

# Content Management System (CMS) for Public Health Professional in the Telehealth Department, Ministry of Health, Malaysia: A Conceptual Framework

Hasnah Hashim, Siti Arpah Noordin, and Norshila Saifuddin

**Abstract**—A vibrant empathetic of the unique information needs of public health professional is dynamic to the design process for a Content Management System (CMS). Voluminous of publication format produced in printed or electronic at various levels from local to international level, support the critical decisions for public health professional in information access relevant. This concept paper is to highlight the matters arise for public health professional in the Telehealth Department of the Ministry of Health (MOH), Malaysia in searching for procurement information. The public health professionals use a variety of databases and portals to search information related to their work which include medical equipments. Hence, the paper will first encounter a step towards establishing a framework for developing a Content Management System (CMS) requirements that will inform the design and development process. Adopting the qualitative research approach, the research conceptual framework will govern the research process to study the requirements of the health professionals from Ministry of Health (MOH), Malaysia.

**Index Terms**—Information needs, system requirements, content management, public health professional, Malaysia.

## I. INTRODUCTION

One of the objectives of Telehealth Department, Ministry of Health (MOH), Malaysia is to develop and improve the information, communication and technology in the medical and health industry. In late 1997, the Telehealth project derives from the Multimedia Super Corridor (MSC) project. was initiated. In 2000, the Telehealth team involved in 4 main projects of Telehealth which includes: Lifetime Health Plan (LHP), Mass Customized Personalized Health Information And Education (MCPHIE), Continuing Medical Education (MC) and TeleConsultancy (TC). In order to retain and assure the Telehealth projects, the Telehealth Unit to carry out Telehealth projects of the Ministry of Health (MOH), Malaysia was established.

Information needs in various disciplines and using information science can deal with all subject areas and field [1]. Complicating the situation is the fact that public health professional includes many disciplines. This is because, the workforce is diverse; and the job functions varies and often overlapping. In fact, the diversity of the public health

professionals' backgrounds and roles present a big challenge to those studying public health information needs, ways to improve access and reduce barriers to needed information [2]. One of the key barriers is information overload is to access the best evidence for decision making and updating effective knowledge which often being addressed through evidence-based medicine [3].

Basically, in Malaysia, the procurement of medical equipments for public health is under the responsibility of the Telehealth Department, Ministry of Health (MOH). Therefore, searching for information, data, specification, materials and clinical information will require an exhaustive searches which include databases and repositories. As these information is not located in a single platform, the responsible health professionals need to have different logins to enable them to execute information searches. Furthermore, for the public health professionals, searching for information for medical equipments will need them to acquire from other sources such as the medical library or information resource centre.

As the public health professional has distinctive information needs, clear understanding is vital in order to design a framework for CMS. Hence this conceptual paper require a broad understanding and review from the present-day perception related to the information needs of the Malaysian public health professionals.

## II. LITERATURE REVIEW

### A. Information Needs of Public Health Professional

As the findings from previous research highlighted the public health literature is poorly indexed in bibliographic databases, disperse across a wide variety journals and in fact other sources across many disciplines [4], [5], consequently, special attention is required in developing a comprehensive search strategy. Therefore, it has been suggested for the public health professionals to have a dual strategy; a) promoting incremental improvements in existing information delivery systems based on the system's preferences of the public health users b) the concurrent development and rigorous evaluation of new models of information organization and delivery that draw on successful resources to deliver information to clinical medical practitioners [6].

Issues addressed by previous studies on the information needs of public health professionals include; information seeking behaviors of public health workers, barriers to information access, and identifying and classifying the specific types of information needed. Studies also focusing on how

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public health workers look for electronic information-seeking behaviors and the requisite skills required to access to electronic databases [7].

