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PayPOS user experience improved small and medium sized micro business existence in the disruptive era

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Abstract. Small and Medium Sized Micro Business (UMKM) owners often experience difficulties in running their business. UMKM needs real-time access on its transactions in order to properly oversee its business endeavors. This study was aimed to overcome UMKM restriction by taking advantage of disruptive era advancement through the development of a web-based UMKM point of sale software application named PayPOS. To do this, we carried out two iterations of user experience (UX) study parallel with the development of transaction and inventory modules. The UX study utilized the Lean UX method and applied mid-fidelity prototype interfaces and cognitive walkthrough to measure its usability metric efficiency and effectiveness. In the meantime, the transaction and inventory modules applied to the incremental method. Here, the development of the transaction module was divided into four increments: basic transactions, sales transactions, repair and maintenance orders, and transaction reports. Whereas the development of the inventory module was divided into two increments: inventory management and purchase order. On the first UX iteration, the success rate was 72%, whereas, on the second iteration, the success rate was 78%. The overall success rate on tasks tested was 92% which indicated that UX outcomes were easy to use. Further, upon modules integration completion, the PayPOS developed was successfully tested using the Black box method. The user acceptance test carried out also indicated that PayPOS exhibited an attractive interface, easy to understand, and suitable menus and submenus. Hence, the employment of UX study results in the development of PayPOS has helped facilitate business owners in managing their business processes.

1. Introduction

Micro, small and medium enterprises (MSMEs) businesses are slower than large ones to adopt new ICTs in this disruptive era. MSMEs face generic barriers to adoption including trust and transaction security and intellectual property rights concerns, and challenges in areas of management skills, technological capabilities, productivity and competitiveness [1]. In the year 2017, the number of workers' in Indonesia was around 113.02 million pupils [2]. These workers exploit the transportation mode to go to their workplace. Given the limited number or unavailable public transportation that reaches their workplaces, motorcycles often become the main choice. In the period of the year 1997 to 2017 the number of motorbikes in Indonesia increased more than 10 times, i.e. 11.57 million in 1997 to 121.02 million in 2017 [3]. Figure 1.a showed that the number of workers was actually less than the number of motorbikes; meaning motorbikes are very popular among many workers. Motorbike procurements are increasing

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significantly because motorbike distributors offering easy facilities for installments with a small amount of down payment or even at 0% of down payment. Indonesia motorbike production [4] is around 588,089 units per month; about 91% of the production was for domestic markets (Figure 1.b).

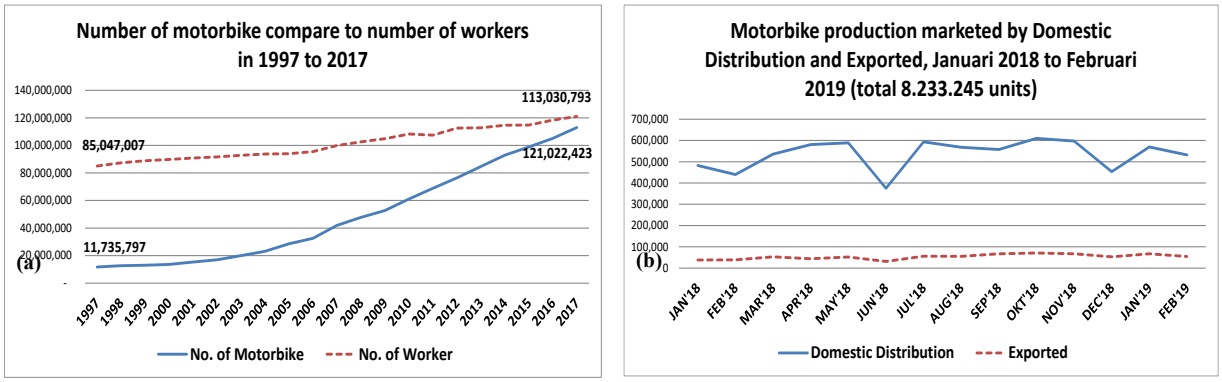

Figure 1. (a) Growth of the number of motorbike and number of workers year 1997 to 2017 and (b) motorbike production in Indonesia.

