

INVESTIGATION OF KNOWLEDGE RETRIEVING CHALLENGES IN UNIVERSITIES ENVIRONMENT

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ABSTRACT

Organizations of various industries linked to education have adopted Knowledge Management System (KMS) in order to enhance businesses operations to better provide competitive advantages of services and products. Knowledge Retrieval is a crucial component of knowledge management. Retrieving focused and valuable knowledge from explicit sources such as scientific articles is of vital importance to better serve academic staff of universities so as to enable them to accomplish their researching and teaching activities more effectively. Traditional methods of knowledge retrieval are time consuming. Academic staff members have often exhausted valuable time and effort in their attempts to extract a precise need of knowledge i.e. expertise. The main aim of this paper is to analyze the challenges faced daily by academic staff members of universities in their working environment pertaining to knowledge retrieval. A questionnaire survey with 50 academic staff members from two Malaysian universities was conducted to analyze knowledge retrieval challenges as well as to highlight solutions to these challenges.

Keywords: *Knowledge Management, Knowledge Retrieval, Universities, Scientific Articles, Academic Staff*

1. INTRODUCTION

At present, knowledge is considered an important asset in various organizations such as businesses, education, health care institutions etc. Knowledge is defined as having an in depth layer than information and data in order to represent objects and relationships between them [1]. Generally, knowledge is categorized into two: explicit and tacit knowledge. Explicit knowledge is defined as experience and skills that are formulated as written documents, which are easy to be captured, retrieved, shared and used. Tacit knowledge is defined as knowledge that resides in the people's mind. This includes experience, thinking, competence, commitment and deed [2].

The salient aspect of KMS lies in its ability to convert the above mentioned knowledge types from one form to another (tacit to explicit, explicit to tacit) as well as to manage knowledge via systematic and organized methods. Thus, the emergence of the theory of knowledge

management (KM) and knowledge management systems was triggered to manage knowledge assets in various organization sectors [3].

KM consists of a set of processes that are activated in 'KM intense' organizations in order to maximize the performance outcome as well as to increase competitive advantage. These processes are known as Knowledge Identification, Knowledge Acquisition, Knowledge Retrieval, Knowledge Sharing, Knowledge Reuse, and Knowledge Refinement [4], [5], [6].

Traditional retrieval methods consume time and effort as well as provide outcomes with mere insufficient general knowledge content that may not serve the needs of academic staff members. As such, knowledge retrieval processes should be managed in an efficient manner to help employees obtain specific need of explicit knowledge accurately and within reasonable time [8].



This paper focused on knowledge retrieval process as one of KM's main processes. [7] Defined it as the process of retrieved knowledge from a warehouse that collects vast amounts of knowledge from various resources to support the activities of people specializing in a specific area.

The main aim of this research is to analyze the challenges that are currently faced by academic staff of universities with regards to knowledge retrieval processes in order to better understand the requirements of knowledge retrieval to address them.

2. RELATED WORKS

In theory, there are three main KM directions which are [9]; (i) technology based search engines to develop the necessary tools of knowledge gathering, (ii) knowledge processes such as collecting and sharing and (iii) KM outcomes which represent the evaluation of KM objectives.

This section presents related works of knowledge management processes and focuses on the knowledge retrieval process.

2.1 Knowledge Management Processes

Many types of framework have been developed by KM researchers to identify the processes of KM of different views. However, there is no one fixed framework of KM that can be used to address the various aspects of the organization. The main objective of KM processes is to share the relevant knowledge to a person at the required time [10],[11].The following processes are considered crucial components of KM life cycle that ensure right and suitable implementations of KM in higher educational organizations [4],[5],[6],[12].

- Knowledge Identification: This phase is held accountable in managing and identifying appropriate explicit knowledge in accordance with pull processes in knowledge sharing phase.
- Knowledge Acquisition: this phase is held accountable on collecting efficient knowledge from knowledge repository based on knowledge identification phase. There are two ways to collect explicit knowledge; (i) select knowledge which discover

and select the explicit knowledge from internal knowledge repository and (ii) create database which discover and select required explicit knowledge not found in knowledge repository from external sources such as the internet.

