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The Development of an Intraorganizational Merchant and Personal Shopper E-Commerce System (MPSAS)

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ABSTRACT

Personal shopper service currently is seen as a more convenient way to assist buying process. The personal shoppers are often employed by department stores and boutiques, although some are freelance or work exclusively online. For a merchant hiring personal shoppers, managing the transaction without a proper management system may cause the personal shoppers had difficulties in integrating the orders received from their customers. Additionally, communication problems often happened between the merchant and personal shoppers where the response time taken to interact with each other may took several hours thus affecting late response given to the customers. Response time is a critical factor in the service industry. The objectives of this research are; 1) To identify current business process and problems related to personal shopper agent service. 2) To design and develop an intraorganizational e-commerce website for personal shopper agent service. 3) To evaluate the functionality and usability of the developed e-Commerce website. This research has been initiated by preliminary analysis on the system requirement based on literature review and survey. Upon completing requirement gathering, the design phase took place to produce system and database conceptual design for the system. The e-Commerce system named as MPSAS was developed by using MySQL as the back-end database while the front-end was created using programming languages namely HTML, CSS and JavaScript. Lastly, system testing was conducted to test MPSAS functionality and usability. Based on the survey and usability testing, the results indicated that the system is capable to serves its designated functions. Three expert users and thirty potential users were involved in the usability testing. Based on the result, the highest mean gathered is for User Interface Construct which is 4.67 (SD=0.43). As all means are above 4 and standard deviation (SD) are less than 1, this shows that the usability of the system is good and user responses has only small dispersion. This paper provides insight on an application that can help a merchant-based company providing personal shopper services to manage transaction within the organization. Order management and communication between parties in the organization are enhanced by the newly computerized system.

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1. Introduction

Personal shopper service currently is seen as a more convenient way to assist buying process [1]. It is an intermediary service provided to facilitate buying and selling transaction between the merchant and its customers. The personal shoppers are often employed by department stores and boutiques, although some are freelance or work exclusively online. For a merchant hiring personal shoppers, managing the transaction without a proper management system may cause the personal shoppers had difficulties in integrating the orders received from their customers and communication problems often happened between the merchant and personal shoppers where the response time taken to interact with each other may took several hours thus affecting late response given to the customers. Response time is a critical factor in the service industry. It is a necessity to deliver customers the experience they want, fast [2].

The presence of personal shopper in Facebook and Instagram has help brick-and-mortar companies to stay ahead [2]. Personal shopper aids their customers who don't have enough time to shop and live miles away from the physical stores that only sells their product offline. Mostly, the personal shoppers are focusing on women clothing and scarf. The personal shopper will then help to shop on behalf of their customers for any products or items they requested for with the sans of their customers. A merchant-based company, named PS.AidaSabrina, operated in Shah Alam, Selangor was selected as a case study to implement an intraorganizational e-Commerce system. The company hires many personal shopper agents to reach customer in various places thus widen their customer base. Each of the agent will receive a monthly commission based on the sales they have made. The value proposition carries by the company includes the secured orders that can be placed by the agents for items that are not yet released, agent is offered with product in much cheaper price than any other retailers and the company also obtain a quantity assurance from the vendors through retail channel dominance.

Currently, the business process starts when the customer place orders to the personal shopper. This is made after they have viewed the latest items available posted on the Instagram or Facebook of the agent. Moreover, the social network belongs to the agent will be updated daily for new products available. After daily orders have been accumulated, the agent will send the orders collected to the merchant through social communication application, Whatsapp, before the orders is collected at the vendors. Only then, the items will be distributed to the agent either through self-pickups or delivery before it is sent to the customers. All the payment for the items requested must be made on the same day. However, all the items purchased is allowed to be returned according to the return policy.

In this tech-savvy world, e-Commerce Website is fundamental to reach more customers and expand company operations. The biggest game changer for e-Commerce has, of course, been the Internet. The growing numbers of online buyers has also increase over the years as people tend to enjoy a sit back and relax shopping experience. This has allowed many business opportunities especially for click-and-mortar companies.

