

PaigeHarrisWEBTEC

by Paige Louise Harris

FILE	1543_PAIGE_LOUISE_HARRIS_PAIGEHARRISWEBTEC_155469_1072789292.DOCX (270.27K)		
TIME SUBMITTED	23-JAN-2019 09:46AM (UTC+0000)	WORD COUNT	3234
SUBMISSION ID	99669059	CHARACTER COUNT	18477

Web Technologies for e-commerce
M7X01705

With Gaynor Thomas

By Paige Harris
P145700

Due by - 23/01/2019

Contents

1.0	Introduction	3
2.0	Security	4
2.1	What security is needed?.....	4
2.2	Securing the log-in	4
2.2.1	SQL and SQL Injections.....	4
2.2.2	Sessions.....	5
2.3	Phishing.....	6
3.0	Scalability	7
3.1	Uptime	7
3.2	Performance	8
3.3	Reliability.....	8
3.4	Manageability	9
3.5	Cost	9
4.0	Usability	10
4.1	Usability Testing.....	10
4.1.1	How to Conduct a Usability Test?	10
5.0	Accessibility.....	11
	References	13

1.0 Introduction

This report will be discussing issues that would need to be considered if the website that has been created was to go live for public use. Some of the issues which are discussed are as follows.

- Security
- Scalability
- Usability
- Accessibility

2.0 Security

When running a website, regardless of whether or not it is for personal or business uses. Security must be used as it helps prevent a number of issues and give your customers reassurance that confidential information cannot be accessed by those who are not authorised.

Having the right security can:

- "To prevent Malware (viruses) being uploaded to your site
- To prevent Phishing emails being sent via your website
- To reassure your website visitors that your website is safe
- To get a better ranking in the search engines like Google
- To protect your business from getting hacked and to protect against losing vital data" [1]

2.1 What security is needed?

For this website, its best to use a website security monitoring system such as 'SiteLock'. SiteLock is a monitoring tool which is usually used for small businesses. There are some key benefits to using this security software, these include;

- Blacklist monitoring
- Malware detection
- Vulnerability
- Identification
- Virus scanning
- Domain ownership verification
- SSL Certificate validation

This form of security would be perfect for the small website as it will monitor throughout the website daily and it will inform the business if any issues are detected.

2.2 Securing the log-in

As the website has users that each have a username and password to log into the account. The website needs to be secure against hackers attacking the website and gaining unauthorised access to user profile and pages that only users can access.

2.2.1 SQL and SQL Injections

To protect your website from anyone typing similar usernames and passwords into the login details page. This can be done when writing the query to check the log in by using '?' instead of the variables name then using SQL to link it to the database and bind the parameters (variables) and indicate the type, this statement both variables are string. This looks for the exact match within the database for the username and the password and does not get effected by any apostrophes within the credentials.

```
$un=$_POST["un"];
$pw=$_POST["pw"];
//echo $un." ".$pw;

$query="SELECT * FROM user WHERE username like ? AND password like ?";
//echo $query;

$stmt=mysqli_stmt_init($link);
//prepare SQL
mysqli_stmt_prepare($stmt,$query);
//Sort out Parameters
mysqli_stmt_bind_param($stmt,"ss",$un,$pw);

mysqli_stmt_execute($stmt); //run query
$result=mysqli_stmt_get_result($stmt);
```

Without this form of protection, hackers could also use an SQL injection to gain access to site. If the query code was the following:

```
$query="SELECT * FROM people WHERE username='$username' AND password='$password'";
```

Then the hacker could access the site by simply typing into the username and password box this;

```
' OR 1=1--'
```

This injection will then change the string of code to:

```
$query="SELECT * FROM people WHERE username=" OR 1=1--" AND password=" OR 1=1--";
```

Meaning that the hacker will have bypassed the need for a username and password and will gain access to the website. Using the website in question as an example, the hacker would be able to view all the information being held as well as add new, edit and delete data from the database, this could have a serious impact on the website.

