barriers that students faced, but with the added barriers of ability, safeguarding, and the most worrying one, 'unwillingness', in addition to this, only 1% of schools reported no barriers [page 49-50].

Going forward I will look at existing research on my chosen subject area and offer a critical review of these as well as demonstrating awareness and potential action that can be taken to combat the issue of the gender gap within STEM based subjects. Research suggests that engaging girls+ from a younger age will aid in combatting gender stereotypes, another aspect is focused on how to engage the young girls of today and what this could like going forward.

The education sector is at a pivotal point in history, and soon schools will be differentiated by their ability to adapt to the modern world, more important than that, education institutes will be judged on how they're encouraging, teaching and aiding our children for a world that is increasingly tech centric.

Review of Current Resources and Literature

Existing Research and Literature

There is one point that I wanted to make a note of here. There is not figure based research on the current state of the technology based education for the young girls+ of today. That being said, there are multiple social aspect research papers that I will include here, I will look at various reports and blogs to attempt to answer critical questions on my subject.

There is a huge focus at the moment targeting Technology Education, and in one such paper, (Herro, Visser and Qian, 2021), explores the way that tech education is received by educators. It concluded from their research that the educators who had higher tech capabilities appreciated Technology Education more than an educator that had limited technology capabilities.

There are many aspects that are affecting the decisions for girls+ to pursue technology based further learning and careers. One researcher, Correll, S.J. (2004), carried out an experiment on undergraduate students, whereby in varying mathematical tests, the men and women were told in one instance that generally men fared better in the test, and in another, the women fared better. Upon self-assessment, men assessed themselves higher than the women did, in the second instance, it was equal self-assessment on perceived performance.

(Deodeshmukh, 2022) researches the varying factors that may prevent female and non-binary identifying individuals to take up further tech-based learning and careers, they cite preconceived notions, stereotyping and lack of women+ role models as a catalyst for the low uptake in STEM learning and careers. This research focused on 6-12th graders, and purposely had representation of varying women+ as guest speakers from STEM based backgrounds, with a higher focus on girls of colour. Although this research is in its infancy, it did discover early on that the younger 6-8th graders engaged a lot more than the older 9-12th graders and poses a question on whether or not gender stereotypes have a deep and lasting effect on the subjects if it is not combatted early on. The experiment also experienced difficulty in engaging from students who only had one care giver for transport, this brings about the subject of disadvantaged youths, are the more disadvantaged girls+ less likely to engage in further learning within a STEM based subject, it is something I will look at trying to answer here.

Overview of Problem & My Approach

Why are teachers important in the development of skills and potential in students?

The UKRI announced in December last year their focus and awardees of the education research programme, there is £5.3M to support 9 projects focused on technology in education. This is a positive step forward and helps to bridge the gap between teaching and technology, which I believe is imperative if we seek a change for the better within tech education for young girls+ (UK Research and Innovation, 2022). With this programme a wide range of key issues are at the centre of these research projects, and many around focusing on the teaching side of things, due to the slow decline of STEM based teachers, and the struggle to retain them.

Teachers as a whole are one of the most valuable resources in the world. They are one of the most pivotal figures in a student's life, and it can be argued that in some cases, teachers are a student's most influential, most formative, and most lasting relationship. This is because it is their responsibility to prepare students for the future, for their futures.

Across the years of research, it is shown that teachers have a significant positive influence on children's learning, especially in the STEM pedagogy. A good step forward is increasing access to hardware and software in schools, along with educator development and knowledge should be a focus for the improvement of education for my chosen demographic.

Educators are an important aspect of future learning, and the much needed change in how we teach students can only happen with the support and innovation of existing and new educators. There are many aspects that can impact education and many think that the approach of connectivism is the way forward in pedagogy and can push through education to transform it into a current and digital centric learning environment. This may also go some way to improving the gender gap and combatting gender stereotypes within the technology sectors.

What approach could encourage more Girls+ in tech based subjects at school?

For this, a recommended holistic approach to education for young girls+ needs to be taken, that doesn't just include education, but includes early years support for emotional well-being. There needs to be an overhaul of addressing real-world issues, like gender bias, and gender stereotypes; facing important issues that are detrimental to women all over the world will aid in arming the future pioneers of our world with tools to deal with these issues when they happen.

An important aspect that will go hand in hand with encouragement, is access to education and positive role models. (Deodeshmukh, 2022) focused her research on role models for young girls and found this effective in engaging the younger age group. As it stands there aren't many ways to present potential role models to the young students of today and I feel an approach of companies, like the Stemettes (Stemettes, n.d.), to carry out future outreach programs in schools, would have a huge positive impact on many girls+. Not only that, but this would also address engaging the disadvantage young girls, which according to research, can have a detrimental impact on their education and future prospects.