2. Literature Review

2.1 Intra-business E-Commerce

There are various ways in categorizing e-commerce (EC) in a business. Each type of e-commerce has their own unique characteristic of functionalities [3]. Researchers in [4] highlighted other than the popular major types of e-commerce categories which are B2C and B2B, e-commerce also includes Intrabusiness e-commerce category which refers to EC transactions among various organizational departments and individuals in one company.

2.2 Personal Shopper Service

Recently, personal shopper service has become a trend among online shoppers in Malaysia. As consumers go online, geocentric shopping advantages based on distance and location become less important; subsequently, retailers may decide to lead or follow customers online, causing a further migration of sales and a decrease in individual store performance. However, the existence of the personal shopper services in the online industry has increase the amount of revenue for company who stays as brick-and-mortar stores.

In Malaysia, the primary attraction of such service is that it significantly cuts down on shopping time for busy customers who wish to utilize their time for other purposes and for those who

are stunted by distance. This can be seen as reintermediation process whereby the process of intermediaries (either new ones or those that had been disintermediated) take on new intermediary roles [3]. The adoption and use of websites by intermediaries can benefit an extended supply chain in terms of utilizing the intermediary websites in a marketplace [4].

Some of the characteristics that have been found in a study show the importance and variety of functions provided by intermediaries, including specialized information, professional advice, customization to consumer' needs, and reduction of uncertainty [5]. Personal shopper service can also be seen as the reintermediation process whereby it also includes the process stated by [5] that identified three characteristics performed in a reintermediation process which are (1) information brokering: passing information between customers and providers, (2) transaction processing: completing forms and forwarding payment to providers, and (3) customer advising.

In addition, the intermediaries have access to specialist knowledge and sources of information [6]. The personal shopper requires all information needed from a merchant regarding a brand or product information that makes them an agent. The presence of an agent is crucial to enable the merchant to reach a wider segment of customers [7]. Additionally, agent also helps to ensure the questions asked by customers related to the product will be answered in a timely manner and to help in shorten the time for product to reach market. Figure 1 shows the personal shopper supply chain.

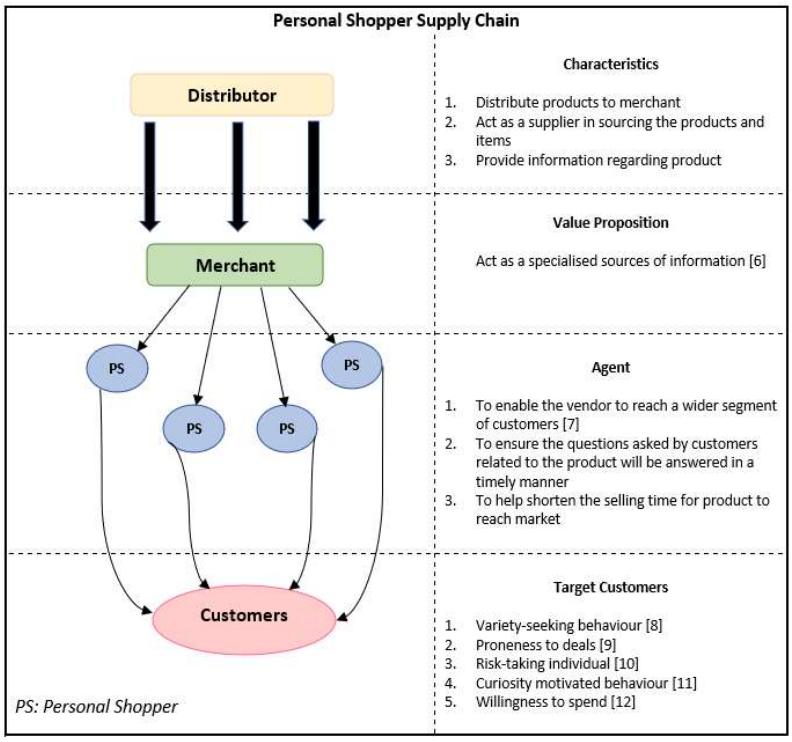


Figure 1. Personal Shopper Supply Chain

2.3 Market Segmentation

The target market for e-Commerce business must be captured in determining the likelihood of customers to buy and spend on specific products or services. Lifestyle refers to the ways how people live life, and spend their time and money as well as their interest, attitudes and personal values that is rather modernized and comprehensive [12]. The target market that uses the personal shopping service provided by the agent can be divided into three segments that consist of different buying behavior:

1. Shoppers who are busy that desiring to keep pace with the trends, yet not having the time to facilitate their needs.
2. Shoppers who choose to have the convenience of personal shopping service.
3. Those needing consultation in wanting to buy or finding an items for someone or on a special occasion.