2.2.2 Sessions

There is also need to protect the websites pages and prevent hackers entering the full web address for the page in your web address in order to access certain pages. The best way to do this for a small website is to create a page which checks the users log in details when the sign in and keep them active for the duration they use the site or when they log out. Each webpage throughout the site must include the 'session', the session will hold the username in the session variable placed at the top of the webpage.

There are two common ways to use the session, including allowing all users to access the page, or only certain users with certain credentials.

The code for all users when logged in to access the page:

```
<?session_start();  
if(@$_SESSION["username"]!="")  
{?  
<html>  
.  
.  
.  
</html>  
<?}  
else  
{<?><h1><?  
    echo "Sorry, this page is not accessible";  
    ?><a href="welcome.php"><h2>Click here to Log in</h2></a><?  
}<?>
```

The code to only allow a certain user to access the page, in this case the user with the username 'paigeharris':

```
<?include "conninfo.php";
session_start();
if(@$_SESSION["username"]=="paigeharris")
{
    ?>
    .
    .
    .
    <?}
else
{?><h1><?
    echo "Sorry, this page is not accessible";
    ?><a href="welcome.php"><h2>Click here to Log in</h2></a><?
}>
```

2.3 Phishing

Phishing is the act of sending fraudulent emails out to customers from a business that most customers might trust, in order to attempt to obtain personal details such as passwords and credit card details. Phishing can also be used through telephone, this is known as 'Vishing' and texting, known as 'SMiShing'.

Common techniques that are used when phishing can be;

1. If something seems to be too good to be true, such as claiming the receiver has won a prize or won money.
2. The contactor will indicate there is a need to have your information urgently, such as, only having a certain amount of time to claim your prize, or even when trying to access personal banking information they might state that a bank account has been suspended and this information will be needed to unlock the account.
3. Hyperlinks aren't always what they will claim to be and might have a hidden agenda. Its best to search the link instead of pressing as it could be sending the user to a fraudulent site. By hovering over the hyperlink you can see the actual site the hyperlink will direct the user to.
4. Attachments can also be dangerous as they can have hidden viruses. It's best not to click any attachment if it didn't come expected or doesn't have a relation to the email.

3.0 Scalability

Websites which are used for anything other than interaction with the user such as e-commerce or have user profiles and log in details should be created with the possibility of expanding in mind. As more people join the website or more items are sold and the website becomes more popular, there must be room for the website to expand and be able to cope with the added information being processed. This means the website should have scalability, "Scalability is a characteristic of a system, model or function that describes its capability to cope and perform well under an increased or expanding workload or scope. A system that scales well will be able to maintain or even increase its level of performance or efficiency even as it is tested by larger and larger operational demands." [2]

The many factors of Scalability are:

1. Uptime
2. Performance
3. Reliability
4. Manageability
5. Cost

3.1. Uptime

Uptime is extremely important, as without your website being up, customers cannot use it, potential revenues could be lost and for large business, just 5 minutes being down could affect them significantly. "Uptime is the amount of time that a server has stayed up and running. This is usually listed as a percentage, like "99.9% uptime." Uptime is a great measure of how good a Web hosting provider is at keeping their systems up and running. If a hosting provider has a high uptime percentage, then that means that their servers stay up and running and so any site you host with them should stay up and running too. Since Web pages can't keep customers if they are down, uptime is very important." [3]

When deciding on which web host to use, look in detail the uptime percentages they are claiming to provide. The majority of webhosts will claim to have over 98% uptime. Here are some examples of this.

"

- 98% uptime = 28.8 minutes/day or 3.4 hours/week or 14.4 hours/month or 7.3 days/year
- 99% uptime = 14.4 minutes/day or 1.7 hours/week or 7.2 hours/month or 3.65 days/year
- 99.5% uptime = 7.2 minutes/day or 0.84 hours/week or 3.6 hours/month or 1.83 days/year
- 99.9% uptime = 1.44 minutes/day or 0.17 hours/week or 0.72 hours/month or 8.8 hours/year" [3]

So where as 98% seems a high percentage, when looking over a year, a whole week could potentially be lost. For a large scale business this could result in a large loss of revenue, especially if the site was to go down during a certain time of the year e.g. Christmas. The scale of impact should also be considered when decided on your webhost, if your site is non-selling/profitable then there would be no need to have the highest percentage uptime as the impact would be small. However, if it is large business trading online, then the higher percentage uptime, the better as it means less loss of revenue. Some webhosts will guarantee a refund if the down time is over a certain amount, per day/month/year depending on the provider, however they will only refund you the time you have lost from how much it costs for their services, and not the amount that has been lost in sales.

