

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES) Taichung, Taiwan 3-6 March, 2022

WEB MARKETPLACE DESIGN AND DEVELOPMENT FOR HOUSEHOLD NEEDS USING THE WDLC MODEL WITH THE SCRUM METHOD

Heru Wijayanto Aripadono, Muhammad Rivaldy Hisham

Faculty of Computer Science, University International Batam

{ heru.wijayanto@uib.edu, 1831032.muhammad@uib.edu }

ABSTRACT

The fast digital era 4.0 revolution requires companies to be responsive in providing breakthroughs in their products so that they are able to guess consumer needs and distribute them in a short time. The growth of online shopping has brought about changes in the standardization of electronic commerce which affects business processes in various fields of business. The web can be used to retrieve data on products in the electronic market and one of them is household appliances which makes it easier for people to become sellers and buyers. The SCRUM method is a new continuous methodology in software development that is also widely used by other researchers because it is able to adapt to changes that occur during the development of the application process that is made. WDLC is a web-based application development method based on the adoption of SDLC that supports the creation of web applications, both simple and complex, and can be adapted to other methods, for example prototypes to be redeveloped repeatedly and gradually. The result of this applied research is a web marketplace for household needs that has been designed and developed using the SCRUM method with the WDLC model.

Keywords: *Web, Marketplace, WDLC, SCRUM, E-commerce.*

PRELIMINARY

At this time the rapid development of Information Technology (IT) and Information Systems (IS) is believed to be an important resource for the industrial world(1). IS and IT are not only useful as supporting tools, but also useful and have a strategic role that can be used to support efficiency and activities as well as productivity in an industry or company.(2). The flexible digital era of the industrial revolution 4.0 requires companies to be able to innovate in making products that suit consumer needs and can be marketed in a short time. This can also answer the company to be able to increase its competitive advantage compared to competitors(3). In today's highly competitive environment, increasing competitive advantage is one of the keys to winning competition and new customers for an organization.

Indonesia is one of the countries that is increasing in terms of the development of information technology, especially the internet. At the beginning of 2021, internet users in Indonesia numbered around 202.6 million or about 73.7% of the total population of Indonesia

and this figure increased by about 15.5% compared to the previous year.(4). The increase in internet users in Indonesia this year can

certainly encourage business owners to start taking advantage of economic growth through internet technology. One of the benefits of the rapid development of the internet world in the development of the business world is E-commerce. E-commerce is the use of the internet network to run business processes, using computers and the internet as a medium, to sell and buy products that will be used later(5). The arrival of new technologies such as Big Data and Internet Of Thing (IoT) in industry 4.0 itself indirectly also encourages the progress of the E-commerce industry.(6). Based on data from We Are Social at the beginning of 2021, around 93% of internet users in Indonesia search online for the product or service they want to buy and from this figure, around 87.1% of internet users make their purchases online.(4). With such a large population of Indonesia, this number is a large number and of course will greatly affect the growth of the digital economy in Indonesia. This

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES) Taichung, Taiwan 3-6 March, 2022

figure is expected to continue to rise, in line with the target of the Indonesian government which wants Indonesia to be the country with the largest digital economy value in Indonesia by 2030.(7). Marketplace is one of the online-based media providers that uses internet technology (web-based) as a place to carry out their business activities, where sellers do not need to bother making online sales, because marketplace providers have provided a place and a place to be able to do online sales and transactions.(8). With a marketplace, every business actor is able to make sales and online transactions easily, without having to incur large costs in building a platform or information technology infrastructure. This is an opportunity for business actors to expand their business more broadly and this is in line with the Indonesian government's strategy to support business actors, especially MSMEs, to collaborate with existing Marketplace platforms, in increasing business actors' access to the use of technology so as to encourage innovation and Indonesia's digital economy in the future(9).E-commerce products that are most hunted and bought by online users are household products, especially during this Covid-19 pandemic.(10). This is also supported by data from Wearesocial, in early 2021 which informed that online spending related to household needs in Indonesia was around \$4.48 billion with a percentage increase of 47.8 percent compared to the previous year.(4). Household needs are mandatory, especially during the COVID-19 pandemic, where almost all activities are carried out at home. Starting from online school at home, to working at home (Work From Home). Household needs are unavoidable for the perpetrators of the head of the family and housewives (IRT) because every household has a need to decorate and maintain the cleanliness of their home. Based on this, we need a marketplace that is able to meet the household needs of families or online users in Indonesia. So that the existence of this marketplace makes it easier for online users to fulfill their needs and with this marketplace it is also able to increase the growth of business actors engaged in household needs, which in turn is able to increase Indonesia's digital economic growth in the future.