- Knowledge Retrieval: This phase retrieves and rearranges the selected portion of knowledge to be pulled through to the knowledge sharing phase. Essentially, there are four processes for knowledge retrieval in order to formulate the final version of explicit knowledge and update explicit and tacit knowledge status; (i) the chosen knowledge design in simple forms that are easy to follow , (ii) codify the created knowledge in order to store it meaningfully in knowledge repository , (iii) check the integration between tacit knowledge, explicit knowledge and organization strategies, and finally (iv) the tacit and explicit knowledge must be updated in accordance to the employees' responses.
- Knowledge Sharing Phase: This phase consists of two basic processes which are (i) pull processes that are used to know the current status of tacit knowledge such as skills and expertise levels as well as identify the employees' needs of explicit knowledge in order to develop their tacit knowledge by using relevant search tools such as search engines, and (ii) the push processes that are used to retrieve the necessary explicit knowledge from the knowledge repository.
- Knowledge Reuse: This phase focuses on the practices and operations of reuse of existing knowledge from various knowledge resources in order to create new knowledge and generate revenue. An example would be the use of explicit knowledge from the knowledge base after integration with new knowledge to reuse it in different situations. This process helps the employees to



increase their innovation level (tacit knowledge) by deriving new ideas and insights as well as greatly adding value for the organization.

- Knowledge Refinement: This phase focuses on refining content quality by capturing new knowledge, adding it onto the existing repository and then reapplying the refining processes (value- adding processes) such as cleansing, labelling, indexing, sorting, abstracting, standardizing, integrating and re-categorizing the acquired knowledge.

2.2 Knowledge Retrieval

The research area in Knowledge management is an immense domain, especially with the information systems fields. Many researchers try to suggest various classification models that categorize knowledge management into various fields [13], [14], [15], [16]. For instance, [13] surveyed 109 executives, obtaining 50 usable responses, on their perceptions of KMS activity within their firms and its potential benefits. According to this research, three perspectives for knowledge management had been identified which are information-based, technology-based, and cultural-based. As a result, the research demonstrated the following conclusion which is 1) knowledge management systems are multi-faceted; and 2) developing metrics to evaluate the benefits of KMS is of utmost importance. In addition, [14] suggested a conceptual foundation that included the knowledge management systems domains of knowledge creation, knowledge storage/retrieval, knowledge transfer, and knowledge application. Interestingly, from their long research laboring in the field of knowledge management, [14] trigger the following questions regarding knowledge retrieval processes which are (1) Can the knowledge that is stored in knowledge repository be accessed by workers who do not know the originator of the knowledge? And (2) what are the most effective retrieval methods?

Logically, knowledge retrieval processes occur between two areas which are the working environment and technology. Practically, most organizations work with the two. Knowledge management strategies which are codification strategy where knowledge is stored in databases,

and a personalization strategy, where information technology is only a tool for communication between people [17].

Accordingly, the retrieval process must start with the identification of information within the organizational memory to fulfill the first strategy (codification), and follow with personal codification of the accessed memory to fulfill the second strategy (personalization).

Apparently, the retrieval and search processes may fluctuate in their meaning and purpose [18]. Thus, distinguishing between search and retrieval is essential. Search is the process where the reserved information is only selected to serve related problem or goal while the retrieval process is the reformatting of the selected information into particular form to satisfy the user's request and need. Respectively, the retrieval process should classify into two steps which are the identification of knowledge, and the user's individual codification of the accessed knowledge. In addition, the stored information may not directly reflect the raised problem and give direct solutions. On the other hand; some information may only give general direction to solve the identified problem [19]. Thus, information technology allows for users to identify and select a specific part of structured information. However, the retrieval process is a problematic process in the meaning and context. From the meaning perspective, retrieval process lacks the capacity to assimilate general problems while the context perspective faces difficulty of context specification [20], [21].