Does early intervention to combat gender stereotypes create a stronger bedrock for girls+ to engage further in tech-based learning?

Gender bias and stereotyping may well seem like a small issue, or a thing of the past, it certainly isn't, it encompasses gender ideals, encourages toxic masculinity, and is detrimental to all genders, not just girls. This can impact career choices and future prospects and if it isn't addressed, it will carry on throughout generations, going in the same circle it always has. Throughout all of my research there seems to be a common theme, the girls+ constantly under-estimate themselves compared to their male counterparts (Pemberton, n.d.).

Early intervention in young girls+ lives to combat gender stereotypes is imperative to helping them build confidence and change the perception of themselves and other girls+. If the world can support and cultivate girls+ from a young age, this will go a long way to supporting higher self-esteem, and greater belief in themselves in pursuing a STEM based learning journey and career. By providing the young girls of today with support and

resources to encourage their creative interests and passions, rather than reinforcing gender stereotypes, will help to create a more inclusive and diverse tech industry of the future.

What impact does a disadvantaged background have on girls+ education and future prospects?

(Hirsch, 2007) looks at the varying backgrounds and experiences of children from disadvantaged upbringings and their attitude towards learning. The key take aways from this paper are; a strong indicator of poor educational performance is a low income; white children are more likely to under-achieve consistently when from a disadvantaged background. It also brings focus to the seemingly connection between disadvantaged youths and lower levels of confidence and self-esteem within education. Experiences of the children that do not do well at school reinforces their lack of confidence surrounding education, and more must be done to address this.

By looking at how disadvantaged backgrounds affect students, it allows me to draw conclusions based on my previous research around gender bias, much of the symptoms of both these subjects are very similar, including low confidence, lack of self-esteem, and low self-belief. This allows me to conclude that girls+, in addition to having to deal with gender bias and discrimination, should they be in a position of disadvantage, they would incur additional hardships overall in all aspects of life.

Existing Resources Review

For a holistic approach to tackle the issue I propose in my final year project brief, I need to look at existing resources and how these operate within the demographic I have set out. I will include here what each resource offers, the target audience and whether or not they include outreach in a school setting.

Resources for Young Girls+

When completing my research on resources available, there are quite a few, not all offer outreach and some operate under 'chapters' to get bigger worldwide coverage. All of them have a similar theme and message, to grow confidence in girls within tech based learning, to champion diversity and inclusivity, and ultimately, to close the gender gap in STEM based careers.

Table 1. Existing Resources

(Stemettes, n.d.), (Cybher, n.d.), (SheCodes, n.d.), (GirlsWhoCode, n.d.), (DigiGirly, n.d.), (Technovation, n.d.),

Resource	Target Age Group	Outreach Engagement	Delivery
Stemettes	5-25 years	Offer School Trips	Online & in-person
GirlsWhoCode	Kindergarten to 12 th Grade, offers Alumni	k-12 class based engagement	Online & in Person
GirlsInTech	Women (Poss children but cannot see this anywhere)	No	Conferences, workshops and online
Microsoft DigiGirly	11-18 years	No	Workshops, mentorship
Technovation	8-18 years	Yes	Community based tech projects, online
CybHER	Middle School – College Age	Yes	Camps, online

Conclusion

When looking at the research and how we engage young girls+ to encourage engagement within STEM based subjects, there's some really good movements with some making huge impacts, the issue is, that impact is not enough and more needs to be done. This issue of gender bias and the gender gap is such a deep rooted issue with pre-conceived notions deep seated within education, communities and families. To tackle this issue, there needs to be a head on and holistic approach, supported by everyone, parents, teachers, and businesses, to encourage and uplift the young women+ of tomorrow, and foster future potential by growing confidence and self-esteem within all girls+.

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System Design & Documentation

For my project, I have opted to create a web app in PHP for my online resource and learning platform. I feel creating a web app will allow for a more dynamic user journey and as I am creating an online learning tool, I feel that creating this in a dynamic way will aid in user interaction. My experience with PHP is much greater than any other coding language or stack and I feel this will help to reduce time constraints and allow me to build a better functioning web app for my proposed users.