3.2. Performance

The websites performance must be high as it is essential to keeping customers on the website, and encourage users to revisit. If a websites performance is poor users will leave for another competitor. "Web Performance Monitoring is the measurement of a website's or web service's ability to respond efficiently to end-user interactions." [4]

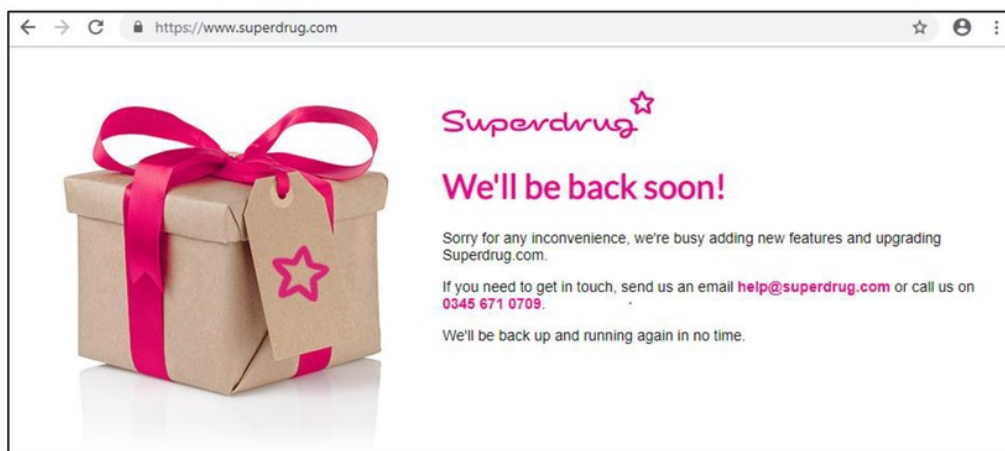
Not all factors can be the website hosts and data's fault, they can also be down to the users. The main factors which effect a websites performance:

1. File Sizes
2. File Quantities
3. Connection speed
4. Plugins
5. Browser
6. PC Cache
7. Traffic Volume

These factors could implement the websites poor performance and cause it to become slow at loading and responding to user interactions. If the website has not been optimized for multiple devices or web browsers, then the user experience becomes negative as elements of the website may become out of place or even dormant. Poor performance can also effect the SEO (search engine optimisation) rankings, causing the website to fall lower and lower from the top of the search results, inevitably, meaning less people will see the site.

3.3. Reliability

The reliability of the website refers to how well the user is able to access data. "Reliability is an attribute of any computer-related component (software, or hardware, or a network, for example) that consistently performs according to its specifications." [5] A good example of this is cloud storage as it can only be accessed online. The user could have used the cloud storage to store a backup of something the user would normally store on their home computer or laptop. If the online cloud is down, then the user will be unable to access any of the data held on the cloud. If a user is currently using a cloud based storage area, which is regularly down, then the user will eventually look at changing the company they use for this service. Normally when a website goes down, a message to the user will show, an example can be seen below;



3.4. Manageability

If the manageability of the site is easy to operate, maintain and update then it makes any problems occurring easy to identify and fix. "The ability of a system to be controlled easily either by means of self-control or by providing certain techniques to ease external controls" [6]. If the website and business is going to expand overtime, it must be easy to manage different areas of the website to allow for any changes which will need to take effect. The system should be designed in a user friendly way to make it as easy to operate as possible. Manageability of the system is vital and essentially is relied on by the scalability of the website. The website cannot grow if maintenance and updates are difficult to perform. When the website is easy to manage, it is easy to add updates and modify the website. For example, a style sheet is the easiest way to change the designs within the website, as it will change all the related areas throughout, such as font family, sizes and colours as well as background images or headers.