[7] Defined the concept of knowledge retrieval as the processes of retrieved knowledge from the warehouse that collects the knowledge from different resources to support the activities of people within specific fields. Thus, the knowledge could be provided at real time. The retrieving processes consist of four main stages; (1) the users provide their searching keywords to retrieve the needed knowledge, (2) the knowledge managed or classified in the knowledge base, (3) the match knowledge with users searching keywords identified and retrieved from knowledge base, and (4) the final retrieving results provided to users as list of sources.

According to [22], there are three main aims of organizational knowledge retrieval which are (1) retrieve valuable knowledge that supports the



working need of workers based on their working context, (2) design the retrieved knowledge in clear and structured format to simplify the management of retrieved knowledge in order to serve the workers' needs of knowledge at real time, and (3) decrease the workers' efforts of extraction of needed knowledge from various and large knowledge sources. However, the traditional retrieving processes return the knowledge to workers in an abstract form -without editing or formatting – which exhausts the workers' efforts and time to manage the retrieved knowledge and extract the exact needs of knowledge [2].

[8] Argued that the knowledge retrieval processes should be managed usefully to allow the workers to get their need of explicit knowledge accurately at real time. Thus, the workers' tacit knowledge could be developed with less effort and time which can increase the performance of businesses operations such as decision making and problem solving. Consequently, the explicit knowledge is one of the major resources of tacit knowledge development which represent the importance of retrieving accurate explicit knowledge at real time to serve the workers' tasks that involve the businesses operations.

On the other hand, the improvements of businesses operations lead to enhanced services and products competitiveness. For example, the right working decisions at the right time could increase the quality and fast delivery of services and products which increase the return value of productions (i.e. competitiveness).

[23] Sees that the organizations are responsible about adopting new systems, methods, or strategies to provide focused and valuable explicit knowledge for its workers to develop their tacit knowledge according to working contexts and strategies.

2.3 Knowledge Retrieving Based Classification and Aggregation Approach

Knowledge retrieval processes can be implemented through various approaches and techniques. The classification approach is considered as an effective mechanism to retrieve specific and focused knowledge based on certain classification. The importance of classifying the articles as various parts is demonstrates through [24]. The current model classified the abstract of the articles

into four parts (purpose, method, results, conclusion) which means that abstracts of the articles are pre-processed using an ad hoc sentence splitter in order to enhance the searching process and eventually retrieve the articles that represent the best match with the user query. In this research, the users were allowed to enter long query which is the abstract part. In addition, the model uses the argumentative moves of the abstract in order to enhance the searching results. The main aim of this model was to search and retrieve scientific articles with similar citations in MEDLINE collections based on the weight of the arguments (classifications) which are purpose, method, results, and conclusion.

On the other hand, the Aggregation approach is also considered as an interesting mechanism to retrieve valuable knowledge. It can be defined as the process of collecting various parts from various resources in order to retrieve it in one document. The aggregation method store and display the individual retrieving results in one document based on certain classifications while the traditional method store and display the retrieval results separately. The importance of aggregation approach has been demonstrated through [25]. The current model emphasizes the concept of aggregation by aggregates the retrieving pages that have the most similarity with the search keywords into one document to enhance the process of display the retrieving results.

Moreover, [26] proposed a new model of knowledge retrieval based on classification and aggregation approaches in order to aggregate specific parts from various science articles into one file. Therefore, the academic staff in universities can save their effort and time to manage the retrieved knowledge through extracting the exact parts of knowledge based on their researching and teaching activities. In their model [26], the articles in knowledge base were categorized as many topics based on university teaching and researching fields i.e. IT files. Each topic in knowledge base consists of many articles of PDF extension. The academic staff types his/her searching query and identify the needed searching scope that prefers to retrieve from articles i.e. problem statement or objectives. All matched articles with



searching Keywords could be retrieved. The scope selected by academic staff using their queries aggregated from all candidates articles

3. RESEARCH PURPOSE

The tacit knowledge of academic staff is considered as the most important aspect to help the universities to support their working activities. Thus, the universities are continuously looking to improve the academic staff's knowledge. The explicit knowledge represents a main source to enhance the academic staff tacit knowledge by obtaining various kinds of explicit knowledge such as articles, books, journals and magazines. The articles in a digital form represent an important kind of explicit knowledge. Therefore, the articles retrieving methods can be used to provide the academic staff with the required needs of explicit knowledge that can help them to support their working activities.