At present, Indonesia has no strict regulations regarding motorbikes service life; hence the number of motorbikes is getting bigger and bigger. In turn, the demand for a motorbike workshop is growing due to routine maintenance or impairment. To do this, consumers may opt to choose an official motorbike workshop or public MSMEs workshop. This study was focused on the public MSMEs business motorbike workshop. Potential MSMEs business benefits and firm and sector-specific strategies drive the adoption and use of ICTs. The use of ICT in MSMEs has an impact on the modernization of business processes, thereby increasing productivity [5]. MSMEs are productive economic businesses that are independent, carried out by individuals or business entities that are not subsidiaries or branches of companies that are owned, controlled, or become part of either directly or indirectly with Small or Large Businesses [6]. The number of MSMEs in 2013 was 57,895,721 units [7]. With an annual growth of 2.41%, the number of MSMEs in 2019 is estimated at about 66,788,342 units. MSMEs have an important and strategic role in national economic development. MSMEs were able to absorb around 87 million workers until 2012 and accounted for around 60% of the country's total Gross Domestic Product [8].

The previous study on the use of ICT in Jambi MSMEs specified that almost all of the 43 MSMEs surveyed carried out their business without taking advantages of ICT [9]. The study summarized that the lack of ICT usage was because MSMEs did not see the benefits of utilizing ICT in their business which was mainly because of lack of ICT skill and knowledge. Nowadays, a computer-based system for proper MSMEs business management is of great importance. One study that supported this statement stated that supply chain management and quality of information sharing gave a positive significant effect on company performance [10]. Further study onthe computer-based system was the development of a desktop-based point of a sales information system [11] using iterative method and study on the development of a web-based point of sales information system using incremental rapid application development (RAD) method [12]. Other study was on the development of desktop-based point of sales information system for biometric payment system [13] and a study on protection profile for PoS (Point of Sale) system that was carried out and intended to draw out security functional requirement for a PoS system based on credit cards which can be used as a reference for its security evaluation [14].

Developing a computer-based system that considers MSMEs user experience (UX) is the starting point for successful implementation of an application aiming to supports MSMEs business efficiently and effectively. A great interface gives MSMEs a realistic feel when using a computer-based system and provides a continuous flow of valuable information. In this study, we developed a web-based motorbike workshop point of the sale information system, called PayPOS. The developed PayPOS utilized Lean UX combined with the incremental process model. PayPOS was expected to facilitate the

MSME motorbike owners in conducting business effectively. In essence, the previously existing manual processes were modified into a computerized and web-based PayPOS system. The previous study on UX was conducted for an information system prototype in two iterations using the Lean UX method [15]. The first iteration success rate was 63% and the second iteration improved into 75%. Success rate refers to the level of user convenience in using an information system prototype. Another study related to inventory management was the analysis of safety stock determination using economic order quantity, safety stock, and reorder point approaches [16]. The study successfully managed inventory management and the amount of safety inventory determination.

2. Methods

The development process of this study was started with PayPOS user experience (UX) aspects parallel with its transactions and inventory management modules. The UX aspects were developed using the Lean UX method which consists of four stages namely declare assumptions, create the minimum viable product (MVP), run experiment, and feedback and research [17]. The PayPOS modules were developed using the incremental process model comprised of communication, planning, modeling, construction, and deployment [18]. The incremental process model was chosen because there was a compelling need to provide a limited set of software functionality to users quickly and then refined and further expanded on that functionality in later software releases. Here, each stage of the incremental process model was affiliated with each stage of the Lean UX method consecutively (Figure 2).

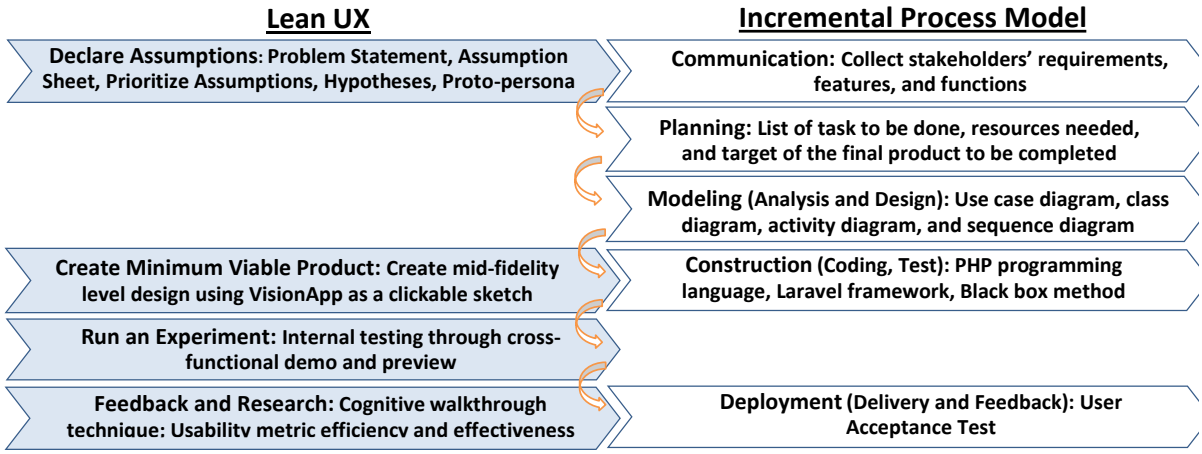

Figure 2. PayPOS development utilized Lean UX affiliated with incremental process model.