2.4 E-Service

Servicing has become one of the mushrooming industries in the current economy that serves the customers according to what they want and how much they pay. From e-Commerce business aspect, e-Service is an interactive, content-centered and Internet-based customer service [14].

Website that implements the e-Service covers the information search services that consist of offering superior website personalization and product description, agreement services such as providing efficient ordering, fulfillment services in terms of furnishing reliable delivery, and after-sales services such as implementing a better return policy that involves in the online shopping process [15]. According to [16], e-Service should also cover all the transaction phase in order to provide an interactive information flow than just giving access to product information and order. In addition, online merchant who offers the e-Service should also include free trials for user to gain experience [17], and online reviews.

All the attributes of the e-Service will therefore enhance customers' valuation of product offerings, increase customer retailer relationships, and therefore ensures customer satisfaction and the product's perceived value [18]. In addition, e-Service can also amplify the perceived control from customers and thus improve customer's satisfaction [19].

3. Methodology

This section discusses the project methodology used in developing Merchant and Personal Shopper Agent System (MPSAS), which is the adapted Waterfall Model. The phases in the methodology were modified from the original model included in [20]. Each phase in the methodology includes different activities to be carried out during the development process. Table 1 summarizes methodology followed in completing MPSAS development.

Table 1. MPSAS Project Development Methodology

Phases	Activities	Outcome
SYSTEM PLANNING	• Conduct interview with merchant • Distribute online questionnaire to personal shopper agent • Identify the flow of the current business process • Identify the problem in current business process	• The flow of current business process is analysed • Description of the problem for MPSAS
SYSTEM DEVELOPMENT	**ANALYSIS**	
	• Conduct interview with the merchant and agent • Gather user requirement from both agent and merchant	• User Requirement of MPSAS • Process Flow Diagram for MPSAS
	DESIGN	
	• Design Context Diagram • Design Data Flow Diagram • Design Entity Relationship Diagram • Design Site Map • Design User Interface	• Context Diagram for MPSAS • Data Flow Diagram (DFD) for MPSAS • Entity Relationship Diagram (ERD) • Site Map for MPSAS • User Interface Design
	DEVELOPMENT	
	• Develop e-Commerce website for MPSAS	• A functional system of MPSAS
	TESTING AND EVALUATION	
	• Prepare test plan and questionnaire • Conduct testing session • Distribute questionnaire to the target users • Analyse result from the test	• Usability and Functionality Evaluation Result
SYSTEM DOCUMENTATION	• Compiling and refining a complete report	• A complete project report

3.1 System Planning

In the system planning phase, the objectives are to gain related information and identify the problems in handling current business process at the selected company. Interview and survey are used as methods for information gathering and problem understanding. At the time the information gathering is done, there are 22 personal shoppers were hired by the merchant and all of them were involved in the survey. Figures 2 and 3 illustrate two findings related to communication difficulties faced by the merchant with the agents and problems faced by the agents in integrating orders received from the customers daily.

