Research Paper

A Study on The Need to Implement a Courier Service Application on Android Smartphones

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Abstract

Efficient logistics System is one of the leading factors associated with boosting trades in countries with thriving economies. Malaysia one of the leading economies in Southeast Asia with a very active manufacturing sector largely has logistic systems at the core of its economic activities. Distribution networks like courier services enable goods and services to be sent from the provider to the final consumer. Recent research shows that the public have expressed average satisfaction with the current system and there is an obvious need to improve upon current method of distributing goods and services via courier services. This research paper studies the possibilities of implementing a system on Android Based Smartphones to ease and make access to courier services more convenient and efficient. The researchers designed questionnaire using Likert Scale Systems and distributed them to Courier Service Users. Analysis of respondents’ feedbacks shows the obvious need for the implementation of courier service mobile application based on Android Operating System platform.

Keyword: Courier service, Android, TAM, mobile app, GPS

1. Introduction

Malaysia currently has a population of approximately 30.4 million people (Furman et al, 2016) and as expected there is constant movement of people and goods from one location to another amidst its evolving population, where some of the reasons are job posting, personal reasons or as a result unforeseen circumstances (Ariff and Davies, 2009). Moving from one apartment or house to the other can be quite stressful process especially if the individual(s) does not have the resources (vehicle) to carry out such action. This difficulty also occurs when sending a parcel or goods to a particular location instigating that the individual need to perform this action themselves. This is where door to door carriage services can be of invaluable help (Agu et al, 2015).

Courier or carriage services can be defined as an outsourcing medium whereby duty or function of transporting goods of a client from one geolocation to another is handled by a contracted
company (Izzah et al, 2016; Noordin et al, 2012). In the past courier, services were limited only to delivery of physical communication documents such as package and mail delivery (Gunert and Sebastian, 2000). The courier industry has however evolved into delivery of both document packages and heavy goods for their customers (Noordin et al, 2012).

<table>
<thead>
<tr>
<th>Courier Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi modal courier services</td>
<td>Services consisting of pick-up, transport and delivery services, whether for domestic or foreign destinations of letters, parcels and packages, rendered by courier and using one or more modes of transport, other than by the national postal administration. These services can be provided by using either self-owned or public transport media.</td>
</tr>
<tr>
<td>Other courier services</td>
<td>Other courier services for goods, not elsewhere classified, e.g., trucking or transfer services without storage, for freight.</td>
</tr>
</tbody>
</table>


Table 1: Courier Services

The aim of this research paper is to analyse and the need for the deployment of Courier service system on the android mobile platform.

Research Question:

The main research questions which this paper aims to address is:

i. Is there a need for implementing a courier Service Mobile Application?

ii. Would users accept a centralized platform that could enable them to have access to courier services?

iii. Would users prefer the platform to be implemented on Smartphones with Android based Operating Systems?

2. Literature Review

2.1 Population demand for courier services

Malaysia is currently the country with the third largest economy in Southeast Asia with rapid growth on influx of immigrants into its domain (Department of Statics Malaysia, 2013). According to Department of Statistics Malaysia, it was predicted there will be an increase in population by 1344 people per day with an averaging of -33 emigrants per day in the year 2016(Source: Trading Economics 2015).

Recent findings show that urbanization and industrialization has led to a higher increase in population in urban areas thereby bringing about a transition from traditional society to modern society (Ariff and Davies, 2009). As result of this activities it now happens that cities and towns have more populations than rural areas (McGregor, 2014).

As at 2009 it was recorded that about 100 million transactions occurred in post offices nationwide and presently courier services continue to deliver more than 3 million items per day to not less than 6.3 million addresses in rural and urban areas in the Malaysia (Yatiim, 2010). The upsurge in population growth has left a huge burden on courier service companies whereby giving them a hard time satisfying their customers. The industry faces challenges as a result of globalization (Noordin et al, 2012).

Though innovations and strategies have been derived to improve customer satisfaction but loopholes still exist because the development of new service failure rate is high resulting from only little focus been placed on customer responsiveness in relation to operational and organizational performance (Noordin et al, 2012). Yatiim (2010, p.4) articulated the importance
of courier service quantifying it to be “essential to the efficient functioning of the economy and society as a whole” therefore, it is necessary to improve service delivery in order to gain competitive advantage and failure to do so will lead to nothing but competitive disadvantage (Yee, 2011).