3. Results and Discussion

3.1. Declare Assumptions, Communication, Planning, and Modeling

During the communication stage, we carried out observations and interviewed the owner of an MSME motorbike workshop which employed three technicians and one cashier/inventory officer (**Figure 3**). Consumers visit the motorbike workshop to purchase some product/spare parts or request a motorbike repair. On the purchase of the product/spare part, the inventory officer manually checks product/spare part availability in the inventory shelves and inform the cashier for further transaction. Unavailable products/spare parts are manually recorded for further reordering process to the supplier. On motorbike repair, technicians check and perform reparation. On the condition that the repairs ask for product/spare part replacement, the technicians contact the inventory officer for its availability, the cashier for consumer approval price, and then upon price confirmation, the technicians continue the reparation process. Every day this motorbike workshop manually record around 50 products/spare parts item sold, purchase out of stock products/spare parts to the supplier, conduct around 5-10 motorbikes' repair, and manually inventories products/spare parts sold or consume in motorbike repairs sessions.

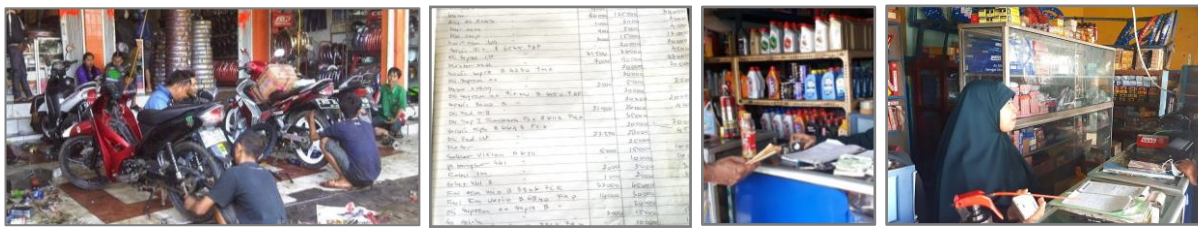

Figure 3. Sample of MSME motorbike workshop for PayPOS development showing the manual process of recording product/spare part sales and repair transactions.

3.1.1. Problem Statement. The owner of the motorbike workshop expressed the need for real-time transactions that were immediately attained from products/spare parts sold and motorbike repaired at the time and place of the transaction occurred.

3.1.2. User Assumptions. Following the communication, the user's assumptions for PayPOS were owner, cashier, inventory officer, and technicians. The developed system solved problems on tracking every incoming and outgoing transaction, carried out inventory management, monitored the performance of technicians, integrated inventory management system with transaction modules, managed customer and transaction data, viewed order lists, and made changes of order status accordingly. Motorbike workshop owners might use the system anytime and anywhere using a laptop connected to the server and viewed various reports. Employees might use the system during business hours and when transactions took place at the business location. Lastly, the most important features were transaction and inventory management features.

3.1.3. Business Assumptions. The study utilized four business assumptions as follow:

Assumption 1: inventory management system
(a) We believed that an inventory officer need PayPOS system containing an inventory management system to manage product/spare part data that were integrated with the transaction module,
(b) This need can be solved by creating an inventory management system,
(c) The risk of this system was that if the product/spare part data entered into the system was invalid, then the transaction module will be disturbed.

Assumption 2: transaction module
(a) We believed that cashiers need PayPOS system to log every transaction aimed to increase transaction business processes efficiency,
(b) This need can be solved by a system that supports an inventory management system and uses actual data such as product data and employee data,
(c) The risk of this system was that if the main data was invalid and not connected to the server, it affected the transaction process.

Assumption 3: technician feature
(a) We believed that technicians need features to see the list of customer orders and that technicians could change the order status,
(b) This need can be solved by creating a transaction module,
(c) The risk of this feature was that technicians cannot enter order data due to filthy hand conditions.

Assumption 4: report feature
(a) We believed that business owners need this feature to monitor business-related information such as oversee reports of repairs, sales, spare parts, and technician productivity,
(b) This need can be solved by creating a transaction module and data collection on employees tasks,

(c) This feature can be used or provided good information if the system was in operation for more than seven days or data was entered into the inventory management system.

