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Reengineering Of Processes And Services In The Library Of The "Gral. Calixto García Íñiguez" Faculty Of Medical Sciences

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ABSTRACT

The library of the "Gral. Calixto García Íñiguez" Faculty of Medical Sciences reflected significant difficulties, both economic and material, as well as in organizational culture. The objective of this work is to expose the reengineering process that was carried out in such a library, with the transfer of knowledge, methods, procedures and technologies, provided by the National Medical Library. Among the main results of this process are the development and improvement of the technical, service and management processes achieved in the library, in accordance with what was established by the National Network of Libraries of the National Health System of Cuba.

Keywords: university libraries, reengineering, reengineering of processes and services.

INTRODUCTION

The library of the Faculty of Medical Sciences (FCM) "Gral. Calixto García Íñiguez" manifested important difficulties from the point of view of organizational culture, as well as economic and materials.

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In 2009, specialists and library technicians from the National Medical Library (BMN), area of the National Information Center for Medical Sciences (CNICM/Infomed), received the mission of carrying out the transfer of knowledge, methods, procedures and technologies according to with what was established by the National Network of Libraries of the National Health System of Cuba in the library of the FCM "Gral. Calixto García Íñiguez". The BMN work team was made up of a master's degree in Information Sciences, two graduates in Library and Information Sciences, a graduate in Health Information Management (GIS), five library technicians, a graduate in Primary Education , two IT technicians, two receptionists and a cleaning assistant. Furthermore, there was no qualified previous personnel with whom to exchange experiences and criteria, so the process began from scratch.

The objective of this work is to expose the reengineering process that was carried out in the FCM library "Gral. Calixto García Íñiguez", and with this to show how the development of the technical, service and management processes was achieved, in the context of an interlibrary cooperation network of the National Health System (SNS), with the dynamics of library services and access to scientific information for the entire university community, with response to the most sophisticated research work.

"GENERAL CALIXTO GARCÍA ÍÑIGUEZ" UNIVERSITY HOSPITAL. HISTORICAL BACKGROUND

Since the first years of the 20th century, the "General Calixto García Íñiguez" National Hospital was considered the second hospital of the Faculty of Medicine of the University of Havana, for having many more facilities for teaching than the

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"Our Lady of Havana" Hospital. las Mercedes", where this activity had been carried out since 1886.

In 1923, on the occasion of the beginning of the university student revolution led by the Cuban student leader *Julio Antonio Mella* , the reorganization of teaching at the Faculty of Medicine of the University of Havana and the transfer to the Hospital of all the chairs that were in an old Havana building located in Zanja and Belascoaín, except those of Descriptive and Topographic Anatomy, which were maintained in the old barracks of the Spanish Civil Guard, until the inauguration in 1940 of the new building of the Faculty «Dr. Ángel Aballí» in the northern portion of the Hospital.

In this context, the "General Calixto García Íñiguez" National Hospital was undoubtedly the most important unit of hospital medical care in the country, not only because of the high number of its beds, its majestic buildings, the beauty of its architectural complex (very similar to that of the main hospitals in Europe), but also for the recognition of the scientific quality and medical care that patients received.

The largest percentage of the Faculty of Medicine's chairs located in its pavilions was consolidated by the prestige acquired in authentic "Cuban schools" in specialties such as General Surgery, Internal Medicine, Dermatology, Parasitology, Obstetrics, Legal Medicine, Psychiatry, Neurosurgery and others.

In 1943, by a new presidential decree, the hospital came to be governed entirely by the Faculty of Medicine of the University of Havana, and it was officially named "General Calixto García Íñiguez" University Hospital. [1]

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In 1976, when the Higher Institute of Medical Sciences of Havana was created, the hospital became the main headquarters of the FCM "Gral. Calixto García Íñiguez", historical heir of the former Faculty of Medicine of the University of Havana, founded in 1728, and as a new location for the Faculty, the "November 27" pavilion would give way to a multiple building, seat of the dean's office, numerous classrooms and the Department of Bachelor's Degree in Nursing [2] (Fig. 1).

The university hospital was established as a transcendental element to satisfy the training demands of the future doctor, based on the paradigm of higher medical education based on the acquisition of professional competencies, which are expressed in abilities and skills when efficiently applying procedures, diagnoses and /or therapeutic.