It has been reported that the medical practitioners in developing countries need more awareness about the use of various information sources for their professional and personal competency development which can be acquired from various training programs such as the Professional Development Course (PDC), RTI/STI in RCH, RCH-2, EmOC (Emergency Obstetric Care, Medical Termination of Pregnancy (MTP) offered by the government of India [8]. Furthermore, the government of India is providing an extension initiative; i.e. Continuing Medical Education (CME) program for both government and private medical practitioners. To increase medical practitioners information skills and competency, probably the training programs offered by the government could include a separate module on Information literacy, which may include digital information literacy skills.

### *B. Various Management Systems for Content*

The advancement of technology allows the development of various systems for managing content. A content management system (CMS) is basically a computer system or an application that allows publishing, editing, or modification of content, as well as site maintenance, from a central page [9]. Large amount of documents are being produced daily by organizations based on their transactions and operations. They realize that documents produced in various formats such as Word files, spreadsheets, PowerPoint presentations need to internally be organized [10]. While there is a need for the organizations to have a standardized and systematic tool to manage their documents, information, records and reports, they must also aware that every related task need to be captured and controlled [11].

The Enterprise Content Management Systems (ECMS) and Web Content Management Systems (WCMS) are the two types of CMS. Enterprise Content Management (ECM) is a formalized means of organizing and storing documents, and other content, that relate to the organization's processes. These high-powered software packages are usually used in an or corporate level section as the software packages are considered comprehensive solutions in delivering effective content management [9]. Both of the systems have similar concepts and functionality to the organization. therefore, ECM systems are used to store and distribute digital content and consists of different kinds of documents that are related to organizational processes also can be critical to business processes. ECM centrally be used to store documents which then can be accessed by users on the other side of the world. which supports employees communication as to align to their business processes. On top of that, ECM systems have been established with the current solutions to allow users to do transactions [11]. As well as ECMS, WCMS is also software system that provides a platform for the central page of sharing documents, reports, manual and varied types of information for the organization. However, as another CMS, WCMS is a a web-based application, designed for creating and managing HTML and at the same time enabling non-technical users, with friendly user interfaces to create,

edit, manage and control a dynamic web content [12]. In the other studies of [13], WCMS is defined as a software tool which facilitates the distribution of writing practices across the organization. Through this feature, with little training, the content writers is directly responsible for the content editing and publishing on the web pages without relying on a webmaster [13].

### *C. Why Needs Content Management System?*

The need for a content management system in an organization is because of the ongoing employees tasks and routines involved every single day as to achieve organization strategic focus. Having a CMS will allow their users to apply the content from different types of document and materials produced by the organizations [5]. Hence, CMS may facilitates a single platform for their users for a timely and accurate information. Thus, it provides employees with the proper knowledge to make the right decisions at the right time.

Information is scatteredly stored in departmental file servers, personal computers, filing cabinets, and desks where only dedicated groups of people have access to it. Hence, a centralized CMS provides the opportunity to formulate new business rules for managing organization information resources [14]. To allow that, a document created or stored in the CMS will have levels of authority for access as to restrict confidential or sensitive information to certain users in the organization. However in an organization, it is possible for general information which is often used repeatedly and highly demand for to be stored in a central page; which include the technical documentation, reference, testing and training, and marketing and educational materials [5].

Today, organizations or companies are becoming competitive in publishing their website while the cost of developing websites continues to increase from time to time. Thus, by implementing a CMS in organizations allows them to manage their own websites [14]. Furthermore, there are scores of available CMSs in the market ready to be deployed [15]. The organization must be able to choose which CMS suits their core business and financial plan. Another stage after the implementation of their own CMS, organization will need to consider the improvisation of the system to a more dynamic website with personalization [14] such as Land's end, Amazon.com, and Yahoo!.

### *D. Preliminary Stage*

At the preliminary stage, the researcher requires ideas to overcome the problem for public health professional in Telehealth department. The purpose of the preliminary stage of the project is to provide sufficient information to a public health professional to enable them to make a decision as whether to proceed further with the project by developing the framework of the CMS for the Malaysian public practitioners. Fig. 1 depicts the preliminary stages of the CMS development.