3.1.4. Hypotheses. Following users and business assumptions mentioned above we developed four hypotheses:

H1: It was believed that making an inventory management system in more detail helped manage the stock of products to be sold. It was said to be true if the inventory officer could easily arrange the product stock to be integrated with the transaction module.

H2: It was believed that trusted transaction modules might support the cashier to manage customer data and transaction data. It was said to be true that the cashier could manage customer data and formulated transactions correctly according to customer requests.

H3: It was believed that features for technicians could simplify transaction regulation between inventory and cashiers. It was said to be true if the technician could oversee the order list and changed the order status.

H4: It was believed that these features will make it easier for business owners to monitor operational activities. It was said to be true that business owners can see reports of the motorcycle workshop business processes

Proto-persona. The study gathered the motorbike workshop proto-persona content which includes background problems, user's needs, and potential solutions as depicted in Table 1. Based on the proto-persona potential solution we determined features for the transaction, inventory, transaction information, and technician performance to be contained within the PayPOS system (Table 2).

Table 1. Proto persona of the motorbike workshop segments.

1. Sketch and name	2. Behavioral demographic information	3. Pain points and needs	4. Potential solutions
Owner: • Motorbike workshop owner • Female • 50 years old	• Infrequent internet user • Familiar with laptop and smartphone	• Monthly reports tedious and time-consuming • Requested transaction report and technician performance • Requested fast and accurate information to make business decisions	• Created a point of sale system for the motorbike workshop called PayPOS • Transactions are processed and stored using a computer-based system • Created transaction monthly report for owner examination • Created an integrated inventory and transaction modules
Cashier: • Concurrently cashier is also the owner • Female • 50 years old	• Infrequent internet user • Familiar with laptop and smartphone	• Monthly financial report tedious and prone to human error • Requested financial report based on reparation service and parts sold • Requested information on product/spare part availability to be processed by the cashier	• Created a transaction module as part of the PayPOS system • Records motorbike reparation and parts sold and procure • The transaction module uses actual data such as product data and employee data • The transaction module is supported by the inventory module for stock availability
Inventory Staff: • The Employee of the workshop • Male • 30 years old	• Rarely use the Internet • Familiar with mobile phone	• Management of the inventory for stock in hand and reorder time • The inventory report is unavailable	• Created the inventory module as part of the PayPOS system • Provide actual data such as spare parts data and employee data for verification
Technicians: • The Employees of the workshop • Male • Age range between 16-30 years old	• Never use the Internet • Familiar with mobile phone	• List of reparation order as a guide for reparation process • Spare parts availability for motorbike reparation	• Provide reparation service order obtain from the transaction module

Table 2. PayPOS features and its tasks.

Feature	Task
1. Transaction information	a. View service transactions b. View product sales transactions
2. Service transaction	a. Perform service b. Change service status c. Register Customer d. Fill in service detail e. Add product f. Print receipt
3. Product sales transaction	a. Perform selling b. Add Product c. Fill in customer data d. Request product e. Accept product f. Print receipt
4. Product ordering inventory	a. Purchase order b. Review purchase order detail c. Accept product d. Determine order payment e. Accept product order
5. Inventory information	View product list
6. Product inventory management	Add product
7. Owner information	View transaction report
8. Order status information	a. View order status b. Approve product order
9. Product sold and service Information	a. View product sold and service b. Print receipt
10. Technician information	View service list
11. Perform service information	a. Add detail service b. Add product
12. General	Log in

Researchers make a low sketch for all features using InVisionApps. Sample flow sketches of sales, add products, fill customer data, request and receive sales products were presented in Figure 4.a-c. For each sketch, we applied font type, color, menu label form, icon, and button of Google Material Design style guide (Figure 5.a-d). The $CornFlowerBlue color was selected as the primary color of the PayPOS system because it gave a cheerful and simple interface impression. This color was also used for the background color of the login, the process properties buttons such as Back, Edit, and Details, and for the header part of the main content. The $Pomegranate color was used for input fields, for the X (Close) icon, and the Delete button. The $Apple color was used for buttons such as Add Product. The $White color is used for the base color card and some writing with a background color such as writing for the button. The $Black color was used as a secondary color to give an elegant and professional impression, which was used in the sidebar navigation and text. The $Gray color is used for input fields. The $Sunglow color was used for background status. Some icons such as the PayPOS logo, shopping trolleys, and service transactions were own created. The modeling of the PayPOS application utilized use case diagram that empowered four actors, namely owner, cashier, inventory staff, and technician (Figure 6).

