

# Stress and Cross Browsing Testing for Educational Startup Website Application

**M. Breda Taftayani, Muharman Lubis, Soni F. Surya Gumilang and Chandra Wardana**

Telkom University, Jalan Telekomunikasi No. 1, Bandung, 40257, Indonesia  
muharmanlubis@telkomuniversity.ac.id

**Abstract.** Education is a primary need to fulfill needs in a whole among people to improve acknowledges, and binding skill. Facilities to improve acknowledges have been varied, for example, program lesson, online learning video, and formal education in every schools that have been implemented. But there are weaknesses to improve, such as undistributed educational, unreachable economic, less learning atmosphere that's made less attractive students, and a system educational non formal with a manually technical. Sinau Yo developed a website to help those problems, in terms educational administration. Sinau Yo has segmented user, there are students and teachers. The Sinau Yo product offers the main feature to creating contract between students and teacher, in a place student had been choose called Sinau Offline. Sinau Offline was developed to help with pleasant learning problems, and prices that can be reached by students. Sinau Yo used a prototype model as an application development and BMC to develop the Sinau Yo business model. Tests carried out include stress tests to measure system capabilities, cross browser tests to measure website suitability in each browser, and a test scenario to measure each process that occurs.

**Keywords:** online learning video, student, teacher, BMC, Sinau Yo.

## 1. Introduction

Education is a primary need for the community and society to learn new things and fundamental theory to solve problem accordingly and response by proper act systematically based on requirement and context of use, even starting from early ages of childhood until growing up. Therefore, it is important for the process of delivering knowledge is not limited to provide basis or create smart people, but also moral and ethical values extremely critical to support the daily lives. Regarding the implementation of educational approach, Indonesia have faced difficult problem of the limitations and constraint of diversity in term of culture, location and any other demographic factors. Other issues faced related to the accessibility of the educational institution, the lack of capable number of teachers and the insufficient resource to conduct teaching and learning session, which are still not evenly distributed. The government has given a law, to be able to build non-formal education. It is explained in the SISDIKNAS Law No.20 year 2003 market 26 Paragraph 5, explained that the places of training or training are places for students or the same community to get additional knowledge outside of school. Based on the above problems, there are still opportunities to build a comfortable learning forum, and with teachers who can be invited to discuss. And even with financial value that can be used by every community. Sinau Yo is here to help the above problems in the learning and teaching system. Sinau Yo offers a teacher search feature, which

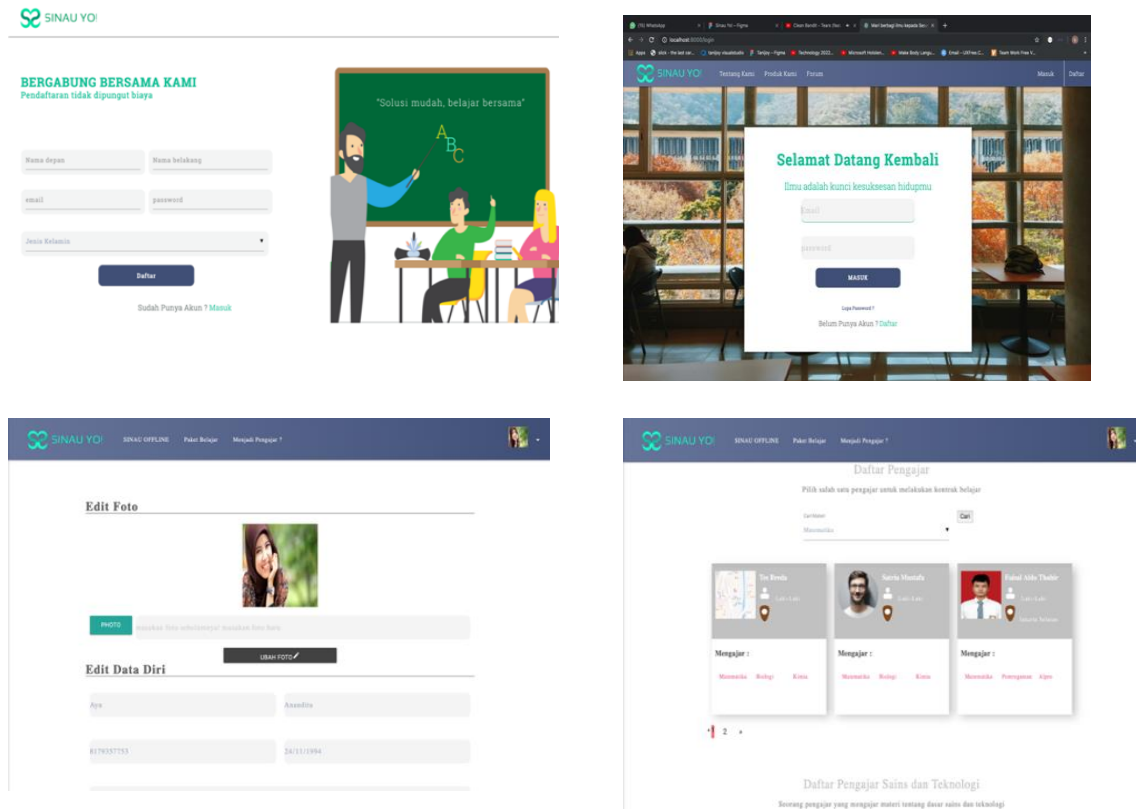
is the main feature of Sinau Yo. In the search feature the teacher has an advantage with one and one subject the student chooses. And there were three packages for Sinau Yo, namely a package of eight meetings, sixteen meetings, and twelve meetings. Each meeting has an affordable price, and each package students can bring their friends to the maximum depending on the package taken. It has a concept that is to connect students with the teacher he chooses in the learning process and teach face-to-face with the discussion system. The reason Sinau Yo applies is that there is mutual discussion between students and teachers, which aims to share knowledge with one another from the teacher or students who are taught later. The most reason education apps need to develop, is to expand our life more better than what we have been through. Based on SISDIKNAS Law No.20 year 2003 market 26 Paragraph 5, Sinau Yo have a chance to support education development.