2.2 Smartphone device and its usage in Malaysia:

The term ‘Smartphone’ has become a popular trend in the mobile phone market. It is even regarded as a ubiquitous device (Ballagas et al, 2006) because of its ability to carry out complex functions similar to that of a PC (Caroll and Heiser, 2010; Kibona, 2010). Smartphone capability surpasses that of feature phones by a large margin (Ni et al, 2009) where some of its significant capabilities include supporting large spectrum of applications, powerful processors, powerful operating systems, multiple network interfaces and lots more (Xia 2015 et al; Ni et al, 2009). The most important benefit of the smartphone as a handheld computing device is its ability to run a complete operating system giving its users leverage to develop applications suited for specific needs (Jeon, 2010). Smartphones usage has been found to surpass ordinary phones in the mobile phone market (Jung, 2013).

Bakon and Hassan (2013) discussed customers perceived value of Smartphone and its impact on deviant behaviours among higher education students in Malaysia.

![Figure 1: Smartphone sales chart (Source: Statista Research and Analysis, 2016)](image)

The statistical data as depicted by the source shows range of smartphone sales from year 2007 to 2015 reaching a staggering amount of over 1.4 billion units. Also, according to predictive analysis during this survey, it was forecasted that there will be a 34 percent increase upon the current sales.

Though statistics on smartphone market in Malaysia is barely available. However, the existing indicates that not less than 85% of Malaysians own a smartphone (Osman et al, 2012). Smartphones are topping the charts of must haves in 2014 (Ching et al, 2015). As the population in Malaysia is on a continuous rise so is the demand for smartphone technology on a high rise (Lay-Yee, 2013).
The most popular smartphone operating systems by retail volume in Malaysia include Android (53%), iOS (23%), Windows (10%), and Blackberry (8%) (Lay-Yee, 2013). Android is currently the most popular operating system in the world with billions of people having android smartphone devices (Gargenta and Nakamura 2011) implying that applications that support android platform will reach majority of the masses.

Smartphones have become a very imperative communication tool but its excessive usage had led much dependency on the device thereby causing somewhat of an addiction to its users (Emad and Haddad, 2015).

2.3 The Proposed System:

The proposed system is to be developed to combat the limitations in customer responsiveness by making accessibility to courier and logistics services easy, instantaneous and dynamic. The system will also provide to its users an unlimited scope when it comes to package delivery, they will be able to send packages without stepping out of their house where door to door delivery of this service takes place in real-time regardless of the distance and how little or big an item is, the system is sure to meet the needs of its users in such horizon.

The system will be designed to handle customer orders for courier companies that support android OS. The design scope will comprise the following:

- Mobile application for customers (client application)
- Mobile application for courier services organizations
- A database server

The system would allow customers (companies included) to make instant delivery orders to courier companies allowing customers to choose pick-up and drop off location for the goods. Drivers of the courier companies are able to receive customers request and have the option to accept or reject requests. If a customer’s request is accepted, he/she will be provided GPS tracking of the whole delivery process until goods are safely delivered.

The server on the other hand is basically meant to handle and store transactions between the other two entities connecting customers to closest courier dispatchers.

Figure below shows a visual overview of the unabridged system framework:

![Figure 2: An Illustration of the Proposed System](image)

