A competitive and contend website becomes the goal of all stakeholders. The website also becomes very influential because it involves the visitor’s perception of it. When the visitor’s enthusiasm for a website is getting higher, the quality of the website is also getting better. Still, if the website visitor quantity is getting higher, the stress level of web e-commerce is also getting higher, and these factors affect the performance of a website. The testing is needed as the benchmark to determine system deficiencies. The purpose of this study is to compare the performance of the Shopee website before the pandemic period and during the pandemic period. The testing tool used is Apache JMeter. The research results are obtained by doing the stress testing, and it is also evidenced by the user enthusiasm assessment of the questionnaire results. The result of the study is directly proportional, i.e. the website stress level increases as the increasing visit rate, with the error rate up to 26.

CCS CONCEPTS
• Software development → Software Testing; • Web → Electronic Commerce.

KEYWORDS
Performance Testing, JMeter, Stress Testing
can handle the number of user requests simultaneously (load), stress testing is performed. This stress testing needs to be done to reduce the significant impact on the success or failure of an e-commerce web. A competitive and contend website is the desire of all parties concerned, from users, founders or business partners. For a website to be reliable and competitive, it must have the ability to display pages to users quickly. And for ecommerce websites, it can support efficient and accurate transactions and also have nearly zero downtime [6]. The purpose of this research is to determine the stress level of an e-commerce website through stress testing. Stress testing was also done by looking at the level of enthusiasm of the community in accessing the e-commerce web before and during the COVID-19 pandemic period by distributing questionnaires to 100 respondents. The benefit of the research results is that it can be a suggestion for improvements for the e-commerce web to improve the performance.

2 BASIC CONCEPT

Shikha Dhiman and Pratibha Sharma conducted a study by analyzing the test tools that were carried out from a web service. The research objective helps in selecting the best tool. The tools being compared are Apache JMeter, Grinder and HttpRider. The parameters used for comparison are response time, throughput, and latency. The results show that the response time for HttpRider is better in Apache JMeter and Grinder [1]. Nirananamurthy et al conducted a study comparing performance testing with JMeter. Researchers discuss performance testing tools and propose a tool with good performance for Website-based industrial applications. Researchers evaluated 2 performance testing tools, namely Apache JMeter and Load Runner. The testing criteria are speed, performance, throughput, and study evaluation. This study recommends JMeter which is suitable for testing the performance of the Website application. Besides being easy to install and access (free), with a user load of 50-100 it can be applied and monitored. This tool can also be used to test the load and stress of a website [4]. Mayang Anglingsari Putri et al conducted a performance test analysis on the Website application. The case study of this research is the new student admission system at Brawijaya University and Malang State Polytechnic. The tool used is Apache JMeter. After analyzing the performance, the researchers conducted interviews with IT staff at the Polinema Information Center. The results of the interviews are used to support the results of the research conducted by the researcher. In terms of performance, Polinema Website is more stable than Universitas Brawijaya Website [5].

2.1 Software Testing

The process of running a program to find errors and computer code testing procedures is to test whether or not it is compatible with software design goals. Dale and Elisabeth defined it as the process of gathering information by making observations and comparing it with the expectation of making the software. Software Testing needs to be done to determine software quality.

2.2 Good Website Performance

A website that has an excellent performance dramatically affects the perception of customers who visit the website. Based on research conducted by Kuzic and Giannator, visits and evaluations of companies can change the customer perceptions of the company’s reputation. Customer satisfaction is a benchmark in website quality/performance [3].

2.3 Performance Testing

Performance Testing is done to determine the time and the response in time as well as the results of an application [7]. The tools used by the performance testing are intended to measure the time required for each task performed by the system. For the performance testing on a website, it can be tested in terms of speed, reliability and capacity of the number of users who load the website simultaneously. Several types of performance testing are Stress Test, Load Test, Strength Test and Volume Test [1].

2.4 Stress Testing

High activity on a website will make the server behave abnormally, or it can have an impact on the server’s shutdown. This is called a stress point on a website. Usually, the stress level on a website will increase if there is a sales offer at a certain time and many users access it.

2.5 Apache JMeter

The testing tools are used to make testing easier and to simulate scope testing on the system tested. This tool automatically performs the testing process, making it easier. Manual testing is more expensive, and it requires more effort and very time-consuming. Meanwhile, the testing with tools does not require a lot of money, time and effort.

Apache JMeter is developed by the Apache Software Foundation. A project that is used to analyze and measure the performance of various services on an application website. JMeter can be used as unit testing for JDBC Database connections, FTP, LDA, Web Service, JMS, HTTP, TCP Connections and OS Native processes. Research conducted by Dhiman et al. discovered that among Apache JMeter, Grinder and HttpRider, the Apache JMeter could show 3 test parameters on response time, throughput and latency in a web application [1].