### *E. Research Methodology*

The study will adopt the qualitative research approach. The method of data and information gathering were semi-structured in nature. It involves some interviews as well as some survey questionnaires. Semi-structured interviews offer information in between the structured and unstructured spectrum of

information gathering.[16]. The benefit of having interviews is to get the total perspective of information about knowledge sharing process and practices.

Several people from the senior position of the Telehealth Department will be interviewed besides survey questionnaires targeted to middle level. The data collected from the interviews and surveys will be analyzed and integrated to give a composite picture of processes, practices and results of developing a framework for Content Management System (CMS) requirements.

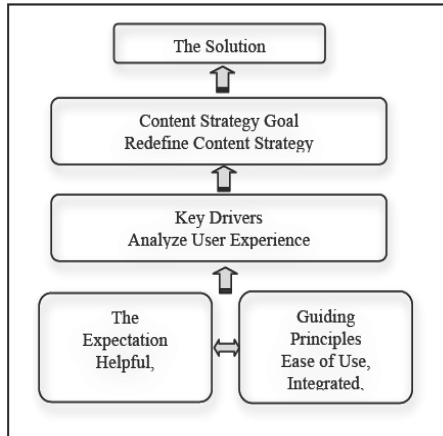


Fig. 1. Preliminary stage of CMS.

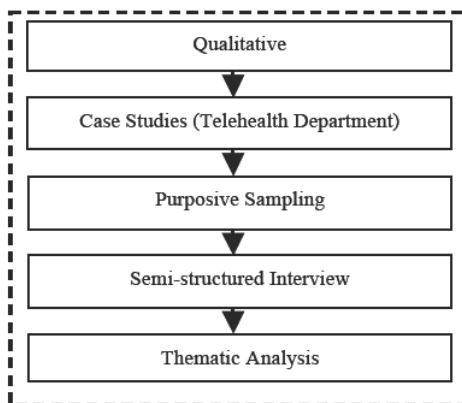


Fig. 2. Research design flow.

### 1) Qualitative

Qualitative research is a type of scientific research [17]. In general terms, scientific research consists of an investigation that 1) Seeks answers to a question 2) Systematically uses a predefined set of procedures to answer the question 3) Collects evidence 4) Produces findings that were not determined in advance 5) Produces findings that are applicable beyond the immediate boundaries of the study.

Qualitative research shares these characteristics. Additionally, it seeks to understand a given research problem or topic from the perspectives of the local population it involves. Qualitative research is especially effective in obtaining culturally specific information about the values, opinions, behaviors, and social contexts of particular populations [18]. It is also a form of social inquiry that focuses on the way people interpret and make sense of their experiences and the world in which they live.

### 2) Case studies

According to [19] case study is a detailed analysis of a person or group, especially as a model of medical, psychiatric, psychological, or social phenomena an intensive analysis. Based on this definition, [20] a case study focused on the research is a bounded system or case [20]. Thus, case study is an excellent opportunity to gain incredible understanding into a case. It enables the researcher to gather data from a variety of sources and to converge the data to clarify the case.

### 3) Purposive sampling

Purposive sampling is virtually synonymous with qualitative research. Purposive sampling represents a group of different non-probability sampling techniques. Also known as judgmental, selective or subjective sampling, purposive sampling relies on the judgment of the researcher when it comes to selecting the units such as people, cases or organizations, events, pieces of data that are to be studied [19]. Usually, the sample being investigated is quite small, especially when compared with probability sampling techniques.

### 4) Semi-structured interview

A semi-structured interview is a method of research used in the social sciences [20]. While a structured interview has a formalized, limited set question, a semi-structured interview is flexible, allowing new questions to be brought up during the interview as a result of what the interviewee says. The interviewer in a semi-structured interview generally has a framework of themes to be explored

### 5) Thematic analysis

Thematic analysis, as in grounded theory and development of cultural models, requires more involvement and interpretation from the researcher. Thematic analysis move beyond counting explicit words or phrases and focus on identifying and describing both implicit and explicit ideas within the data, that is, themes. Codes are then typically developed to represent the identified themes and applied or linked to raw data as summary markers for later analysis [21].