METHOD

1. SCRUM

With the rapid development of technology called the internet, people can easily transact without having to meet and make it easier for the chance of success for a transaction to become legitimate, but there are still many buyers/sellers who are harmed by the responsible party.(11). When transacting in the scope of E-commerce, there are many things that can cause losses in the form of default so that it can reduce the buyer's sense of confidence in the E-commerce system itself.(12). Today, there are many frameworks for implementing IT governance. However, with the implementation model of sustainable IT governance development, relatively short activities are required for preparation, planning, and application development(13). One of them that is currently widely used is the SCRUM method which is a new method in software development and can adapt to changes that occur during application development.(14) SCRUM can help companies to save costs and time, management costs are minimal so that they can provide faster and cheaper results.



Figure 1. SCRUM method

The SCRUM method is a software model designed for agile development teams. One of the advantages of Scrum over other conventional methodologies such as waterfall is the speed of adaptation(15).

In its implementation, this method is generally divided into several steps, namely:

a. Product Backlog (PB)

In the PB stage, it aims to summarize the requirements needed to work on the features that have been defined at the project plan design stage. After the needs are adjusted, all the relevant points are separated in the form of small bullet points, each small point is an important requirement, so it is prioritized when developing.

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES) Taichung, Taiwan 3-6 March, 2022

b. Sprint Planning

This stage must be carried out every time a new sprint is executed. In this stage, it is necessary to organize the processes that are poured into sub-points that need to be completed in the first period of the sprint.

c. Sprint Backlog

This stage must be carried out every time a new sprint is executed. At this stage, the system developer will describe a real picture of the project being worked on.

d. Daily Scrum

At this stage, an analysis of the results and progress of system work will be carried out, be it UI/UX, design, coding, and testing with the aim of aligning the work carried out with the aim of developing the system to be developed.

e. Sprint Retrospective

In this case, a presentation of the results of the work for 1 sprint period will be carried out to get suggestions and opinions (feedback) in the work of the previous stage.

f. Increment

This is the last stage in the scrum framework. Increment is work that can be examined and completed to support empiricism at the end of the sprint. In this case, every time you do a sprint, the end result is an increment which is a step to be able to achieve the expected goal or vision. This stage is also the stage of project work which is said to be completed by the product owner.

2. WDLC

Web Development Life Cycle(WDLC) is a web-based application development method based on the adoption of the Software Development Life Cycle(16)which also supports both simple and/or complex web design and can also be adapted to other methods(17).

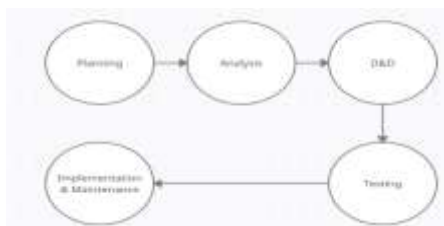


Figure 2. Web Development Life Cycle (WDLC) Model

a. Planning

The planning stage is the first step in designing a website using the WDLC method. Determining the goals and objectives of the created website is the first step in the planning process.

b. Analysis

At this stage, identification of needs analysis will be carried out for the design and development of this E-commerce web, starting from the programming language used for display and database, the framework to be used and hosting to be purchased for publication to the internet.

c. Website Design and Development

At this stage, a blueprint for the website will be prepared, the preparation also contains various diagrammatic representations of logical and physical objects to be developed during the design stage. The main objects including the data model and presentation will also be documented in the system design.

d. Testing

The testing phase shows whether the results of the website produced are in accordance with user expectations, the information needed with the performance achieved and the functionality of the website builder. The components tested in this phase include system content, functionality, ease of use and accuracy.

e. Website Implementation and Maintenance
At the website implementation and maintenance stage, the results of the framework and blueprint description from this website will be implemented and also conclude the results of the questionnaires from users and visitors from this website, after that there will be changes that will enter the maintenance phase and will improve and add what features only input in the questionnaire.