2.6 Shopee

Shopee is an e-commerce company under Garena (changed name to SEA Group), an internet company in Southeast Asia. Running a C2C mobile marketplace business, Shopee was officially introduced in Singapore in 2015 followed by Malaysia, the Philippines, Taiwan, Thailand, Vietnam, and Indonesia. It is carrying the vision “To be the Number One C2C Mobile Marketplace in Southeast Asia”. Six months of operating in Indonesia, Shopee has been downloaded by nearly 1 million people.

The results of the questionnaire in previous research conducted by the author and referring to google trends on August
Performance Testing on the Shopee Website in the Pandemic Period of Covid-19

20th 2020 show that Shopee is one of the most popular online shops in the community.

3 RESEARCH METHOD

This model theory test is in the form of performance testing. The model test scenario with Apache JMeter is shown in Figure 1. The input used for testing is the number of users, time, and HTTP requests. If all the inputs have been fulfilled, the testing process can be carried out. Furthermore, the results will be presented in the form of graphs and tables regarding the performance analysis of the Shopee website.

4 IMPLEMENTATION AND RESULT

In this study, the testing was carried out to determine the performance of e-commerce sites before the COVID-19 pandemic period and during the COVID-19 pandemic period. The testing was carried out on 385 users within 60 seconds. The following in Figure 2 is the result of thread group for stress testing input processing. The following in Figure 3 is the result of thread group for stress testing input processing. The following in Figure 4 is the result of stress testing.

The performance testing is done with the testing tool Apache JMeter at three different time frames. The first period is from 04.00 to 12.00 on West Indonesian Time Zone (WIB), the second period is from 12.00 to 20.00 WIB, and the third period is from 20.00 to 04.00 WIB. The results obtained from the test are as follows (table 1-3).

<table>
<thead>
<tr>
<th>Period</th>
<th>Error percentage</th>
<th>Success percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Pandemic</td>
<td>4.06</td>
<td>95.94</td>
</tr>
<tr>
<td>During Pandemic</td>
<td>49.87</td>
<td>50.13</td>
</tr>
</tbody>
</table>

Table 2: Performance Results Range 2

<table>
<thead>
<tr>
<th>Period</th>
<th>Error percentage</th>
<th>Success percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Pandemic</td>
<td>9.51</td>
<td>90.49</td>
</tr>
<tr>
<td>During Pandemic</td>
<td>6.23</td>
<td>93.77</td>
</tr>
</tbody>
</table>

Table 3: Performance Results Range 3

<table>
<thead>
<tr>
<th>Period</th>
<th>Error percentage</th>
<th>Success percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Pandemic</td>
<td>1.96</td>
<td>98.04</td>
</tr>
<tr>
<td>During Pandemic</td>
<td>25.45</td>
<td>74.55</td>
</tr>
</tbody>
</table>
5 ANALYSIS AND DISCUSSION

5.1 The Comparison of Shopee Website Performance before The Pandemic and During The Pandemic

Based on the stress testing on the Shopee e-commerce website, some significant differences have occurred. By using three periods of time and from the response of 385 users at the same time shows the difference in error rates during the COVID-19 pandemic and before the COVID-19 pandemic. The following Figure 2 shows the error rate increased to 49.87 percent in the first period or at 04.00 to 08.00 WIB. The following in Figure 5 is the result of stress testing.

![Figure 5: Shopee Performance Level Chart](image)

5.2 The Comparison of The Questionnaire with Test Results

The questionnaire shared to 100 respondents was distributed before and during COVID-19. This is done to determine the enthusiastic level of e-commerce web users. Before the COVID-19 pandemic, the e-commerce web users reached up to 46 percent of the number of respondents. During the pandemic, the trend of e-commerce web users increased to 91 percent. Meanwhile, Shopee e-commerce web users reached up to 84 percent of the total respondents. This is because the Shopee e-commerce web has an attraction for the consumers, that 57.6 percent of the respondents chose Shopee because of the ease of use level. 48.9 percent of the respondents chose shoppe because of the level of service suits the people’s tastes.

The process of taking respondents is carried out by distributing closed questionnaires to 100 respondents. This is done to determine the level of response of electronic commerce users to shopee performance. The following in Figure 6 is the result of stress testing.

![Figure 6: Percentage of Shopee User Enthusiasm](image)

6 CONCLUSION

Performance testing carried out in this study were using the Apache JMeter tool. The testing is done specifically referring to the stress level testing on the shoppe website. The results of research conducted with the Apache Jmeter tester show the suitability, and they are directly proportional to the results of the questionnaire. This is because many users use Shopee during the pandemic. This is also supported by the number of errors in performance testing, which is higher than the number of errors in performance testing before the pandemic. Based on the results of the research, testing in the future for this data requires a long time so that it takes a long process in testing processing. So that if to carry out a more effective and efficient testing process, it is hoped that you will be able to prepare more deadlines so that the test can be analyzed more deeply by using scripts.

REFERENCES


