

PROGRAM DESCRIPTION / DESCRIPTION DU PROGRAMME

Information overload in healthcare management: How the READ Portal is helping healthcare managers¹

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Abstract: Information overload is a serious threat to the productivity of healthcare managers. Instead of facilitating informed decision making, an overabundance of information actually impedes managers from negotiating information effectively. There are many methods of dealing with information overload, one of which is the use of web infomediaries as a source of information. The University of British Columbia's Centre for Health Care Management's READ Portal (<http://www.read.chcm.ubc.ca>) is an example of an infomediary that is striving to help healthcare managers overcome the effects of information overload. This portal aggregates content from numerous high-quality sources, which is then hosted in one easy to access location. Content is condensed into brief abstracts and synopses that are easy to ingest and includes links to full-text articles and papers that viewers can either choose to visit or not, depending on their needs. The READ Portal can be used as a model for other organizations looking to meet the information needs of managers without overwhelming them with excessive information.

Introduction

Information overload is a serious issue faced by all types of upper-level management in the modern information economy [1]. It occurs when individuals are exposed to more information than they can effectively utilize, which causes frustration and anxiety and leads to poor decision making [2, 3]. The dynamic information needs of the healthcare community make healthcare managers especially prone to the perils of information overload [4]. For this paper, the definition of healthcare manager includes those who hold either managerial or executive positions within primary care or acute care facilities [5]. They are responsible for various operational aspects of their healthcare organizations, including human resources management, organizational development, strategic planning, project management, capital development, and financing, etc. [5].

Conducting research for this program description necessitated the use of library and information sciences databases, medical databases, and business databases. As such, the following databases were scanned to find information about the impact of information overload on the productivity of upper-level healthcare managers: Pubmed; Cumulative Index to Nursing and Allied Health Literature (CINAHL); Library, Information Science & Technology Abstracts (LISTA); Library and Information

Science Abstracts (LISA); ABI/INFORM; and Google Scholar. A variety of terms relating to management and access to information were employed to conduct the literature search, including subject headings specific to each database (i.e., "Health Services Administration/Management" and "Knowledge Management" in CINAHL or "Information Overload" and "Management" in LISTA) and keyword terms when no appropriate thesaurus terms were apparent (i.e., trying multiple terms to describe health care administration in LISA to capture all relevant results). Citation linking was also used to find the most up-to-date, relevant articles. As this description focuses on the efficacy of a solitary knowledge management system (the READ Portal), tools like Google Analytics and Bit.Ly URL shortener were employed to find meaningful data about user behaviours. Although the primary date range for the literature review was 2000 to 2011, one article from 1976 that discusses the origins of information overload was consulted to provide historical context to the subject.

Although there exists a great deal of literature concerning information overload as it pertains to medical practitioners, the literature review revealed that there has been little research conducted specifically on the effects of information overload on healthcare managers. As such, to be considered for inclusion within this literature review,

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the selected resources were required to be current and focused on information overload within a managerial context or a healthcare setting (i.e., information overload as faced by doctors, healthcare administrators, etc.).

Current research indicates numerous occupational causes of information overload among healthcare managers, including heavy workloads; increased time demands from various groups (e.g., patient safety advocates); the increasing number of academic, business, and trade publications; and excessive intra-organizational meetings [4, 6, 7]. Additionally, as mobile technology advances, healthcare managers are further inundated with data [7]. As a result, healthcare managers struggle to stay up-to-date with the immense volume of information that is published through a myriad of avenues such as journals, newspapers, websites, grey literature, and government and agency reports [4, 6].

Both individual and organizational productivity are adversely affected by the pitfalls of information overload in the healthcare management setting. Individual performance suffers due to stress, exhaustion, and anxiety resulting from the inability to consume all of the pertinent information related to their field [1, 6, 8]. Organizational productivity is affected due to misdirected personnel resources or lagging behind current information, which results in unnecessarily missing opportunities to cut costs and improve efficiency [1, 6, 8]. While these factors negatively affect all types of business and management, they are especially critical in the healthcare sector where human wellbeing is predicated upon a well-informed workforce. In his 2001 article on the subject, Wilson gives the example of a manager who may wish to cut staff hours to balance a budget, but that this desire must be tempered with research that shows that cutting hospital staff has a direct correlation with increased mortality rates [2]. In the healthcare sector managers must have access to all the pertinent information available to ensure that they are making the best decisions.

