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PERFORMANCE ANALYSIS OF BUSINESS STARTUP WEBSITE USING GT-METRIX WITH WATERFALL SOFTWARE DEVELOPMENT LIFE CYCLE METHOD

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Abstract: Business ventures began to expand towards technology that initially used conventional sales and payment methods, then developed by young people who saw business opportunities could be simplified in an easy way but had a lot of profit. They utilize computer technology by creating ways to sell through online, namely website media as startup business people. The purpose of the study was to analyze the performance of the "bikinian ibu" website with a http://bikinanibu.lovestoblog.com/ url address. Analysis activities in the form of measuring website speed performance, testing browser timing, testing Tab Structure, Testing Tab Waterfall in diagram form, Testing Tab History, Testing website vitals, Testing Tab Speed. The method used is the Waterfall method by following the following stages: analysis, design or design, coding, testing and maintenance. Based on the results of testing the performance of the "mother-made" website in the GTMetrix section, a Performance analysis score of 93% was obtained, CLS (Cumulative Layout Shift) has not shown good results because it exceeds the maximum standard score on CLS (Cumulative Layout Shift), the structure score covers 89% with the grade A category which means it shows good results. Website loading time also shows good results, website testing looks like there are constraints in the medium and low urgency categories. On the Waterfall tab of the website in the form of waterfall chart results there are 2 404 errors, 20 requests with a total file size of 622KB and 0.96MB for uncompressed files, while the time to load the website is 1.4 seconds. From the results of the Total Page Size of the website is 624KB, while the total page request is obtained as much as 20.
Keyword: Analysis, GTMetrix, Waterfall, Website

INTRODUCTION

Business ventures began to expand or look at technology and turned out to be in great demand by business people ranging from large and small businesses. Especially if business people use sophisticated media supported by technology by spreading widely to its use that is able to reach local areas and whose reach is wide seen from the location of the Indonesian region spread across the archipelago, added again with adequate internet support, the business businesses offered are able to be right on target [1]. Usually, young people have a future business concept to become young interpreneurs by building start-up businesses. The period of use of information technology is growing. So emerged startup industries or e-commerce-based trading businesses. Startup trading businesses in doing their work to market products are usually done mobile (Sonata, n.d.). Beginner trading business or startup trading business or newly established trading business is known as startup trading business [2]. A startup business is an institution that is formed to find a repeatable, profitable and scalable business framework. In general, startup trading businesses have 8 characters, namely:

1. Trading business aged < 3 years
2. Total employees less than 20 employees
3. revenue from sales per year < $ 100,000.00
4. trading business is still running in the process of developing
5. dominated in the field of technology in the use of running a trading business

6. commodities produced are generally application-based in digital models
7. business trading standards are involved on websites and online because they are internet-based
8. Business actors are run and dominated by young people (Hadi Ryandono, 2019).

Startup trading business can be divided into 5 fields with the largest market coverage, namely:

1. E-Commerce / online buying and selling transactions (Marketing)
2. Transport And Food / costs (Transport, Food Delivery)
3. Online media (Advertising, Gaming, Video On Demand, Music On Demand)
4. Online Travel (Flight, Hotel, Vacation Rental)
5. Financial Service (Payment, Remittance, Lending, Insurance, Investing) (Sudarwanto & Kharisma, 2022).

METHODOLOGY

The method used by researchers in observation is applied research in the form of observation to overcome a case directly. The method chosen is the Waterfall method because the system limitations described are clear and there is a small possibility that these limitations will occur [15]

Waterfall Method

The Waterfall method is known as a model that performs checks in a row or linear (sequential linear). The Waterfall method applies the life cycle strategy of computer devices in the form of software in parallel and gradually starting from elaboration (analysis), design (design), coding (programming), testing (inspection) and maintenance (supervision). The advantage of using the Waterfall method is that the structure is composed of each stage of system development that is transparent, the storage of documentation produced at each stage of development also becomes clear [16]. after the previous stage has been completed, so that it does not appear stacked in the implementation of System Requirements Analysis on the Waterfall model According to Pressman can be observed in Figure 1. Waterfall Model According to Pressman (2012)

