COURIER TRACKING MANAGEMENT SYSTEM WITH NOTIFICATION USING BARCODE SCANNER

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ABSTRACT

Kolej Universiti Poly-Tech MARA (KUPTM) highly requires a Courier Tracking Management System in managing the ingoing and outgoing of parcels easily. However, in reality, the efficiency of obtaining the tracking and managing data is a very challenging task. The aim of this study is to develop an efficient and economical system called the Courier Tracking Management System. This system is developed using the Adobe Dreamweaver based PHP programming and Javascript. The proposed system was initially tested by users using the Unit Testing technique. The proposed system was found to be successful in increasing the efficiency of tracking and managing parcels in KUPTM with the success rate of 85 percent.

1.0 Introduction

The study deals with courier tracking management system. Courier Tracking Management System is a web-based system that manages the ingoing and outgoing parcels in Kolej Universiti Poly-Tech MARA (KUPTM). The current practice of parcel managing and tracking was carried out manually which resulted in the increase of workload and time waste among the administration staff as the parcels had to be delivered to respective departments. Furthermore, recipients of the parcel which are commonly among KUPTM staff and students also faced difficulties in tracking their parcel as they had to repeated check on the arrival of the packages at the administration office. Thus, it is believed that KUPTM highly requires a Courier Tracking Management System to manage ingoing and outgoing parcel effectively and efficiently.

The aim of this study is to develop a Courier Tracking Management System for KUPTM to assist the management of parcel among staff and administrators. In this study, the tracking process is automated and the parcel update collecting status will be provided. Moreover, the system will provide Short Message Service (SMS) notification which will notify the users on the arrival of parcel time without any delay.

The development of users' application uses Spiral Methodology and the programming language used is PHP programming while XAMPP, Apache, MyPHP is used as a server backend and Adobe Dream Weaver serves as IDEs at the development stage. The system is a web-based system that allows the user to access using their portable device. The system is found to be successful in improving the efficiency of tracking parcel in KUPTM with the success rate of 85 percent.

2.0 Research Problem

Ever since the online business has become one of the top options in business transactions, the number of online shoppers are also increases yearly (Hajli, Shanmugam, Papagiannidis, Zahay, & Richard, 2017; Shuen, 2018). Indirectly, the courier services sector has simultaneously expended significantly. Courier companies have become a major necessity for companies that requires courier services on a regular basis to deliver parcels from different places (Le & Ukkusuri, 2018; Rai, Verlinde, & Macharis, 2018; Rajendran, Wahab, Ling, & Yun, 2018). Most staff and students of KUPTM are also uses courier services to deliver their online purchased goods or items and have them delivered to KUPTM due to the fact that most of them spend more time at the establishment rather than at home in which, it makes the transitions or process easier for both parties, i.e; the courier company and the receiver.

The administration department of KUPTM is responsible in receiving letters and parcels addressed to KUPTM's staff and students. However, it is not the administration department's personnel who are responsible to manage personal parcel as they are only required to handle formal letters and parcels. Most of them feel oblige to receive and handle the parcels for other staff as well. Thus, their workload has somehow increased drastically as they require more time in handling and managing the parcel, in which, at times the items are takes most of their workspace and disrupts their movements.

Many complaints were made by the receiver as most of them did not get any updates from the administration department regarding their parcel's arrival status. The only way for them to find out about the delivered parcel is by regularly checking the status at the administration office; which some finds it inefficient and cumbersome. Meanwhile, for students, the Student's Council will make an announcement through social media platform such as Twitter to update on the arrival of their parcel. However, this is not proven to be efficient as not all students are active on social media platforms and they might not have a Twitter account. Moreover, administration staff also expresses their concerns and discomfort in having to manage staffs' and students' personal parcels as at times, these recipients do not collect their packages or parcel at all which resulted in having the administration office full of uncollected parcels from staff and students.

3.0 Related Works

Reviewing existing courier tracking process and workflow is fundamental in order to meet the research objectives. Various technologies have been developed and emerged recently, to provide an automatic approach to track, monitor and manage courier services (Atletiko, 2017; Iwan, Kijewska, & Lemke, 2016). Reviewing related work shows the advantages and disadvantages of existing systems. The related works selected were Track and Trace PosLaju System, City-Link Express System and FedEx Tracking System. Those are all related to the proposed system which is to track and manage the parcel.