I will make use of the various aspects afforded to me by using PHP including Twig Templating, PHP Code Sniffer, PHPUnit, and following the model, view and controller (MVC) architecture, which allows me to separate the data, the appearance and control the behaviour in a separation that allows easy viewing of the structure and operation of my system. This will ensure I keep with in line with separation of concerns (SOC) with my coding style and will allow for easy debugging and future collaboration on this project, in addition to this, PHP has multiple libraries to avoid duplication of code, so it will reduce time constraints as opposed to coding from scratch. PHPUnit will allow for easy testing of my system for when I reach the testing phase of my project and PHP Code Sniffer will allow me to beautify and correct my code. There are additional libraries which will allow me to easily complete form validations, data sanitisation which will be very important as my web app will be taking user input. A few benefits of utilising the existing PHP libraries are that it will ensure that I am guided to writing code in a neat way with predisposed naming conventions included, it also offers better web app security and can help go some way to protecting against some exploits, including but not limited to; cross-site scripting. (Brotherton, 2022)

Front end (Client side): PHP language with Twig, HTML, CSS and possibly some java via a bootstrap to create the UI view for the users. The visitors will have navigation functionality and users will have what the visitors have as well as the added benefit of a dashboard and full learning platform access. There will be a super user account for management of user accounts to enable adding and removing users. For the design portion for each course, I will make use of some open source online libraries to implement HTML and CSS like uiverse (n.d.) and possibly Spline(n.d.) for anything UI object related.

Back end (Server side): Database for users, login and logout functions, checking parameters and hashing passwords. I will utilise existing Slim PHP framework as it will allow me to keep in with the SOC, by utilising existing libraries of code to help me to reduce the amount of code and duplication that can sometimes occur when creating a web app, it will also keep things secure and reduce the amount of development needed.

Table 2. Depicting what will be used when creating my web app

View & Architecture	Functionality & Languages
Twig Templating (With HTML, CSS, Java Bootstrap)	PHP, Javascript, MySQL
MVC Architecture (Model, View, Controller)	Slim App (Library)