This research is conducted under the scope of what are the challenges that are faced in the knowledge retrieving in universities? This research focuses on the challenges that face the explicit knowledge retrieving (scientific articles) for academic staff in universities. The challenges analysis is important to understand the current situation of dimensions of knowledge retrieving methods, and the possible enhancements that could be conducted to improve these methods.

4. DATA COLLECTION

[27] Mentioned that, the use of questionnaire is an effective method to collect data from organizations' workers in order to reflect the current and real situation of specific issue. On the other hand, the questionnaire can indicate the importance of proposed ideas that could be implemented in the organizations.

Thus, the questionnaire survey was conducted in order to analyze the current challenges that face the knowledge retrieving processes in universities. The questionnaire items were adopted from various studies that related to challenges and importance of knowledge retrieving [28],[29].The questionnaire was formulated into three main parts; (1) The Process of Online Articles Retrieving (items 1-7), (2) The Challenges of Online Articles Retrieving (items 8-17) and (3) The Aggregation of Articles Content (items 18-27). The questionnaire responses were

in one file. The final single document that contains the aggregated parts will be shared with the academic staff.

collected based on 5 - Likert scale (1) SA for Strongly Agree , (2) A for Agree , (3) N for Neutral , (4) D for Disagree and (5) SD for Strongly Disagree.

The questionnaire was used to collect quantitative data from academic staff in two Malaysian universities (UPM and Multimedia). The data were collected in the second semester of 2014/2015 academic year. The questionnaire was distributed to academic staffs that possess different qualification levels i.e. PhD and Master and different job experience levels. The researcher collected 53 responses; there were 3 responses dismissed due to incomplete answer. Thus, 50 responses were considered valid for the purpose of this research. As such,, the valid responses represent 94% of all collected responses. The total number of the academic staff in the ICT colleges in UPM and multimedia universities was about 149 workers. According to [30], the sampling percent should be 10% at the minimum for the size of population between 101-1000 workers. Thus, the sampling percent of this research is valid (i.e. 34% of population). Table 1 summarizes the required sampling percent according to size of population.

Table 1: Sampling Rates (Yount, 2006)

Size of Population	Sampling Percentage
0-100	100%
101-1,000	10%
1,001-5,000	5%
5,001-10,000	3%
10,000+	1%

5. DATA ANALYSIS

The SPSS version 20.0 is used to analyze the collected data due to efficiency of SPSS tool in quantitative data analysis. In this study, statistical analyses used are (1) reliability analysis, (2) frequencies analysis and (3) descriptive statistics. These statistical analyses will be discussed accordingly in the following sections.

5.1 Questionnaire Reliability

The questionnaire reliability is defined as stable interrelation between items responses [12].For example, the random answers of items were considered instable responses. The Cronbach alpha, an efficient analysis measure, was used to



measure the reliability of the questionnaire. The acceptable coefficient alpha should be more than 0.7, [12]. Table 2 shows that coefficient alpha is 0.85 based on 50 responses and 27 scaled items. Thus, the questionnaire of this research is reliable due to the acceptance level of coefficient alpha.

Table 2: Questionnaire reliability

Questionnaire Items	Response s Number	Coefficient alpha
27	50	0.85

5.2 Demographic Data

The main aim of demographic data analysis is to confirm the validity of questionnaire responses. The respondents’ characteristics such as qualification level and experience in years had an effect on the provided responses of questionnaire .Therefore, the respondents could have adequate characteristics to ensure the collected responses validity .There are four variables involved in the demographic data in this questionnaire which are gender, age, qualification level, and experience years.

With regards to respondents’ gender, the number of female respondents is 35 (70% of respondent’s total number) while the number of male respondents is 15 (30% of respondents total number). Thus, the collected responses are mixed opinions of male and female respondents. This cover the possible differences of respondents’ vision according to their gender (i.e. female may have different vision than male).