The Faculty of Medicine, aware of its responsibility, began to arbitrate specific proposals that would facilitate the necessary changes to be introduced in accordance with the role of the map of competencies that would be the basis and foundation of the definition of the programs and, in short, of the curriculum. [3]

An important aspect that contributed to the improvement of the hospital teaching structure was the involvement of the doctor in the teaching of medicine and the training of the doctor as a teacher (greater professionalization of teaching). The hospital was able to be converted into an institution that has assumed among its missions the teaching of medicine, a practice that continues to this day.

The needs in the training of doctors in pre- and postgraduate education, particularly those related to the definition, acquisition and evaluation of informational competencies, require a powerful hospital structure that supports medical teaching

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and the practice of clinical skills. The transcendent role reserved for university hospitals imposes that the health institution must adapt at all times to guarantee the maintenance of quality teaching, which implies changes in the structure, organization and hospital management.

LIBRARY OF THE FCM "GRAL. CALIXTO GARCÍA ÍÑIGUEZ"

With the aim of supporting the educational teaching process of the Faculty, a library classified as university was created in 1976, made up of all the bibliographic, audiovisual and documentary collections that constituted, by then, the bibliographic documentary heritage of the Faculty.

From its beginnings, the library represented a functional entity for the Faculty, whose main mission was to facilitate and favor - with its material and professional means of Library Science - the tasks inherent to the teaching and research function, axes of medical education. It was classified as a university library for three elements: the type of users to whom services would be provided, the type of collection and direct subordination to the teaching headquarters .

From the beginning, a modest library activity arose, without procedures that meant continuous progress, which produced a stagnation in the services provided, as well as the technical processes for the organization and recovery of the information stored there. Likewise, the location chosen as headquarters did not guarantee the durability of the document, nor the conditions required for the study. Despite such difficulties, users made up of managers, teachers, researchers and students made use of bibliographic funds that to some extent responded to the study plans.

After some time, and with the increase in the impact produced by information and communications technologies, as well as the demands of health professionals from

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the point of view of scientific information, a change in the design of the system according to with the informational-training needs of users.

This need for change is fundamentally based on the fact that the library is the center of the most important activities in the academic life of the university, in which the most diverse types of study and research are carried out through its resources and services. The quality of these affects the academic level of university activity and, therefore, the greater or lesser importance given to it reveals, in turn, the importance of the institution of which it is a part. [4]

THEORETICAL ASPECTS OF THE REENGINEERING OF LIBRARY PROCESSES AND SERVICES

According to a review of the literature, it can be stated that reengineering responds "... to the drastic changes that an organization undergoes when its processes are restructured. The basis of reengineering is customer service; it describes a business model, a set of techniques that executives and managers will have to use to reinvent their companies, in order to compete in a new world . " [5] According to *Ponjuán Dante* , *Villardefrancos Álvarez* and *León Santos* "…the application of process reengineering in information systems allows us to obtain a different model, which not only improves working conditions, the environment, the impact, the appearance of new values in the members of the organization, but also introduces results that contribute to the qualitative processes of information organizations. [6] Likewise, these authors recognize that the advances brought by reengineering focus on: [6]

- Optimization of organizational processes.
- Access to reliable, accurate and timely information more quickly.

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- The possibility of sharing information between all components of the organization.
- The elimination of data and unnecessary operations.
- Reduction of process times and costs.

Similarly, the document of the American Library Association (ALA), from 1964, currently in force, was taken into account , which establishes that within institutions there is a variety of fundamental documents such as: regulations, collection development policies, organization manuals. and procedures, standards, among others. All of them constitute tools that evaluate, regulate, direct, specify, etc., each and every one of the activities and functions that are carried out in the library. [7] Said documentation requires periodic review by library staff, in order to maintain updating and validity during the life of the libraries.

ALA also states in terms of furniture and equipment that "everything is needed from an eraser or pencil, to the most sophisticated computer equipment, or the most expensive and elegant shelves or display cases, all depending on the financial resources that the institution has, "It is also important that at least the minimum needs are covered in this sense, since in the same way as with all other points, if any of them are missing, a library cannot function." [7]

STAGES FOR THE REENGINEERING PROCESS IN THE LIBRARY OF THE FCM "GRAL. CALIXTO GARCÍA ÍÑIGUEZ"

The stages for the reengineering process of this library were the following:

1. Update of the mission, vision and legal framework composed of laws, regulations and decrees of the library.

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2. Definition of the organic structure and preparation of the organizational chart with the inputs and outputs in relation to the different areas of the Faculty.

