

3rd International Conference on Research and Innovation in Information Systems – 2013 (ICRIIS'13)

Web Information Gathering Processes for Gold and Silver Price Information

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Abstract- This paper presents a research on product-specific web information gathering concept that intends to improve web searching through conventional search engines. Search engines are useful for searching general information; however, the results are not always accurate because they return the results based on key-words occurrences, but not accurateness. Further, users must filter and organize the information accordingly to make the information meaningful. Users must also visit multiple websites independently to check whether the information is relevant. These processes are tedious and very time consuming especially for users who search for specific products information. Hence, we propose a web information gathering model that aims to provide a standard for developing product-specific web searching tools. It was applied in a mobile application called Gold-Trader. The mobile application provides gold and silver prices information to individual or personal traders. It can help individual or personal traders to monitor and compare gold and silver prices from multiple websites without the needs to visit them individually.

Keywords—gold trading, gold price, decision making, information gathering, mobile application

I. INTRODUCTION

The World Wide Web (www) contains massive amount of information about almost everything in the world. It creates a new phenomenon called “information overload” in the Internet [1]. Simply said, Internet users receive too much information today that causes difficulty to search, filter, choose and organize the right one for them.

Although search engines are available to help users to search information in the Internet, they only provide unstructured information that is mostly based on key-words search. Users must go through each of the search results and filter them according to their needs. This is very time-consuming tasks especially for those who search for business-related information. The best approach to overcome this phenomenon is through the use of personalized tools that can help users to search, filter and organize information that is truly relevant to their needs.

In the context of commodities trading, information on market price updates is always valuable for individual traders. Unlike professional traders that use specific software to monitor commodity market price updates, individual traders are often rely on the unstructured information from the Internet. A trade research analyst, David Bromley [2] highlighted that traders participating in

commodity markets are mostly private individuals who do not own specific software to help them in their business operations. Searching and browsing for commodity prices from the Internet are their main task to keep the businesses run. Many of them failed because of ineffective information searching and lack of knowledge and skill in information and communication technology (ICT). Hence, software tools that can assist individual commodity traders on the market price updates are highly needed and certainly benefit them in running their businesses.

In this paper, we present our work on developing a mobile application for individual traders to monitor market price updates for gold and silver commodities. Firstly, in Section II, we explain the concept of web information gathering, and how it can be adapted as a generic information gathering model for the selected domain of application.

In Section III, we describe the methodology and implementation of the information gathering model in a real-time mobile application for gold and silver price updates known as Gold-Trader. Then, Section IV discusses the benefits and limitations of the systems. The conclusion and future works are provided in Section V of this paper.

II. WEB INFORMATION GATHERING

With advances in Internet technology, the web is a rapid source for obtaining information. However, the amount of information in the web is continually growing and has caused information overload. Too much information is available for users that caused difficulty to them to search, filter and select the best information that fulfil their needs.

Normal Internet users use search engines to search information that they need. We all acknowledge that search engines play important roles in retrieving web contents for users. However, it only provides partial assistance, as users have to filter the web contents from the results and organize the information in a separate document either in word processing software or on a paper.

The above processes that users carried out in searching, filtering, organizing and presenting web information is described as a web information gathering process. Simple examples of information gathering include Internet users who intent to travel abroad, students who do their review assignments, and customers who search for a product to buy. In general users perform information gathering to acquire useful and meaningful information from the web [3].

This is the major drawback of current web browsers where information extraction from the web could not be easily transferred into a meaning and useful one [4]. This is because web browsers rank the results according to the occurrences of the given key-words rather than their correctness in web documents. Hence, information retrieval and integration from the web is a crucial issue that requires urgent attention [5].

Many researchers attempted to overcome this issue by proposing and developing systems and tools specifically for information retrieval [6]. Some of the systems were explained in detailed by Lam and Gong, [4] such as KnowItAll, DataRover, WeDax, and ANDES. A paper by Chang *et al.* [7] reviewed and compared information extraction systems such as TSIMMIS, Minerva, Web-OQL, W4F, XWRAP, SRV, RAPIER, WHISK, WIEN, STALKER, SoftMealy, NoDoSE and DEByE, just to name a few.