With regards to respondents age, the range of most of the respondents, age is between 35-46 years which represent 48% of all respondents. Thus, the presented respondents reflect the opinions of workers who will be working in their universities for long years in future (i.e. 15-25 years). In other words, the presented responses reflect the current and future situation of universities. The respondents who age more than 46 years represent 28% of all respondents followed by 26% of respondent’s age between 25-35 years.

With regards to qualification levels variables, all respondents have PhD and Master qualification levels with majority holding PhD qualification (76% of all respondents). Thus, the collected responses reflect the academic staff opinions based on their teaching and researching activities. The

teaching and researching activities are usually accomplished by academic staff that own PhD and Master qualifications.

With regards to experience in years of respondents, majority of the respondents have more than seven experience years (80% of respondents’ total) followed by 12% of respondents who have 2-4 experience years. There are 6% of all respondents who have 5-7 experience years and 2% of all respondents have less than 2 experiences in terms of years. Consequently, this segment of respondents is a mature group to provide valid responses for this study. The workers with long experience in years can provide richer value of data than the low experience workers.

5.3 Descriptive Analysis

This section presents the descriptive analysis of scaled items that belong to three main sections of the questionnaire; (1), (2), and (3). The items responses were collected based on 5-Likert Scale; 1 for Strongly Agree (SA), 2 for Agree (A) , 3 for Neutral (N) , 4 for Disagree (D) , and 5 for Strongly Disagree (SD). The responses agreement level are analysed depend on responses means. Table 3 shows the decision of responses agreement level based on means intervals [31].

Table 3: Responses Agreement Level Based on Means Intervals (Al-qawasmeh et al., 2013)

Means Interval	Agreement Rotation	Agreement Level
1-1.49	Strongly Agree	Very High
1.5-2.49	Agree	High
2.5-3.49	Neutral	Medium
3.5-4.49	Disagree	Low
4.5-5	Strongly Disagree	Very Low

5.3.1 Process of online articles retrieving

This part aims to analyze the importance of online articles retrieving for academic staff to support their teaching and researching activities. Are the academic staff seeing the online articles as important sources to support their teaching and researching activities? This is the main question that could be answered through this part. The main explicit knowledge source of the proposed model of this research is the online articles. Therefore, the researcher needs to ensure that the online articles are important knowledge sources for the academic staff.



Table 4: Descriptive Analysis of Process Online Articles Retrieving

Item No	Item	SA	A	N	D	SD	Mean
1	I rely more on the online articles to provide me with the needed knowledge rather than other resources such as books, magazines, and journals.	43	0	7	0	0	1.28
2	I typically look for the articles using search engines such as Google.	46	0	2	1	1	1.22
3	The current search engines usually retrieve the articles in a list form.	45	0	2	2	1	1.28
4	The articles provide important source of knowledge to support my teaching and researching activities.	42	0	8	0	0	1.32
5	I need to retrieve many articles daily to support my teaching and researching activities.	34	0	12	4	0	1.72
6	I find the articles are the most available and accessible sources to support my teaching and researching activities.	43	0	7	0	0	1.28
7	Most of the retrieved articles have standards layout to represent the sections which simplify the extraction of the needed sections for my researching activities.	30	0	16	4	0	1.88

According to descriptive analysis of this part that is show in table 4, item number 4 shows that the respondents agreeing that the online articles are important to develop their working activities and item number 2 shows that the respondents are daily looking for the online articles using search engines to retrieve the needed knowledge based on their working activities. Items number 1 and 6 show that the availability and accessibility of the online articles are the main reasons to adapt the online articles as a main knowledge source rather than other sources such as books and magazine. Based on item number 3, the respondents agreed that the articles are usually retrieved as a list. Moreover, item number 7 shows that the respondents agree that the retrieved articles are designed based on standard layout i.e. introduction, literature review, and methodology.

Based on the findings of table 4, it can be concluded that academic staff see the online articles as the most important knowledge source to support their working activities. However, the articles retrieved are based on the traditional retrieving method i.e. retrieve the articles as a list.