The table below demonstrates the comparison between existing and system, briefly highlighting their similarities and differences.
<table>
<thead>
<tr>
<th>S/N</th>
<th>Criteria</th>
<th>(Conventional method)</th>
<th>(Website)</th>
<th>Proposed System</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>General Overview</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>1. Accessibility</strong></td>
<td>There is no standardized way of getting this service and the process is not convenient</td>
<td>Accessing this service is more convenient than the but the is that the user needs to know and remember the website URL each time</td>
<td>This system will be available on popular platform for mobile phone users. The user need only install-once-use-always</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The conventional method can be very inefficient as carriage drivers or representative mostly need to come and take a survey of goods to be conveyed before negotiation</td>
<td>Less time consuming but the user needs to install a browser and know the URL of the website</td>
<td>Also, less time consuming but in this case the user needs to only have the application</td>
</tr>
<tr>
<td></td>
<td><strong>2. Time management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>There is no guarantee for the security of one’s property or goods except a thorough research has been done on the company. And it is not safe for the customer does not have genuine evidence of the deal</td>
<td>This system is more secure than the Conventional method but then again there might be fake websites which pretend to be offering such service.</td>
<td>This system is very secure as the user will have access to evidence of deal and the customer will only be connected to genuine companies.</td>
</tr>
<tr>
<td></td>
<td><strong>3. Security</strong></td>
<td>In most cases customers are not fully aware of the terms and conditions of the company and this might lead to disagreements</td>
<td>Terms and conditions are clearly stated</td>
<td>Terms and condition are clearly stated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>there are no services offered in real time as customers are expected to request for service ahead supposed date</td>
<td>Users will be request for services on the go. There will be an instant response to all customer request</td>
<td>Users will be request for services on the go. There will be an instant response to all customer request</td>
</tr>
<tr>
<td></td>
<td><strong>4. Terms and Conditions</strong></td>
<td>Only deals in moving of properties for Home owners or tenants</td>
<td>Only deals in moving of properties for Home owners or tenants and companies</td>
<td>Comprises service delivery form light packages to heavy goods for both companies and home owners</td>
</tr>
<tr>
<td></td>
<td><strong>5. Real Time Services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only deals in moving of properties for Home owners or tenants</td>
<td>Only deals in moving of properties for Home owners or tenants and companies</td>
<td>Comprises service delivery form light packages to heavy goods for both companies and home owners</td>
</tr>
<tr>
<td></td>
<td><strong>6. Scope</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only deals in moving of properties for Home owners or tenants</td>
<td>Only deals in moving of properties for Home owners or tenants and companies</td>
<td>Comprises service delivery form light packages to heavy goods for both companies and home owners</td>
</tr>
</tbody>
</table>

**Features**

1. GPS Tracking of Goods: **NO**
2. Credit Card Payment: **NO**
3. Personnel Service rating: **NO**
4. Instant cost estimation for any chosen service package: **NO**
5. Delivery status notification: **YES**

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Table 2: Existing System Comparison

<table>
<thead>
<tr>
<th>S/N</th>
<th>Criteria</th>
<th>FastFast</th>
<th>LaLamove</th>
<th>Proposed System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>GPS Tracking of Goods</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>2.</td>
<td>Credit Card Payment</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>3.</td>
<td>Personnel Service rating</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>4.</td>
<td>Instant cost estimation for any chosen service package</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>5.</td>
<td>Delivery status notification</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>6.</td>
<td>Customer Signature verification</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>7.</td>
<td>Free call or message driver option</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

Table 3: Similar System Comparison

3. **Research Methodology and Design**

It is simply the procedure of arriving at reliable elucidation to a problematic situation through the strategic organized collection, investigation and clarification of data, thus making research the process of seeking for the solution only of those problems of which the answers can be given on the basis of accessible facilities (Singh, 2006). Research is important as it can bring about new concepts to current understanding and only through research can there be possibility of making evolution in a field (Rajasekar et al, 2006; Singh, 2006).

In this research paper the chosen type of research methodology used to gather information to be used for analysis is known as Quantitative Research. Creswell (2014) extensively discussed about Quantitative Research describing it as a methodology for analysing objective philosophies by investigating the rapport among variables where these variables can be critically studied so that an unorganised data can be analysed using statistical techniques which can be further used to derive findings.
Choosing quantitative research as the research methodology of this study will aid the statistical evaluation in further chapters to derive findings which are in contrast to subject matter of this research.

### 3.1 Research Design:

A research can generally be Basic (fundamental) or Applied research (Kothari, 2004) but based on methodology or approach a research is said to be of a qualitative or a quantitative type (Mackey and Gass 2016). Based upon the context of the subject matter in this research paper, this chapter is to be focused on the type of research based on the methodology. The research design therefore is based upon survey context which is a descriptive type of research design.

**Method and Framework of Data Collection:**

Based on the scope and concept of this research, primary data is used for analytical purposes. Primary data is all about collecting first-hand data that is required for the information in the research study regardless of the approach taken when gathering information (Kumar, 2014).