RESULTS AND DISCUSSION

This BrainDO E-commerce website was created to make it easier for sellers and buyers to transact in real-time and also this website will focus on equipment and household needs in Indonesia by using the look, compare, buy method that focuses on household needs, it is hoped that with the presence of This E-commerce website can help facilitate the chance of success of each transaction.

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES)

Taichung, Taiwan 3-6 March, 2022

1. Purchasing and Third Party Diagrams

Figure 3 is the process and service of a customer when using the Braindo web marketplace. New and registered customers will be directed to a special web for the user and after that the user will see the goods in the view service such as buying goods and so on, then proceed with purchases which will be directed by the automatic payment authentication system from the 3rd party service payment which will be validated first. whether the payment used by the user is valid or not, that way the payment will be guaranteed a 100 percent success rate.

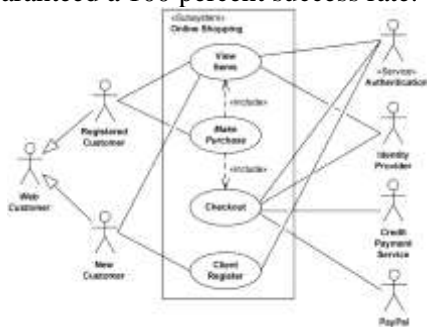


Figure 3. Integrated Modeling Language Diagram (processed by the author)

2. Flow diagram

A diagram with certain symbols that describes the sequence of processes in detail and the relationship between a process (instructions) and other processes in the program. This is based on a flow chart, which is a description of the results of thinking in analyzing a problem. Because each analysis will produce different results from each other. However, in general, every flowchart design always consists of three parts, namely input, process, and output.

a. Registration

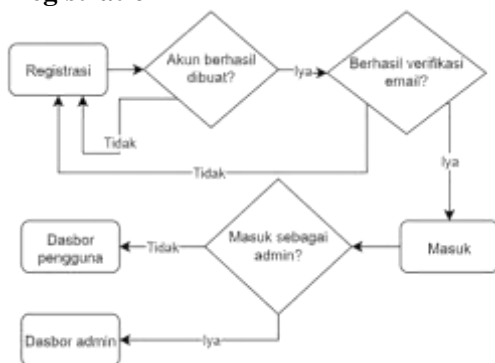


Figure 4. Registration flow chart

The registration stage is the initial stage when you want to register an account on the BrainDO

website, at this stage the visitor will fill out a form which will later become the account of the visitor. For the registration stage, the researcher conducted a survey to several visitors and created a form for first/last name, cell phone number, electronic email and password.

b. Purchase

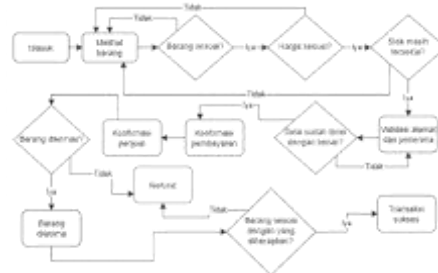


Figure 5. Purchase flow chart

The stage of purchasing goods starts from logging in and proceeds to view the goods then if the buyer has found the desired item there will be a choice whether the goods, prices, stock are appropriate and available, proceed to validating the recipient's address by ensuring the data has been filled correctly.

c. Payment

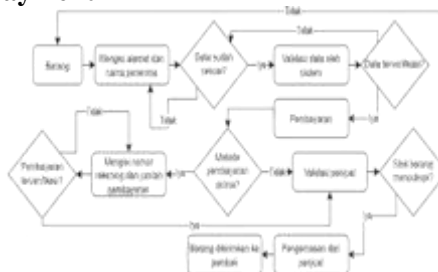


Figure 6. Payment flow chart

Payment starts from the goods, continues to fill in the address and name of the recipient or buyer, then it is confirmed whether the data that has been filled in is appropriate or not and after that it is validated by the system, if the data verification does not match it will return to data adjustments or corrections.