5.3.2 Challenges of online articles retrieving

The main aim of this part is to analyze the challenges of the online articles retrieving based on current or traditional retrieving method.

Table 5 presents the descriptive analysis of this part. Item number 8 confirm that the respondents are agreeing that the articles can be retrieved easily. However, items number 10 and 11 show that the respondents consume effort and time to retrieve the specific needed knowledge due to the style of current retrieving method i.e. show the articles as a list form. On the other hand, items number 15, 16 and 17 show that the respondents face difficulties to provide searching queries to retrieve the exact need of knowledge and they face challenges to manage the needed knowledge that needs to be retrieved from the lists of articles. According to items number 13 and 14, the respondents would like to improve the current retrieving method to access the exact need of knowledge with less effort and time.

Table 5: Descriptive Analysis of Challenges of Online Articles Retrieving

Item No	Item	SA	A	N	D	SD	Mean
8	I can easily find the needed articles for my daily teaching and researching activities.	34	0	11	5	0	1.74
9	The Traditional design of retrieving the articles in a list form waste a lot of my time.	14	0	27	9	0	2.62
10	The Traditional design of retrieving the articles in a list form complicate the extracting of the specific parts that I need from the articles.	20	0	22	8	0	2.36
11	The Traditional design of retrieving the articles in a list form provide less matching results to my search query.	22	0	19	9	0	2.30
12	I prefer to retrieve specific parts of the articles rather than the whole articles.	21	0	13	14	2	2.52
13	The current search engine provides me with general retrieving results even if i only search for specific parts.	32	0	14	4	0	1.80
14	I would likely put less effort to look for specific parts of articles.	23	0	17	9	1	2.30
15	I use advanced query syntax to help me find what I'm looking for	29	0	16	5	0	1.94
16	It is hard to access many articles in order to retrieve the exact needed content.	28	0	13	9	0	2.06
17	I need to manage the parts of the articles using supportive methods such as papers to decide the most efficient articles for my teaching and researching activities.	31	0	14	5	0	1.86

Based on the findings of this table, it can be seen that the respondents can easily retrieve the online articles in their daily activities. Nevertheless, they are agreeing that the current traditional retrieving method have many challenges. Accordingly, the results indicate that the consumed time, effort, and the articles management are the most important challenges that face the respondents during the online searching progress. In addition, the results indicate that the traditional retrieving methods provide general explicit knowledge while the respondents are searching for more specific knowledge. Thus, we can conclude that the respondents would like to use more improved methods to retrieve their online needed knowledge.

5.3.3 Aggregation of articles content

This part demonstrates the opinions of academic staff of the articles retrieving method based on classification and aggregation approach to enhance the teaching and researching activities. According to the descriptive analysis of this part that is shown in table 6, items number 18 and 26 shows that the respondents prefer to retrieve the collected parts of articles in one single document. In addition, item number 24 and 25 show that the respondents usually search for specific parts of the articles i.e. introduction, problem statement, literature review and they are agreeing that retrieving specific parts of the articles based on this classification will provide more useful



knowledge to support their teaching and researching activities. Accordingly, item numbers 19, 20, 21, 22 show that the respondents are agreeing that the aggregation approach will enhance the work activities by consuming less time and effort. Respectively, item number 23 shows that the respondents agree that the aggregation approach will motivate them to be

more effective members in the scientific research field. Eventually, item 27 shows that the respondents are strongly agreeing that the aggregation approach will provide more matching results to their queries and that will better provide them with the much needed explicit knowledge.