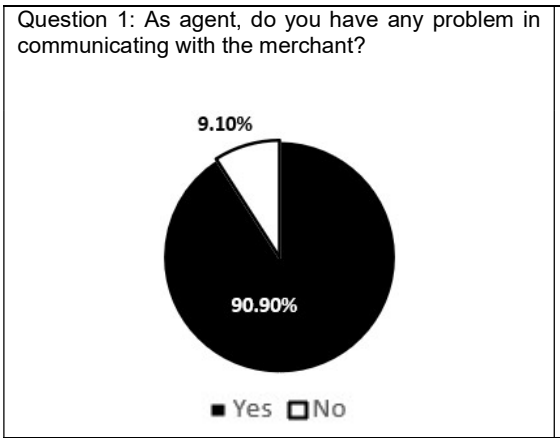


Figure 2. Communication Problems between Agent and Merchant

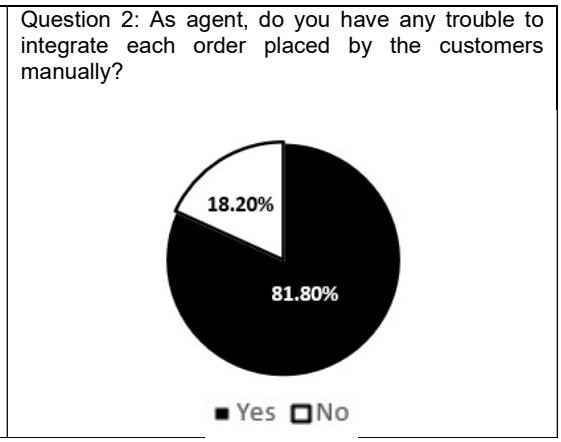


Figure 3. Agent Facing Difficulties in Filing Order Form

Furthermore, the respondents were also asked a question regarding the time taken to respond when a question is asked between the merchant and agent. 68.2% respondents answered they took several hours to respond to each other for both agent and merchant, while 13.6% respondents answered within 1 hour and from 5 minutes to 15 minutes. This is an indicator showing that the communication takes up to several hours before the orders could be finalized. This has shown a lack of efficiency and timeliness in communication. All respondents (100%) agreed to the question “Would the existence of e-Commerce website will help you to easily check the availability of current in-stores product at the physical stores?”.

3.2 System Development

Merchant and Personal Shopper Agent System (MPSAS) is developed to allow the agent to view an e-Catalogue with product information, facilitate the communication between agent and the merchant and also to help integrate orders from each agent to merchant. The first step in the system development phase is analysis. the functional and non-functional requirements and user requirements are gathered via interview session. The analysis activities involve comparing the similar characteristics of the existing system, identifying a suitable system development model, and researching suitable theory for the proposed system. Next is the design process. In this process, Context Diagram, Data Flow Diagram, Entity Relationship Diagram, Site Map, and User Interface Design have been constructed. This process aims to provide a clear perspective on how the proposed system will operate at the end of the project.

The development process takes place when all the design are completed. In this process, the code is produced, and the focus for the developer is to produce a well-functioning system based on the collected requirements and the chosen theory. Figure 4 to Figure 7 depict four sample features of the theory that had been implemented on MPSAS.

Lastly, is testing and evaluation activity which involves testing the functionality and usability of the system. The functionality testing was done by the developer and usability testing were conducted by the expert users and the merchant/personal shoppers of the company. The results are presented in section 4 of this paper.

Figure 4. Customized Website Information [21] [22]

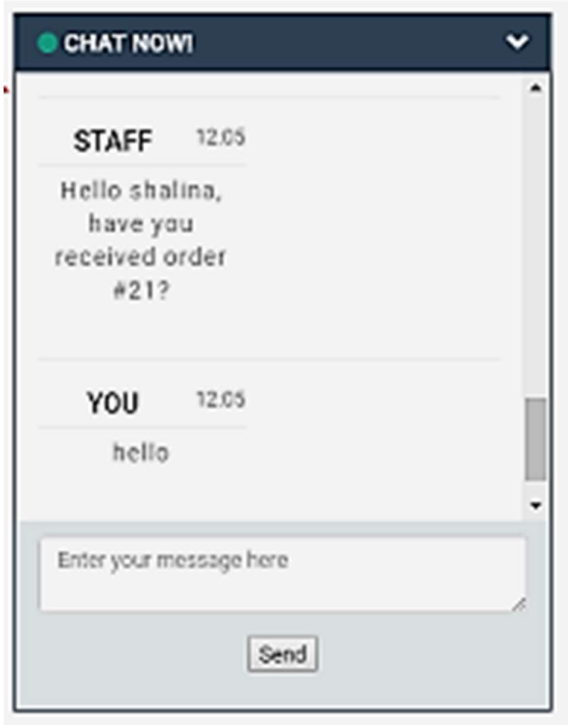


Figure 5. Chat box [23

Figure 6. Bid-and-secure process [24]