3.5. Cost

Cost can include both hardware and software costs, as well as maintenance costs. If it is going to cost a considerably amount to expand the website, costs should be compared to how much income the website will gain against the amount it will cost to implement the expansion. For example, if there are many users which will be using the website at the same time, can the current servers cope with the stress or are more needed?

4.0. Usability

Usability is a main factor to consider when creating a website, as it sets the general standards for how the website should be presented and what will help make the users experience simple.

“Usability is the measure of a product's potential to accomplish the goals of the user. In information technology, the term is often used in relation to software applications and Web sites... Some factors used in determining product usability are ease-of-use, visual consistency, and a clear, defined process for evolution.” [7]

The main factors for usability are;

1. Learnability
 - a. How quickly is the user able to fully understand and work with the user face?
2. Efficiency
 - a. Can the user navigate through the website in order to accomplish the task in hand?
3. Memorability
 - a. Does the user, on return to the website, remember how to use the site?
4. Errors & Error Frequency
 - a. How often is the user making errors?
 - b. Are the errors serious?
 - c. Can the user go back a step without consequences?
5. Satisfaction
 - a. How satisfied is the user after completing the task?
 - b. Did they complete the task?

4.1. Usability Testing

Before a website going live to the public, tests should be performed on the usability of the website to evaluate whether or not the website is as user friendly as possible. “Usability testing is a way to see how easy to use something is by testing it with real users. Users are asked to complete tasks, typically while they are being observed by a researcher, to see where they encounter problems and experience confusion. If more people encounter similar problems, recommendations will be made to overcome these usability issues.” [8]

4.1.1. How to Conduct a Usability Test?

When conducting a usability test, there are 6 main steps that need to be followed. These are;

1. Build a Prototype (the website)
2. Create a Test Plan
3. Choose your participants for the testing (it should be tested on a range of people, firstly look at the potential target audience and then those who might be computer literate might understand a more complex user face whereas a member of the older generation who doesn't use computers often most probably won't understand it.)
4. Perform the Test
5. Document the results
6. Use results to correct any issues

If many issues were found, it would be a good idea to repeat the process to ensure that no new issues are found before going live.

5.0. Accessibility

Accessibility should always be considered so that people with disabilities can also view and use a website to as good a standard as any. The website must be designed and coded with disabilities in mind and not to shut anyone out essentially expanding the audience.

“Web accessibility means that websites, tools, and technologies are designed and developed so that people with disabilities can use them. More specifically, people can:

- perceive, understand, navigate, and interact with the Web
- contribute to the Web” [9]

The accessibility generally looks at different ways it can get around the following types of disabilities,

- “auditory
- cognitive
- neurological
- physical
- speech
- visual” [9]

Web accessibility also considers other barriers which can affect the user experience;

- “people using mobile phones, smart watches, smart TVs, and other devices with small screens, different input modes, etc.
- older people with changing abilities due to ageing
- people with “temporary disabilities” such as a broken arm or lost glasses
- people with “situational limitations” such as in bright sunlight or in an environment where they cannot listen to audio
- people using a slow Internet connection, or who have limited or expensive bandwidth” [9]

In order to make the website as accessible as possible, there are key points which will help make sure it is.

The website should be keyboard friendly, meaning the website can be fully used by only the use of a keyboard and no mouse is necessary. The tab button will allow users to navigate throughout the page, from button to links and forms.

The website should also ensure that all the content is accessible, mainly an issue when the website contains dynamic content, which is something on the page which will change without reloading. As the majority of screen readers will only read what is on the page when it is first loaded, some content could be missed therefore the user needs to be informed when something moves or changes. This can be done by using ARIA landmarks, these tags are used for all content on the website to define what it is, dynamic content can then be defined as a ‘live region’, this will allow the screen reader to understand that the content will change.

