

## **Health Information Quality Management System: Academics Health Libraries Perspectives**

**Eduardo Alentejo<sup>1</sup>, Dr. Henning Lobin<sup>2</sup>, Dr. Sofia G. Baptista<sup>3</sup>.**

<sup>1</sup> UNIRIO/Universidade de Brasília

<sup>2</sup> Justus-Liebig-Universität

<sup>3</sup> Universidade de Brasília

**Abstract.** This paper treats about health information quality in health academic libraries in Brazil and Germany. This research analyses the Health Information Management linked to Health Information Quality for educational and research purposes. Through qualitative and quantitative research, data were collected from literature review and empirical surveys applied in health academic libraries. The method known as ‘Information System on Quality’ was adopted. The objective is to design a model of information quality management for health academic libraries. As a main result it identified that the quality management model adopted by academic libraries offer different information quality perceptions by professionals and library’s users. It concludes that quality standards are possible to be adopted by any academic health library.

**Keywords:** Academic Health Library. Information Quality. Health Information Quality. Quality Management. Management of Health Information Quality.

### **1. Introduction**

This paper analyses management of health information quality to integrate Health Information Management within academic libraries. It describes how it can be exploited to assist academic health libraries to achieve its mission. The World Health Organisation recognizes that the 21<sup>st</sup> century is marked by intense production and communication of health knowledge and information, although without uniform quality. In this way, the researchers analyzed how health information management in academic libraries can be oriented to the quality in academic libraries, affecting the perception of information quality for users in the context of health systems within a national health system. Through qualitative and quantitative research, data were collected from literature review

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Received: 8.5.2013 / Accepted: 26.2.2014

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ISSN 2241-1925



and from health academic environments with professors and post graduate students: a) Brazil: Universidade de São Paulo (USP) Health Library System; b) Germany: Justus-Liebig-Universität Health Libraries System (JLU). Through semi-structured questionnaire and interviews with librarian focus groups, it was adopted the method known as 'Information System on Quality' to identify: 1) the user's quality perception; 2) relations between consume of health information with user's scientific production, 3) quality management of library. Through empirical studies, this study aligns the findings from literature about health information management with the management quality model. This research had intended to design a management model capable to be integrated to health academics libraries.

## **2. Results of Literature Review**

In the Information Society era, the issue of 'quality' became timely to survey the scope of services and products for conventional and digital libraries. Specifically, information quality embraces networks cooperation and interoperability under Web platforms in certain specialized areas, such as health (Alentejo, 2013). Concerning to libraries management, some standards have contributed to improve information services. Some of them can be highlighted: ISO 11620:2008: Information in Documents - Library Performance ISO 20983:2003: Information and documentation - Performance indicators for electronic library services, ISO / TR 28118:2009: Information and documentation - Performance indicators for National Libraries, and LibQUAL+™. However, different approaches coexist within domains of quality and information quality. Quality management - in any organization - depends on the decision and membership of a particular approach available. Düren (2012) explains that Quality Management is one of the management challenges in academic libraries. According to the author, the quality of the service provided differentiates libraries from others providers of information service. In the literature, there is a consensus that quality management is associated to information quality (Targino, 2009; Alentejo, 2013). However, it should be noted that there is no consensus on information quality definition (Wagner, 1990). Once health information organisations around the world are influenced by their own national health system (European Association of Health Information and Libraries, 2008), libraries are inserted in the three pillars that compose a national health system. The World Health Organization (2010) explains these pillars as being: 1) health and sanitary national's policies, and ways to promote health care for citizens; 2) health education and professional training; 3) health sciences researches (Targino, 2009; Chartered Institute of Library and Information Professionals, 2011). In this sense, health information is an important issue to national health system. Health Information Systems (HIS) can be applied for different purposes, such as: health literacy and Medicine/Health Based in Evidence (Marshall, 1992; Lopes, 2000; Medical Library Association, 2003; Moraes, 2006), development of technology for health; and also, improvement for search engine for health information (Risk and Dzenowagis, 2001; Hollander, 2006; Haux, 2006). Health libraries such as:

Virtual Health Library, Hospital Library, Health Sciences Libraries, Academic Health Libraries are no longer the unique providers on health information to society (Lopes, 2007). Due to the constant growing of health science specializations, social mobility and the ongoing growing of health information widely spread on different information channels based on Internet, the health information management has becoming widely necessary to society (Lopes, 2007). Health libraries and their managers take part of the constitution of knowledge organization systems and sources of data due to requirements from institutional and national health policy (Moraes, 2006; Targino, 2009). In order to meet other health information needs in specific fields, the internal use of health information by libraries aims to obtain health information and materializes exactly their mission of Health Information Management (Hollander, 2006). Thus, understanding the library as a social system which primary mission is knowledge organization through development of their products and services, libraries are subject to the mission of its organizational structure aiming to meet the institutional needs of their sponsors and users (Lankes, 2011). In this way, the information generated in health information systems are subsidies to the processes of policy generation, education, research and health care, and therefore, the information must have their application through processes of collection, organisation, preservation and transfer to the society. Such understandings may boost the health information flow. In turn, information flows become available for accessing health in different domains. In this context, assuming that information is a predominant aspect to health system in a country (World Health Organisation, 2010), libraries perform activities on the management of health information, becoming part of this context. Internally activities undertaken by libraries are consolidated through: documentary management, management information systems, electronic document management, evaluation and selection of sources of scientific information, evaluation and development of information systems and assessment of information quality in health on the Internet (Targino, 2009; Robins; Holmes; Stansbury, 2010). The main objective of any health library is therefore providing relevant information guarantees to society. Burgess, Gray and Fiddian (2007, pp. 213-242) state that information quality depends on an information management model in any type of organisation. The authors explain that this model should be oriented to quality management.

### **3 JLU and USP Health Information Management**

JLU and USP are public institutions. JLU Medicine Faculty has a library system comprised by nineteen specialized medical libraries under the Central Library structure. The health care services are the responsibility of the University Hospital: "Universitätsklinikum Giessen und Marburg". USP Health Sciences Courses count on a library network system so-called "Sistema Integrado de Bibliotecas (SIBi)" with twelve health libraries to assist eighteen Health Sciences Graduate courses, and three postgraduate Health Courses. SIBi also integrates a Center of Library and Scientific Documentation Service to assist USP University Hospital. The network libraries of USP and JLU operate their

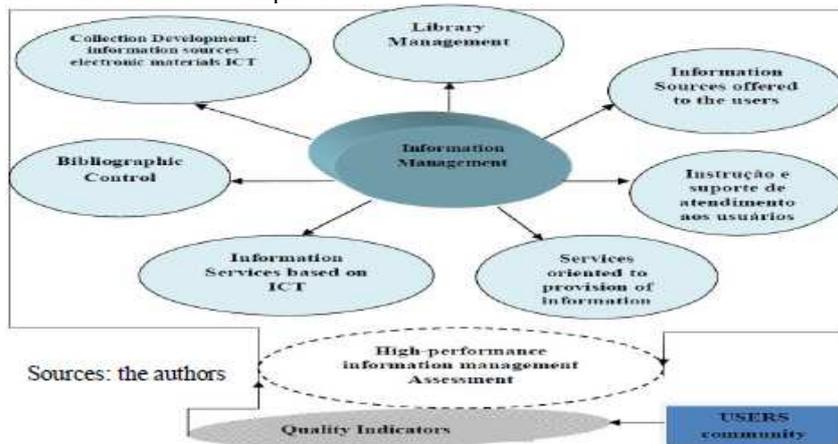
Management Models upon the adoption of the concept in health proposed internationally by World Health Organisation. The values assigned to libraries are based on studies conducted on the health system from the perspective of universal public health characteristics of both health national systems. From an educational point of view, USP and JLU academic health libraries are dynamic organisations based in networks cooperation with the Government and civil entities. Both health sciences academic libraries are connected with the national health system and are able to promote: education, training, research, promotion of national health practices in accordance with institutional mission and objectives. From the information management point of view, both libraries have conventional information services and offer diversity of electronics tools and facilities to their users, such as: Online Integrated Catalog (OPAC); Portal on Internet, Databases and Open Access to Scientific Journals collections and Bibliographies. They also offer to user self-management system; among other services, it is possible to manage loan solicitations, information services as well as their users can suggest new information sources acquisitions. In JLU case, due to management changes overtime, the integrated information system as well as the library system promotion, some health physical libraries, usually small in shape and maintained by departments and institutes, became integrated and their collections joined the main library systems. The Library System of JLU is a participant of HeBIS (<http://www.hebis.de/>), this participation is essential for many of the electronic services provided by the library. HeBIS is an electronic information service system based on union of academic libraries in Hessen and parts of the Rhineland Palatinate and is one of the six regional library unions in Germany. HeBIS is based on a central union database in Frankfurt am Main with six local subsystems (at the Universities and Technical Universities in Darmstadt, Frankfurt am Main, Giessen, Kassel, Marburg, Mainz) equipped with the internationally widespread software from PICA OCLC (HeBIS, ©2003-2012). The remarks concerning the retrieval of information are based on researches conducted in the collections of libraries in the system and external connection with other information sources through the unique OPAC for the whole Library System. SIBi's mission comprises a Public Health Portal within reach of professors, students, workforce and every citizen. It integrates national and international access to Databases in Health Sciences and also offers access to electronic journals and e-books and others scientific documentation. SIBi has partnership with Governmental Health Institutions and others Health Information Systems, as Scientific Electronic Library Online (SciELO), Portal of Public Health Theses and Latin American and Caribbean Center on Health Sciences Information, also known by its original name Regional Library of Medicine (BIREME) that manages the Virtual Health Library (VHL).