Track and Trace PosLaju

Based on Figure 1, PosLaju is the most well-known website that actually focuses on the tracking parcel and provides details about the cost of postage fees (Yussoff, 2014). Users can search the parcel, postcode, calculate postage fees and also find the outlets of PosLaju Malaysia. The website has provided some guidelines for the users to use but somehow the interface looks very simple. As for the functions, everything is functioning well but it does not provide any update features that might attract the user to surf the website. Besides that, for the properties on the website is it too direct and not too much information.
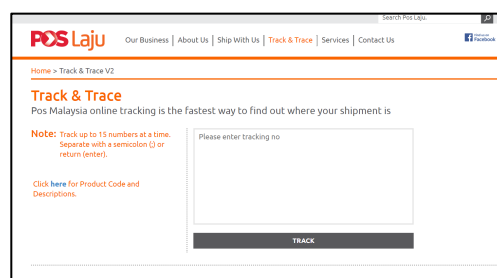
**Figure 1.** Track and Trace PosLaju Website

City-Link Express

Figure 2 as shown below, City-Link is also known as a website to track user's parcel. There are various functions that are well functioning while the features that are included in the website might be helpful for the page users (Takerngsaksiri, Wakamiya, & Aramaki, 2019). The application provides user's sign in which is the users can have their own account in the City-Link website. In this website, there various information that the users can obtain and at the same time, their website does not only focus on the track, but the users can also access the company's detail, services and products. At the tracking space, they also provide the instruction to key in the number tracking so it is good for user to track their parcel without much difficulties and hassle.

Figure 2. City-Link Express Website

FedEx Tracking

Based on Figure 3, the FedEx website does not only focus on the tracking parcel but also provides lot of information that user can search such as shipping, tracking, services and also location (Bhardwaj & Momaya, 2006). FedEx also provides a database that user can have their own account. The system interface is user-friendly and easy to understand. It also uses good graphics in term of the picture and also combination color used is well-suited. FedEx also provides the instruction on how to key in the tracking number and it can also track the other way round such as by using track reference, TCN and by giving proof of delivery. It is useful because they have a backup if the users do not remember their tracking number.
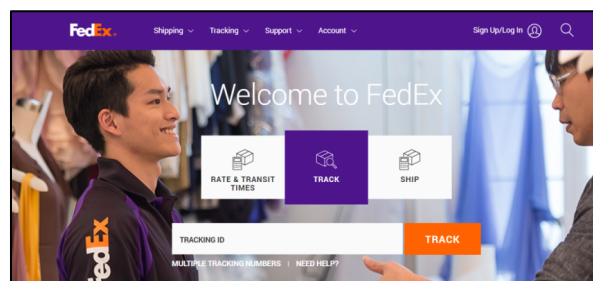
Figure 3. FedEx Tracking

4.0 Methodology

The system is developed using Spiral Model. The spiral model (Figure 4) has four phases, which is identifying, development, evolution and risk analysis. A software project repeatedly passes through these phases. The baseline spiral, starting in the planning phase, requirements is gathered and risk is assessed. Each subsequent spiral builds on the baseline spiral. The benefit of the spiral model is high amount of risk analysis hence, avoidance of risk is enhanced. It is also good for large and mission-critical projects. The spiral model also are approval and documentation control. The last benefits are software is produced early in the software life cycle and the additional functionality can be added later.
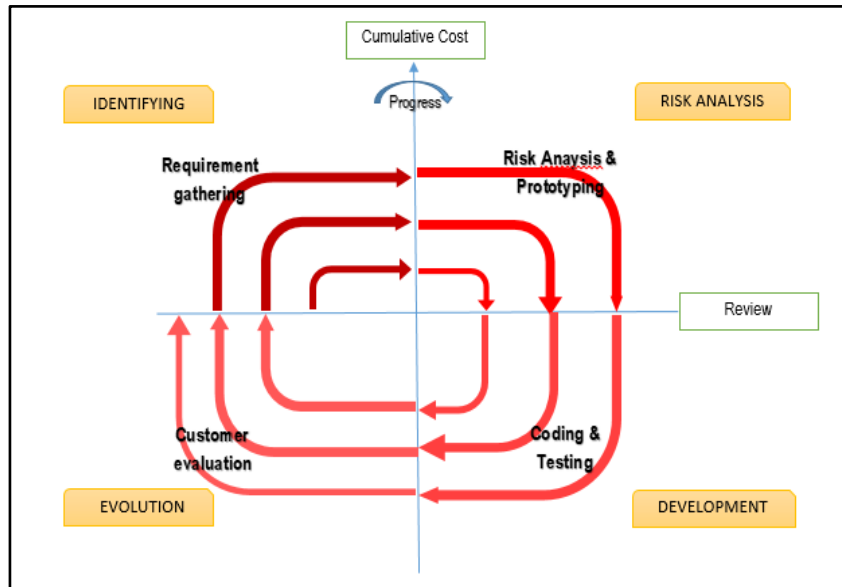
Figure 4. Spiral Model