Adding alternative text to images will give the user a description of what the image is if it does not load. It can also be read by screen readers to describe the image to the user, without this, many users would miss the content.

Colour blindness is another issue which needs to come into consideration. The colours which are used on the website should have high contrast when layered to ensure it is easy to read, for example the black text on blue background is difficult to read, however the black text on a much lighter blue, is easier to read. The colours used should also flow throughout the website as well as not having too many colours, as it can make the website look unprofessional and can be straining on the eyes.

Hello, Welcome to this website

Hello, Welcome to this website

Structuring the content on the website makes it easier for users to understand as well as improving the flow throughout the website. Use Heading styles when creating the headings throughout the webpage. By only having one heading with the style H1 in the code will allow for easier navigation throughout the website.

Allow the user to resize the text if needed, this can help those users who have visual impairments to still read themselves without the need for screen readers.

References

- [1] "How To Secure My Website," pickaweb, [Online]. Available: <https://www.pickaweb.co.uk/blog/how-to-secure-my-website/>. [Accessed 14 01 2019].
- [2] "scalability," investopedia, [Online]. Available: <https://www.investopedia.com/terms/s/scalability.asp>. [Accessed 01 15 2019].
- [3] "What is Uptime in Web Hosting," lifewire, [Online]. Available: <https://www.lifewire.com/uptime-in-web-hosting-3467355>. [Accessed 15 01 2019].
- [4] "What is Web Performance Monitoring?," uptrends, [Online]. Available: <https://www.uptrends.com/what-is/Web-Performance-Monitoring>. [Accessed 15 01 2019].
- [5] "reliability," whatis, [Online]. Available: <https://whatis.techtarget.com/definition/reliability>. [Accessed 15 01 2019].
- [6] "What is Manageability," igi-global, [Online]. Available: <https://www.igi-global.com/dictionary/taxonomy-grid-systems/17754>. [Accessed 15 01 2019].
- [7] "usability," techtarget, [Online]. Available: <https://searchmicroservices.techtarget.com/definition/usability>. [Accessed 16 01 2019].
- [8] "What is usability testing?," experienceux, [Online]. Available: <https://www.experienceux.co.uk/faqs/what-is-usability-testing/>. [Accessed 16 01 2019].
- [9] "Introduction to Web Accessibility," w3, [Online]. Available: <https://www.w3.org/WAI/fundamentals/accessibility-intro/>. [Accessed 16 01 2019].

FINAL GRADE

72/100

GENERAL COMMENTS

Instructor

WEBSITE

- Range of PHP coding demonstrated - A good range demonstrated. Searches were quite extensive and it is good to see the use of a pulldown menu as part of them.

It would be nice if the YouTube links were clickable - this would make it more usable for your website visitors

Administrator features add/edit/delete were used.

Be careful on the registration section - some validation is present here, but you should ensure that the same username cannot be used twice - otherwise you will create a duplicate user which is a potential security risk. Validation is also needed on song entry so that not all the fields can be left blank.

23.5/30

- Database structure and design – Well normalised on the whole, but the starrating probably doesn't need a table of its own - just a number for the rating would do. The artists for the songs need normalising as they will appear many times as the database grows.

7/10

- Overall Integration of Website - Laid out well and

quite easy to navigate overall.

7.5/10

Knowledge and Understanding of Subject – A good understanding was demonstrated, see my comments about validation above.

15/20

REPORT

Research-informed Literature – Some security issues have been identified such as SQL Injection. Some very good discussion of scalability covering the relevant points, well done. Usability and Accessibility similarly, the main points have been addressed.

11/15

Analysis – Some good illustration of the problem of SQL Injection and careful use of sessions. There are some other security issues you could have discussed such as cross site scripting, CAPTCHA, honeypots etc. You need to expand this narrative to include the other parts of your site - would you consider your current site to be accessible? Are the colours you have used suitable for the colour blindness issue and so on? You could have included some screenshots to illustrate whether they are or not.

8.5/15

Overall = 72.5%

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13