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Web Development with LAMP Stack

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ABSTRACT

The present websites are developed with old stack using C# and .NET architecture. For providing the better user navigation and robust experience, the stack will be updated to LAMP. The stack includes HTML, CSS, JS, PHP, MYSQL and auto encryption and decryption of password. To ensure security from the attacks like SQL Injection, prepared statements and hashed passwords are used. The animations play a key role in enhanced user experience. The website needs to be as small as possible so that the page will be loaded faster. For hosting the website, Plesk platform is used. Plesk is a commercial web hosting and server datacentre automation software developed for Linux and Windows based retail hosting service providers. The entire data will be centralized into single database. For any website, the responsiveness plays a major role. The user needs to have good experience not only with the big screens but also with the smaller screens like mobiles. Bootstrap framework helps to achieve mobile-responsiveness. Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains HTML, CSS and JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components. Most of the pages need to be dynamic pages. The modules including the student module, Department Module, Faculty Module, Examination Module, Galleries are all dynamic pages. The project will result in a web application which provides friendly navigation. It works on live data and will be available for everyone.

Keywords: Hashed Passwords, LAMP, Plesk, Responsiveness.

1. Introduction

The objective of this project is to develop Website with current technologies and to provide enhanced user interface. It contains various modules like Placement Cell, Examination Module, Student Module, Admin Module, Departments Module and Online Payments Module. Designers frequently consider the technologies that must be used to make a website user interactive while developing a specific website. The majority of the pages on this website are user interactive and responsive as a result of the usage of various web technologies including HTML, CSS, JS, PHP, and MySQL. HTML, CSS, Bootstrap, JavaScript were used for front end. PHP, Ajax were used for back end. And MySQL was used for interacting with the server. The module is based on session management. The application has an authenticated login system, where the passwords will be hashed and even the database administrator can't know the exact password. Additionally, the designers had to face a number of challenges when creating this specific website, including those relating to password security, SQL injection, database centralization from ftp to database, and many others. The designers employed prepared statements to prevent SQL injection, in which the data was transferred as question marks and then again decrypted to its current form. Whereas for passwords, they had employed hashed techniques, resulting in passwords that were close to 128 kilobytes in length and contained ASCII letters, Hex codes, color values, and many more. Additionally, the website had both static and dynamic pages. The results page and attendance page are the only dynamic pages. and several static sites, including student and faculty directories.

2. Related Work

[1]. This paper describes how a specific SQL injection happened, from which user it happened, and how to discover that specific injection was known using the suggested approach. Additionally, with the aid of the injection, explains each and every injection in detail. In general, SQL injection is nothing more than a front-end malicious code addition that increases interaction with the target databases. If an error is found, this code unintentionally sends the information to the RDBMS server, which subsequently retrieves the desired information from the chosen region name. The attacks covered in this paper fall into two categories: client-side and server-side. Client-side attacks include spoofing material and scripting assaults. Attacks involving command execution are the next on being explored, and they include buffer overflow, format string attacks, operating system commanding, lightweight directory access protocol injection, and SQL injection. Attacks based on authentication are the next in line and include Brute force attacks, inadequate authentication, and password recovery. Finally, there is information disclosure, which includes directory indexing, information leakage, path traversal, and resource location. Additionally, the classification of the attacks was discussed using examples to aid in the students' perception. The proposed work consists of five steps, starting with a user-generated anomaly pattern query. Next, set 1 was set to 1 and increased until it reached n. Finally, the values for the query length and pattern values were compared to obtain the anomaly value, which was then compared to the threshold value. If the anomaly value was less than the threshold

value, the proposed work was rejected; otherwise, it was accepted.

[2]. The author of this paper describes SQL injection, the primary form of the attack, as well as the other kinds of attacks and how they can be stopped. Generally speaking, SQL injection consisted of running malicious SQL instructions by inserting them into online forms or input page requests. when the database is accessed using dynamic SQL queries built utilising the input content. In general, there are two types of SQL attacks: the first involves putting malicious code directly into user-input variables, and the second involves entering the code into strings that are stored as tables. The escape character correction, wrong type handling, vulnerabilities in database servers, blind SQL Injection Attack, conditional response, conditional errors, and time delay are only a few of the various forms of SQL Injection Attacks that have been reported. These SQL injections were thoroughly discussed by the author with examples. The configuration file's magic_quotes_gpc and magic_quotes_runtime settings allow us to add slashes to convert SQL statements.