There are many methods of dealing with information overload, including filtering information, withdrawing from the information seeking process, employing push technologies, or using web infomediaries [6, 9, 10]. When an individual “filters” they attempt to isolate and ignore information that is not directly pertinent to their research need. This method of mediation is widely used but can be problematic for healthcare professionals as valuable information may inadvertently be overlooked. Other professionals will simply attempt to limit the amount of information that they have at their disposal, otherwise known as the “withdraw strategy.” The withdraw strategy counteracts good research practices (i.e., consulting a multitude of varied sources) and, as a result, valuable information may be missed [9]. Additional methods of dealing with information include employing push technologies. Subscribers define their information need and, when new content that meets their criteria is available, it is “pushed” to them via email, text message, or some other form of electronic communication. Push technology relies on information seekers to understand their information needs and to be able to convey said needs into searchable terms. The inability of many people to construct effective search terms may result in missing relevant resources.

Additionally, push technologies underestimate the value of serendipitous discovery, as users do not accidentally stumble upon useful information during the research process [10].

Web infomediaries are agents that act as aggregators of relevant information. They collect, review, and disseminate information to target audiences using information technology. By sifting through the vast amounts of data and only presenting that which is right for the target audience, an infomediary rescues the information seeker from the common burdens of information overload [6]. Portals, a type of content aggregator that provides online access to information sources, are one of the most valuable types of web infomediaries [6]. A portal’s structured approach to purposeful information dissemination helps stem the tide of information overload. There are numerous types of portals currently in use, including data portals, which focus on managing organized data; collaborative portals, which strive to create interactive hubs; and information portals, which collect data from a variety of sources in one location [11]. Typically, a portal is categorically and hierarchically arranged to facilitate ease of browsing. All types of portals typically include features such as federated search functionality, email updates, RSS feeds, links to other sites, and more [6].

Portals are used by a number of disciplines to counteract information overload: organizations use portals in knowledge management settings; scientists and researchers use portals to avoid overlapping studies; and top-level managers utilize portals to help with the decision-making process [6, 11–14]. Portals are especially ideal in the dynamic realm of healthcare management, as many healthcare professionals and executives have a stated preference for digital information from online sources [15]. Continuously maintained portals ensure that these professionals are seamlessly updated with current and reliable medical management research and information [16]. It is important to note, however, that portal managers must employ strict standards in selecting content to ensure that the portal meets the information needs of the user. A portal that contains irrelevant content will quickly be discarded as a trusted information source if it does not meet the needs of its users [6].

Description

The READ (Research, Evidence, and Analysis for Health Care Decision-makers) Portal (<http://read.chcm.ubc.ca>) at the University of British Columbia’s (UBC) Centre for Health Care Management (CHCM) is one example of a portal-style infomediary that is seeking to assist healthcare managers in addressing their information needs without succumbing to information overload. READ’s mission is to “provide health care managers with access to high quality, timely, open access and gray literature with an emphasis on Canadian content, compiled and annotated by experts at the UBC Centre for Health Care Management” [17]. This new initiative, launched in September 2010, provides healthcare managers with timely access to articles, press releases, multimedia presentations, reports, open-access journal articles, and

grey literature. The website is updated by the CHCM librarian with one new content item daily from Monday to Friday. To ensure that all site users can utilize the content, only open-access articles are posted. Content items for READ include government publications, university research materials, news items, journal articles, and other types of content that relate to hospital and healthcare management, economics, technology, and information. The resources come from a broad variety of sources, including databases with open-access articles (Pubmed Central, PLoS ONE), online journals (BCMJ, McKinsey Quarterly), government funded websites (Canada Health Infoway, Veteran Affairs), and industry websites (The King's Fund).