Figure 1. Front End System Design

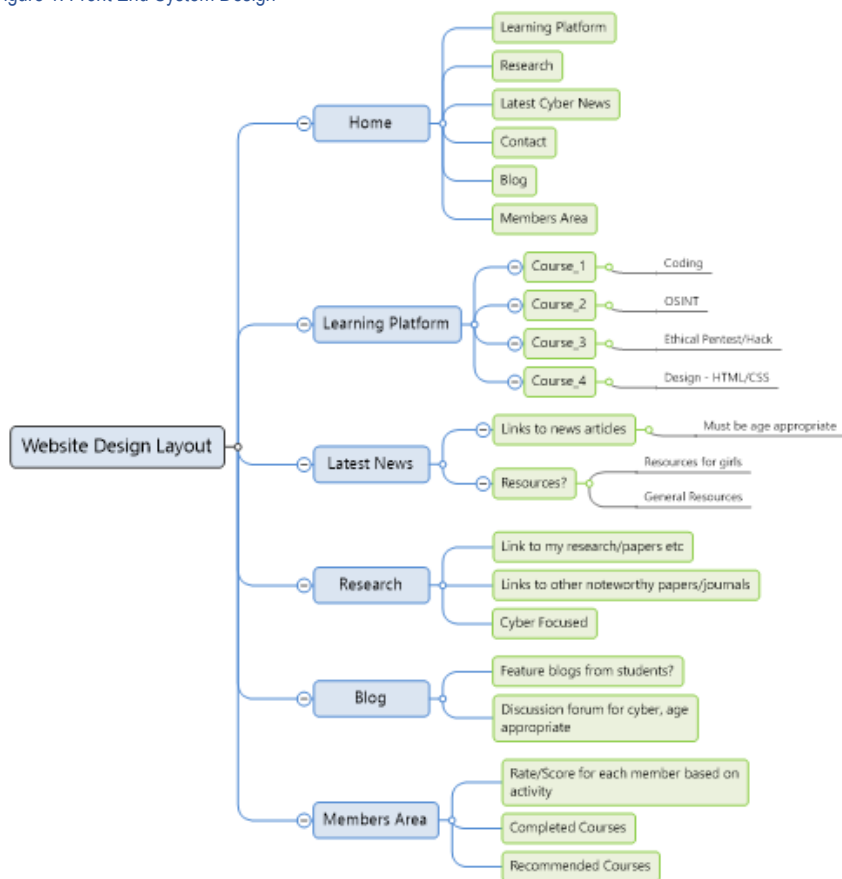


Figure 2. Database ERD Examples

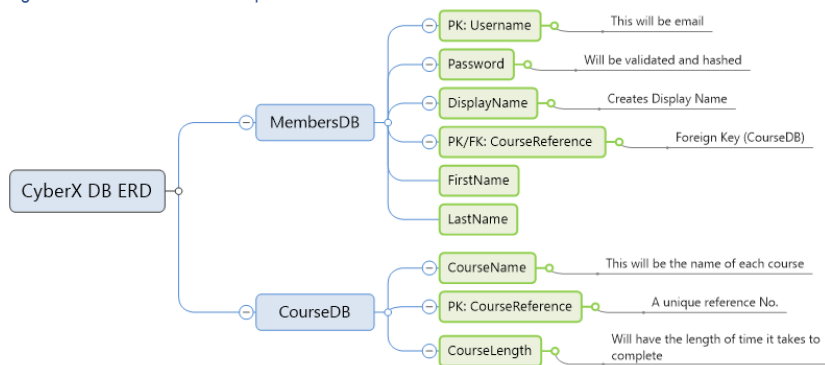
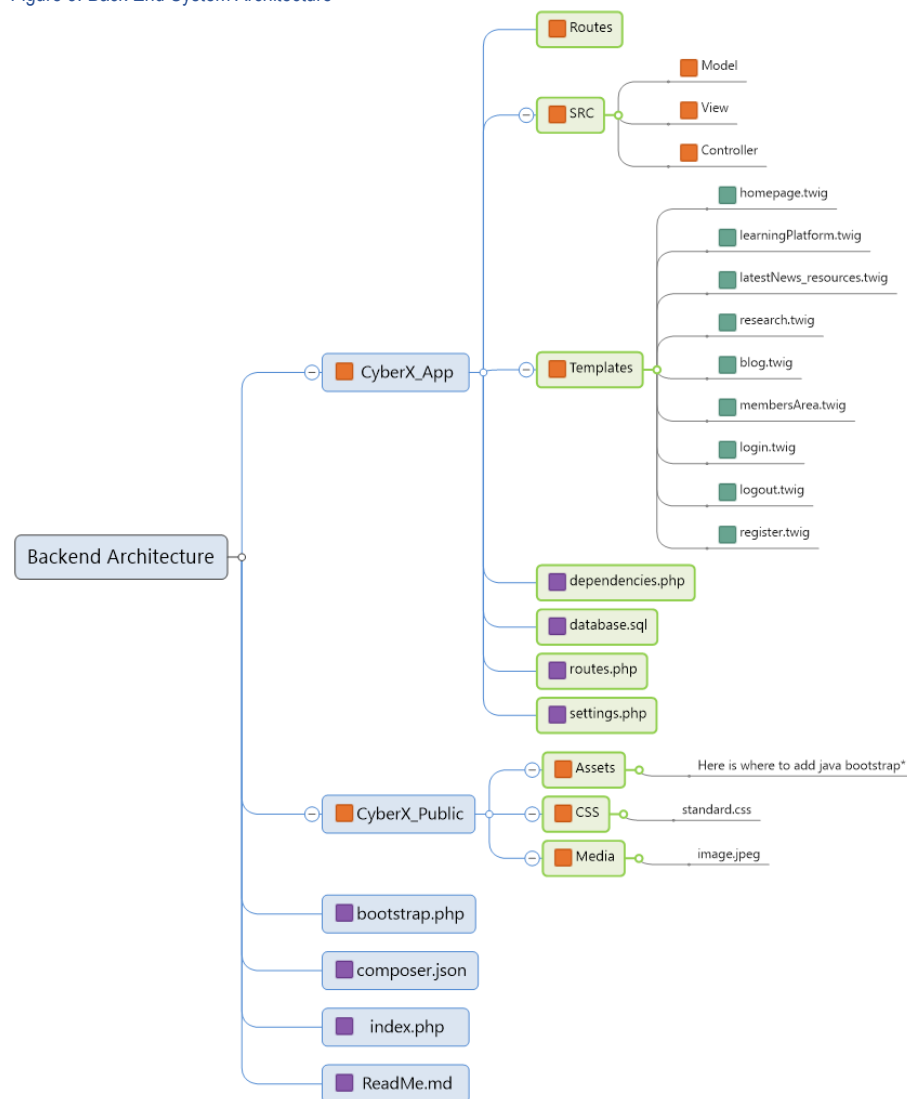


Figure 3. Back End System Architecture



CyberX Courses

In this section I will be exploring the course content that I will implement and integrate within my web app. At this stage I am unsure how it will work with integrating a responsive online course and plan to undertake further learning online to supplement my knowledge on this. The architecture will have a twig file for each course, further facilitated by individual files located in the Routes, View and Controller portions of my existing architecture.

Course one

Python for Beginners - This course will offer the basic 'Hello World' structure while introducing some basics in functionality and design. I am considering whether to add this as a guided video tutorial and utilise a free online python compiler or to create my own online compiler. Time constraints could be an issue here.

Course two

Inspector Digi - This course will offer some type of digital investigations to expose young people to the fascinating world of digital investigations. I have considered an OSINT task and will further develop this throughout my project.

Course three

Roll The Dice - The aim of course three is to expand on the knowledge being taught in course one and will allow students to explore Python more in depth.