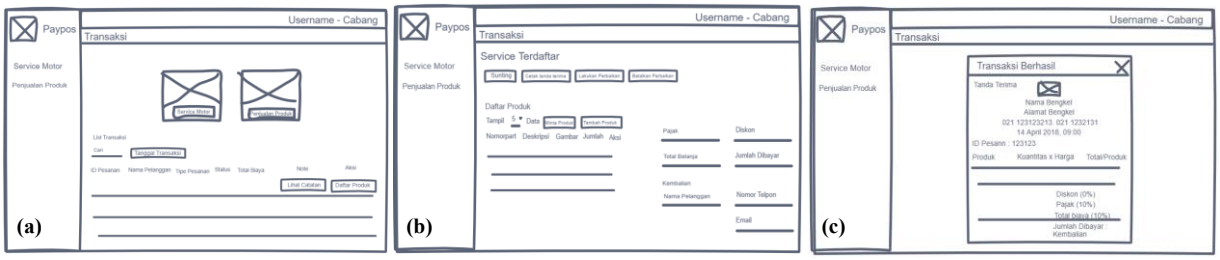

Figure 4. (a) The home view sketch for cashier; (b) the sketch to add the product, fill in the customer data, and request and receive product sales; and (c) the sketch of invoice production after a transaction was successfully completed.



Figure 5. (a) Color style guide; (b) Style font type guide; (c) Icon style guide; and (d) own created PayPOS logo, shopping trolley, and transaction service.

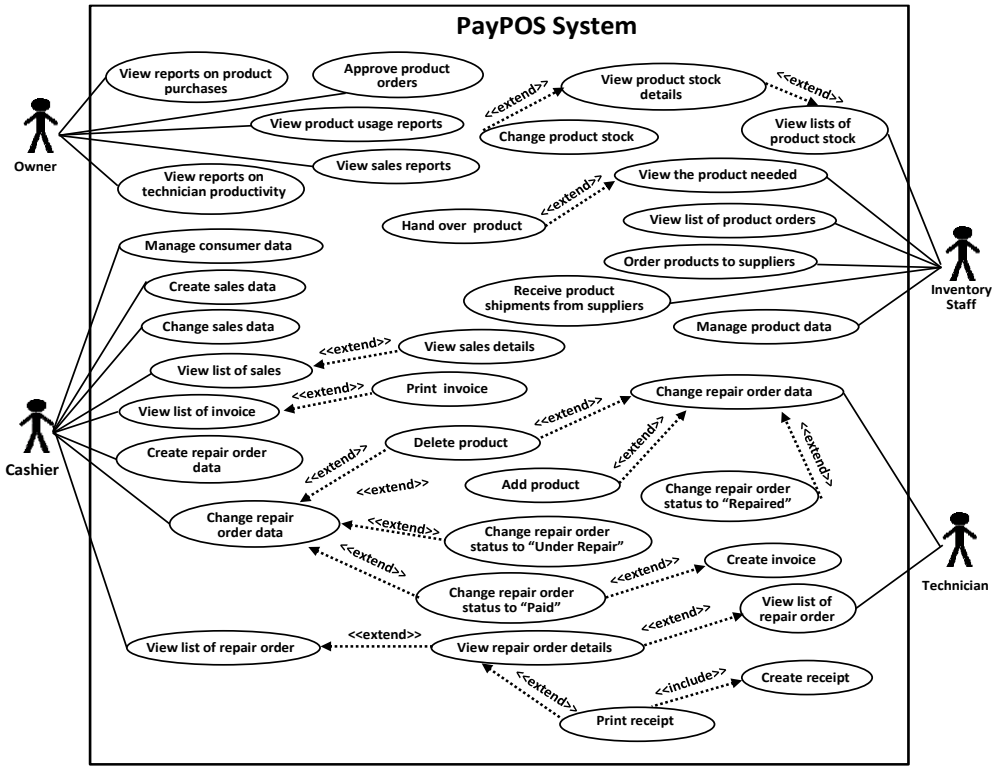

Figure 6. PayPOS 1st iteration use case diagram for owner, cashier, inventory staff, and technician.