### F. A Conceptual Research Framework

The study will focus on group of public health professional in Telehealth department, Ministry of Health (MOH), Malaysia. This group of public health professionals are in charge of procurement for medical equipments. The research tends to address two research questions; a) what are the information seeking behaviour of the public health professional in e-procurement b) what are the barriers to meeting those needs. Hence, the objectives of this research are: a) to explore types of information needs in e-procurement for public health professional b) to investigate information seeking behavior for public health professional and c) to identify the barriers faced by the health professionals while executing their daily practice. Therefore, input from these activities will be capitalized to develop a dynamic, scalable and effective CMS for public health professional in Telehealth department.

A conceptual research framework for this study is adapted from the environmental scanning framework [22]. Thus, environmental scanning as information seeking and organizational learning processes, discussed implications for managerial action, and practicing in their daily tasks to

investigate the public health professional to achieve their organization objectives.

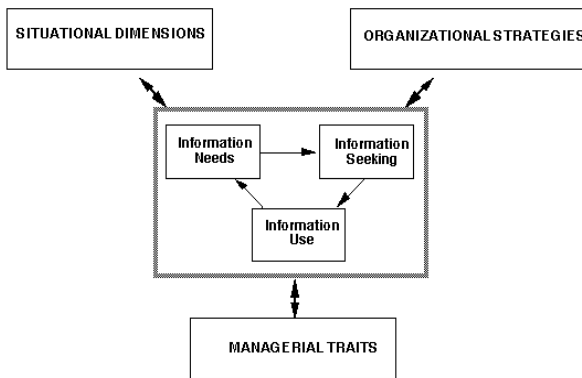


Fig. 3. Conceptual research framework [22].

Referring to [22] environmental scanning, this conceptual framework is adopted for the public health professionals procurement activities in Telehealth Department. Situational dimension is related to scan from manager's level in order to realize certain changes to the external environment because of ambiguity or insecurity [22]. Therefore, in this situation public health professional in Telehealth Department has been given opportunity to use other library resources without any fees or charges in their daily practice. However, the other library started to charge with certain cost to their external users. In this organizational strategy [22], information gathers to develop, plan and construct policies. Hence, in Telehealth Department, information will be manipulated to develop strategy, policy, documentation, and procedure. While the managerial traits refers to tasks and job experience also should be investigated. Senior public health professionals will have more experience than the juniors in the department. Therefore, they will be different in such as their practicing experience, knowledge, skill, and involvement. In Telehealth Department, scanning for information needs to gather input from public health professionals types of information needed as they have different specialization of and experience. Information seeking according to [22] is related to the information resources. In this research, it can be referred to existing databases from different vendors. It is known that various appropriate databases, online searching, journals, handbooks, and manuals that public health professionals use in their daily tasks. Information use in this research, relates to the long-term plan for the selection and implementation of the resources for the public health professional, so to enable the utilization of the system.

### G. Data Collection

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. As in a qualitative research, the most common methods employed include observations, interviews and focus groups [23]. Therefore, the data collection method adopted in this study is the semi-structured interview. One of the reason of adopting this approach is because, from the

qualitative interview, it allows the researcher a considerable flexibility on how to conduct it [24].

The other type of data collection for this research is the focus group. It is from the focus groups will ideas and views allowed to be challenged interactively as to achieve credibility [25]. Focus group in this research is the public health professional in the Telehealth Department, which their task is related to the procurement activities of the medical equipments for the Ministry of Health.

After defining focus group for this research, next process involves semi-structured interview for public health professional in Telehealth Department. Semi-structured interviews, facilitate an immediate response to a question. It also allows both parties to explore the meaning of the questions and answers and resolve uncertainty [23]. Hence, this semi-structured interview provides a friendly emphasis to data collection. Furthermore, semi-structured interviews reduce communication gaps between both parties; researcher and informants and may could facilitate a greater degree of research effectiveness.