Figure 1. Waterfall Model According to Pressman (2012)

Description of the stages of the Waterfall model according to Pressman is as follows:

1. System analysis (Analyze Requirements) Needs Analysis by conducting some information collection consisting of discussions, surveys, interviews and direct field observations. The function of the analysis phase is to take the problems that arise, efficiently, and the considerations that lead to an analysis, and look for a number of obstacles / obstacles that must be faced by the system to determine the solution [17].
2. Design and Planning Stage (Design Analize) At the system design stage by describing the division of requirements regulated by the hardware system (hardware) and software (software). Architectural exposure activities determine the use of the system as a whole. Software design implies system recognition and generalizes all running systems and their supporters [18].
3. The implementation stage is the programming stage. The results of the design will be applied and developed into learning materials. Creating websites that use a number of programming languages such as PHP, HTML, CSS, JQuery, and Java, then collaborated with a data called a database, then

inserted into MySQL data. In this phase, testing checks on functionality, as well as expectations of good performance are used [19].

4. Testing Phase Testing is testing the system designed, then then introduced to the user. In the testing phase, the black-box Testing and System Usability Scale (SUS) methods are used by bringing up detailed test results [20] . From the testing stage or testing it will be known that the system designed will be in accordance with the functional needs of the system or not [20].
5. Maintenance Phase The last phase after the system can be operated, then the next phase goes to the maintenance or maintenance phase. In the system maintenance phase by correcting errors / errors that arise in the previous stage [21]. In the maintenance phase, improvements will usually be found when errors appear in the system that refer to new needs [22]. At this stage correcting errors in the form of unknown errors in the previous stage, then maintenance activities include repairing system defects, correcting running system parts, and system development according to the needs that will be used [23].

RESULTS AND DISCUSSION

Website Display (Home) "bikinan ibu"

Website " Bikinan Ibu " as a sample to be tested in terms of performance or performance and related matters. The "mother-made" website is created using PHP & MySql programming languages with the display of the " Bikinan Ibu " website home in the http://bikinanibu.lovestoblog.com/ website address displayed with the output in Figure 2. Website Home Display "bikinan ibu"

Figure 2. Home Website Display "Bikinan Ibu"

Testing the " Bikinan Ibu " website in the GTMetrix section

The next step is to choose a website page with a https://gtmetrix.com address, then the test is done by inserting http://bikinanibu.lovestoblog.com/ website address as a test sample. On the Gtmetrix home page will appear as shown in Figure 3. Testing Websites Made in the GTMetrix section

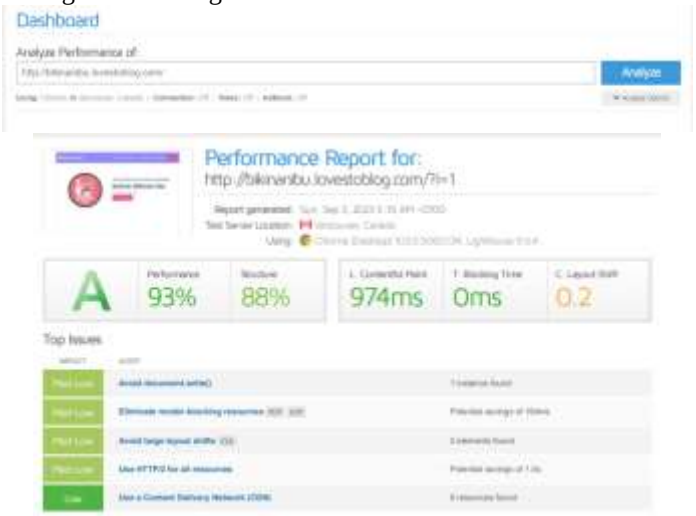

Figure 3. Testing Websites "Bikinan Ibu" in the GTMetrix section

Testing " Bikinan Ibu " websites in the gtmetrix grade section

The test carried out wants to find out the grade score in the form of division of scores A, B, C, D, and F. as shown in Figure 4. Testing "mom-made" websites in the gtmetrix grade section

Figure 4. Testing " Bikinan Ibu " websites in the gtmetrix grade section

Based on the results of testing the performance of the "made by Ibu" website in the GTMetrix Grade section, a Performance analysis score of 93% was obtained, and the structure score for this website was 89%. So that the overall score obtained for this website is grade A. So, from the results of performance and structure analysis which indicates that the performance of the "mother-made" website has a page access speed that shows good / good results, because the indications produced by the higher the grade and score of the test results, the performance of the website tested is good / good.