       The programming language used for the implementation includes PHP programming was employed for the development of the users' application. XAMPP, Apache, MyPHP used as a server backend and Adobe Dream Weaver served as IDEs at the development stage.

5.0 The Proposed System

The proposed system eliminates all manual works by providing useful functionalities that were not exist in the current practice. The scope of this project is to facilitate users in managing and tracing parcel arrived at KUPTM. Figure 5 shows the flow chart of the proposed system. The proposed system focuses on tracking parcel using barcode scanner that provides SMS notification as acknowledgement of arrival. Admin will add barcode number and phone number to the system for new arrival parcel. Then, the system will automatically send SMS notification to parcel's receiver. For first time users, they need to register by using link provided in the SMS notification. QR Code will be sent via email for parcel collection.
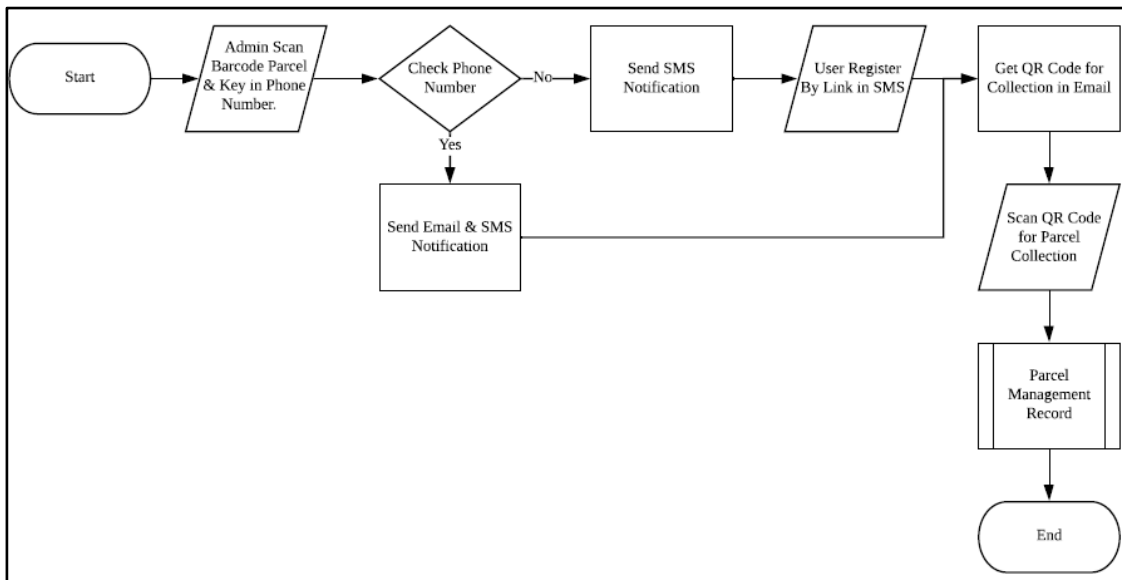

Figure 5. Flow Chart Diagram

Figure 6 shows user's main page. The main features for the main page are the user can track and trace their parcel. What they need to do is use barcode scanner to read tracking number or enter manually the tracking number into the text box and clicks the submit button. User can go to other pages by clicking on Location & Contact or FAQ button.
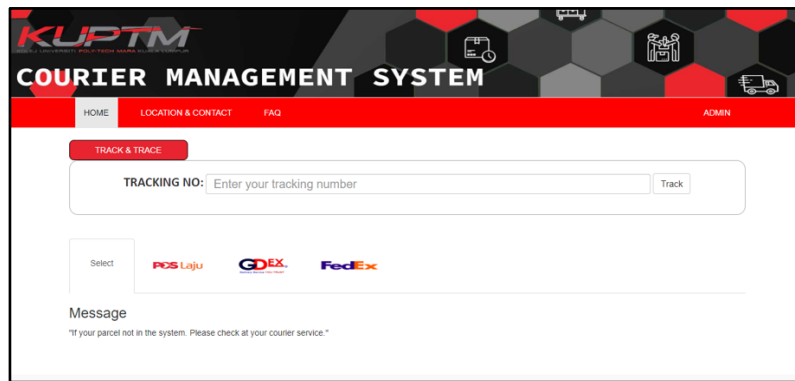
Figure 6. Main Page