Course four

Basic Java - As the tech world grows, so does the programming languages used. Javascript is one of those programming languages and is popular among some big companies, including PayPal, Netflix, Groupon and Uber. Microsoft even uses Javascript within their stack to facilitate some of their operations, so it makes sense to introduce some basic Java.

System Users & Use Cases

In this section I will cover the potential users that may visit my web application, CyberX. It is important for me to understand who my users might be to ensure a more dynamic and responsive web application targeted to my desired audience. As I have opted to use an Agile Methodology in my development project, I will utilise user stories and couple these with use cases; which will allow me to focus on the end result of each users interaction as well getting a clear picture of what system requirements there are and the benefits to the users, these will be backed up with flow diagrams depicting the user journey. Ultimately, what I will provide here will help define the project scope and user requirements. (Larson & Larson, 2004)

WebApp Visitor – This is someone who will visit the website, explore the content, with the option to create an account. This could be a student, parent or teacher.

A user may visit the web application and will always land first on the *Homepage*, a typical user will then have the options to navigate to the following pages:

Learning Platform: This will give an overview of what courses are available to the user. For a more in depth access to the learning materials, a user will have to sign up as a member (Free membership). It will show an overview of the four courses currently available to them as a user (*Coding Course, OSINT Course, Ethical Pentest/Hacking Course, Design Course – HTML, CSS*).

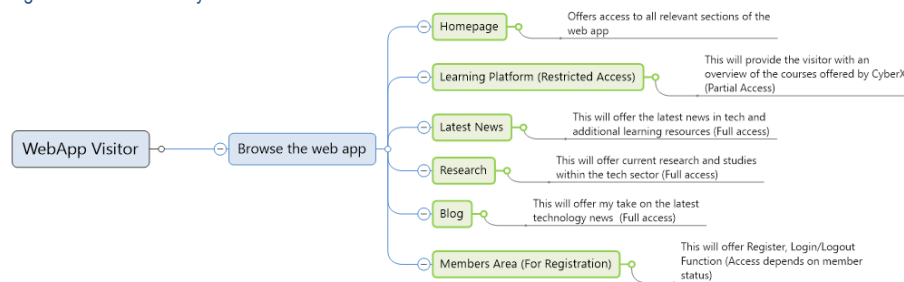
Latest News: This functionality will offer links to the latest news in the world of tech as well as other resources to upskill their tech knowledge.

Research: This section is accessible to all visitors and will constitute of research and studies within the tech sector.

Blog: This is a functionality that at this stage may just be a blog with admin only privileges and user viewing only, which would offer my take on current tech events. A future feature that I may consider adding is encouraging collaboration on this, from students and fellow educators.

Members Area: This section will have a register function for visitors that are not yet members, there will be a login feature but for this use case we will take it as a new user. Here they will have the option to sign-up as a member, there will be validation stages working behind the scenes to ensure a correct email is used and the password will have verification and ensure a safe and secure access point.

Figure 4. Visitor Journey



Member (Student, Parent, Teacher) – This is a user that already has an account and could be at any point in their learning journey, they will have access to a members area as well as the ability to look at their completed journey so far on the courses they have chosen, possibly via a dashboard. I am considering whether or not to add the option of having a membership for educational establishments which could show the school rating for their existing tech education and offer supplementary support in improving this aspect of their curriculum. I will define this as I go along, it may well be this is a feature that can be added later.

Learning Platform: This will give an overview of what courses are available to the member. It will show existing courses that have been started and a more in-depth look at the other courses available to the member (*Coding Course, OSINT Course, Ethical Pentest/Hacking Course, Design Course – HTML, CSS*).

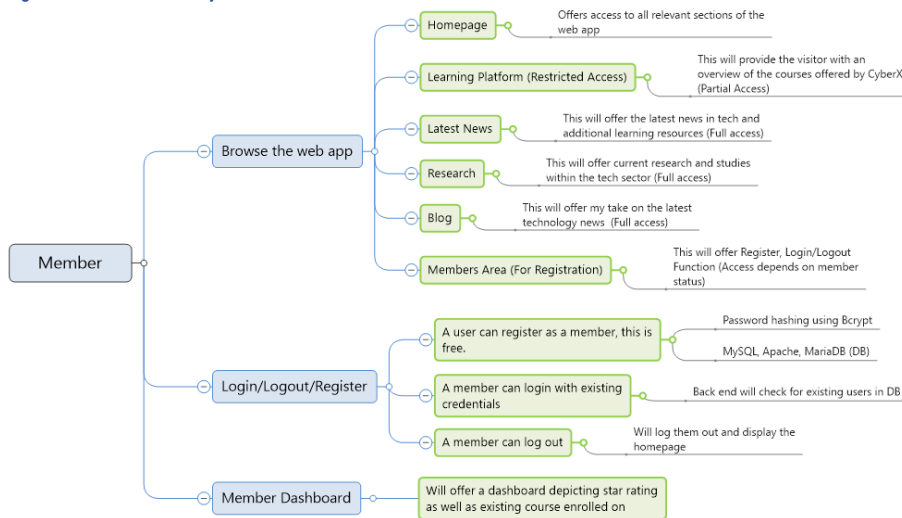
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Blog: This is a functionality that at this stage may just be a blog with admin only privileges and user viewing only, which would offer my take on current tech events. A future feature that I may consider adding is encouraging collaboration on this, from students and fellow educators.