### **3.1 The Academics Libraries HIS Models**

On literature, there are many ways to perceive HIS models. The major is usually submitted under institutional application. Electronic information services increase information management and depend on close collaboration between publishers, librarians and network providers. The network environment provides

a different structure for the provision of services in information, i.e., the boundaries between internal and external supply are different. Given the variety of outside vendors that can provide the network to the library, their management consider the installation of special equipment (hardware and software) considering the network assessment and resources based on the process of delivering the document to the user. Considering the types of specialized information on health, both models of the information management of both libraries allow: assess to the library performance and also activities of libraries such as selection and acquisition of electronic information sources based on criteria selected by the library, such as costs, operability, usability, comprehensiveness, credibility of editors etc. In this context, users and employees receive specific training to use electronic information systems. However, the supply of equipment for the university, of which the library is a part, may withdraw the management control from the libraries. Thus, even if there is the possibility to control any of the essential infrastructure for the provision of electronic information service, performance is judged by the library user. In this sense, the user's perception about the quality of information is linked with the system of information provision. So, criteria such as accessibility, usability, operability and use are taken into account when using the system, if the experience is negative for the user, both documents retrieval as quality assessment system are impacted. This suggests that, in this perspective, the quality of information is also impacted. In this scenario, understanding the history of the library, its collections, products and users and varied possibility of the use of health information, it can be inferred that those academic libraries promote information management products and services through traditional and electronic information, making the provision of services and generation of information products hybrid in conventional and digital ways. Based on the focus of Information Management, the model described below represents the flow of activities and assignments employed by JLU and USP Health Libraries Systems

Flow Chart: HIS based in process:



### **3.2 Quality Perceptions from users and information professionals**

The flow chart represents the description of the activities, functions and actions developed internally by health information management which users and information professionals perceive the quality systems. By focusing on information management, search is a relatively complete vision or essential about the activities of a particular library activity of those libraries, the quality perception refers to the above model, and they are:

a) Administrative activity that involves among other activities: financial organisation, human resource management, planning actions related to the purposes of the library, administrative decision making, establishing quality policies (among other defining elements: assessment, creation of performance indicators, resources, programs, processes, data collection).

b) Selection and acquisition process: defining the scope of the collection and technological resources - a process that involves the planning and implementation of selection criteria and evaluation of information sources and technological resources based on studies of use and users and evaluation of collections and library facilities (infrastructure, warehouses, spaces for consultation and reading etc.), as well as considering the technology market: suppliers of electronic systems and digital publishers;

c) Bibliographic control: refers to the activities of the organisation and delivery of collections, including exploratory bibliographic control (rating system) and descriptive (cataloging policies) projection of the catalog, index etc. policies. Considering even devices of the electronic access system organization: OPAC, reference databases, bibliographies, personalized information services.

d) Electronic information services: information management runs the management of electronic information systems, including variables such as ease of use, structure of information retrieval and content of information, evaluated from the perspective of both the management system and users, that observe the credibility and recognition of sources of information that comprise the collection concurrently with the library's mission elapsed interests of library users.

e) Information resources available to users: policy decisions regarding the structure of supply of informational resources available to users, this policy guides the processes of selection and assessment and management of electronic systems as they consider as limitations of the use of information systems the diversity of the audience in the library, such as impaired vision, knowledge regarding the use of certain electronic systems, skills with network resources, Internet and Intranet. In this sense, usability and accessibility are criteria to be considered in the evaluation and selection of information services.

