

Context-Based Information Retrieval of Athletic Sport Management System (ASMS)

Muhammad Haziq Lim Abdullah¹, Nuridawati Mustafa², Norazlin Mohammed³, Nur Filzah Zainon⁴

Faculty of Information and Communication Technology

Universiti Teknikal Malaysia Melaka

Locked Bag 1200, Hang Tuah Jaya,

75450 Ayer Keroh, Melaka, Malaysia

{¹haziq, ²nuridawati, ³norazlin }@utem.edu.my, ⁴zaatreyu@yahoo.com

Abstract- Athletic Sport Management System (ASMS) is an online system that help user in managing and handling data for athletic sport event. This system consists of 7 main modules such as registration, lane determination, result representation and etc. that will be discussed in this paper. As overall, this paper delivers the design and implementation of ASM. This study intends to develop a computerized system for athletic sport management (ASMS) that could assist administration in planning and managing the athletic sport activity. This paper presents the design and the implementation phase of the research. Context-based information retrieval is being chosen as the searching technique to enhance the searching capability. Furthermore, we proposed the use of similar word detection and knowledge based in searching module to enhance the retrieval effectiveness.

I. INTRODUCTION

The main goal of information retrieval system is to find a relevant query based on user's input. The common search queries are simple and often from one or two keywords. This simple queries resulting an unsatisfied result when it is returned. Specialized search technique, on the other hand can provide a good result returned from the user's queries. The quality of search result can be measured with the following two criteria such as precision rate and recall rate [1].

A search engine usually tries to search from user inputs and built an index and ranked before the retrieved documents are presented as a result. In this research, context-based has been proposed as a new approach of finding a similar and related word to improve the search queries in Athletic Sport Management System (ASMS). ASMS is a web-based application that will ease user to manage sports' data such as registration, event scheduling and scoring and data reporting.

Based on the information retrieval approach the search engine will index a similar and related word for better search queries quality. Given a sufficient result to the user's need may

constitute to user satisfaction by providing an efficient precision and recall rate and overcome the queries result overload.

The paper contents are organized as follows. Firstly, we present overview of related works. Then, a detailed description of system overview delivered. This also includes a brief explanation on every modules developed. Then, it followed by the system architecture. Finally, conclusions and future directions are presented.

II. RELATED WORK

The rapid growth of available information in digital format in World Wide Web (WWW) constitute to information overload. In such environment, user would need the assistance of powerful searching and browsing tools to find information desired. Context-based information retrieval has become one of the attention tools to perform the effective and meet the information needed by the user. There are many different notion of context have been used in information retrieval system and information topics or subject has become the most popular notion of context that has been used.

While, reference [2] proposed a context-based information retrieval system which each document is assigned with context(s) based on the type of information. The type of information is derived from enlarged range of categories for a document collection based on context and related with users' activity to make the categories easy to understand and intuitive to user. Furthermore, [3] indicates a new methodology for assigning context to documents in collection to improve the information retrieval effectiveness and conduct an experiment to prove the effectiveness of the system. This methodology involved assigning one or more context categories to document from a pre-defined set of context categories by using Context Allocation (CA) system. In this

activity, 'Context assigner' in the system will read the document then assign the context(s) that best describe the contents of documents. Based on the experiment conducted, the performance of the context-based information retrieval system that used the methodology was better than the baseline information retrieval system in term of precision ratio, user effort, time spent and user satisfaction.

It is well known that user preferences are complex and different to each other. Each user has different information needs for his query in different situation therefore, searching and browsing tool must provide powerful searching tool that can handle user with these different preferences [4]. Due to this matter, [5] proposed a context-based adaptive personalized web search to improve information retrieval effectiveness. Xuwei Pan indicate three key technologies to implement in the context-based adaptive personalized web search which are semantic indexing for web sources, modeling and acquiring user context and semantic similarity matching between web resources and user context. This research is mainly about adapting the search results according to each user's information needs in different situation.

One of the implementation of context based is in medical area. According to [6], they are using qualifiers that are stored in a resaurus rather than in SGML-like DTD. The retrieval process in the Patient Records collection takes into account the flexibility of the qualifying process while reformulating the queries.