Members Area: This section will have a register function, as well as a login/logout feature. The members area will be displayed as a dashboard and will have a rating system of some kind to show the completed learning as well as encourage members to continue on to completion. For each course that is completed, a member will gain a star on their profile. This will also provide a percentage bar depicting remainder of the course to be completed and offer suggestions for their next learning journey. A future feature that I may consider adding is an educator dashboard which will incorporate their students learning journeys, their school tech rating (From my Fuzzy Logic development project) and a section on providing pointers on what the educators can do to increase their tech education score.

Figure 5. Member Journey



Administration Profile – This will be classified as the super user and will have the full functionality of a visitor and member as well having permissions to add and remove users.

Admin Dashboard: This will have functionality to manage the content and its users/members.

Figure 6. Admin User

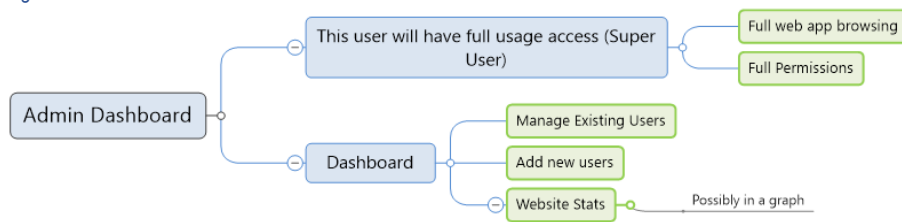
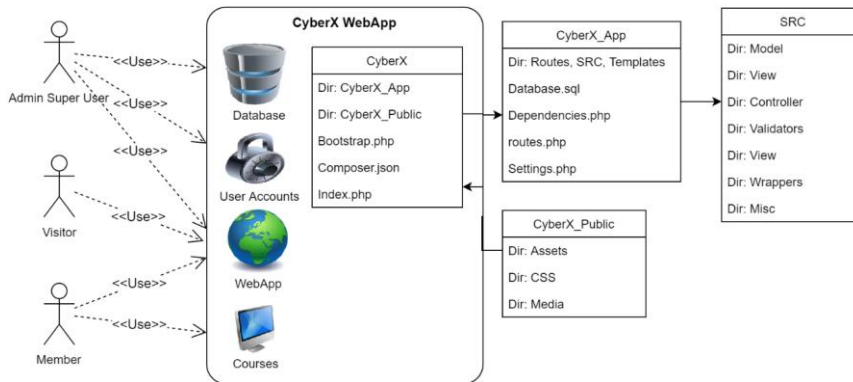


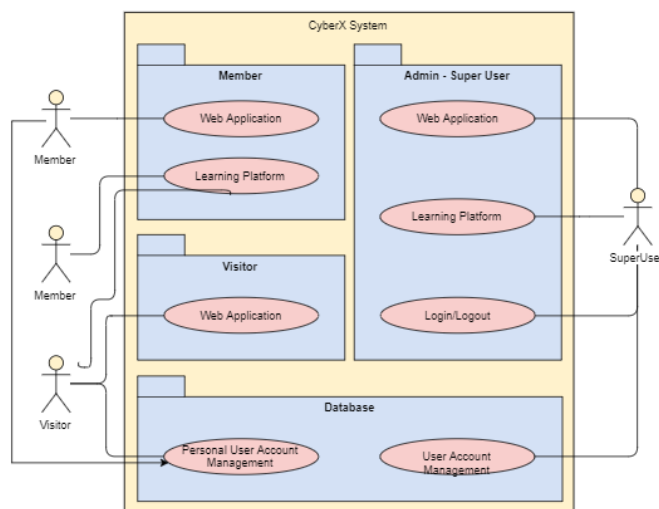
Figure 7. Diagram showing front end and back end



After planning and visualising my users and their journey, I have found the need for various supplemental programming tools. Going forward I will be devising the back end using PHP, Javascript, MySQL, MariaDB, Twig Templating, MVC Architecture, utilising Separation of Concerns (SOC), and following the SOLID principles.