f) Management of information services offered: requires a core stock for projection service and product information such as: academic repositories, networking with the user in Internet Portals of libraries and knowledge networks. It also requires a core stock for evaluation of services regarding the use of systems and collections, where the use of qualitative studies of users and provide contributions to the improvement of library systems.

g) Assessment of the performance of information management: the management considers all activities stem from its management to evaluate its performance. It is created evaluation criteria that correspond to activities in the context of the goals and mission of the library, focusing on the user community. As a result of the internal management, both libraries create core performance indicators and quality based on the intrinsic evaluations and management processes based on the judgment of the users. This evaluation employs the application of rational, objective and continuous methodologies

in constantly seeking to improve information management performed by the libraries systems.

h) Library users: information management must know who the library's users are. Essentially, users are faculty, students and staff who work within the institution, researching, studying and using library resources. However, both libraries systems have: current and actual users, registered in the library, the management evaluate the amount of visits per capita relative to the amount of registered users, and therefore, they identify infrequent users of library.

In this sense, those academic libraries perform the Health Information Management considering the health system by understanding that they are oriented to quality management. The social transformations require from their models constant efforts to best practices services and products to meet consumer demand for information that is not only focused on collections or information systems, but the interaction between collections, systems and users.

### **3.3 The user's quality perception**

Concerning the quality of the library, the value assigned by the user binds to the information services and information products of the library with which they constitute the means that can facilitate or hinder the acquisition of information. Although there is this bond, the evaluation cannot occur in the same proportion of the measures that both aspects may be perceived. From the set of variables, the total sample gave about 78.50% of satisfaction with the services and products of the libraries, and around 64% positively perceive the quality of health information obtained through the mediation of the library. This suggests that the difference in total score between the users' perception on the quality of library services and products relating to information obtained has a relative difference of 14.50%.

### **3.4 Relations between consume of health information with user's scientific production**

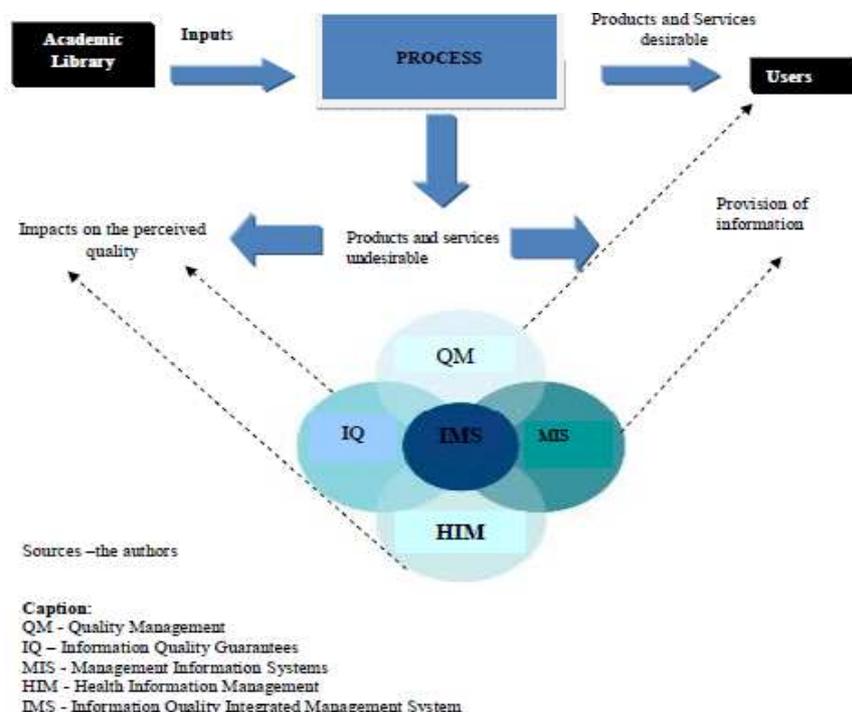
Concerning the library and what it can offer in terms of information quality criteria that users and librarians evaluate the quality are exactly alike. Libraries usually treat in their studies of use and user-focused users, but not exactly in the importance they attribute to the quality of information. In terms of usefulness for users of information obtained in the library to promote their scientific production, the results showed that underlying the assessment of the users, they express their requirements, which are not always satisfied. Also confirms that the difference presented in both assessments (14.50%) is the gap found in reference to the size of a problem or an opportunity for implementing improvements to balance the assessment of quality of health information on the quality of the library. That is, the overall satisfaction with the library and information quality has simultaneous effects in the users' expectations. Also, the library and information can be evaluated in relation to the compliance with specifications and requirements that comes from users and must be treated as elements inherent in information management and quality within the library.