3. Programming Language

a. MySQLi

MySQLi is the result of the latest version or development of MySQL. Security and debugging capabilities will be improved to resolve various issues.

b. PhpMyAdmin

Understanding phpMyAdmin and its functions have a significant role. In this case,

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES) Taichung, Taiwan 3-6 March, 2022

handling when creating a website is very important to be done professionally.

4. Framework

a. Bootstrap Framework

Bootstrap is described as simple CSS but built with a more powerful and flexible preprocessor than standard CSS.

b. SCSS Framework

SassyCSS is the latest syntax for SASS (Syntacally Awesome Style Sheets). SASS itself is a CSS preprocessor, a program that processes data using CSS output syntax.

c. Laravel Framework

Laravel is the only framework that helps to get the most out of PHP when developing websites.

5. Hosting

The minimum hosting specifications to run a marketplace website are described in table 1 below:

Table 1. Minimum hosting specifications

Type	Minimum	Recommendation
Storage	1 Gb	Unlimited
Email Account	1	Unlimited
MySQL	1	Unlimited
FTP Account	1	Unlimited
Domain	3 months	1 year
SSL	1 month	1 year
Transfer Speed	1Mbps/s	Unlimited
Subdomain	1	Unlimited
Servers	Indonesia	Indonesia, United States

6. Website Design And Development

a. Page structure design

The combination of linear and hierarchical structures is a commonly used structure in web system design. The structure on the main page is divided into 3 parts: information, products and my account. On the information is shared several pages of our contact, Terms and Conditions (T & C), office address, blog, contact, shipping and privacy policy. Then in the product section there are popular, best, newest and categories, while in my account there are edit accounts, notifications, addresses and payment pages.

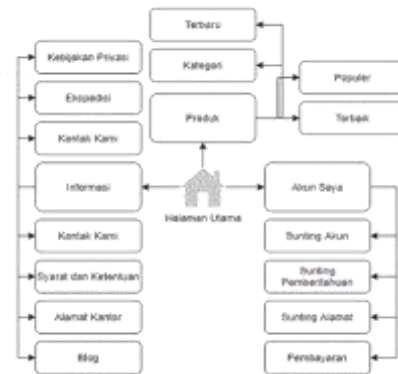


Figure 7. KSLSH

b. Page Design

In designing or designing the main page, use painting software on the main page to create a design. The purpose of designing this page is to show an overview, design or design of the web page that will be developed. In the main page, it is designed to have a Header section, then below it consists of four sections, namely: Home, Application, Login and My Account. After that, it is continued with examples of goods in this E-commerce and other information sections that support this web site.



Figure 8. Main Page Design

7. Testing And Implementation

a. From the User's Side

The implementation is carried out starting from processing the website to display the user's page, such as the display of the results from the blueprint in Figure 9.

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES)

Taichung, Taiwan 3-6 March, 2022

1) User Interface



Figure 9. User Interface

The user interface display is the very first page in which it has been designed as effectively and as simple as possible for the layout and design, starting from the BrainDO logo and categories. This website presents in the form of a banner with a large size so that it will attract visitors to see and make it possible to buy goods that are placed on best selling.

2) User Registration



Figure 10. User Registration

In the user registration process, the system only asks to fill out a registration form in the form of first name, last name, electronic email, password, password confirmation and also a subscription. As for in-depth questions such as date of birth, gender, address and so on it will be entered into the user configuration.



Figure 11. After registration

After filling in the registration form and there are no errors in the data, a notification will appear that the account has been created and activation is in the form of confirmation on the registered email account. After that, confirmation will be carried out and will be directed to a web display that conveys information that the registration

was successful, namely in the form of a welcome text and happy shopping.

3) Purchase of goods



Figure 12. Purchase of goods

If the user wants to buy or just see the item that will be reviewed, the user simply clicks on the picture of the item he wants to see then scrolls the web down and sees the description, specifications, reviews and videos of the products shown in Figure 12.

4) Payment



Figure 13. Checkout stage

Figure 13 describes what can be done at the checkout stage such as using coupons (usually obtained using print media or so on), estimated tax and shipping and the final total amount that will be charged to the buyer.

