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Local Pricewatch Information Solicitation and Sharing Model Using Mobile Crowdsourcing

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ABSTRACT

Shopping, in particular groceries shopping, is a necessity and has become part and parcel of our life, be it daily, weekly or monthly. Tied to this activity is the concern over the ever increasing price of goods. Ideally, one would want to be able to compare the price of an item between one shop and another before getting the best deal. However, this is impracticable if not impossible due to a number of factors, especially the time constraint. Nevertheless, advances in the internet technology, combined with the widespread use of the internet-ready devices that are often packaged with mobile internet plans have enabled rapid and timely information sharing, hence, creating an opportunity that can overcome the impossibility. People who go to different shops everyday can share information on the prices of items at the shops that they visit, which will be useful for those who are planning to buy similar items. What is missing is the mechanism to enable such information sharing. This paper therefore explains about such mechanism that we call the local pricewatch information solicitation and sharing (LoPrice) model that uses voluntary crowdsourcing technique to solicit the information from the public. Prior to that, justification on the need for the model is presented. Judging from the success of its counterparts in other areas of social networking, it is expected that the model can quickly gain interest from the public, hence helping them to save on their expenditures.

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INTRODUCTION

Were we ever be in a situation where the price of good that we had just bought from a shop is found cheaper at another nearby shop? We would have bought the item at the latter shop should we knew it, right? But how could we possibly know about it unless somebody else shares the information with us? And how can we know the information before it is too late? In this modern society, Groceries shopping is certainly inevitable and has become the main source of obtaining food and other supplies. It is no longer an option, but a necessity. Gone were the days where raw food can be obtained just by plucking them from the backyard plants or from the livestock reared around the house.

When one thinks about shopping, one cannot help but to also think about the ex-penses incurred by it. The ever increasing price of goods, that is becoming more and more significant lately, has therefore become the main concern of many people. Latest report on household expenditure survey by the Department of Statistics Malaysia (Department of Statistics Malaysia), which is done once every five years, showed that the average monthly household expenditure had increased by 12.1% from 2004/05 to 2009/10. An independent survey (Kenaikan harga barang keperluan isirumah) also showed that increment on prices of items even reached 43% within a six-month period, which was certainly burdensome as the prices hike was far beyond the yearly income increment. Making life affordable and less burdensome is so important that it has now become the concern of our (Malaysian) government. A number of initiatives are seen being implemented by the government to help easing the citizens with their expenditures such as the cash aid scheme (BR1M).

In our opinion, solution to this problem can be approached from at least three di-rections. First, is by raising the living standard of low-income household, which hap-pens to be one of the national key result areas (NKRA) of our government (Enam Bidang Keberhasilan Utama Negara). Sec-ond, is by keeping the goods prices low and third, is by being more selective in buying the goods. While the first approach is a long term approach, the second approach may require strict and close monitoring from the authorised bodies. Therefore, it is the third approach that seems most amenable to all of us and hence, the approach that we are interested in.

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As we are aware, and probably as part of the marketing strategies, prices for the same goods differ between one shop and another. This difference can be significant, amounting to as much as RM10 per item, if, for example, the other shop is having a sale. Most of the time, we have to depend on luck in order to get the best price as the price changes from time to time and the pattern of change is unknown to us. In an ideal situation, we would want to be able to compare the price between one shop and another for each item that we want to buy. Unfortunately, it is time consuming to move from one shop to another just to compare prices and then to return to the shop that offered the lowest price to buy it. Let alone to do it within a reasonable time-frame. It will also incur additional cost, as we need transportation to move about. Not to mention the difficulty in getting a parking space and et cetera, which render this practice infeasible. To overcome these problems, the local pricewatch information solicitation and sharing (LoPrice) model is therefore proposed. The aim is to help the users in finding the needed items at the most reasonable, if not lowest price and at nearby stores. The difficulty in comparing prices of items to be bought within an acceptable period of time is therefore the problem statement to be addressed by the research.

1. Background:

Recent advances in the internet and mobile technology have shed some light towards overcoming the stated problem above. The widespread use of internet-ready mobile devices combined with the availability of more and more affordable mobile data plans and packages has enabled the users to share information on just about anything at anytime. One type of information that they can share, and should be sharing is on the prices of items. People who go to different shops everyday can share information on the prices of items at the shops that they visit with others using their mobile devices. This information will be useful to those who are planning to buy similar items. In this way, the task of visiting each different shop can be distributed amongst them and price comparison can be done by just tapping and scrolling the mobile devices. This idea of distributing the potential solutions to the public in order to obtain the best one is what Surowiecki (Surowiecki) termed as 'the wisdom of crowds' and has become amongst the seminal work in crowdsourcing. The term 'crowdsourcing' was later formally coined by Howe (Howe, 2006) to mean the act of outsourcing tasks to an undefined, large group of people or community (the crowd) through an open call (Zhang, 2001). Crowdsourcing process generally comprises the following steps (Zhang, 2001).