This will allow me to create a dynamic web app for my users, a members area complete with an interactive dashboard, a functional learning environment, and a database to hold relevant information. Using the above mentioned stack will allow me to create a secure web application for my users to keep in line with current regulations around GDPR.

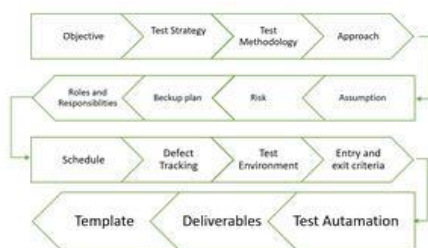
Figure 8. UML Depicting Access for CyberX Users



Indicative Test Plan

For the testing phase of my project I will ensure that all aspects of my project are comprehensively tested to ensure it acts the way I want it to and it provides the functionality desired to my users. In this section I will detail the scope of my test plan, the type of testing and detail any potential risks and issues that I may come across. I have opted to go for Type Specific test plan strategy which will divide my test plan into chunks of the type of testing required, for example; performance testing and security testing. I will take on the role of Testing Manager and Tester in this project.

Figure 9. Test Plan Attributes To Consider (Vivek, G. 2022)



Scope of Testing

The scope of testing will demonstrate the features that I will be testing and also include the features that I will not be testing, the features that will not be tested are made up of any software components created by someone else, this will be software that may be already tested and working that I will include that will not need vigorous testing.

Table 3. Testing Scope

Front End		Back End	
WebApp Functionality	WebApp Processes	Database	Code
Buttons	Login	New User	Standards
Links	Logout	Existing User	Style
Menu	Learning Platform	Data Storage	Syntax
Design	User Dashboard	Table Creation	Indentation
Layout	Super Admin Dashboard	Sessions	Security
Accessibility	Navigation	Password Hashing/Storage	Debugging & Logging

Type of Testing

The type of testing I will use will be varied and focus on the UI section of CyberX, the Security, the Functionality, Database and, PHP Code and any stacks that I use. I will break it down into sections and first start with a front-end test plan and a back end test plan, I will separate these into two sections to allow a clear and concise plan moving forward. As I have opted for a Type Specific test plan route, I feel this will give me the clarity and focus needed to enable me to carry out a comprehensive test plan strategy. This will also allow me to clearly see which section a bug may be in and enable a quick response to fix this.

Risks & Issues

The risks and issues to consider are; time constraints, the entry and exit strategy. There are tight deadlines that need to be adhered to and carrying out an effective test plan will allow continuous and effective testing for all the different aspects of this project. The entry and exit strategy will be important for the project and will allow a set of conditions to starting and finishing the testing plan. In addition to the points raised, it is important to consider all aspects of my web application to ensure a full and comprehensive study is carried out to enable clear definition of the functionality and what will need to be tested.

Further risks and issues to be considered are the knowledge and competence of the test manager and tester, if the knowledge is minimal then education on testing will be needed which may add additional stress to the already considered time constraints. To combat this it is important to know the existing skillset of the tester and testing manager to ensure reduced strain on the risk of time constraint and keep new learning to minimum where possible.

Actual Tests

Table 4. Test Plan 1 – Processes:

Test #	Test Name	Test	Expected Result	Actual Result	Working?	Notes
1	Register	Click register, Add in Details	Registers user and shows a success message			
2	Login	Enter in existing details and click login	Successful login, shows user dashboard			
3	Logout	Click logout button	Shows success message for logging out			
4	Learning Platform	Navigate the the learning platform page (Do as a visitor and as a user)	Shows the correct format for either a visitor or a user			
5	User Dashboard	Login as a user and click on Dashboard	Correctly shows a user profile and dashboard			
6	SuperUser Dashboard (Admin)	Login as the super user and click on dashboard	Correctly shows admin dashboard with admin privileges			
7	RETEST SECTION	SECTION TO RETEST ANY FAILED TESTS				