3.2. Create Minimum Viable Product (MVP) and Construction

The MVP results utilized clickable mid-fidelity to represent the prototype interface consisted of six interfaces for the owner, ten interfaces for the cashier, ten interfaces for inventory staff, and two interfaces for the technician. The advantage of using a prototype is that the visual and elemental design, as well as its workflows, can be tested and its user interfaces can be reviewed. For instance, Figure 7.a showed owner dashboard to view total ongoing transactions, gross income, net income, monthly net income diagram, percentage of annual transaction types, highest and lowest product demand list, highest and lowest product income, product sales quantity list from daily transactions, and transactions that occur based on the date. The owner can also perceive technician productivity information. Figure 7.b showed the cashier main page contained two main menus, the Motorbike Service menu for motorbike repair transaction activities and the Product Sales menu for product sales transaction activities. The cashier main page also contained a list of transactions that were occurred that might further be filtered by date of transaction. Figure 7.c showed the main page of the inventory staff prototype interface. The

interface contains two main features of the inventory module, namely product management and product orders to suppliers. In this case study, we utilized the official motorbike brand product supplier. The inventory main page displayed a table or list of products contained within the PayPOS database. The table might be filtered to show all products, product availability, or products that were not available. In addition, there were a Create Order Product and Technician Inquiry buttons. Figure 7.d showed the technician interface contained a registered service list and entered input such as Type of Problem, Type of Service, Type of Repair, Notes, and required products/spare parts. Here, the technician must enter the transaction details to change the status of the transaction that was previously registered to be repaired.

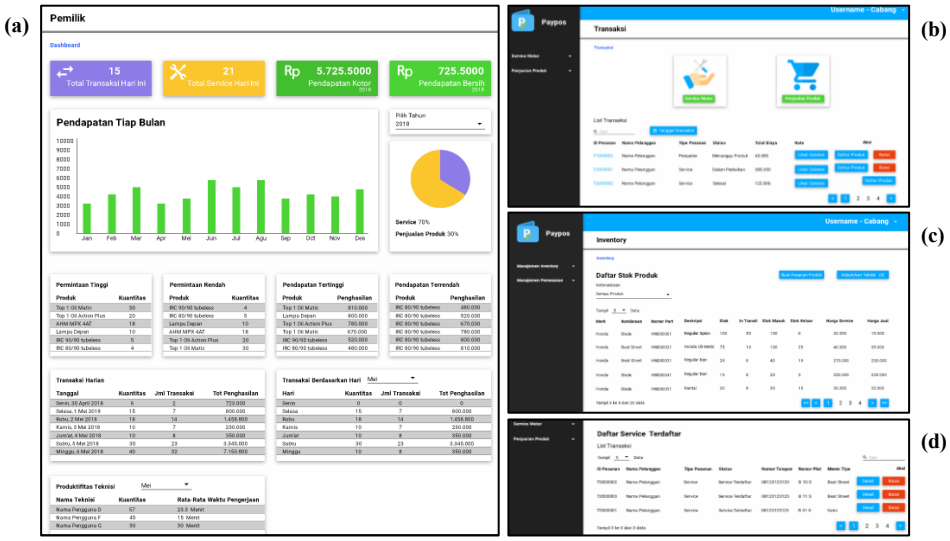

Figure 7. (a) Clickable mid-fidelity of owner dashboard; (b) cashier homepage; (c) inventory staff main page; and (d) technician.

Further, the PayPOS system was constructed using PHP programming language with the Laravel framework and Sublime Text. Laravel framework uses the model-view-controller (MVC) concept. MVC concept distinguishes classes that represent data, classes that govern the appearance of the system, and classes that govern controls. In classes that represent data or models, we added eloquent features. Eloquent is an object-relational mapping (ORM) that is very powerful and flexible in the Laravel environment. Eloquent Laravel help map an object with a database. Eloquent bridge objects defined in source code and databases, how objects are stored, retrieved, and deleted. Figure 8.a showed that the List of Products Needed interface comprised of information on the repair order number, product name, amount needed, cashier, product status, time the product received, and who gives the product. When the Change Status button is clicked, then the Assign Product form will appear to be filled in with the data accordingly **(**Figure 8.b**)**. After the coding was completed according to its function, we carried out testing and evaluation of system functions using the black box testing methods. The black box testing method is a software testing method that focuses on the functionality, especially on input and output applications without having to test the algorithm level. The results of each iteration testing were that eventually overall main functions of the PayPOS system were succeeded according to the scenarios given.

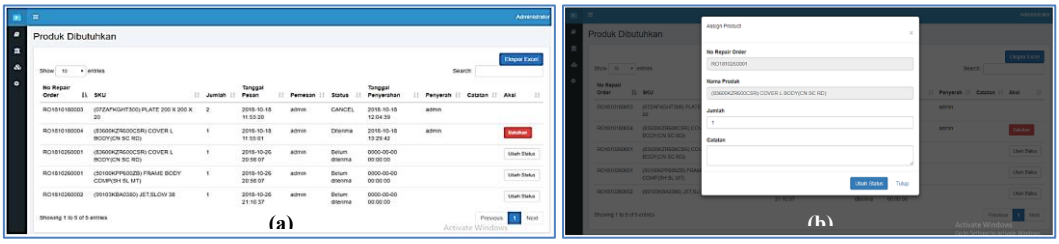

Figure 8. (a) The product interface of Product needed for repair and (b) the display when product validation will be changed the status.