Table 6: Descriptive analysis of Aggregation of Articles Content

Item No	Item	SA	A	N	D	SD	Mean
18	I prefer to retrieve collected parts of various articles in one document	31	0	14	5	0	1.86
19	The collected parts from various articles in one document will minimize my effort to decide the most useful content for my teaching and researching activities.	38	0	9	3	0	1.54
20	The collected parts from various articles in one document are less time consuming to decide the most useful content for my teaching and searching activities.	37	0	11	2	0	1.56
21	The collected parts from various articles in one document will improve the management of contents interrelation identification.	39	0	9	2	0	1.48
22	The ability of retrieving the needed parts in one document will enhance my teaching and researching capabilities.	36	0	10	4	0	1.64
23	The ability of retrieving the needed parts in one document will motivate me to do more research.	28	0	16	6	0	2.00
24	I usually look for specific parts of articles such as problem statement, literature review, results, or methodology.	34	0	7	8	1	1.84
	The classification of the retrieving parts of the articles such as problem statement, literature review, results or methodology will be more useful than retrieving the whole articles.	32	0	11	7	0	1.86
26	I prefer to retrieve the collected parts from various articles in one document such as retrieving the problem statement parts of the same search query in one document.	30	0	16	4	0	1.88
27	The aggregation of the articles parts based on certain classification will help to provide more matching results to my query.	36	0	12	2	0	1.6

Based on the findings of this table, most of the academic staff agrees that the aggregation method will enhance the retrieving process of the scientific articles. In addition, the results indicate that the academic staff consider the aggregation approach based on certain classification i.e. introduction, problem statement and literature review will consume less time and effort as well as provide more matching results to their search queries. Thus, it can be concluded that the aggregation concept is highly accepted by the respondents and the aggregation approach will provide the respondents with the needed knowledge in less time and effort.

5.4 Results Discussion

The conducted study of this research revealed the current situation of knowledge retrieval processes inside the universities' environment.

Accordingly, the data analysis from the distributed questionnaire shows that the academic staff inside the universities' environment currently used traditional retrieval methods with regards to articles retrieving purpose (i.e. google). These traditional methods retrieved the required articles in a list form without editing or formatting. Thus, the data analysis of research questionnaire indicates that there are problems in the current articles retrieving process. Consequently, certain challenges have been discovered and demonstrated to give a holistic picture of the difficulties that are faced the academic staff in the current article retrieval process. From this perspective, it can be seen that the traditional retrieval process retrieve general knowledge content while the academic staff search for specific knowledge content and thus lead to the consumption of large amount of time. In addition, great effort was laboured during the current retrieval process in order to manage the



general retrieval knowledge to derive the specific required needs.

With regards to the previous challenges, the data analysis of this research questionnaire indicated that the majority of academic staff preferred to use different methods in order to retrieve specific parts of articles rather than retrieve the whole article. In addition, the academic staff is willing to try different methods that could reduce the time and effort involved in the current articles retrieval process.

6. RECOMMENDATIONS

According to the questionnaire results, it is recommended that new models of articles retrieving based on aggregation and classification methods to retrieve specific articles parts be developed. The classification method that classify the articles into certain parts in the purpose of retrieving these parts is considered as a useful idea by enhancing the search engine and provide more specific details. For example, the articles can be classified as many parts such as introduction, literature review, methodology, findings and conclusion. The classification technique was provided clearly by only one piece of work which is [26]. Thus, the classification of articles parts could enhance through deep classifications i.e. the literature review part can be classified as many parts such as concepts definitions, aspects reviewing and models discussion.

On the other hand, the aggregation method is also considered as a useful method since it can automatically generate and collect the specific articles parts based on the given classification and aggregated into one document. For example, the academic staff would retrieve one document that contains the findings part from various articles that related to searching query of academic staff. Therefore, the academic staff can reduce searching effort and time by selecting the most suitable knowledge that satisfies their working needs.

7. CONCLUSION

The scientific articles represent the main explicit knowledge resources to develop the tacit knowledge of universities academic staff in order to accomplish various activities such as researching and teaching activities. The current retrieving methods that adopted by academic staff are retrieving the articles as list of sources based

on knowledge searching keywords. These methods are consuming the academic staff efforts and time to extract focused and valuable knowledge that satisfy their working needs of knowledge. Knowledge retrieving based on classification and aggregation approaches could be useful to reduce the required efforts and time to retrieve parts of knowledge in one document rather than list of whole knowledge sources. In the future the knowledge retrieving model according to proposed approaches of classification and aggregation could be developed in order to clarify the proposed processes of knowledge retrieving in details.

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