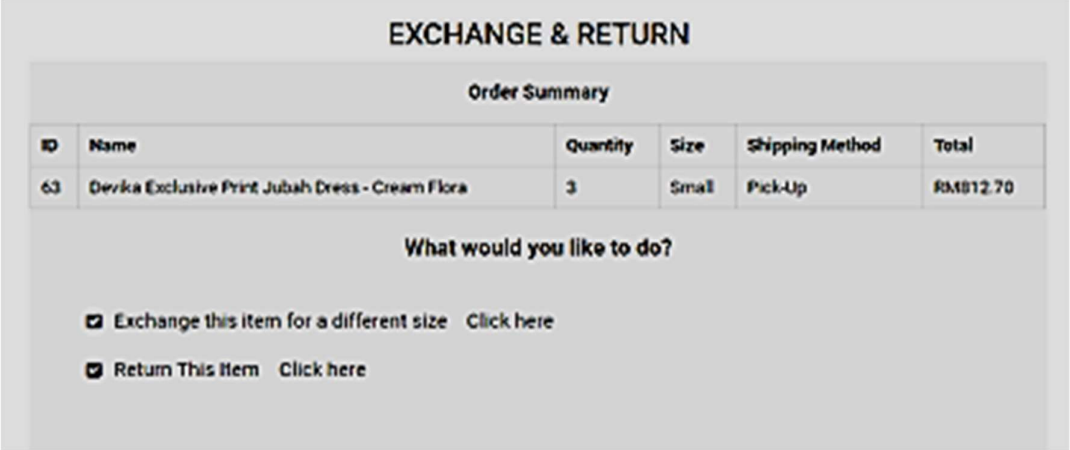


Figure 7. Exchange and return [25]

3.3 System Documentation

The last phase is where all the information in the system is combined into one report after the project is completed. System documentation provides the flow of the project and serves as a reference to the user about the MPSAS project. Therefore, the documentation needs to be created for an explicit purpose and can be understood by future users.

4. Results and Discussion

4.1 Merchant and Personal Shopper Agent System (MPSAS)

MPSAS has successfully been developed by implementing e-service features needed. It provides functionalities to support the task of the personal shopper agents and merchant. The

information that is essential for the agent such as My Rewards, My Bid, My Orders, Exchange and Return and Payment History are summarized at the sidebar of agent dashboard. E-Service as mentioned by [22] stated that one of the characteristics that need to be integrated in a service-provider website is customized website information for the user. Figure 8 shows My Rewards page for the agent to get information for the commission received at any given time.