## **2. Methods**

The discussion in the research was carried out, namely the making of the Sinau Yo website application with laravel framework with the PHP programming language, assisted with CSS materialize as a tool to build website applications in a responsive form. And after the website construction has been carried out, testing is done, namely stress test testing with Apache benchmark and with a cross browser test to test the compatibility of each web element used in a web browser, which the application has been built with Laravel framework as the main basis for website development and materialize as a tool to handle layouts in every hardware device for the process accessibility. If the system runs well in cross browser testing then it can be concluded that the application has been meet portability characteristics [14]. All data, such as cookies, browser history, cached data, and saved browser passwords, after each use, make sure that the next customer gets a configuration request in the initial environment and that the test data or web application cannot be retrieved All data, including browser passwords, will be erased in order to offer or view from us or other users. Stress testing is a method used to measure the vulnerability of a portfolio or the entire financial system to various hypothetical scenarios. Stress testing is a "what if" method. In estimating what happens to the company's capital, profits, or cash flow, or the entire system, if any risks are realized [12].

## **3. Result and Discussion**

Commonly, people receive formal education and earn graduation around the need to find jobs and positions in the market. However, some people tend to look for alternatives to provide a suitable education for their future. This indicates that there are some issues that focus on approaches to current education models. With the advent of information technology in the era of Industry 4.0, people learn almost every topic online in every aspect of daily life, without any regard for its credibility [1][2][3]. Web application is one type of software that can be used on a web browser. Initially web-based applications were used as a source of information, but until now it has been growing. And the purpose is to do business, information resources, entertainment, surveys and more. The components of a web application are HTML code as the first element, CSS code as an implementation of web design, and Javascript for interaction of data and interaction to the user later. Prototype models are one of the application system development techniques for designing applications to become alpha versions. And the process is applied from a collection of problems that have been tested and then found a solution to the collection of problems. The purpose of this prototype model is to be able to be tested continuously during the process of developing or designing software running. In addition, the prototype model also has advantages, includes avoiding a process that is not needed, the existence of an error process or does not function according to business process needs and understandability for the business processes needed by the user.