[1] presents a new context-based method for automatic detection and extraction of similar and related words from text. It indicates that 7 out of 10 searches with both similar words reduces higher relevance rate and can be improve by 15%. Besides that the retrieved document quality is improved in two aspects such as probability of retrieving isolated English words in others written documents in other languages is reduced and entries due to lack of details in some documents such as simple summary entry is reduced. Using same method, [2] conducted another experiments on specialized search engines such as Business and Economy directory in Yahoo! resulted 85% - 95% similar retrieved documents based on similar keyword queries are given a same result.

III. SYSTEM OVERVIEW

ASMS is a web-based application that provides features to help user in managing and handling data for athletic sport event. The main purpose is to systematically manage the record and to ensure the correctness and effective way of displaying overall results. Besides, it is to provide consistency in handling, processing and easier to keep track and maintain data.

Overall, ASMS consists of 7 modules with 4 different users. Table 1, it shows the different user's module accessibility.

Table 1: Roles vs. Accessibility

Roles	Accessibility
Administrator	<ol style="list-style-type: none"> 1. Authentication 2. User Account Registration 3. Athletes Registration 4. Athlete Attendance Registration 5. Result 6. Report
Athletic Committee	<ol style="list-style-type: none"> 1. Authentication 2. Athletes Registration 3. Athlete Attendance Registration 4. Result 5. Report
Secretariat	<ol style="list-style-type: none"> 1. Authentication 2. Athlete Attendance Registration 3. Result 4. Report
Division Manager	<ol style="list-style-type: none"> 1. Authentication 2. Athletes Registration

The 7 modules that been listed earlier are described as below:-

a) Authentication

In order to access the system, user have to login. The users are divided into four roles which are the Administrator, Athletic Committee, Athletic Secretariat and Division Manager.

b) User Account Registration

Administrator is the super user which means all the modules are accessible to them. Administrator can add, delete, or edit users account for Athletic Committee, Athletic Secretariat or Division Manager. The modules accessibility for each roles is depends to who they are. Athletic Committee is also being able to create account for Athletic Secretariat or Division Manager.

c) Athletes Registration

This module is for Division Manager to register athletes to represents their department. The registration can be done during certain period. During the period, division manager can register, make changes of athletes and events participated. After the period, the system will be freeze and any changes after the period must go through athletic committee. Athlete's number will be given one the registration completed. Each athlete can only register for 2 individual games and 2 for group. There were 2 categories, senior and veteran.

d) *Athlete Attendance Registration*

Before start any events, every athlete must register in order to verify them as valid and registered athlete. Each athlete has to scan their staff id card.

e) *Result*

After every event completed, the Athletic Secretariat will key in the recorded time. The system will determine the winners according to time inserted. However, the score will be given based on ladder score. For track event, this module will provide function to determine lane for athlete during heat and final event.

f) *Report*

This module will produce the overall result of the competition and even can show every department achievement. It will be generated in graphical or statistical method. This report can be view by Athletic Committee in the future to keep track/view previous result.

g) *Searching module*

This module implements the Context-Based method of IR. The overall work flow is shown as below:-

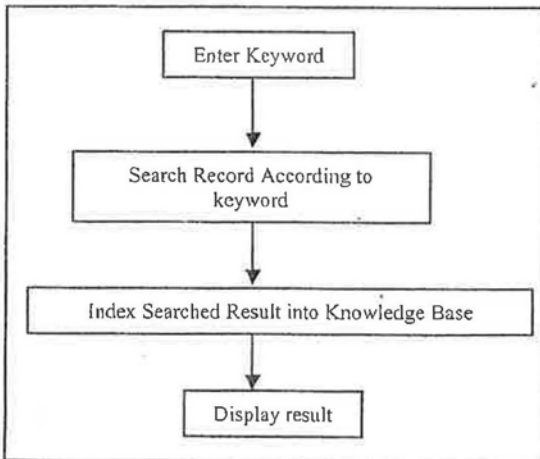


Fig. 1: ASMS Searching Work Flow

As refer to Fig. 1, there are several steps to execute the searching process.

1. Firstly, the user will enter keyword to do some searching. For example is to search previous result.
2. Then the searching process will begin to search from the knowledge base.
 - 2.1 If result found, the result will be taken from the knowledge base.
 - 2.2 If not found, the searching process will find the result from related tables.
3. Indexed the new search result to knowledge base for future usage.