Testing the Website "Bikinan Ibu" in the Structure section

The results of testing the "mother-made" website in the Structure section, then obtained on the display as Figure 5. Testing the Website Creation in the Structure section.

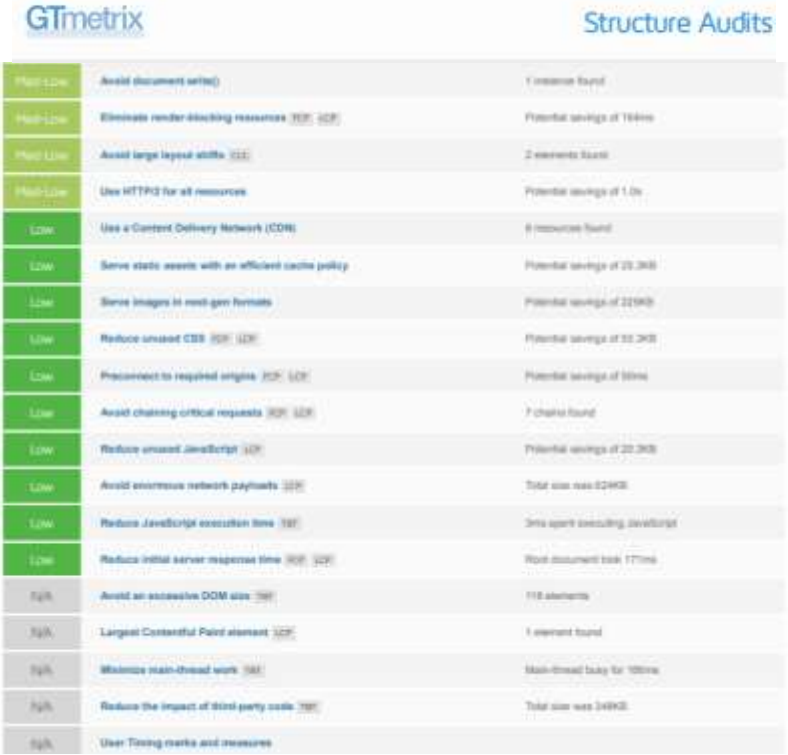

Figure 5. Testing the Website "Bikinan Ibu" in the Structure section

The Structure Tab shows the results of testing the "Bikinan Ibu" website using GTMetrix against the front end structure of the website It can be seen that the "Bikinan Ibu"" website has problems / problems with the front end script and the impact on website performance. The influence of constraints / problems on testing can be categorized according to the level of very important needs, which are categorized at the High (high), Medium (medium), and Low (low) levels. Basically, the results of Structure testing do not directly affect the speed of website performance. However, by improving the front end structure can help improve overall loading times when the website is used. From the results of testing the "Bikinan Ibu" website, it can be seen that the problem of the mother-made website is the performance of the website loading time. Where the category of obstacles / problems is still at the level of Medium (medium), and Low

(low) which means that the level of tolerance for the performance of the "Bikinan Ibu" website is not worrying in its use.

Testing the " Bikinan Ibu " Website in the Top Issues and Page Details sections

The “Bikinan Ibu” website test in the Top Issues section is in Figure 6. Testing the “Bikinan Ibu” website in the Top Issues section, and Page Details are shown in Figure 7. Testing the “Bikinan Ibu” website in the Page Details section

Figure 6. Testing “Bikinan Ibu” websites in the Top Issues section

Testing the “Bikinan Ibu” website in the Top Issues section is a collection of problems / problems on the website from the Structure tab. From the results of testing the “Bikinan Ibu” website, it can be seen that the problem of the “Bikinan Ibu” website is the performance of the website loading time. Where the category of obstacle / problem is still at the level of Medium (medium), and Low (low).