**Figure 1** Register Page and Login Page & Edit Profile Page and Find Teacher Page

In Actual the prototype model allows the application to change depending on the feedback obtained and allows for new needs in terms of application requirements but the lack of this prototype model present an error system with reasons that needs continue to change due to feedback from users. Cross Browsing test allows users to capture snapshots and videos for live tests. These records are important to the question and answer process and allow users to document problems and communicate securely with other users without the need for a procedure license. Additionally, users can capture the test network packet log and view the HTTP request stream from the page request. Likewise, the screen capture system captures and saves a screenshot of the tested URL [10]. Often, web pages generate different elements from run to run, such as ads and statistics for the entire page. These variable elements are very likely to lead to false positive results and should be ignored during the comparison [11]. Stress testing, which focuses on validating the performance of the system being tested when it is under pressure, and the volume of pressure that is outside the anticipated system, this test is useful to find out whether the system will fail based on benchmark indicators tested [13]. Stress testing relies on potential exceptions, albeit exceptional, but differs from macroeconomic forecasting approaches with early warning indicators that must be considered in the strategy and policy development process. Typically, early warning indicators rely on historical data, and stress tests rely on historical data or hypothetical scenarios. Therefore, the disassembly test analyses the consequences of the crisis according to the financial stability, not the likelihood of the crisis [12].

Web designers have trouble making sure their website works well when viewed in modern browsers. Likewise, it is difficult for software testers to test websites on all browsers. Thus, cross-browsing tests have many advantages, such as compatibility tests, which almost every tools that is available has not define fully the concept of behavioural compatibility between browsers and cannot be automatically verified. It is up to human users to set the criteria and verify their compatibility concept, usually manually

with noticeable behaviour. This makes the whole process very personalized and the quality of the check itself is very questionable. On the other hand, behaviour coverage provides modern dynamic web applications that display features of richness and geological behaviour that cannot be adequately covered by manual examination of a few screenshots or a small number of effects. Several solution does not provide an automated way to systematically and comprehensively examine web application behaviour. Usually, such an investigation is necessary to identify errors that are involved in the depth of functioning of a web application. Finally, the process of browsing web applications in different environments and comparing the visual behaviour completely with manual through tools related to scalability, providing the tools in a consistent and reproducible way across many browser operating system operating systems, in actual it is really difficult to apply [5][10].

```
Connect:      3   9 11.8   8   147
Processing:  107 5738 2429.9 6309 10684
Waiting:     88 5459 2375.0 5635 9878
Total:       130 5747 2429.6 6312 10688

Percentage of the requests served within a certain time (ms)
 50%  6312
 66%  7108
 75%  7756
 80%  8031
 90%  8694
 95%  9187
 98%  9579
 99%  9891
100% 10688 (longest request)
Muhmmads-MacBook-Pro:~ muhmmadbredadataftayani$ ab -n 200 -c 100 http://sinayo.com/
This is ApacheBench, Version 2.3 <$Revision: 1026891 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking sinayo.com (be patient)
Completed 100 requests
Completed 200 requests
Finished 200 requests

Server Software:      LiteSpeed
Server Hostname:     sinayo.com
Server Port:         80

Document Path:       /
Document Length:     16383 bytes

Concurrency Level:   100
Time taken for tests: 15.978 seconds
Complete requests:   200
Failed requests:     199
  (Connect: 0, Receive: 0, Length: 199, Exceptions: 0)
Total transferred:   3217350 bytes
HTML transferred:   3021283 bytes
Requests per second: 12.52 [#/sec] (mean)
Time per request:    7988.837 [ms] (mean)
Time per request:    79.888 [ms] (mean, across all concurrent requests)
Transfer rate:       196.65 [Kbytes/sec] received

Connection Times (ms)
  min  mean[+/-sd] median  max
Connect:    5   15  4.7    15   35
Processing: 138 5841 2566.8 6227 11329
Waiting:    111 5599 2498.7 6014 11150
Total:      151 5856 2566.2 6243 11342

Percentage of the requests served within a certain time (ms)
 50%  6243
 66%  7241
 75%  7751
 80%  7977
 90%  8945
 95%  9712
 98% 10721
 99% 11041
100% 11342 (longest request)
Muhmmads-MacBook-Pro:~ muhmmadbredadataftayani$
```

Figure 2 Stress Testing

Stress testing is one of the tests that tests the resilience of a system or web service that is used in applications to support application requirements. Things that are usually tested include knowing the resilience of the system from the many users who use applications, system capabilities, and system security. To test the stress test, Sinau Yo uses the Apache benchmark. And what we test from Apache benchmark, which is the resilience of the application if there are many users accessing the Sinau Yo website. In the figure below, it shows the total number of websites simultaneously accessing as many as 100, and users who access as many as 200. In these results, the results of the 15-second response to respond to 200 users, with 100 users accessing simultaneously. Cross browser testing is a test that is carried out to test the appearance of a website in each browser that is used. Sinau Yo tests the cross browser on the sinauyo.com website application with the reason to know the differences in the appearance, interaction, and shape of each web component in each browser, and also every component website to make sure function of component. Meanwhile, Sinau Yo uses google chrome and safari to test the display on the Sinau Yo website. It has aim doing with these two testing, Sinau Yo could make a review for the apps according the right function and the view of apps.