The security administration page has authentication password and username to login into the system. This to ensure only authorized person can access and control the system. Administration main page provides searching engine for administrators to trace the parcel with a tracking number. Figure 7 shows the Main Page for system Admin.
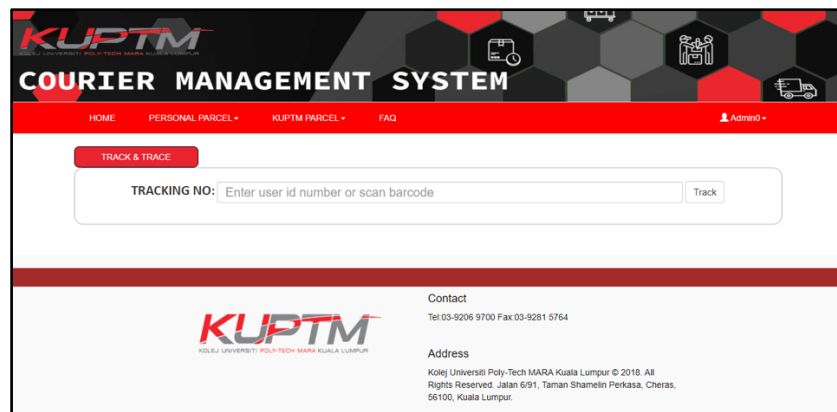

Figure 7. Admin Main Page

The System Administrator can insert new received parcel using barcode scanner in Add New Parcel Page as shown in Figure 8. System Administrator needs to key in all data provided in the form. System will automatically send notification through SMS to the phone number entered.
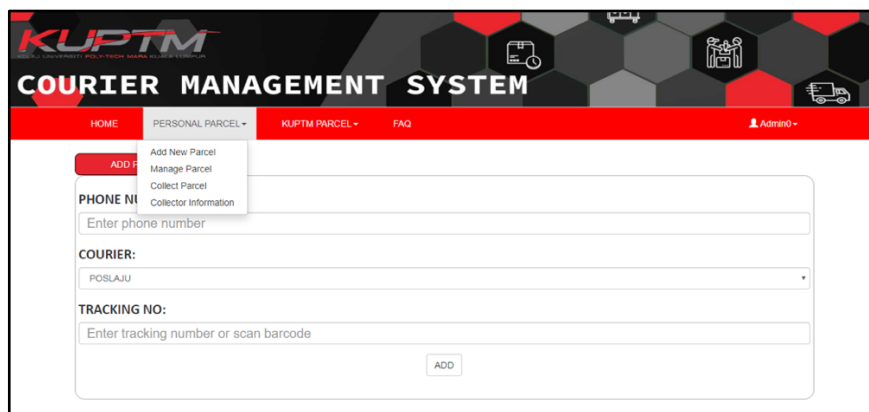

Figure 8. Add New Parcel Page

While for Manage Parcel's Page provides search and filter mechanism that is able to list data according to the status. System Admin is able to update or delete the information by clicking the action at the right of the table as shown in Figure 9.

Figure 9. Manage Parcel Page

6.0 Conclusion and Recommendation

KUPTM Courier Tracking Management System is already developed as an official system that can benefit students, academic and non-academic staff by facilitating the business process. We believe the administration staff can manage their work easily without wasting their time to get their parcel. Besides that, this study also managed to establish every single phase of the system efficiently within the time given. However, several improvements can be done for further development as follow:

i.   *Integrate with existing system.*

        KUPTM Courier Tracking Management System can be integrated with existing Campus Management System (CMS) in providing existing database of students and staffs.

ii.   *Provide verified notification or security.*

        Provide a secured pin number can ensure only the right recipient will collect the parcel. System will automatically generate pin number and parcel recipient will received the pin number through SMS.

iii.   *Upgrade to mobile application.*

        Mobile application will be more efficient since the emergence of mobile application technology has become a bridge to communication and expand profit in more business industries.

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