1. Crowdsourcer proposes tasks and make it known to the public, with clear requirements and reward if any.
2. The public submit potential solutions.
3. The public investigate, or evaluate the solutions and choose the best one.
4. Crowdsourcer determines the best solution and reward the winner.
5. Crowdsourcer gets and owns the best solution.

Two prerequisites of crowdsourcing are (1) the open call format and (2) the large network of potential labourers (Howe, 2006). Fig. 1 shows the steps in a crowdsourcing process in a slightly different arrangement, but maintaining the same composition.



Fig. 1: The eight steps crowdsourcing process.

Motivations to participate in a crowdsourcing exercise vary. More often than not, the strongest motivation is monetary reward, as discovered by Brabham (The crowdsourcing process in eight steps), although a more recent study showed otherwise (The crowdsourcing process in eight steps). As a result, crowdsourcing has been

successfully applied in business or other profit making sectors such as Threadless and iStockphoto. The potential of crowdsourcing has also been explored in auction (The crowdsourcing process in eight steps).

However, the presence of crowdsourcing and widespread availability of mobile devices per se are not sufficient to solve the stated problem. A model is needed for the crowdsourcing to be successfully applied in information sharing of items prices and for the benefits to be optimally reaped, which prompts the need for this research. Furthermore, Brabham (Brabham, 2008) argued that the benefits of crowdsourcing should also be enjoyed by the non-profit making sectors. Though examples on the use of crowd-sourcing for non-profit purposes are already seen (Armstrong, 2012; Rovere, 2012; Heipke, 2010), rooms for research in this area are still plenty.

With regard to price comparison application, a number of applications were found as a result of our exhaustive search, noticeably in the US (HuMuch; CatCrunch; ShopSavvy; Smoopa Price Checker; Price Comparison; Grocery King Shopping List) and France (Grocery Price Watch; Leclerc). In the context of Malaysia, only three such applications were found as shown in Table 1. However, they were all web-based applications, which means that the information sharing was not done using dedicated mobile applications. Furthermore, the information on these websites was also outdated. In one particular instance, we found that the price of an item was last updated in 2011!

Table 1: Price comparison applications in Malaysia.

Name	Website	Source of information	Coverage (items)	Coverage (stores)
Yellavia	www.yellavia.com/	Users	21 categories of items, groceries is one of them	Not specified
lpengguna	www.lpengguna.com/	Administrator	Groceries	Not specified
PriceChecker.my	http://www.pricechecker.my/	Inactive – the site is not working		MYDIN, Carrefour, Tesco, Giant, Lazada

2. The LoPrice Model:

Taking into consideration (1) the need to have a means to properly share the information on prices of items, (2) the widespread use of mobile devices, (3) the research opportunity on the use of crowdsourcing for non-profit making sectors that is still wide and (4) the missing of such applications in Malaysia, the LoPrice model is proposed with the four considerations above being the motivations towards the construction of the model as shown in Fig. 2.

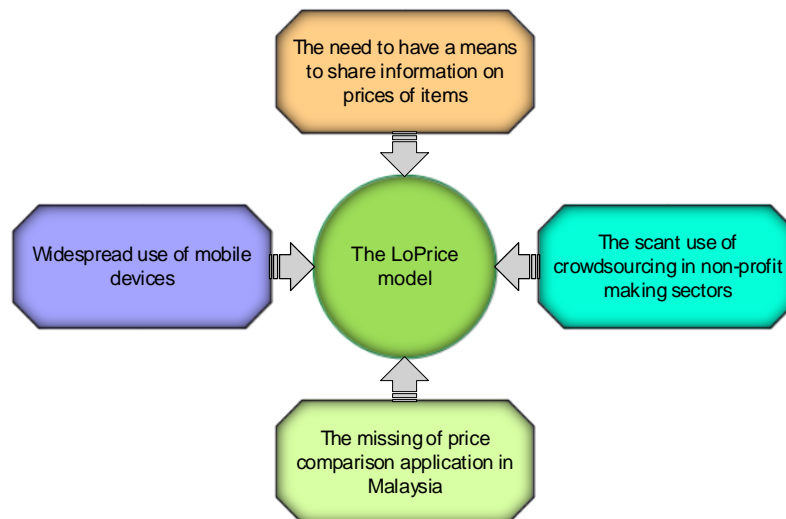


Fig. 2: Motivations for the research.

The conceptual view of the LoPrice model is shown in Fig. 3. As can be seen from the figure, information comes from the public users through their mobile devices. Information for each item includes its price, location of the store where it can be bought from, its category, and the validity period of the stated price, if known. Application on the server side captures the information and makes it available to other users whenever requested. The existing crowdsourcing process are modified to suit the non-profit making purpose and subsequently applied in obtaining the information on prices of items from the public. The LoPrice model will be developed in line with the characteristics of social perspective based on the taxonomy of network communities proposed by Albors et al. (2008). To realise the LoPrice model, a price information sharing application will be

developed, which can be used as a point of reference for users to find the location of the needed items at the best price.