### **3.5 The Quality Management of Library**

Managerial practices of academic libraries in the emerging area of health can influence the perception of its user about the quality of information provided. Considering that the libraries are oriented to quality, the elements of evaluation and implementation of quality management programs may include managerial resources to consider the quality of health information. Assessment elements identified in this study are used to measure the performance and quality of services and products. However, they are focused only on the user. They are made up of criteria and indicators to be used in user studies regarding satisfaction with certain products or services offered by libraries. This suggests that there is the ability of libraries to create their own quality indicators and apply them in their studies and user-friendliness. However, this approach does not reach the point of view of information use, what makes sense to the user in context. This was verified by analyzing the interviews. It was perceived that studies of user needs and lack of criteria and indicators don't consider the application and use of information obtained in the library user. The elements of the evaluation of these libraries do not address the quality of information as an essential part of information management and quality studies limit the users' information needs without considering the contexts of their application. However, librarians are aware that the implementation and use of health information have diverse social implications and can be applied to teaching, researching, promoting social actions in the context of health, and help save lives. However, by analyzing the results, it is noticed that the libraries of this study provide conditions to make changes in user-centered paradigm now to consider what makes sense to the user, what it is and why it is important for the user and how information serves for his application context.

### **4. Health Information Quality Management Model**

The Health Information Quality Management Model can assist academic health libraries to achieve its mission by fulfilling health information quality for many aspects of their objectives. It involves: a) libraries user's quality perception; b) relations between consume of health information with user's scientific production; c) quality management program adopted by libraries; however, by the capacity of those libraries to create quality criteria and indicators, it is possible to develop and fit a health quality information management model without compromising the process of their own quality management program; d) health information quality. The conceptual design of the research is formulated in the following figure considering the common aspects of Information Management, Quality Management and quality of health information from the focus of management system based on process in the context of academic library in health:



The Quality Management shall allow the development of management based in process and establishment of quality services and information products that are desirable by users. It means that this model may guide the activities and practices of information management, controlling and eliminating elements of undesirable products and services in the provision of information by the information system. Considering the dynamic model of the perception of quality by the user, the actions and activities of provision of information can be measured by the frequent use of the system as well as on the use of the information obtained by the user, having as one variable the production scientific parameter of their users. The information quality influences the usage of information by the user. It is inferred that integration with other management systems is possible. In this sense, information quality management is potentially linked with Quality Management Information within a platform of Integrated Management System (IMS).

### 5. Results

As a main result it was identified that the quality management model adopted by those academic libraries offer different information quality perceptions by professionals and library’s users. Academics health libraries offer three perspectives for health quality information: the library as a strategy for the provision of information and knowledge within the health information cycle, the library as an instance of quality management in health library and information

while managing the health information is able to create own indicators for assessing the quality of health information, taking into consideration the following criteria: a) quality of its products and services; b) the impact of its management actions, products and services information on the technical-scientific community of users; c) its role within the health information system that comprises its visibility as to their share of equity in health in a particular social context; d) user's high quality perception depends on the quality management adopted by libraries; e) user's perception on health information quality depends on the quantitative of electronic information sources available within libraries; e) information quality perception depends on facilities in libraries to access information and library services; f) scientific production as well as health educational process depends on library quality users perceptions, g) the offer of several electronic information sources and machines to intermediate access to information for any user application are conditions and determinants to increase health information quality perception by users and librarians. The quality of health information is a magnified view of information in the context of the health system property. It is socially desired, its relevance permeates the production processes, organization, dissemination and appropriation of information available on the informational flows. This extended form, the information systems in health have as a goal the quality of its communication, dissemination and use, so that society as a whole can achieve health objectives.

## 6. Conclusions

Under the approach of management by process, a model of quality information health management can be designed to allow integration within the different realities of university libraries in the area. In this sense, 'Quality Health Information Management System' can be addressed to health libraries as a model of quality management in health information. This integrated quality management system is a permanent process in shape and operationally oriented to keep identifying: a) users information needs; b) recognition by librarians to obtain skills for managing electronic information sources; c) aggregating information services to promote the user's scientific and educational production; d) recognition by librarians and academics decision makers that an multidisciplinary staff is needed to development and maintenance of electronic machines, software applied to health purposes and networks based on web; e) establishment of quality policies to guarantee the continuous quality management process.

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