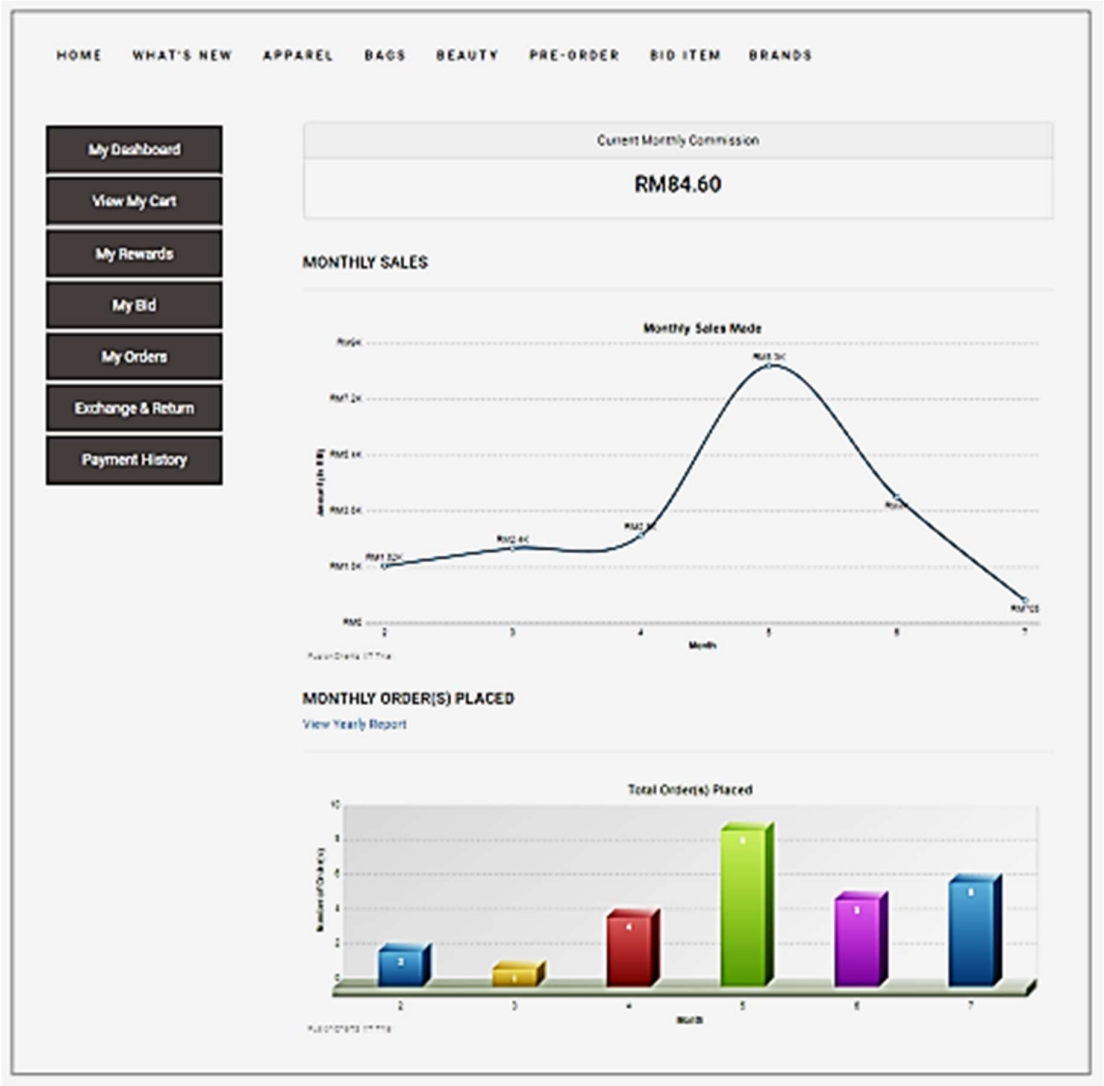


Figure 8. My Rewards Page in MPSAS

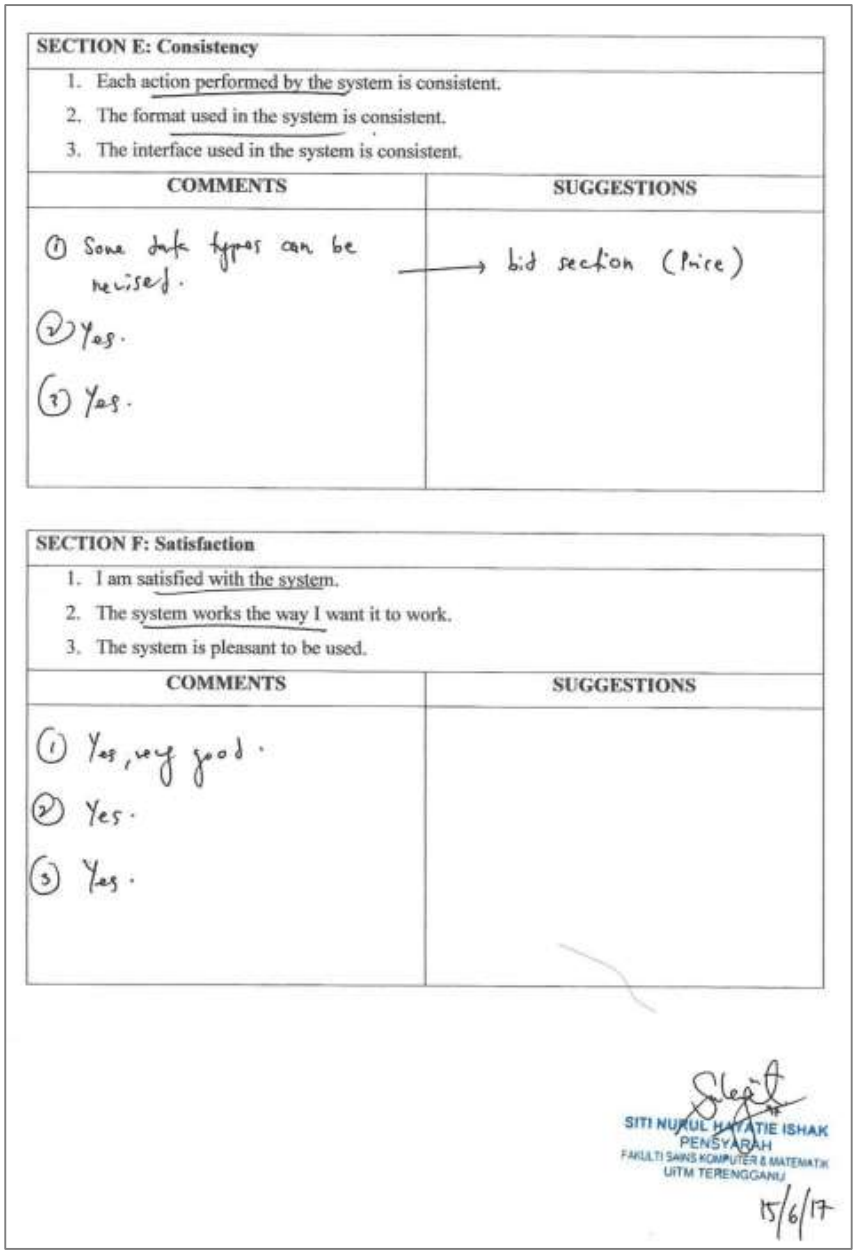
Other than agents as the user, MPSAS has also successfully incorporate specific dedicated functions to help manager and staff to perform their tasks. Table 2 summarizes systems' functionalities for each user.

Table 2. System Functionalities Based on User

Agent	Staff	Manager
• Search product • View product • Bid product • Order product • Chat with staff • Checkout • Make payment	• View product • Add product • Edit product • View orders • Update order • Chat with agent • Delete product	• View personal • shopper details • View staff details • Update user status • View report

4.2 Evaluation Results

An evaluation process has been conducted to verify the system's functionality and usability. Functionality test is conducted by the developer and a tester. Test plan was used as an instrument to collect findings. The test plan contains list of functionalities available for the agents, manager, and staff in the system. Upon completion of the testing, the developer has made a conclusion that the system is well functioned and is ready to be tested by the users. The users can be classified into two distinct groups which are experts and other users. Expert users are the ones who have achieved certain milestones within their academic achievement, industrial exposure, and specific knowledge in the related fields. Users on the other hand, are randomly selected from the agents, merchant as well as other potential users. There are three (3) expert users and thirty (30) users involved during the evaluation process of MPSAS. The feedback sample from the expert is depicted in Figure 9.



SECTION E: Consistency

1. Each action performed by the system is consistent.
2. The format used in the system is consistent.
3. The interface used in the system is consistent.

COMMENTS	SUGGESTIONS
(1) Some data types can be revised.	→ bid section (Price)
(2) Yes.	
(3) Yes.	

SECTION F: Satisfaction

1. I am satisfied with the system.
2. The system works the way I want it to work.
3. The system is pleasant to be used.

COMMENTS	SUGGESTIONS
(1) Yes, very good.	
(2) Yes.	
(3) Yes.	