The following sub-sections explain generic information gathering tasks, information gathering models, and the selected domain that we intend to look into. Web information gathering is particularly discussed in the context of gold and silver price information.

A. Information Gathering Tasks

Web information gathering through common search engines is an activity that requires users to perform a sequence of tasks. Generally, users must have the list of relevant keywords in corresponding to the topics of interest. The search engine will display the results to users. Then they must browse for the relevant web contents. Users have to choose and decide the web contents that match the topic.

A recent research by Alhenshiri *et al.* [8] suggested that web information searching comprises three tasks. The tasks are visualization, clustering and refinding. Later, they refined the tasks into managing information, handling multiple sessions, and refinding information. They also proposed a prototype system known as Web Information Gathering Interface (WIGI) to demonstrate the steps. They also compared the prototype against common web browsers where the proposed tool improved organization of information significantly compared to common web browsers.

Lam and Gong [4] proposed three stages of tasks in web information extraction that are extracting, transforming and loading information. These three tasks are relatively similar with web information gathering tasks. The terms information gathering and information extraction are always used interchangeably.

B. Information Gathering Models

Many studies proposed models and techniques to provide an improved information gathering systems. The following paragraphs discuss a few of them.

Yi *et al.* [9] proposed a web gathering system called Grand Central Station that comprises three main components. They are a gatherer, a summarizer and a topic

expander. A gatherer visits web pages in the Internet and passes the web content information to the summarizer. The summarizer will extract and keep the websites' metadata, while the topic expander will identify and extend the topics that are related to the given one from the metadata. The metadata were used to guide the crawler to search only relevant topics. The proposed system is an improved solution for regular web browsers.

Tao *et al.* [6] proposed a personalized information gathering model based on users' background of knowledge. It aims to improve information gathering systems by adapting users' background of knowledge. It consists of four main components (i) a querying model, (ii) a computer model, (iii) an ontology model and, (iv) a concept model. A web information need that a user formulated is stored in the querying model. Then, the computer model captures information in the querying model and creates a user profile. It will be stored in the ontology model. The concept model stores the explicit representation of user profile. This is a good attempt to provide personalized and adaptive web information gathering systems.

C. Product-Specific Information Gathering: Gold and Silver Price Information

In spite knowledge sharing, the Internet also provides a platform for conducting businesses. Many Internet users perform information gathering processes to obtain information on particular items or products either for trading or personal use. Information gathering for product information is tedious where users usually spent a lot of time eliminating unnecessary information from search engine results [10].

Price search engines and web agents are emerging solutions for product information gathering where these tools search for products prices and information from multiple websites. The tools have made information gathering and product purchasing easier for users than ordinary search engines [11]. Product information gathering tools provide comparative information that can support online consumers in their decision making process.

The tools are usually available to support specific products for example flight tickets, accommodations, retail consumer products, and electronic products, just to name a few. Business entities especially travel agents also have their websites online and gather information on flight tickets and accommodations across multiple providers. Some examples of the websites include shopper.com, Travelocity, Orbitz, Expedia, and many more.

Tools that accommodate information on specific products can be seen as an ideal solution for web information gathering. The tools eliminate unnecessary information and focus on what users really need and add some intelligent components that help users in their decision making process.

In the context of this paper, we specifically look into commodities where their prices are determined by supply and demand in a universal market. Gold is a valuable

commodity where its price has increase to almost \$1,700 per ounce at the end of 2012 compared to US\$400 in 2003[12]. The same trend is also happened in silver price. The increase in the price has attracted people to buy and sell these two commodities as they are profitable and give good returns.

Nowadays, many individual or personal traders are actively buying and selling gold and silver. Unlike professional traders who use commercial tools and software, personal traders mostly rely on information from the web. They use search engine to collect information about gold and silver prices and sort the information manually. Some traders visit multiple websites to gather information on the commodities prices and perform a simple analysis manually. It is a repetitive process that the traders have to carry out when searching for gold and silver prices information.