#### 4. Conclusion

In this research we know that client side rendering and server side. Based on the research carried out to develop the Sinau Yo company with the creation of website-based applications with the Laravel web framework, and also CSS Materialize, among others:

- The website-based Sinau Yo application aims to help the teaching and learning process between students and teachers. And also as the main application to help Sinau Yo business processes.
- The Sinau Yo website application is designed using the Laravel version 5.6 and materialize beta. And also on the Sinau Yo website application using the mysql DBMS as data design, and using the OOCSS concept as a concept to design and maintain CSS codes if there are changes to the CSS code with the help of preprocessing using Sass preprocessing. And using UML as a website application design to find out the application flow.
- To develop the Sinau Yo company, Sinau Yo has several business approaches, namely by making BMC as a measurement tool to determine business needs and application features. Make several social media, as a promotional tool. And introducing to the community, teachers, or students to partner with Sinau Yo to be able to teach at Sinau Yo and to attract Sinau Yo students.

The Sinau Yo website application has been tested with Apache benchmark, to measure how well the application responds to the number of users. And cross browser testing, to test the feasibility of html, CSS, and JavaScript elements in the Google Chrome browser and Safari.

#### 5. References

- [1] Lubis M, Kusumasari TF and Hakim L. 2018 The Indonesia Public Information Disclosure Act (UU-KIP): Its Challenges and Responses. *IJECE*, **8** (1), February 2018.
- [2] Lubis M, Lubis AR, Lubis B and Lubis A. 2018 Incremental Innovation towards Business Performance: Data Management Challenges in Healthcare Industry in Indonesia. *MATEC Web Conf.* 218, 04015.
- [3] Lubis M, Fauzi R and Lubis AR. 2018 Enterprise Application Integration for High School Students using Blended Learning System. *MATEC Web Conf.* **218**, 04016, 2018.
- [4] Fejzullahu, F., & Kanaparan, G. 2017 Challenges in Software Design and Development of Cross-Platform Mobile Applications. *Journal of Applied Technology and Innovation*, 68-78.
- [5] Khan, M. E. 2012 A Comparative Study of White Box, Black Box and Grey Box Testing Techniques, **3**(6), 12–15.
- [6] Norman DA and Verganti R. 2012 Incremental and Radical Innovation: Design Research versus Technology and Meaning Change. *Design Issues: Designing Pleasurable Products and Interfaces Conference*. March.
- [7] Tellis GJ, Prabhu JC and Chandy RK. 2009 Radical Innovation Across Nations: The preeminence of Corporate Culture. *Journal of Marketing*, 73(January), pp. 3-23.
- [8] Ardevol LM. 2013 *User Experience Methodology for the Design and Evaluation of Interactive Systems*. PhD Thesis, Universitat de Lleida.
- [9] Lubis AR, Fachrizal F and Lubis M. 2017 The Effect of Social Media to Cultural Homecoming Tradition of Computer Students in Medan. *Procedia Computer Science* **124**, 423-428.

- [10] Mesbah A and Prasad MR. 2011 Automated cross-browser compatibility testing. *Proceedings of Int. Conf. on Software Engineering*.
- [11] Choudhary SR, Versee H and Orso A. 2010 A Cross-browser Web Application Testing Tool. *Proceedings of Int. Conf IEEE on Software Maintenance*.
- [12] Basarir C and Toraman C. 2014 Financial Stability Analysis in Banking Sector: A Stress Test Method. *The Journal of Accounting and Finance*, April.
- [13] H. Basri, S. Alfarizi, A. R. Mulyawan, A. Wiguna, and I. Habiba, 2019 Perancangan Sistem Informasi Booking Perekaman E-Ktp (Si Mbok) Berbasis Web,” *J. Pilar Nusa Mandiri*, **15**(1), pp. 69–76.
- [14] A. W. Purnamasari, Andi Winda Purnamasari, 2017 Sistem Informasi Pelayanan Oleh Pihak Kepolisian Berbasis Web (SIP-OKE).