3. Description of general functions and by job positions.

4. Remodeling and reorganization of the physical spaces (includes sanitary facilities) and furniture of the library, for which a plan was designed (Fig. 2) that would allow the library to be reconstructed, in such a way that it would allow the authorization of the essential areas for develop all library activity. On the other hand, the incorporation of additional furniture (shelves for the bibliographic collection, furniture for library staff and users, among others) and technology equipment donated entirely by BMN/Infomed, required maximum use of the area.

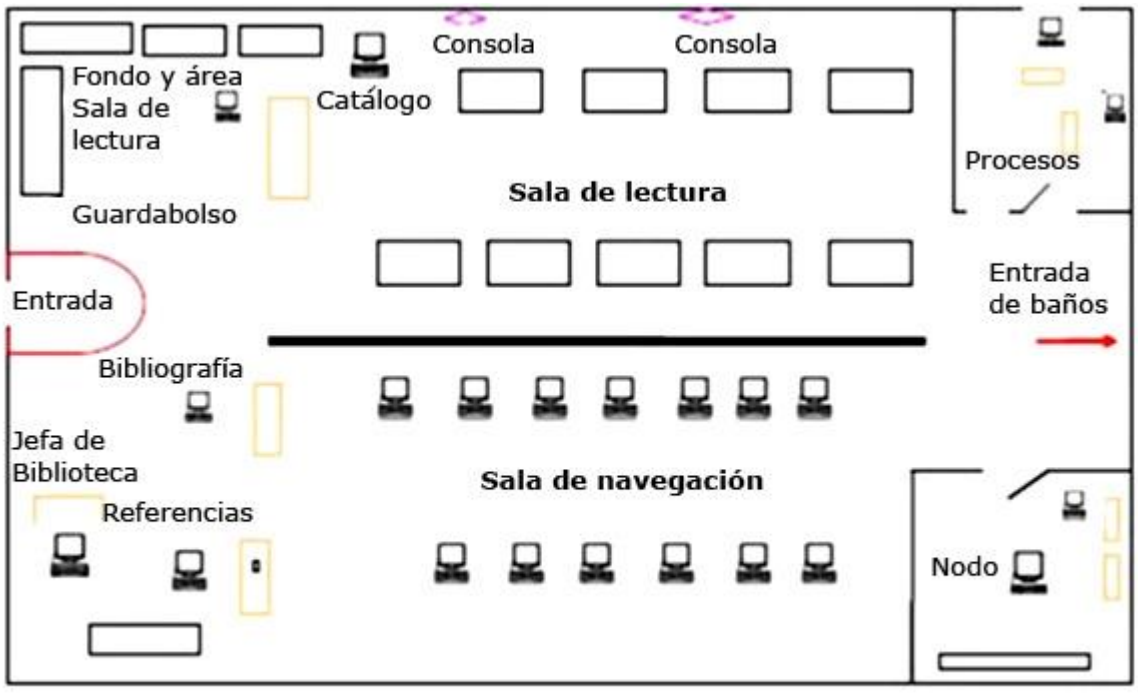

Fig. 2. Diseño del plano propuesto para la reconstrucción de la biblioteca de la Facultad "Calixto García".

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Likewise, the air conditioning and ventilation of the premises was improved through the repair of two existing air conditioning units that had not been used until then; In this way, the necessary conditions were considerably optimized to facilitate study, research and recreation through reading, taking into account the different needs of individual study, group study, study in a low voice, and study in silence.

At the same time, the security and physical protection mechanisms of the library premises and its basic means were strengthened, through the securing of doors and windows, installation of bars, renewal of locks and placement of fire extinguishers; Likewise, lighting fixtures were added that considerably improved visibility within the premises.

This stage required the work of a multidisciplinary team (constructors, electricians, computer scientists, civil engineers, refrigeration technicians, administrators and library science specialists) from the BMN and the CNICM/Infomed, where the following stand out:

- The organization, inventory and processing of the documentary collection, as well as evaluation of the state of preservation of the collections. The work of selecting and discarding documentary material was carried out in collaboration with the Faculty's teaching staff, in accordance with current study plans and programs. The bibliographic material was organized in consecutive order.
- The creation of an online catalog for books and theses with the application of LILDBI (LILACS -Bibliographic Description and Indexing-), a component program of the LILACS Methodology and developed by BIREME (Latin American and Caribbean Center for Health Sciences Information) , with the aim of

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facilitating the work of bibliographic description and indexing in the process of creating bibliographic records. The LILDBI supports the bibliographic databases of the Latin American and Caribbean Health Sciences Information System; Therefore, the CNICM, as the coordinating center of this project in Cuba, establishes as a policy the use of LILDBI by the library network of the National Health System.