[3]. Website Building involves many things to be noted. Whatever the page is built, it should promise security. A web application is even prone to a large number of cyber-attacks. One major attack which is even stated in the OWASP top ten security risks is Injection Attack. This work proposes an approach of providing a sort of validation filter to the input fields that are to be entered or filled by the user. The main aim of the author lead in providing an efficient approach which can resist from injection vulnerabilities with at least an accuracy of 98.4%. To design the filter, few considerations have been made. This paper states that any user input should not be trusted and validations to be done for all the elements such as the HTTP headers, cookies etc. It considers what are the elements that need to be generalized and even briefs the need of technologies to be used in making of filter. The filter considers all the data that it receives from a web request. The filter is made on the basis of OWASP Stinger 2.x framework. The complete development of filter passes six various stages. In the regex stage, the text is validated by using various expressions where it has a predefined structure for each field. In the second stage, it contains mandate checking and the process of sanitization takes place which means removal of reserved words from the strings. In the parameter section the flag is sanitized to TRUE. HTTP Headers are even validated along with JSON format and XML format which checks the complete schema. The tool developed will be used to scan the input and then a controller is implemented at two steps – Request is given to filter and then if it is valid, it is then redirected to the application. The model is tested on public and private web applications and obtained an accuracy of 98.4% with an average processing speed of 50ms.

[4]. In this article, the author created a search engine that was already present in the previous work and was created using PHP and MySQL. The text mining strategy, which is a self-organizing method, was employed by the developers to design this specific website. This was accomplished with the aid of nodes, which are educated by feeding data to them. The pre-existing data served as pre-training for it. The search engine was created using PHP and the MVC framework along with MySQL. In order for this search engine to automatically fetch all files containing a given keyword, the user must enter the term. With PHP's Model-View-Controller framework, data was collected from the view, processed by the model, and then passed to the controller for further processing before being returned to the view once more. However, in this case, the model is PHP, which processes the requests, and the controller was MySQL, which retrieves the data. The view is the web browser, which takes the data or requests. The search engine has ten primary classes, and inside each class, there are many sections, and within each part, there are various divisions, such that when we enter a term, we get the fields for every division within each section.

[5]. Based on an existing website that was created using PHP and MySQL, the author created a new website. Typically, the LAMP server is where PHP runs. The choice of PHP as the language was made for a variety of factors, including its high degree of portability and security in comparison to other languages. PHP was generally used on numerous servers, including the AMP server, WAMP, XMAPP, etc. Additionally, the developers of this website have addressed numerous issues on it, including database and server issues. The project is constructed based on client requests, after which module functionality is constructed. Account security and stored data encryption are resolved by the database connection. The previously used website has numerous modules, so the developers will redesign that specific website once more and reimplement the entire module for improved functioning.

[6]. In this work, the author proposed a novel approach to password security using hashing, known as 5A, which consists of five phases, each of which involves performing a hash and storing the results in a specific database. These results are then used depending on the needs of the application. The steps of the 5A algorithm are the registration page, where users join the website if they haven't already, the results being hashed with the good random salt algorithm, the login process, the sending of the OTP to the user, the requirement that the user upload an image, and the provision of an offline signature image. A specific master key was then established for each user, saved in the database, and delivered to the user along with a copy of the master key. Additionally, the author had also covered the differences between hashing and encryption and which was preferable. Additionally, everything of this implementation was done in ASP.Net, C#, and SQL Server.