Questionnaires which is one of the major methods of data collection method in quantitative research (Kothari, 2004) is used as the method of data collection for this research, where data to be collected for analytical purposes is used to suffice the development of the proposed system.

Convenient sampling method was used to collect data from 102 respondents. The minimum age for the target respondents is 18 years.

The questionnaire comprises 5-point Likert statements, requiring no confidential details of respondents thereby making it easy for the respondents to participate in the survey. The Scope of questionnaire comprises demographic questions pertinent to the research but most importantly the questionnaire was designed based on the Technology Acceptance Model (TAM) framework that will help analyse the acceptance rate of the proposed system.

TAM is a popular theory and most widely used context in the expanse of information system for measuring technology acceptance (Al-Busaidi and Al-Shihi, 2010; Ma and Liu, 2004). The image shows the visual representation of TAM.

![Figure 3: Technology acceptance model (Davis, 1989)](image)

TAM was initially introduced by Davis (1986). TAM theorizes that acceptance of a new system can be forecasted based on behavioural intention (BI) of the user, attitude towards usage (A), and two other internal factors: perceived usefulness (U) and perceived ease of use (E) (Alharbi and Drew, 2014).
In TAM, behavioural intention (BI) expresses the definite use of a system, hence determines technology acceptance (Alharbi and Drew, 2014). Attitude towards use (A) and perceived usefulness (U) both determine BI (A), where BI is also secondarily influence by perceived ease of use (E) (Davis, 1989). A is straight-forwardly influenced by U and E, whereas U is primarily influenced by E.

However, for the purpose this research in the application of TAM the external variables were excluded and also Actual system usage (AS). Actual system usage (AS) is also excluded as the proposed system is of new concept in Malaysia. In support to this motion Davis and Warshaw (1989) defined behavioural intention (BI) as the extent to which an individual has developed conscious idea wether to accomplish or not to accomplish certain quantified behavior in future. Thus illustration of the research model below:

![Figure 4: Research Model](image)

Based upon the model of the research, the questionnaire was broken down into sections to help gather data relevant to the research. Table below comprises the questions bases broken down into segments.

<table>
<thead>
<tr>
<th>Perceived Ease of Use (E)</th>
<th>E1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing methods of reaching out to courier companies is difficult or me</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perceived Usefulness (U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A courier System mobile application will be useful and efficient to both individuals and companies.</td>
</tr>
<tr>
<td>When moving out of an apartment I make use of courier services to move my properties.</td>
</tr>
<tr>
<td>The corporation I own or work for often make use of courier services to move company goods.</td>
</tr>
<tr>
<td>It would be satisfying, if I can send an item to a someone from my location without visiting any courier outlet.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attitude Towards Using (A)</th>
<th>A1</th>
</tr>
</thead>
<tbody>
<tr>
<td>An application on my mobile phone that can link me to companies offering courier services, is a good idea.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behavioural Intention to use(BI)</th>
<th>BI1</th>
</tr>
</thead>
<tbody>
<tr>
<td>If real-time courier mobile based application is developed, I would like to use it.</td>
<td></td>
</tr>
<tr>
<td>I would recommend such an application to a friend, family member or company.</td>
<td>BI2</td>
</tr>
</tbody>
</table>

Table 4: Questionnaire model

4. Results and Discussion

Analysis on collected data is done in this chapter. This chapter comprises brief discussion on the analysis of obtained data whilst concisely focusing on the subject matter of this research paper, which is the analysing the public acceptance rate on the proposed system. Analysis is carried in respect to the research model as stated in previous chapter.
Demographic Analysis:

![Figure 5: Demographic Analysis on Smartphone OS used by respondents](image)

From the result shown, Android leads by a very high margin of 64% followed by Apple's iOS with 34.3% leaving other mobile platforms trailing behind. The result from the pie chart is also in accordance to the deduction made earlier in chapter two about Android platform leading the smartphone industry.