It is the CHCM librarian's job to scan through all the content sources to identify resources that are relevant to healthcare managers. Some of the sites used for the READ portal have email subscription services so that the librarian is updated with new content as it becomes available. Other sites that do not offer such services require that the librarian visit every week to check for new content. These sites are tracked using an in-house created list of relevant sources. Once relevant materials are identified, the librarian posts article synopses and abstracts with a citation and link to the original article on the READ home page. The READ Portal back-end is based off a custom install of WordPress, a content management system that allows for easy maintenance of the portal and provides other value added services, such as the automatic upload of new posts to the READ Twitter account. Typically, the portal requires 10 hours of maintenance per week.

By aggregating these summarized, compact information snippets in a centralized location, the READ Portal provides healthcare managers and executives with access to valuable research and articles that they do not have time to find independently and ensures that they are not being overwhelmed with excess information that is not applicable to them. According to a 2010 study of information overload in healthcare management, this format of information dissemination also addresses the manner in which managers want to receive new data [18]. The study found that managers want bite-size pieces of information that are easily digestible while still imparting the "meat" of the work. If they feel the work is of sufficient value, they will choose to read the entire article at their leisure [18]. The READ Portal encourages this type of research behavior.

The READ Portal attempts to organize information in an intuitive, user-friendly way to combat information overload. Each article is hand-tagged using a thesaurus that was created in-house and is based on Medical Subject Headings (MeSH). Portal visitors can access content by visiting the home page and browsing the latest articles that have been posted; by searching the site for specific terms or tags; and by clicking through posts that are archived with the MeSH-based tags. Currently one of the most popular tags is "statistical and numerical data". The ease with which portal users can search and browse content is one of the ways that the READ portal helps to mitigate information overload.

Outcomes

To ensure the success of the READ Portal, the site designers conducted a comprehensive information need analysis of healthcare managers. First, a review of six existing sites that targeted healthcare managers was conducted to ascertain what aspects of the site were efficacious and what parts were lacking. Next, healthcare executives within the greater Vancouver region were surveyed as to their online information seeking behaviour to tailor the site towards their information needs. Finally, a site mock-up (basic prototype), including the labeling scheme and site organization hierarchy, was created and tested by a number of volunteers from the healthcare management community. The research and development invested in the construction of the portal was necessary to ensure that the site would be effective in helping healthcare managers access high-quality information without contributing to information overload. The results of the testing lead to a reformatted version of the final site, which was launched in September 2010.

To ensure the continued efficacy of the READ Portal, a number of analytical tools are used to track site usage. Both Google Analytics and Bit.Ly (a URL shortener that allows for the tracking of link clicks) are used to monitor important statistics such as the average time on site, number of visitors per week, point of entry, source of traffic, and pages visited. Industry Mailout, a proprietary e-newsletter generator that allows for the easy creation and dissemination of information, is also used to monitor click-through rates from the biweekly READ newsletter. A Google Analytics review indicates that, while the majority of visitors come from Canada, there are also numerous site users from across the globe, including the United States, Australia, and the United Kingdom. Users access the content from a number of different sources, including navigating directly to the site to check updates, adding the READ RSS to feed readers, and receiving email updates. Use of these analytical tools helps the READ Portal be a fluid knowledge enterprise that constantly evolves to meet its target's needs.

Discussion

Healthcare executives are often victims of information overload and, as a result, they frequently miss or bypass relevant information available to them. This is potentially disastrous as healthcare executives are in charge of critical services such as hospital administration and management, and a lack of proper data can lead to uninformed decision-making and therefore potentially increases the risk of harm to patients [2]. While a numerous approaches to counteract information overload among healthcare managers exist, the one method that stands out is infomediation, specifically through the use of portals. Portals stem the onslaught on information overload by aggregating high-quality content from numerous sources in one easy-to-access location. Portals are only as useful as the quality of their content and, as such, some portals are better than others; however, this risk can be mitigated by implementing rigorous vetting policies and techniques as well as ensuring

capable staff are seeking out content [6]. The READ Portal is one such example of an infomediary that is effectively and successfully mitigating information overload without bypassing quality information.