Analyzing the search engine results and browsing multiple websites are time consuming tasks. It also requires traders to organize the information into a meaning form. As these processes are tedious, a software tool that can simplify this practice is highly needed. Simple web information gathering processes is a way to achieve it. It is explained in the following section.

III. METHODOLOGY AND IMPLEMENTATION

This section explains the development of a mobile application for gold and silver price updates named Gold-Trader.. The use of smart phones and tablets is an emerging trend within Internet users. Therefore, a mobile application that accessible through these devices can benefit the traders especially in searching and organizing related information.

A. Method

A mobile application development methodology called Agile-SCRUM methodology for mobile application development [13] was adapted. The methodology consists of five phases that are: (i) Requirements Analysis, (ii) Design and Development, (iii) Test and QA, (iv) Product acceptance phase and (v) Release to Market. Figure 1 shows the overall methodology.

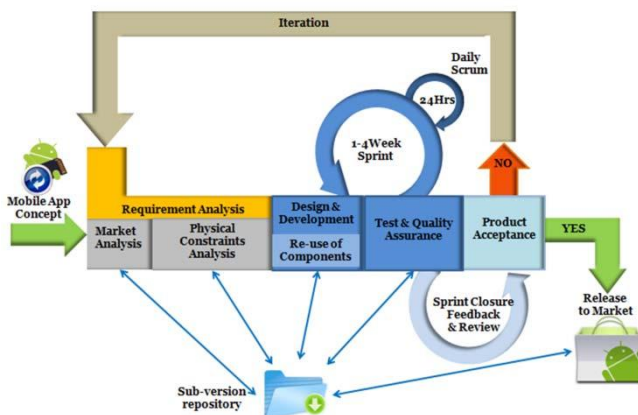


Figure 1. Agile-Scrum Methodology [13]

B. Programming Environment

Gold-Trader was written in Java and PHP scripting language. The application interfaces was coded in Java while the web information gathering processes were written in PHP.

C. Web Information Gathering Model

In this section, we propose a model for product-specific web information gathering. We specifically explain the model with regard to Gold-Trader system that will be explained further in Section IV.

The model consists of three components that are (i) a collector, (ii) an organizer, and (iii) an expander. The collector's role is to collect web content of the chosen product from the websites specified by the expander. Instead of holding the current internet address for the websites, the expander also organizes, stores, and updates the addresses according to the users' needs. The web content will be converted into strings by the collector and the information will be passed to the organizer. The organizer's role is to find matching strings, store them in array and present the information in a table. The information will be presented to users through web browsers. The collector also retrieves the web contents regularly (i.e., every hour) to provide users with the latest information. Figure 2 illustrates the model.

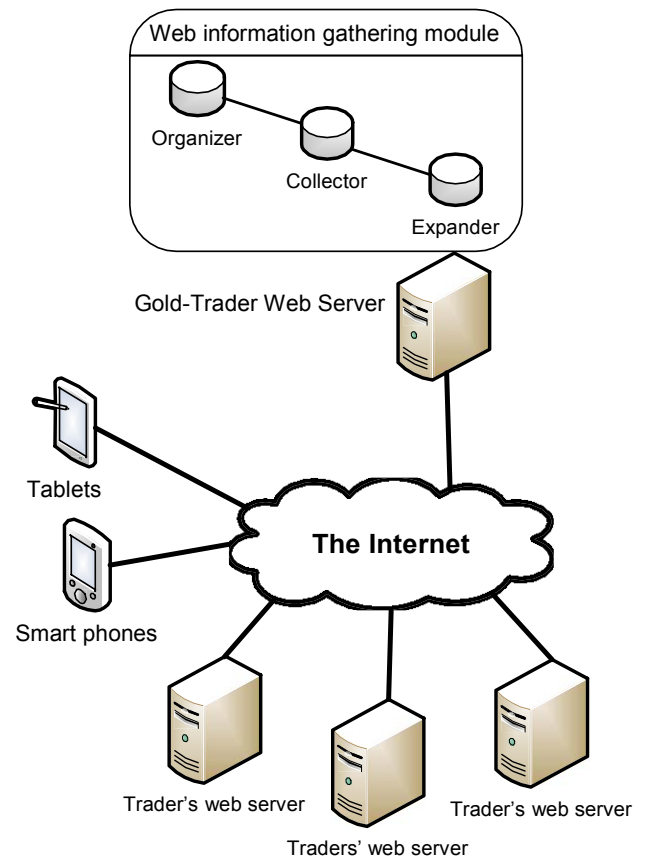


Figure 2. Web information gathering model

The three components were combined in a module called a web information gathering module that runs on a web server. Other possible entities in this model are users (i.e., individual traders) that access the application through smart phones and tablets, and other web servers where the web contents of specific products are retrieved from. The overall process of the model is illustrated in Figure 3.