3.3. Run an experiment

At this stage, our developer teams run usage experiment on the resulted clickable prototype interfaces. Usage experiment gave an illustration to our developer teams regarding the interface technology that will be constructed, provided more knowledge about the PayPOS information system, and provided feedback for the development of the next minimum viable product. However, during the first iteration of the experiment, developers failed on usage experiment of *New customer service transactions* due to text button ambiguity, *Change service transaction status* due to workflow ambiguity, and *Make product orders to suppliers* due to the unclear navigation menu. Following that, the 1st iteration features and its term contained within Table 2 and its use case diagram depicted in Figure 6 was further modified at the 2nd iteration into features as stated in Table 3. For instance, the technician actor was decided not to use the system due to the filthy hand during reparation sessions. Hence, the drawbacks were resolved in the second iteration (Table 3).

Table 3. The results of two iteration usage experiments on the developed clickable prototype interfaces.

No.	Clickable prototype interfaces	Experiment Results	
		Developer #1	Developer #2
1.	Registered customer service transactions	+	+
2.	New customer service transactions	+	-/+
3.	Change service transaction status	-/+	-/+
4.	Canceled transaction service	+	+
5.	Delay service transaction	+	+
6.	Product sales transactions	+	+
7.	View customer data	+	+
8.	View list of transactions.	+	+
9.	Inventory management	+	+
10.	Make product orders to suppliers	-/+	-/+
11.	Down payment product order to supplier transaction	+	+
12.	Cash product order to supplier transaction	+	+
13.	Cash on delivery (COD) product order to supplier transaction	+	+
14.	View list of repair transactions	+	+
15.	View product sales transactions	+	+
16.	View reports on product sales and service transactions	+	+
17.	Approve product orders to suppliers	+	+
18.	View detail approved product orders to suppliers.	+	+
19.	Reject product orders to suppliers	+	+
20.	View detail rejected product orders to suppliers	+	+
21.	View list of service transactions	+	+
22.	Change service transaction status (technician)	+	+
23.	User management	/+	/+

Note: + denoted succeed n first iteration, -/+ denoted failed on the first iteration and succeed on the second iteration, /+ denoted addition on the second iteration and succeeded

3.4. Feedback and Research and Deployment

The owner who is also the cashier, the inventory staff, and the technician tried over the clickable prototype interfaces using cognitive walkthrough approaches (Figure 9). Three examiners measured the time taken for each clickable prototype interface to obtain the completion benchmark time. The time needed for each prototype interface was determined based on a self-test with a tolerance time limit or benchmark completion time to triple the time of each task [19]. The examiners' background was computer science students, experienced workers, and had familiarity with information systems. The

examiners were given an explanation regarding the business process and the PayPOS system flow. This knowledge was necessary to get the ideal time of each prototype interface in the PayPOS system so that the usability of each task can be known. The time completed was multiplied by the tolerance limit (twice) and divided by three (number of testers). If the examiner failed or could not complete the task then the value was zero. Further, the examiners' result was deducted by stakeholders' time of completion; if the result was positive, then the task was deemed inefficient. During stakeholder first iteration, 2 out of 22 examined tasks were failed (0, bold red font color) which lead to a 90% success rate (Table 4). Also, 4 tasks were exceeding its benchmark value (bold red font color) causing 72% of efficiency. During the second iteration, 9 tasks out of 9 examined tasks were all succeeded causing a 100% success rate. However, 3 tasks were exceeding its benchmark value giving 67% of efficiency.



Figure 9. (a) Stakeholder/owner, (b) inventory staff, and (c) technician (d) during feedback and research.

Table 4. Time completion of tasks measured by examiners and PayPOS users.