[7]. In this article, the author contrasts the hybrid database—which is only the mongo db database—with the SQL database. The author conducted an experiment to assess and contrast the useability of the SQL database with the mongo dB database. The experiment consisted of nothing more than the author taking two identically configured systems and giving data to each of them. The author then compared the results based on the analysis performed for the comparison, including a schema comparison, a read and write performance comparison, a database performance comparison based on user profile data, a disc usage comparison, a CPU and RAM comparison, and a comparison of read and write performance. Additionally, this comparison was based on datasets that were provided to the systems, and it focused primarily on response time, disc use, and if any triggers, foreign keys, or transaction concepts were present. When compared to the SQL database, most of the findings indicated that mongo dB was superior. Utilizing this specific database will minimise its size and provide a specific json file that will be useful to web developers in the creation of the website.

[8]. The main objective of this paper was to create a strong password for the user such that no other person can hack it, and it was achieved by the hashing algorithm. In general hashing is a technique that manipulates the data in such a manner the only algorithm itself know how the

password was been saved and it was been stored in the database and for each hash code a particular password was been given to the user and which helps to prevent from the hackers. It was done by mixing the ASCII code and colour code in which it generates 6-digit hash code. In general, the hashing has the two steps encoding and decoding. In these two processes, the encoding takes the password as input, converts it to ASCII, obtains the tokens, adds two spaces from the range 0 to 99, and then adds two spaces from the hexadecimal code. Based on the index, if the password is odd, ASCII will come first; if it is even, hexadecimal will. When decoding, it executes a for loop with input from both the user and the database, and if the values match, the login was successful. The collision issue is resolved by this method, which also has preimage resistance and the avalanche effect (which means a slight change in the password it affects the output hash code).

[9].   In this paper, the author had created passwords using the hash function, and that was done with the aid of the OTP, in which the specific user will get a chance to enter the password once the user logs into the website, and then after he receives the OTP to his registered email or mobile number, the user can directly enter the OTP. This OTP was generated was done by the hash algorithm. In general, there was a time elapse for each website, however it was just around 3 minutes for the supplied website and about 20 minutes for the other websites, like Facebook. Because the OTP notion was present, only the first of the two ways the generic hash algorithm operates was used here. This kind of security will keep hackers out. In general, security should encompass things like authenticity, integrity, and privacy. Additionally, the GAMMU platform was utilised for OTP creation, and if any intermediaries were present, it also recorded their DNS addresses in the database and prevented them from accessing the website. Additionally, the author has explored other ways to put this hashing notion into practise, but the suggested technique provides the best privacy and security.

[10].   The author of this paper covered the many types of SQL injection as well as SQL injection prevention techniques. The simplest form of SQL injection consisted of inserting malicious code; this may be fixed by removing the '--' comment mark. SQL injection can take the form of tautologies, union queries, illegal or illogical queries, piggybacked queries, inference, and stored procedures. The author had also covered the relevant research in that topic. Data validation, rejecting the bad input and accepting the input that is good, was the technique suggested in this paper that is used to remove the injection. When he logs into a certain website, the author adds the hash value to his username and password to further demonstrate how the hash function works. The hash value in this instance was produced by the hash function algorithm and is saved in the database. The stored value and the new value are compared now if any user attempted to access the data, which generates a new value. If it wasn't identical, the person wouldn't be able to access the data.

[11].   The authors of this paper covered a number of methods for making the website more responsive. The key benefit of having a responsive website is that it draws more users to log in to that specific website. Additionally, doing this has the significant drawback of adding a lot of code to the application, which increases the processing time required to load the page. This responsiveness may be attained via techniques like media queries, which change web pages based on screen resolution and also specify certain parameters for how big a given web page should be. Additionally, the CSS file will be placed into the following one, which is bootstrap responsive navigation. The content will be adjusted based on the file and the screen resolution. The height of the properties will be chosen in the CSS settings, which is the next option. The next one is flow layout, which will be used in accordance with the DIV property. The principles found in web technologies that are beneficial for web page development have also been covered by the author.