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Figure 9. Expert Feedback Sample

The experts have evaluated the system according to six constructs which are User Interface, Navigation, Learnability, Usefulness, Consistency and Satisfaction. Outcomes from the expert user evaluation are in the form of comments and suggestions. Overall, the experts agreed that the system's user interface, related to the usage of color, image(s), characters, font, and the position of the messages for the system is well implemented. Next is the navigation where it emphasizes on the sequence of performing each task and how it should be performed along with the button and links provided to help navigating the system. The experts agreed that the sequence of tasks is acceptable and easy to navigate. However, since there are many components in the system, the experts suggested the developer to have a better flow for demonstration purposes. In addition, the experts were also asked regarding the learnability construct where it focuses on the feature of the system, performing tasks in a straightforward manner and how quick the system can be adapted as user. The feedbacks received by each expert were good and they were satisfied with the learnability of the system. In addition, the experts have also agreed that MPSAS is useful to the system users in terms of task accomplishment and increase job productivity. In terms of consistency in action performed and the format used, the experts have suggested minimal format changes which is to use currency symbol (RM) in the bid column section and to add commission amount in each transaction report. Lastly, the expert users are also satisfied with how the system works and the user requirements fulfillment.

The next evaluation activity includes user evaluation. It is one of the methods to collect data regarding the usability of the system. The evaluation was done based on similar construct assessed in the expert user evaluation. The data are presented in the graph format which summarizes the data in six distinctive constructs. The results from the users' evaluation are depicted in Figure 10 respectively.

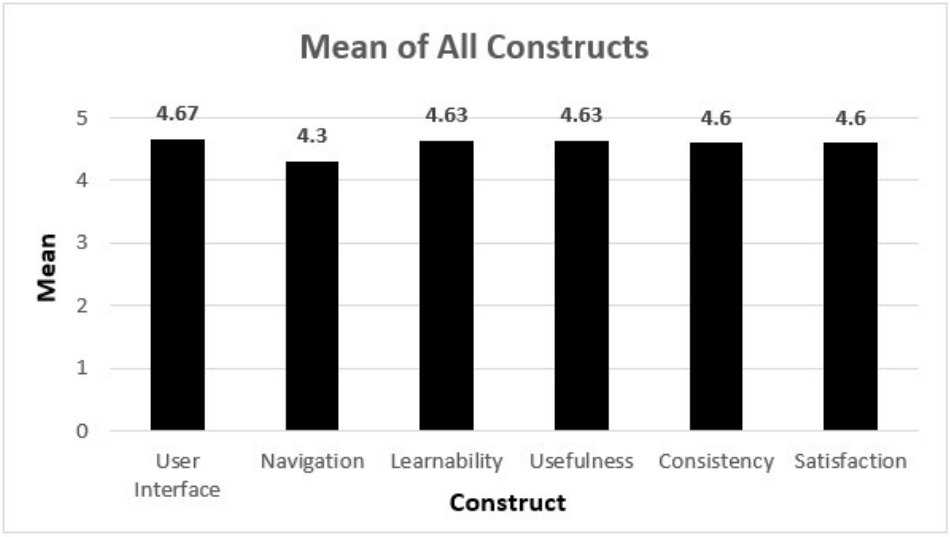

Figure 10. Mean Summary from the User Evaluation

Figure 10 shows that all the six constructs received positive usability acceptances based on the users' feedback or evaluation. The navigation of the system can be improved for in the future improvement of the system.

5. Conclusion

MPSAS, an intraorganizational merchant and personal shopper e-commerce system is still in its early stage. The reason for the development is to provide a structured platform to communicate and embark on business transactions for the merchant providing personal shopper service. The problems faced in current business process involving disintegrated communication and ordering features are the driving force to the development of the system. The system development has adapted the front-end and back-end components from various reviews on similar existing websites.

The evaluation results have provided positive indicator to enhance the system in the future. Currently the modules are to be used by the merchant and the personal shopper agents. The limitation of the current system is it focuses on the functionality for two categories of users which are the merchant and the personal shopper agents. In the future, it is suggested that the customer may perform specific functions to accomplish certain related tasks.

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Conflict of Interest
The authors declare no conflict of interest in the subject matter or materials discussed in this manuscript.

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