5) Search



Figure 14. Search Features

On the search button there is a form filling in to find out what items will be reviewed next, for example in Figure 14 the user wants to search for television and the web will bring up the products sold by the seller with a display of prices and specifications of the goods to be purchased, this is quite easy for the user to compare prices with other sellers.

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES)

Taichung, Taiwan 3-6 March, 2022

b. From the Administrator's Side

The administrator side view is made as simple as possible, with the aim of helping admins in managing the website properly, so that business processes in managing e-commerce can run well and smoothly.

a. Admin Interface



Figure 15. Admin interface

At the implementation stage, the administrator interface from the main page will display an admin dashboard containing total sales, total purchases, total users (who have registered) as well as graph analysis from daily, monthly, yearly.

b. Purchase and Sales



Figure 16. Buyer user details

In the advanced purchase view, there are items that have been and/or will be sold from the seller to the buyer, from the purchase list there is a filter to make it easier for the admin to see and crosscheck the items to be submitted for preparation of complaints, while in the action column there is an eye button that can be used to view details. ongoing and/or completed transactions as shown in the following figure 17.



Figure 17. More details of user purchases

As shown in Figure 17, you can see the details of the items purchased and/or sold, such as the date of purchase, payment method, the courier service used for delivery, details from the customer, detailed address of the seller and

buyer, total price paid, payment history, purchase history and comments from sellers.

c. Buyer



Figure 18. View from the buyer's side

Description of accounts or users who have registered and verified email (as shown in Figure 18, several columns will appear such as customer name, address, email, cellphone number, affiliation, transaction history, reward points and IP address so that the admin can track if the seller or buyer is commit an unscrupulous act.

d. PDF

The system adds a PDF feature in the system, to make it easier for users to save documents digitally. And this can also be proof of payment for users, and help e-commerce admins, especially the finance department, in storing data related to the payment process.



Figure 19. Export PDF Note 1



Figure 20. Export Courier Notes PDF

Figure 20 is a pdf file to make it easier to print receipts or proof of delivery if the buyer wants to make sure the goods he ordered were sent or not and in Figure 20 is a pdf file export display to make it easier for sellers to print invoice receipts so that they are ready to be attached to

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES) Taichung, Taiwan 3-6 March, 2022

the goods to be sent to expedition as required by the seller.

e. Sales Analysis

Sales results data, will be displayed in graphical form, which aims to help admins or business owners in analyzing the results of sales that occur. So that the data displayed can make the BrainDO team, make decisions related to future promotion or sales strategies. The data that can be displayed is a daily, weekly, monthly and even yearly sales graph.

8. User Survey

To ensure the process and features can run well, an online survey was conducted using a questionnaire, to 50 users or visitors of BrainDo. The focus of this survey is to ensure that the features and processes in E-Commerce are running well and in accordance with user expectations. The results of this survey can be described as follows:

Table 2. Results of the BrainDO pengunjung visitor questionnaire

FUNCTI ON NAME	IN ACCORDAN CE	IT IS NOT IN ACCORDAN CE WITH
header	40	10
My account	24	26
Day and date	32	18
Edit informatio n	44	6
Request	47	3
Name, address, cart	49	1
customer service	42	8
Order has not been paid	35	15
Order already paid	41	9
Order failed	35	15
Order sent	27	33
Order returned	48	2

Item advertisem ent	12	38
Footer	44	6

The results from the table above show that the most inappropriate function is product advertisement, this is because the advertisement is too large and almost covers the website footer area. Then for the functions that are most preferred and in accordance with user expectations, namely the name, address and cart. This is preferred because the names and addresses that are inputted into the system have been running very well and there are also no errors in typing and the data displayed in the system.

CONCLUSIONS AND SUGGESTIONS

By implementing a marketplace system using the SCRUM method and the Web Development Life Cycle model, the web can be designed and developed in a faster and more structured time, and if there is a problem with web development, you can roll back immediately on the 3rd week in the daily scrum to deal with the problem. the. Buyers and sellers can order the things they need and can directly order on a mock-up web that has been made with a payment system using cash on delivery (COD) or a payment system using PPOB (Payment Point Online Bank), this can make it easier for sellers and buyers to transact and make payments virtually as expected in this era of the COVID-19 pandemic.