There are a number of developments currently planned for the READ Portal, the first of which will be the introduction of “Hot Topic” pages. By mining data from Google Analytics and Bit.Ly, the READ librarian is able to see which categories are most popular among portal users. This information will be used in the formation of monthly “Hot Topic” pages, which will be similar in style to library pathfinders containing general information about the topic, links to web pages that focus on the topic, links to articles and reports on the topic, and suggested strategies for finding further information about the topic. This will be an ongoing process and old “Hot Topics” will be archived for reference.

Concurrent to the implementation of the hot topic section, the next stage of the READ Portal will include a survey of existing users to assess how the site can be improved to meet their information needs. Questions that target site usage, access, quality, and content preferences will be asked so that the site can be restructured if necessary. To maintain efficacy and relevancy, portals must never be static and should continuously strive for improvement [6].

References

1. Dean D, Webb C. Recovering from information overload. McKinsey Q [Internet]. 2010 [cited 2011 Jan 25]. Available from: https://www.mckinseyquarterly.com/Recovering_from_information_overload_2735.
2. Wilson, TD. Information overload: implications for health-care services. *Health Informatics Journal*. 2001;7(2):112–7. doi:10.1177/146045820100700210.
3. Wilson, CE. Information discrimination: a human habit. *Canadian Journal of Information Science*. 1976;1(1):59–64.
4. Bowen S, Erikson T, Martens PJ, Crockett S. More than ‘using research’: the real challenges in promoting evidence-informed decision-making. *Healthcare Policy*. 2009;4(3):87–102.
5. Walshe K, Smith J. *Healthcare Management*. Berkshire (GBR): McGraw-Hill Education; 2006.
6. Ho J, Tang R. Towards an optimal resolution to information overload: an infomediary approach. *Proceedings of the 2001 International ACM SIGGROUP Conference on Supporting Group Work*; 2001 Sep 30–Oct 03; Boulder, Colo. New York: ACM; 2001.
7. Spath P. The quality-cost connection: How quality managers can stop information overload. *Hosp Peer Rev*. 2002;27(7):101–3.
8. Hunt RE, Newman RG. Medical knowledge overload: a disturbing trend for physicians. *Health Care Manage Rev*. 1997;22(1):70–5.
9. Savolainen, R. Filtering and withdrawing: strategies for coping with information overload in everyday contexts. *Journal of Information Science*. 2007;33(5):611–21. doi:10.1177/0165551506077418.
10. Edmonds A, Morris A. The problem of information overload in business organisations: a review of the literature. *International Journal of Information Management*. 2000;20(1):17–28. doi:10.1016/S0268-4012(99)00051-1.
11. Kim, YJ, Chaudhury A, Rao HR. A knowledge management perspective to evaluation of enterprise information portals. *Knowledge and Process Management*. 2002;9(2):57–71. doi:10.1002/kpm.137.
12. Chau M, Huang Z, Qin J, Zhou Y, Chen H. Building a scientific knowledge web portal: The NanoPort experience. *Decis Support Systems* 2006;42(2):1216–38. doi:10.1016/j.dss.2006.01.004.
13. Granzino S. Behind the numbers: patching the holes in portal technology. Information Week [Internet]. New York: UBM; 2011. [cited 2011 Jan 20]. Available from: <http://www.informationweek.com>.
14. Rudnick M. Direct new portal funding to decision support tools. *Employee Benefit Plan Rev*. 2004;59(4):25–7.
15. Jackson R, Baird W, Davis-Reynolds L, Smith C, Blackburn S, Allsebrook J. The information requirements and information-seeking behaviours of health and social care professionals providing care to children with health care needs: a pilot study. *Health Information Library Journal* 2007;24(2):95–102. doi:10.1111/j.1471-1842.2007.00700.x.
16. Wiseman S, Jawaheer G, Kostkova P, Madle G. Specialist digital libraries – National Resource for Infection Control (NRIC) – Information overload or underload? *British Journal of Infection Control*. 2008;9(5):4–9.
17. READ Portal [Internet]. Vancouver: UBC Centre for Health Care Management; 2010–2011 [cited 2011 Jan 20]. Available from: <http://www.read.chcm.ubc.ca>.
18. MacDonald J, Bath P, and Booth A. Information overload and information poverty: challenges for healthcare services managers? *Journal of Documentation*. 2010;67(2):1–29. Epub 2010 Winter.