Table 5. Test plan 2 – Functionality

Test #	Test Name	Test	Expected Result	Actual Result	Working?	Notes
1	Homepage (HP) – Links & buttons, View & Navigation	Click all routes (links & buttons) to the HP. In addition to this, test all buttons and links within this section	All buttons and links that are designed to link to the HP takes the user to the HP, shows excellent UI view & Nav			
2	Learning Platform (LP) - Links & buttons, View & Navigation	Click all routes (links & buttons) to the LP. In addition to this, test all buttons and links within this section	All buttons and links that are designed to link to the LP takes the user to the LP, shows excellent UI view & Nav			
3	Latest News (LN) - Links & buttons, View & Navigation (Include subsequent buttons/links (Resources))	Click all routes (links & buttons) to the LN. In addition to this, test all buttons and links within this section	All buttons and links that are designed to link to the LN takes the user to the LN, shows excellent UI view & Nav			
4	Research (R.) - Links & buttons, View & Navigation	Click all routes (links & buttons) to the R. In addition to this, test all buttons and links within this section	All buttons and links that are designed to link to the R takes the user to the R, shows excellent UI view & Nav			
5	Blog (B) - Links & buttons, View & Navigation	Click all routes (links & buttons) to the B. In addition to this, test all buttons and links within this section	All buttons and links that are designed to link to the B takes the user to the B, shows excellent UI view & Nav			
6	Members Area (MA) - Links & buttons, View & Navigation	Click all routes (links & buttons) to the (MA). In addition to this, test all buttons	All buttons and links that are designed to link to the (MA) takes the user to the (MA),			

		and links within this section	shows excellent UI view & Nav for both user and superuser			
7	RETEST SECTION	SECTION TO RETEST ANY FAILED TESTS				

Table 6. Test plan 3 – Database

Test #	Test Name	Test	Expected Result	Actual Result	Working?	Notes
1	Create Tables	Create a DB for users and relevant data that needs storing	Success on creating table via automated PHP/SQL script			
2	User Validation	Checks existing DB for user info, then adds new user or logs existing user in. Validates PW, and Username.	Success message for either new user creation or existing user login. Successful error handling for incorrect login/register			
3	Super user validation	Test to check validation, privileges and access	Successful error handling with incorrect login, checks PW, checks privileges and			
4	Database Management	Test to ensure DB can be managed by super user, adding or removing users.	Success on adding and removing users.			
5	RETEST SECTION	SECTION TO RETEST ANY FAILED TESTS				
6						
7						

Table 7. Test plan 4 – Code

Test #	Test Name	Test	Expected Result	Actual Result	Working?	Notes
1	Code Testing	PHP Unit	No bugs			
2	PHP Syntax	PHP Code Checker	No code errors, syntax correct			
3	PHP Indentation	PHP Code Sniffer - Can be done within PHP Storm and automated	Code styling correct			
4	PHP Coding Standards	PHP Code Sniffer -	Code standards correct			
5	HTML Validation	W3 Markup (Online) - Copy & Paste into browser	No HTML Errors			
6	Var Dump (For Functions)	Test to check what is happening with any functions, will test all.	No issues and functions working as expected			
7	RETEST SECTION	SECTION TO RETEST ANY FAILED TESTS				

Implementation Report

Throughout my project I will be utilising the Agile methodology, I want to be able to complete sections of the development at different intervals, and at the same time, while testing along the way of the different aspects involved, and Agile allows this innovative way of working (Red Hat, 2020) this way of working will also play to my strengths and weaknesses in a positive light, keeping me focused on small chunks as opposed to a more rigid style of working in the Waterfall methodology, and on large areas of coding which may exploit my weakness of losing focus. Choosing this methodology will give me the flexibility to adapt and change to anything that might crop up during my development of CyberX. Although it is just me working on this project, I will make use of Scrum framework to plan out my weekly actions to put into Sprints, this will allow me to keep track in a way that will not take too much time but also allows for proper planning at each stage of the development.

For demonstration of my initial code, I will have the front end available via Twig templating to ensure the design is there, this will include the menus, and placeholders for the navigation of the web app. For the web app design I have opted for white background and will opt for neon blue and pink for the logo and have some of my logo colours working through the web app via the menu headers and some imaging/colours. The basis of my web application will be available and ready for me to continue and implement the desired functionality required.

I will have the architecture set out and will work from a top-down approach and add files as and when I need to. The architecture which be easy to read and navigate with naming conventions to support outside viewing and understanding, there will be a read.me file which will be completed towards the end of my project to explain things further.

Figure 10. CyberX Logo (Canva, 2022)



Sprint Backlog

After going through everything completed so far, I have devised a plan of what needs implementing going into the final deliverable. It is important for me to keep note of what needs doing to enable efficient working and ensure nothing is missed. Each week I take stock of what's been done and what needs doing and plan for the week ahead. Using the Agile methodology, I will create the basics and add functionality/features as I go along.

Table 8. Sprint Backlog

Task	Notes
Main Report	Presentation, Description of components, & Development lifecycle, critical analysis & reflection
Database	Create database using PHP
Learning Platform	Create learning platform, research stacks to work well with this.
Viva Presentation	Presentation & preparation

Commented [SD1]: Just checking - is the logo on the right supposed to be back to front?

Commented [VH2R1]: Yes, the image is flipped, do you think I should remove it? It is just for different uses.

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