Figure 7. Testing the “Bikinan Ibu” website in the Page Details section

Testing the "mom-made" website in the Page Details section is useful for providing a shorter version of info on the Waterfall tab chart. From the test results of the "mother-made" website, it can be seen that the Total Page Size for the "Mom-made" website is 624KB. Total Page Size is the overall size of the pages examined by GTMetrix. Meanwhile, the total number of page requests obtained was 20.

Testing Created Websites “Bikinan Ibu” in the Performance Metrics section

Testing the "mother-made" website on the Web Vitals section, then obtained the results as shown in figure 8

Figure 8. Testing “Bikinan Ibu” websites in the Performance Metrics section

Performance Metrics measure website speed using tools provided in the form of Lighthouse. Performance Metrics are divided into several categories as in Table 1. Results of Website Testing “Bikinan Ibu” on Performance Metrics

Table 1. Results of Website Testing "Bikinan Ibu" on Performance Metrics

	CATEGORY	SPEED TIME	INFORMATION
1	*First Contentful Paint (FCP)*	555 milliseconds	functions to measure the length of time it takes for the home page of the website to appear in front of the viewer/user. First Contentful Paint (FCP) has a set parameter, namely a maximum of 0.9 seconds.
2	*Speed Index*	684 milliseconds	serves to measure the speed with which the content of the "mother's home" website is fully visible. Speed Index has a speed parameter that is set to a maximum of 1.3 seconds.
3	*Time to Reactive*	1,1 seconds	serves to measure the length of time required for a "mother-made" website to be fully utilized. Time to Reactive has a maximum parameter set of 2.5 seconds.
4	*Largest Contentful Paint (LCP)*	947 milliseconds	Functions to measure the waiting time for displaying elements, such as images or heading text, until they can be displayed to the user. Largest Contentful Paint (LCP) itself has a maximum parameter set by GTMetrix, namely 1.2 seconds
5	*Total Blocking Time (TBT)*	0 milliseconds	Functions to measure waiting time on website pages that display all functions accessible to users. Total Blocking Time (TBT) itself has a maximum parameter from GTMetrix which is 150 milliseconds
6	*Cumulative Layout Shift (CLS)*	0,2 milliseconds	Functions to measure changes in the appearance/layout of the page during loading (waiting time) until the appearance actually appears in full manifestation. Cumulative Layout Shift (CLS) itself has a maximum parameter from GTMetrix of 0.1 seconds.

From the results of the Perfomance Metrix test in table 1, it indicates that the "Bikinan Ibu" website has good results, but in the CLS (Cumulative Layout Shift) section it has not shown good results because it exceeds the maximum standard score on CLS (Cumulative Layout Shift).

Testing Created Websites "Bikinan Ibu" in the Waterfall section

Next, the results of testing the Bikinan Ibu website Waterfall section, then obtained as picture 8.

Figure 9. Testing Created Websites "Bikinan Ibu" in the Waterfall section

The website made by the mother as a whole uses PHP and MySQL programming languages, but is also assisted by using Javascript and CSS languages. So, based on the results of the waterfall chart, the website made by you has 2 404 errors, 20 requests with a total file size of 622KB and 0.96MB for uncompressed files, while the time obtained to load the website is 1.4 seconds.

CONCLUSION

Startup Website Performance Analysis Trading business using Gtmetrix With the Waterfall Software Development Life Cycle method has the results of testing the performance of the website made by you using GTMetrix obtained a Performance analysis score of 93%, but in the CLS (Cumulative Layout Shift) section it has not shown good results because it exceeds the maximum standard score on CLS, but the structure score includes 89% with the grade A category which means it shows good results, The website loading time span also shows good results, testing the website at risk looks to have problems in the medium (medium) and low (low) urgency categories, Page Details provides more concise version information of the Waterfall tab diagram, based on the results of the waterfall chart, the website made by you there are 2 404 errors, 20 requests with a total file size of 622KB and 0.96MB for uncompressed files, while the time obtained to load the website is 1.4 seconds. The total page size of the website is 624KB, while the total page request is obtained as much as 20. However, it can be concluded that the analysis of the mother-made website produces good and good performance among its users.

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