[12].   The author of this document performed a review of the current technologies used to build websites and provided a brief explanation for each one. HTML (Hyper Text Markup Language), CSS (Cascading Style Sheets), JS (JavaScript), and PHP are the main technologies. A web page's structure is provided by HTML, its colouring is provided by CSS, and its functionality is provided by JS for a given web page. In contrast, PHP will serve as the back-end logic that manages the web page, determining what kind of data the user requested and sending that specific data to the user. Developers typically focus on the page's responsiveness or adaptability. In contrast to adaptive content, which was fixed, responsive content changes dynamically. The developers will also examine each parameter that must be added to the website. Additionally, the tiers in which these technologies are present were mentioned. Moreover, the Document object model of the fundamental website was mentioned.

[13].   The author of this paper addressed numerous strategies used by developers to create responsive websites. This was created by the developers using ASP.NET. Responsive in general refers to the written code producing the desired result dependent on the screen resolution. Fluid grid layouts (Relative-based grid), flexible pictures and media, media queries, and screen resolution are just a few of the strategies utilised to accomplish this. The percentages assigned to each and every block in the liquid grid layouts split the screen according to the percentages. Of contrast, the content and visuals in flexible images and media are altered according on the screen's resolution. And the max width, min width, max height and min height were used to do it. These are the front-end strategies, but media queries and screen resolutions are identical to flexible pictures and media. In contrast, the RWD class was used in the backend, where it contains information about whether the request is coming from a mobile device or a laptop. It was observed from the mobile request method that the pick function will choose the specific resolution of the website to the user based on that information.

[14].   The author of this article talked about responsive design for web technologies. The technology to allow web pages to adjust their resolution dependent on the screen's pixels must be included as, in general, websites will be static. It may be accomplished in responsive design with fluid grid layouts and media queries. The % assigned to each place in fluid grid layouts is fixed based on the pixels and was transformed to the percentage depending on the screen resolution. The existing material will then be adjusted appropriately. The next is media queries, which provide the content's portrait, landscape, tablet, Desktop pixels values are given in the code itself and it will be changed based on the screen resolution. Breakpoint and viewport are two other aspects the author covered that are beneficial for responsive design. The author had also discussed some topics related to the responsive web design.

[15]. The authors of this study created an online store selling T-shirts and mugs. Additionally, they had created a portal for personalization where customers could design their own t-shirts and place orders. The two-tier architecture is followed by the process. The application logic is located in the database layer itself, whereas the client is located on one tier and the database layer on the other. In the study, the author also covered a few process workflows. Numerous web technologies, including HTML, CSS, JS, PHP, Next JS, Node JS, Nest JS, and Mongo DB, were employed by the author. The process that a certain user should follow after completing each stage was also discussed by the author, as well as how the web sites are connected to one another. As a platform as a service (PaaS) where we can directly supply the code to it, the Heroku website is where they had deployed their work.

[16]. Using the PHP, CSS, and MySQL frameworks, the author of this article created an e-commerce website. Additionally, the author covered the work carried out by other programmers in the linked sector and the tools they employed. The developer's primary responsibility is to create a search engine for the e-commerce website that will index every website he has come across to yet. Additionally, the search engine's relevant data came from the internet. PHP larvel was used to create the search engine. On the basis of their work, the developers had also impressed all the clients, management, and customers. Additionally, they have developed Admin Panel, Login/Sign Up, Product Cart, Google Captcha, PayPal checkout, Magnify Product Image, Add, Edit, Remove, and View Products, User Administration Observe the daily/monthly sales. Additionally, the author has detailed discussions on each technology.

3. Conclusion

This leads us to the conclusion that the website we created was based on information we found in papers, journals, conferences, and surveys from various publications, to which we then added features that are almost certainly beneficial to the website. Our website was mostly constructed using HTML, CSS, JS, PHP, and MySQL. Additionally, we utilized hashed passwords for the login system, which provides a unique user address for each user and saves their password in the database to be used by the programmed itself, to provide security for the user or customers. Additionally, we had utilized the database's centralization from ftp to database. Furthermore, the website was hosted on the Plesk platform, which offers a larger database than other platforms. Along with using prepared statements, which deliver data in a way that it is converted into question marks, we also employed sql injection, which protects user data from many forms of assaults. Finally, we had placed all of the front-end and back-end validations into the specific website, preventing the user from entering the right data as they were entering it.

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