Perceived Ease of Use (E):

![Figure 6: Analysis on perceived ease of E1](image)

Analysis was made from the survey in order to inspect the rate of satisfaction of the public with the existing systems in comparison with the perceived ease of usage to be offered by proposed system. A minute number of respondents (8.8%) Disagree with the fact about difficulty in the existing system. 25% are Neutral to this assertion 18.6 % Strongly-agree and majority of 47.1% Agree, attesting to the fact that the public is not completely satisfied with the existing systems.
**Perceived Usefulness (U):**

It is important to verify the relevance of a software to the environment, that is checking if it is valuable to its target users. In response to this analysis 34.3% of respondents Strongly-agreed, 59.8% Agree and only 5.9% are Neutral on the idea with no one Disagreeing. This implies that the respondents are certain that the application if implemented, will be useful to the community.

*Figure 7: Analysis on perceived usefulness U1*

In the questionnaire, questions were posed to respondents to help assess the relevance of courier service in a wide scope or perspective apart from the normal delivering of packages and parcels. From the analysis made, 16.7% and 50% of the participant Strongly Agree and Agree respectively to claim of using courier services when moving out of an apartment. Where 19.6% are for neutral opinion, 5.9% disagree and 7.8% Strongly Disagree. With affirmative answers widely out weighing the contrary shows that majority make use of courier services in inquired context.

*Figure 8: Analysis on perceived usefulness U2*
The question asked here is verify if courier services are needed beyond individual needs. The result from the bar chart above showing that 48% and 16% Strongly-Agree and Disagree respectively where 24% are Neutral and 3.9% Slight-Disagree and only 6.9% Disagree, approves the fact not only is courier service used needed by individuals but also companies and firms.

This question was asked in the survey in order to verify the degree to which the public rates perceived usefulness of the proposed system. The feedback gotten was a very positive as 66 respondents (64%) out 102 participants are highly satisfied by such potential benefit. 28% of the respondents also Agree to this claim of satisfaction just 2.9% are Neutral and only 3.9% are unenthusiastic about the advantage brought by proposed system.
Attitude Towards Using (A):

Analysis was carried out in this survey in order to gain insight on the attitude of the respondents towards the idea of using the proposed system. 53.9% Strongly-Agree to the idea, 34.3% agree, just 9.8% are Neutral about the idea and 1% each (Disagree and Strongly-Disagree) are contrary to the idea. This implies that the respondents strongly feel that the developing the proposed system is a good idea.

Behavioural Intention to use (BI):

This section is a very important part of the questionnaire as it critically reflects behavioural intention (BI) which is actually one of the main determinant of technology acceptance of a system (Alharbi and Drew, 2014). Respondents were asked if they would like to use the proposed system. The response was positive with 65% of the respondents Strongly-Agreeing to use the system, 28% Agree, 3.9 are Neutral, 2% Disagree and only 1% Strongly Disagree.
This is another question asked in order to verify BI of the respondents. This question also provided in order analyse how quickly the proposed system will be disseminated among the public should it be implemented. Respondents were asked if they would recommend the proposed system to companies, friends or family members should it be implemented. The most positive results which are 61.8% Strongly-Agree and 27.5% Agree together making a total of 89.3% shows that proposed system likely to spread quickly and vastly upon its deployment.

5. Conclusion

Through application of the technology acceptance model, the researchers are able to address issues associated with the research, viz-a-viz: analysing the need for courier service on mobile phones, opinion of users on choice of OS on for which the system is to be implemented and if the centralised platform enable access to courier services.

From results and findings, it is observed that using four divisions of TAM most especially perceived usefulness (U) and behavioural intention to use (BI), respondents gave positive reaction to idea of courier service implementation on mobile phones. Secondly analysis in this research shows that majority of smartphone users use the android OS implying that upon implementation of the proposed system on the android OS of majority of smartphone users will be satisfied. Lastly based on extensive research, accurate logic and analysis on the perceived ease of use of the proposed system it is rational to infer that users will accept system deployment on the chosen centralised platform (smartphone). However future improvement is intended to be induced to proposed system and also further deployment on the iPhone operating system.

Upon accomplishing the aim the research courier service will not be one click away for it users but also be able to reach the masses easily in Malaysia. This development will be immensely useful for door to door courier service in Malaysia.

References


F. D. Davis (1989) 'Perceived usefulness, perceived ease of use, and user acceptance of information technology', *MIS quarterly*, pp. 319-340.


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