- The implementation, in the library's technical process area, of the entry of documents into the LILDBI system.
- The development of collection development policy, collection disaster reduction plan and assessment of the physical condition of collections.
- The establishment of the services of: reading and consultation room (Fig. 3), reference, bibliography, interlibrary loan and navigation through the Infomed network (Cuban Health Portal) and health sites identified on the Internet. For the operation of such services, the National Medical Library/Infomed donated 27 computers, 16 of them intended for users. Likewise, connectivity was ensured that would guarantee access to scientific information from the Infomed Portal and other services available on the Internet for health professionals. It was also necessary to enable a reception service with a bag-keeping function. Initially, two work brigades were formed, with hours from 8:00 am to 8:00 pm, Monday to Saturday. Subsequently and jointly with the Faculty directors, the schedule was established from 8:15 am to 6:00 pm, from Monday to Saturday, according to the interests of the users (Fig. 3). Once this stage was completed, the FCM university library "Gral. Calixto García" was inaugurated on June 7, 2010, a date chosen

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because it was Librarian's Day in Cuba in honor of the birth of the Cuban bibliographer *Antonio Bachiller y Morales* .

Fig. 3. Sala de lectura de la biblioteca de la Facultad "Calixto García".

- The writing of the service procedure manuals for: reading and consultation room, reference, bibliography, interlibrary loan and navigation room, with the corresponding regulations, as well as the study of the needs of real and potential users (Fig. 4).

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Fig. 4. Sala de navegación de la biblioteca de la Facultad "Calixto García".

- The establishment of a user education program (information literacy) where information search specialists from the BMN developed educational activities as shown in the image, with the participation of teachers, researchers and students from the FCM "Gral. Calixto García". In this way, courses were taught for the Hinari, Medline, Ebsco and Cumed databases. Such courses had a curricular program in advance as part of the Information Literacy project of the National Information Center for Medical Sciences/Infomed. Likewise, training courses were developed for users in the Linux operating system, established on the computers of all services (Fig. 5) .

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Fig. 5. Educación a usuarios y bibliotecarios de la Facultad por parte de especialista de la Biblioteca Médica Nacional.

- The design in electronic format (Microsoft Excel) of the statistical model indicated by the Department of Statistics of the Ministry of Public Health of Cuba (MINSAP), which facilitates the statistical report of all library services for the evaluation of the behavior of the services provided , which can constitute a warning for future modifications in vision and objectives.
- The training and advice of relief staff in the library, the last stage that begins in September 2010, with the preparation and training of graduates in Health Information Management (GIS), graduates in Library and Information Sciences (BCI), medium technicians in Library Science and IT, to guarantee that these replacement personnel have the skills in management, technical processes, library services and computer security, in line with the interests of the user community, which would be fulfilling another of the objectives set in 2009: "organize the staff and services that will be provided in the library of the Calixto García Faculty..." [8]

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RESULTS UNTIL DECEMBER 2011

1. Creation of a direction for library services and processes.
2. Redesign of the premises assigned for the library.
3. Selection and discarding of the documents that make up the bibliographic fund.
4. Organization of the bibliographic fund (in consecutive order and according to current Classification Standards in the *National Library of Medicine*).
5. Creation of a technical information processing department.
6. Creation of an electronic catalog that responds to the bibliographic fund (books, theses and magazines).
7. Creation of the reading room service.
8. Creation of the bibliography service.
9. Creation of the reference service.
10. Creation of reception service (information and bag storage).
11. Installation of an internal electronic network.
12. Creation of a node with direct access server to Infomed and Internet service.
13. Creation of navigation service room.
14. Establishment of internal regulations for all services.
15. Description and application of a computer security plan.
16. Systematic information literacy for users who attend the library (training and courses).
17. Identification of users and their information needs for the creation of a selective information dissemination service (personalized and specialized attention).

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18. Constitution of the relief staff that would guarantee the continuity of the library services, which was made up of: two graduates in Health Information Management (GIS), a Library Science technician, a Computer Science technician, a trained graduate of Library and Information Science (BCI) and a receptionist (pre-university graduate).