IV. SYSTEM ARCHITECTURE

ASMS is a system developed using PHP and Javascript. For the data storage MySQL is being used and Apache as the Web server. Fig. 2 above shows the architectural overview on ASMS which can be divided into three layers which are presentation layer, application layer and data layer. The presentation layer is the user interface of the system. Here, the user uses web browser (for instance, Internet Explorer) to access ASMS via online. In the application layer, the web server receives user's request. The server may retrieve data from data storage for processing the request, before returning relevant results to the web browser.

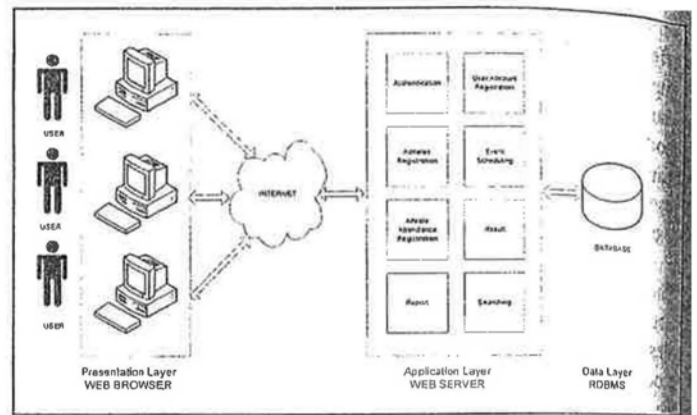


Fig. 2: System Architecture

V. SYSTEM IMPLEMENTATION

This system aim to provide functionality that can help user in managing data before, during and after event is held. As overall, Fig. 3-8 shows the system interfaces created in this system.

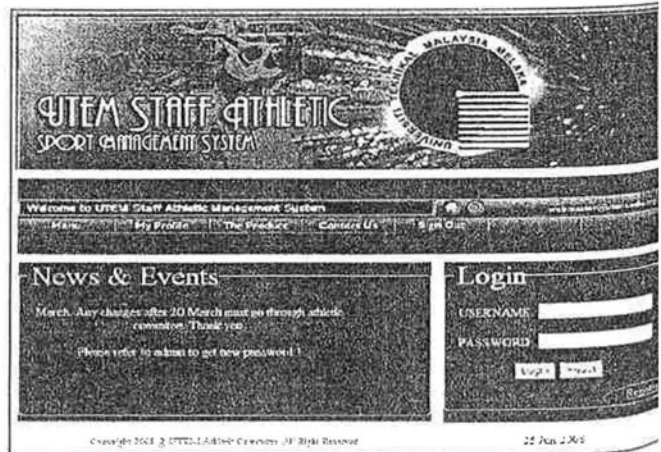


Fig. 3: Users' Authentication Page

Fig. 3 show the main page of the system. User need to login in order to use the system. Any new news and events also will be displayed in the main page. After successful login,

user will be directed to page as in Fig. 4. There are functionalities menu according to user's role.

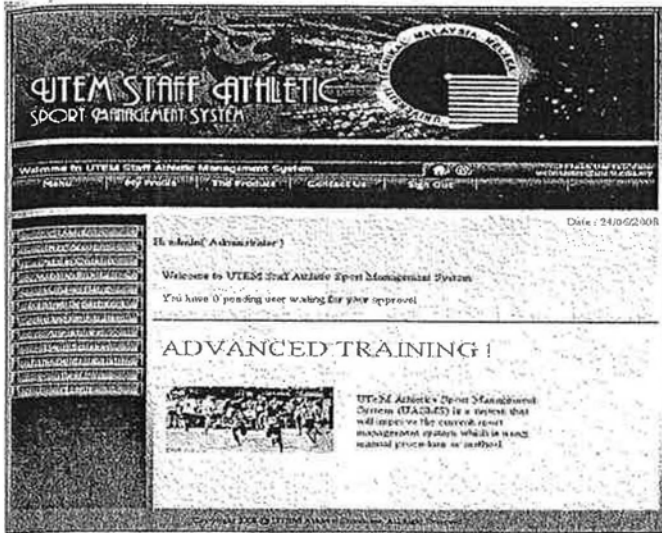


Fig. 4: Users' Main Menu Page

Besides managing athletes' registration, the main concern is the lane determination. It usually happened during heat in track event. The correct lane for final event should be given base on the time recorded for each athlete during heat.