### H. Data Analysis

Qualitative data may be analyzed in several ways, such as thematic analysis, or in [26] suggested; ethnographic analysis, narrative analysis, phenomenological analysis, constant comparative method, content analysis and analytic induction. The method chosen in analyzing the interview transcript is thematic analysis. The thematic analysis will be employed as to formalise the identification and development of themes generated from the qualitative data [27].

### I. Sampling

Purposive sampling offers researchers the benefits of a variety of features or processes which researchers could access himself if he is interested, however, is not a simple approval to be applied to any case the researcher intend to study [28]. According to [29], purposive sampling will assist the procedure of gaining access to information-rich cases, which facilitates researchers to explore the width and breadth of the phenomenon under study and thereby gaining in-depth understanding of the said phenomenon. Purposive sampling is employed, in this research to identify and select a specified number of public health professional believed to be the informants who could provide and generate pertinent data based on their involvement in procurement activities.

### J. Open Source CMS

Open source refers to the concept and practice of making program source code openly available which allows users as well as the developers have access to the core designing functionalities. In this context it allows them to modify or add on features to the source code and redistribute it. Extensive collaboration and circulation are central to the open source movement [30]. Furthermore the open source software offers one approach to address the technical problems in providing optimal delivery of online learning [31].

Open source CMS enables user to have the software by downloading from the web server. A user can do whatever they wish with the product and the code behind it, increasing and integrating, as it is appropriate to their organization. The CMS

software is free and anyone can download and install them on a web server without the cost. A user either needs to put a lot of time into implementing and maintaining the system if they need to hire someone to do it for them if there is no expertise [9]. However, open source CMS implemented as a web-based application designed for creating and managing HTML and also enabling non-technical users, with friendly user interfaces to create, edit, manage and control a dynamic web material [12].

There are various open source CMS available ready to be downloaded. However, user needs to do some research, evaluation and comparison for the appropriate open source CMS as to reduce cost of having their own CMS. Currently, among the commonly used open-source CMS are Joomla, Drupal and WordPress [9]. Furthermore, the comparison of programming languages, databases and web servers to build CMS, will enable users to review the most appropriate CMS solution. It also provides information on FTP support and UTF-8 support for the CMS. Additionally, [9] states Joomla is the easier to for beginners. Even though, there are fewer choices of design templates for Joomla, the software has a enhance user interface rather Drupal. While, WordPress is categorize as the best solution for the user as the plugin architecture allows them to extend its features.

There is another analysis and comparison of open source CMS available on the web server. The studies has list of many more open source CMS such as eZpublish, Mambo, MySourceMatrix, OpenCms, Plone, Typo3, WebGUI besides the three commonly used open source CMS such as Joomla, Drupal and WordPress [32]. Moreover, this study makes comparison of open source CMS in specific attributes, with complex technologies such as AJAX, and extensive application of search engine optimization (SEO). Besides, this study gives more idea of selection for a content management system depends on a variety of criteria, depending on the scope of the project. Anyway, the other part, which is documentation, has been highlighted in this study. Back to the objectives of this research as to provide helpful, attentive, fast, personalized, ease of use, integrated and scalable CMS for the public health professional at Telehealth Department, this study much more informative and instructive for the coverage of open source CMS. Nevertheless, recommendation for the open source CMS with ready-made templates, enable user speedier time to have their own CMS.

### III. CONCLUSION

Content Management System is becoming widely used in managing web content. These tools provide a platform for the construction of web-based tools that are easier to manage. It is hardly to recommend the best solution of open source CMS because it is depending on various criteria such as the nature of the project itself, the reasonable price, the expertise and existing content database of the organization. In this research, researcher is considering for the early stage of developing a framework for the public health professional in Telehealth Department, Ministry of Health, Malaysia. The result of this early stage, will resume for the

CMS architecture of this project.

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