No.	Task	Examiner time (second)				User time (second)	
		E1	**E2**	**E3**	**Avg.**	**Iter-1**	**Iter-2**
1.	Registered customer service transactions	184	242	194	206	122	
2.	New customer service transactions	192	202	182	192	100	
3.	Change service transaction status	46	68	58	**57**	**0**	**78**
4.	Canceled transaction service	42	40	40	40	26	
5.	Delay service transaction	34	62	54	50	23	
6.	Product sales transactions	112	110	104	108	55	
7.	View customer data	12	10	14	12	4	
8.	View list of transactions.	12	12	12	12	11	
9.	Inventory management	82	102	88	90	50	
10.	Make product orders to suppliers	50	52	48	**50**	**132**	50
11.	Down payment - product order to supplier transaction	78	80	72	**76**	**120**	54
12.	Cash - product order to supplier transaction	60	68	58	**62**	**72**	**72**
13.	Cash on delivery (COD) - product order to supplier transaction	54	64	58	**58**	**70**	54
14.	View list of service transactions	24	30	24	26	16	
15.	View product sales transactions	28	36	34	32	17	
16.	View reports on product sales and service transactions	28	34	30	30	20	
17.	Approve product orders to suppliers	16	24	20	20	10	
18.	View detail approved product orders to suppliers.	36	40	32	36	20	
19.	Reject product orders to suppliers	28	32	28	29	10	
20.	View detail rejected product orders to suppliers	36	46	40	40	12	
21.	View list of service transactions	10	8	12	10	6	
22.	Change service transaction status (technician)	34	38	30	**34**	**0**	
23.	User management						
	a. View customer data				18		12
	b. Add user				18		**30**
	c. Update user				16		9
	d. Delete user				14		8

Note: **E1** – Examiner 1; **E2** – Examiner 2; **E3** – Examiner 3; **Avg.** – Average; **Iter-1** – Iteration 1; **Iter-2** – Iteration 2

On the deployment stage, we carried out a user acceptance test (UAT) using seven subject questions intended for the owner and the inventory staff. The UAT was done to determine the response of users to the PayPOS system that was deployed. The value of the acceptance level was categorized as follows: 100-80 denoted that the PayPOS system was very acceptable; 79-60 denoted that the PayPOS system was acceptable; 59-40 denoted that PayPOS system was rather acceptable; 39-20 denoted that PayPOS system was unacceptable; 19-0 denoted that PayPOS system was rejected. The owner acceptance value ranged from 60 to 80 with an average of 73.6 which meant that on average the PayPOS system was acceptable (Table 5). In addition, the owner inferred that the system was very attractive, the report was

very easy to understand, and the modules were very good. The inventory staff acceptance value ranged from 50 to 80 with an average of 72.1 which affirmed that the PayPOS system was acceptable. However, the inventory staff felt that the inventory module was valued 50 or rather acceptable. This was due to the shifting from manual-based into computer-based inventory business processes.

Table 5. Question parameters for user acceptance testing.

No.	Subject questions	Owner value	Inventory Staff value	Average
1.	Was this PayPOS information system attractive?	80	75	77.5
2.	Were the menus and submenus in the management inventory module easy to understand?	60	50	55
3.	Were the product sub-modules inquired by technicians easy to understand?	65	70	67.5
4.	Was the submodule of product management easy to understand?	80	80	80
5.	Were the submodule ordering and product acceptance easy to understand?	70	70	70
6.	Were inventory management reports easy to understand?	80	80	80
7.	Was the inventory management module good?	80	80	80
	Total	**515**	**505**	**510**
	Average	**73.6**	**72.1**	**72.9**

4. Conclusion

In conclusion, the developed PayPOS system prototypes using the Lean UX method fostered a framework for further application system development. Collaboration between the development team intensified the understanding of the team regarding both its manifestation and functionally. The Lean UX method captured shortcomings in terms of design and interface flow and other features that may not be realized during application construction. Designing a PayPOS system prototype by taking into consideration the user experience aspects had been successfully carried out. The success rate for iteration one was 90% and the efficiency value was 72%. In the second iteration, we obtained a success rate of 100% and an efficiency value of 78%. The entire task of the PayPOS system was 26 tasks, with 24 successful and two of them completed outside the standard time limit. The overall success rate was 100% and the efficiency value was 92%. This value showed that the PayPOS system prototypes were easy to use and the business processes were in accordance with the motorbike workshop business processes.

Collaboration between the user experience, the inventory, and the transaction research team produced interconnected functional system requirements. To all intents and purposes, the development of inventory and transaction modules was successfully carried out. The development of the inventory module was integrated and supported the transaction module developed. Also, the developed system is equipped with product management which is needed by the technicians to support the order repair process in transaction modules. Intrinsically, the developed PayPOS system helped MSMEs motorbike workshop in carrying out business in a more specific, measurable, attainable, realistic, and timely (smart) manner. This way, MSMEs conducts business intelligently and professionally by taking advantage of the disruptive era so that the business improve and sustain. For the next study, we suggest the addition of a filter feature on the inventory report to provide information on which products are sold faster and the best time for reorder point.

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