19. Accreditation in 2010 to the FCM "Gral. Calixto García" as Excellence in Nursing for areas evaluated. The library was decisive in this achievement, with the quality and organization of services along with the skills of the staff. The library statistics in 2011 were as follows:

- Total loans made: 3,281
- Total bibliographies created: 275
- References in navigation service: 5,191
- Reference bureau service: 1 953
- Total references provided: 7,144
- Total users who attended the library: 27,958
- Total documents in electronic catalog to date: 3,101

The FCM library "Gral. Calixto García Íñiguez" is today a department with academic rank directly dependent on the Vice-Dean of Postgraduate Studies and Research. By the end of 2011, the library - from its small premises within the Faculty, arising from a re-engineering of its technical, methodological, service and management processes - shows in writing the results that show the path that took it, from of the year 2012, to be the reference library for the entire network of university libraries in Health Sciences of Cuba, an extremely high challenge for all

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its staff, who must be involved in this objective and assume it as a goal, with the support of the Faculty management.

CONCLUSIONS

For the FCM Library "Gral. Calixto García Íñiguez" it has been vital to maintain for years the mission of university libraries, which is to support the research, study and teaching of its users (professors, researchers and students), predominantly members of the parent institution, expecting results reflected in user satisfaction; However, this requires that both users and human capital related to the organization actively participate in all processes.

With the reengineering, the two fundamental functions of the library were rescued, for which it was created in 1976 and which was revitalized in 2009 with the effort and skills of BMN specialists:

- *Technical function* : constitution, organization and conservation of the collection and its accessibility for students, teachers and researchers.
- *Educational function* : facilitate higher education training, as well as materials for scientific research and funds that allow the systematization of higher culture.

Currently, this university library plans to continue developing the technical, service and management processes, in the context of an interlibrary cooperation network of the National Health System (SNS), with the dynamics of library services and access to information scientific in the information age, for the entire university community that belongs to it, with response to the most sophisticated research work.

For all the BMN personnel who participated in the reengineering process of the FCM Library "Gral. Calixto García Íñiguez", there remains the satisfaction of

having contributed to the physical, material, technological and methodological development through the transfer of technology and the transmission of knowledge, skills, experiences and good practices. Monitoring is planned through systematic information audits of the institution by CNICM/Infomed specialists.

REFERENCES

1. Delgado García G. Since our beginnings [cited February 2, 2012]. Available at: http://instituciones.sld.cu/hucgarcia/historia/

2. _____. "General Calixto García" Clinical Surgical Teaching Hospital: historical account on its centenary. Public Salt Hist Square [Internet]. 2006 [cited February 2, 2012];(99):[approx. 19 p.]. Available at: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0045-91782006000100012&lng=en

3. Nogales-Espert A. The university hospital. In: Villanueva JL, Millán J, Barón M, editors. Standards for teaching medicine. Madrid: Lilly Foundation; 2006. p. 11-22.

4. Association of Librarians of Higher Education Institutions. Standards for library service in higher education institutions. Jalapa, Mexico: ABIESI; 1968. p. 111.

5. Hammer MY. Reengineering: Standard . Santa Fé de Bogotá: 1994.

6. Ponjuán Dante G, Villardefrancos Álvarez MC, León Santos M. Principles and methods for organizational improvement. Havana: Editorial "Félix Varela"; 2005.

7. ALA. ALA Standards for General University Libraries. Washington, DC: Pan American Union, General Secretariat, Organization of American States; 1964. p. 5.

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Medicine And Communication, A Fundamental Tool For The Doctor-Patient Relationship

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ABSTRACT

The quality of medical care has human communication as its central theme; But if this communication is deficient, the possibility of conflicts increases. It has been shown that in most cases the problems are not related to poor professional technical performance, but rather to a failure in the communication process between doctor and patient. The present work proposes an analysis of the communication between patient and doctor from a linguistic point of view. It is based on the idea that said communication has its own characteristics that must be taken into account in the discursive and communicative strategies that the doctor develops to achieve successful communication.

Keywords: communication, discursive strategies, social practice, speech acts.

INTRODUCTION

Medicine has traditionally been considered the dominant profession model, located in the field of health. As this has evolved and become more complex, the doctor's skills have increased and become progressively more complicated.

The objective of this work is to carry out a qualitative analysis of the communication between patient and doctor from a linguistic point of view, starting from the idea that said communication has its own characteristics that must be taken into account in the discursive and communicative strategies that the doctor develop to achieve successful communication.