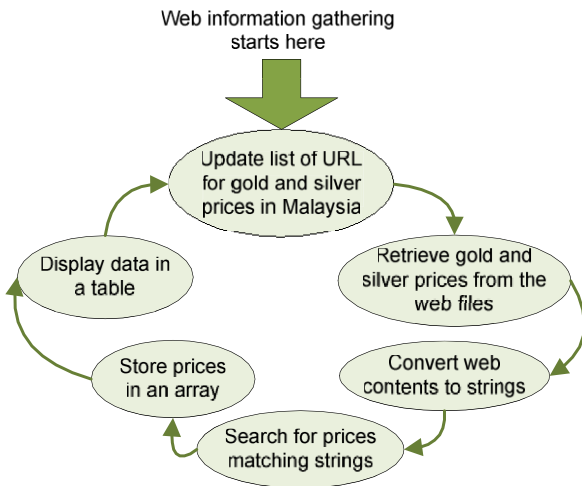


Figure 3. Web information gathering processes

D. Information Resources

In gathering the prices, four gold and silver traders’ websites based in Malaysia were used as follow:

- GoldCrest Pavilion Sdn. Bhd. (<http://www.gcp.com.my>)
- Gold Silver Resources Sdn. Bhd. (<http://gsr2u.com.my/sistem>)
- Public Gold Marketing Sdn. Bhd. (<https://publicgold.com.my>)
- World Islamic Mint (<http://www.worldislamicmint.my>)

The four websites were selected to demonstrate the concept of web information gathering. Other websites that provide live updates for gold and silver prices can also be included.

IV. GOLD-TRADER: A MOBILE APPLICATION

Gold-Trader focuses on three important functions. First, traders can view live updates of gold and silver prices via smart phones and tablets. The system provides live updates of gold and silver prices by using graphical animated graphs. The graph is set in the homepage of the application so that traders can see this first to see the current trend in the prices.

The application also offers traders to view gold and silver prices from various companies. The application gathers prices of gold and silver from the websites mentioned above so that traders can have more options to choose to buy from any company that they want.

The last function allows traders to compare the prices of gold and silver from all companies. Traders are no longer required to open one-by-one of all the gold and silver

traders’ websites and check each and every prices they have offered. Gold-Trader provides them all in a simple-to-view table and all they need to do is just pick and choose. Screenshots in Figures 4 and 5 show the application interfaces.



Figure 4. The main interface of Gold-Trader



Figure 5. Gold prices from different websites

V. CONCLUSION AND FUTURE WORKS

Web information gathering processes using search engines are common tasks that users frequently perform in the Internet. However, the processes do not necessarily give users accurate results as the search engines gather the information based on key-words occurrences. In addition, the users must filter, sort and organize the information according to their needs. These processes are tedious and time-consuming. A more efficient way than conventional search engines is highly needed especially for trading and commerce-related information searching.

This paper introduced Gold-Trader; a mobile application implemented using web information gathering processes for gold and silver prices information. This application was developed using PHP web-scripting and Java programming languages. Gold-Trader allows traders to view live updates of gold and silver prices. They can view gold and silver prices from various gold and silver websites and compare the prices for the commodities trading. The mobile application eliminates the time traders spent on searching, filtering and organizing information from the web. The application is also available on the go through smart phones and tablets.

The current version of Gold-Trader application has a limitation in terms of loading graphical information. The graph that has been setup in the homepage is very large in its size taking long time to load. In the future, we intend to solve this issue so that the application is lighter and easy to load.

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