2.1 Investigation Areas:

As explained above, in the context of Malaysia, applications that can be used to compare prices of items were once developed and in use. However, their use could not be sustained over time. Information was not updated, hence, defeating their intended purpose. The preliminary part of the construction of the LoPrice model is therefore a study that investigates the factors influencing users participation and their 'stickiness' to such application. Findings from this investigation are taken into consideration in constructing the LoPrice model. Secondly, to enable quick updates on items information, users are expected to provide as minimum information as possible. In other words, the LoPrice model should automate as much information as possible and one particular information that can potentially be automatically obtained is the location of the item, assuming that a user provides the information while he or she is still in the shop. For this reason, mechanism to geographically tag (geotag) the information sent based on location sent is investigated. Finally, an algorithm for timely update of new and existing information is also developed. The algorithm, among others, ensures that obsolete information is being purged from the application server. These areas of investigation are also shown in Fig. 3.

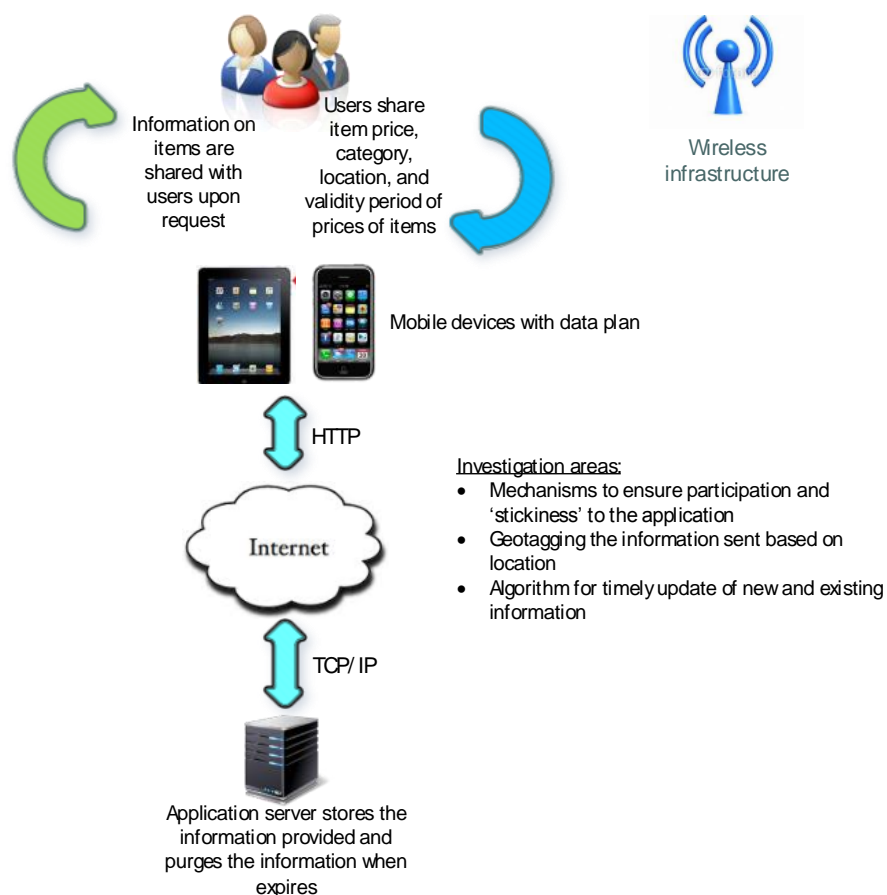


Fig. 3: Conceptual view of the LoPrice model and the areas of investigation.

3. Issues and Challenges:

Two main issues regarding crowdsourcing, which are the misuse of cheap labour and the reliability of information provided (Hodson, 2013) are noted. With regard to cheap labour, it was argued that the crowds get rewarded and they are not forced to do the tasks. With regard to quality, Surowiecki discovered that groups, albeit amateurs are often smarter than the smartest people in them, under the right circumstances. Also, a study reported on the use of crowdsourcing in transcribing showed 74% accuracy, which is viable compared to 88.5% with professional transcription (Aron, 2012). Not to mention that measures to overcome the issues are already in the pipeline (Hodson, 2013). Nevertheless, at this point, we did not anticipate these issues to become hindrances to this research because no direct profit in monetary form will be generated. The benefit of using the LoPrice model will return to its users, hence they are not the labourers in any way. Since they are benefitting from the use of the model, we can account on them to provide accurate information.

4. Conclusion and Further Work:

This paper provides justification on the need for the LoPrice model and briefly explains about the model. Judging from the success of its counterparts in other areas of social networking, it is expected that the application developed from the LoPrice model can quickly gain interest from the public. The expected benefit gained by the users is still in the form of monetary reward, albeit indirectly, through the reduced amount of expenditures. Future work includes the development of the prototype system to be used to evaluate the LoPrice model. At least two types of evaluation will be performed; experimental and empirical. Experimental evaluation will assess the efficiency of the LoPrice model such as the timeliness of the information shared and the empirical results obtained will be quantitatively analysed using appropriate statistical analyses to determine its effectiveness. From the analysis results, the research contribution and the scope of applicability of the LoPrice model will be determined. Additionally, further work will also be made to look at the scalability of the LoPrice model, that is, the potential of extending its coverage beyond local community.

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