In the future, related to the payment process, you can use payment methods that are internationally recognized such as paypal, visa, credit card, google play card, telegraphic transfer, and other international payment media. Meanwhile, to prevent data or files being damaged due to viruses or attacks by hackers should admins already have to prepare the data that needs to be stored in cloud-based storage or store data on an adequate hard disk in order to prevent data loss that can create losses on mock-ups and also data leaks from customers.

The results of the interview with the E-commerce web resource BrainDO still have shortcomings in the registration section such as the absence of OTP (One Time Passcode) or other double verification, then the design section of the cellphone number is added with email and

The 2nd Conference on Management, Business, Innovation, Education, and Social Science (CoMBInES) Taichung, Taiwan 3-6 March, 2022

improvements to the CSS language and footer which are still very rigid. This can also be a feature improvement for further development.

BIBLIOGRAPHY

1. Yulia, lady. Halal products industry development strategy is a strategy for developing the halal product industry. A Islamic business [internet]. 2018;8(1):121–62. Available from: <https://jurnalbimasislam.kemenag.go.id/jbi/article/view/171/118>
2. Murti Z, Andrachmi A, Ansis R, Rogerleonick A, Damanik A, Siregar Jani Richi Rikardo. Analysis of the role and leadership of information technology: a case study of the Agency for the Assessment and Application of Technology (BPPT). 2020;
3. This Ningsih putu diah untari. Introducing scrum as an enterprise framework to meet the challenges of changing markets. 2020;3(2):210–26.
4. Cuponation. Digital 2021. Global digital insights. 2021.
5. Primary ir, zulita ln, sari hl. Development of Bengkulu traditional cake marketing through e-commerce media Development of Bengkulu traditional cake marketing through media. J com. 2021;1(1):157–64.
6. Lin w, wu z, lin l, wen a, li j. An ensemble random forest algorithm for insurance big data analysis. Ieee access. 2017;5(july):16568–75.
7. Goddess fs. Jokowi called Indonesia's digital economy the fastest development in Southeast Asia. Bisnis.com [internet]. 2021; available from: <https://ekonomi.bisnis.com/read/20210413/9/1380241/jokowi-sebut-perkembangan-ekonomi-digital-ri-tercepat-di-asia-tenggara>
8. Nuraida w, ade irman saeful mutaqin s, akbar g. Introduction and use of the e-commerce marketplace for SME players in the Cilegon area. J devotee din. 2019;6(1):31–9.
9. Industry k. Making Indonesia. Making Indonesia. 2019. 1–8 p.m.
10. Burhan fa. The most sought after household products by Tokopedia and Shopee consumers - e-commerce katadata.co.id. Datadata.
11. Suryani n, haq id, kusumadewi s. Sirekto (web-based joint account information system for online transactions). 2021;1(1):19–27.
12. Kurniawan o, zurnetti a, suharizal. Settlement of default disputes in online buying and selling agreements (e-commerce) that lead to fraud. J syntax transform. 2020;1(7):353–8.
13. Ultimate rwp, khalida r. Agile project management with the scrum method approach as a continuous service improvement company. Pamungkas, rwp, khalida, r (2019) managing agility projects using the scrum method approach as a continuous service improvement for sisfotek pros companies, 187–194 http://seminar.iaii.or.id/index.php/sisfotek/article/view/124prosiding_sisf [internet]. 2019;3(1):187–94. Available from: <http://seminar.iaii.or.id/index.php/sisfotek/article/view/124>
14. Masood z, hoda r, blincoe k. real worldscrum a grounded theory of variations in practice. Ieee trans softw eng. 2020;(September):1–1.
15. My sasmito, mohamad zulfiqar you. Implementation of scrum framework on web development of mapping salted egg production. In: iop conference series: materials science and engineering. 2020.
16. Dermawan i, p sw, budilaksono s, suwarno ma. Ikra-Ith National Seminar web development using the WDLC (web development life cycle) method. J ikra-ith inform. 2019;3(7):39–48.
17. Annisa n, febriyani k, hadiprakoso rb, cryptography r, cyber p. Design and build a web-based electronic official script application using wdcl. 2021;12(1).