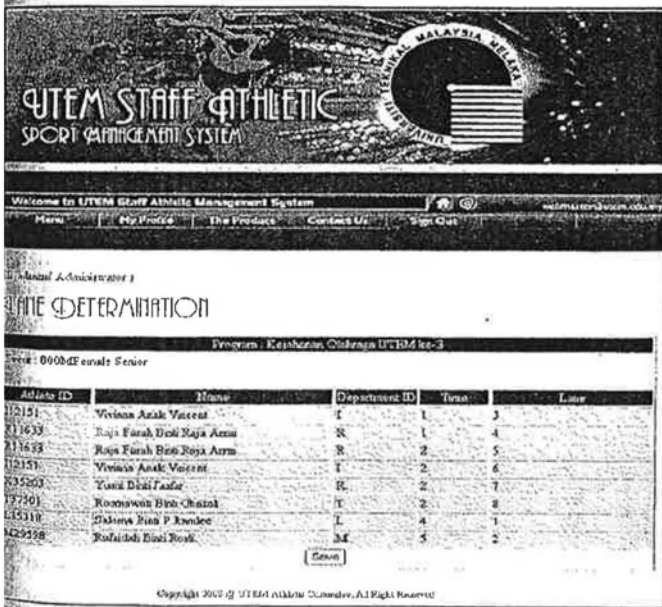


Fig. 5: Lane Determination Page

Once the lane has been determined, each athlete will be easily assigned to lane as shown in Fig. 5. After final event occurred, the time will be recorded and final result will be determined based on time as in Fig. 6. Fig. 7 shows the overall result of every department participated and Fig. 8 shows the bar graph of overall result.

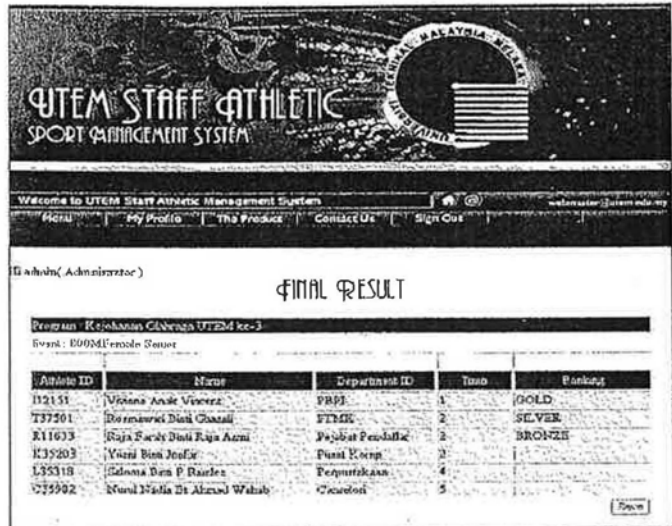


Fig. 6: Final Event Result



Fig. 7: Overall Result

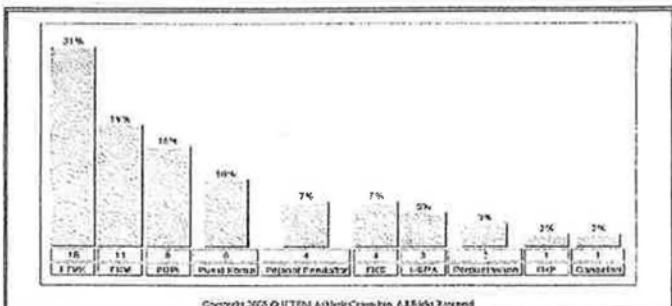


Fig. 8: Graphical Overall Result

VI. CONCLUSION

This paper presented the design and the early implementation of the development phase of athletic sport management system (ASMS) using context-based information retrieval. The aim of this project is to develop a computerized system to manage athletic sport activity more easily. Furthermore, in order to provide each user with more relevant information while searching information, we proposed a context-based information retrieval approach combine with similar word detection and knowledge based. This technology was chosen because it provides suitable approach and it is thought can give better result compared to conventional system in order to improve the retrieval effectiveness.

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