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For the analysis, a communication model is presented, within which the coding and decoding processes, aimed at achieving a high degree of interaction, are decisive for successful treatment and is based on the proposal of a communication that is developed not only as a linguistic exchange, but also as an integral process, where all human components—body, expression, environment, word—definitely contribute to discursive articulation.

How important is communication in medical practice? Why can we consider that communication is essential for physical and mental recovery? One thing is "knowing how to communicate" and another is "knowing communication"; just as one thing is "being healthy" and another is "knowing about medicine."

Throughout the history of humanity we can see the struggle of human beings to survive natural disasters, accidents, mishaps and misfortunes, but above all disease. The emergence of medicine is inextricably linked to the evolution of human relationships.

Facing the problem of human communication requires, first, conceiving it as a social practice that occurs in specific cultural contexts and, second, understanding culture, according to *Ernst Cassirer* , [1] as a complex articulation of networks through of symbolic constructions such as language, art, myth, magic and science.

Geertz, in his work *The Interpretation of Cultures,* considers that "man is an animal inserted in plots of meaning that he himself has woven," and that "culture is that warp," which is why "the analysis of culture It must be […] not an experimental science in search of laws, but an interpretive science in search of meanings." [2]

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For *Geertz*, culture indicates a historically transmitted scheme of meanings represented in symbols; a system of notions inherited and expressed in symbolic forms through which men communicate, reproduce, conserve and develop their knowledge and attitudes towards life.

If we start from this premise, if we assume that language is not limited to the classic representational conception of the world, but rather becomes the inventor of realities, it is possible to create situations through therapeutic dialogue to build alternative spaces to understand how the patient creates its world of meanings and expresses it. From there, the doctor can strengthen the bond, capture the patient's attention and provoke changes in the attributions of meaning about the patient's situation.

From our individual perspectives, we have realized that many times the expectations we have, whether as a doctor or as a patient, are not carried out in the clinical consultation, since the problem goes beyond the therapeutic diagnosis. Our impression is that doctor training has a deficiency in the topic "communication." Traditionally, medical schools have given little importance to communication competence, which—from our point of view—is essential for healing to take place.

These plots of meaning, that warp that is culture, are a scheme of meanings represented in symbols, a system of notions inherited and expressed in symbolic forms, through which human beings communicate, reproduce, conserve and develop their knowledge. and their attitudes towards life.

With the passage of time, human beings have increasingly perfected resources and technology, and have had a wide network of information and increasingly complex

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means of communication. However, we often forget about communication and language as the greatest power we have to discern the environment and make sense of it.

THE DISEASE AND COMMUNICATION BETWEEN DOCTOR AND PATIENT

It is necessary to understand illness as a biological event that obtains precise meaning through culture, since both society and science define it, evaluate it and symbolize it. They result in a social construction in which, based on the specific characteristics of each disease, individuals interpret it and model their behaviors as patients of the disease or in relation to the patient.

Each language has certain ways to express concepts, appropriate reality and communicate with others. These forms of expression become more specific depending on the interlocutor and the register; That is, linguistic varieties depend on the moment and the communicative context and can be *diatopic* or geographical (based on the territorial location of the speaker), *diaphasic* or stylistic (they respond to communicative situations that the speaker faces), and *diastratic* or social. (they obey the social diversity of the speakers). [3] So that each science and each scientific-communicative circumstance present particular ways to relate to their interlocutors and for written communication.

Medical science is no exception. Being in constant development and evolution, naming new techniques, new treatments, new diseases and new terms is essential; Therefore, it is necessary to expand the field of medical discourse to designate its activity,

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taking into consideration that it is one of the most specialized languages that requires an adequate increase in vocabulary to achieve fluid communication.

The evolution undergone by medical language is a reflection of the historical experience of people and their cultural development. Spelling semantic changes, metaphors, synonymy, paronymy and linguistic variants express this diversity.

Felipe Mellizo [4] asserts that naming the parts of the body in Latin allows us to understand that it is not only anatomy that is manifested, but that the history of culture is also being explained.

According to recent studies [5] that have been carried out in the Spanish-speaking world, the doctor's competence profile must have as fundamental elements: the technical knowledge of the profession, the skills to develop it and the capacity for interpersonal interaction, that is, the attitude in front of patients.

To provide fruitful and productive care, the doctor must perform three fundamental tasks: interviewing the patient and establishing the diagnosis, prognosis and therapeutic plan; the appropriate use of available resources and most importantly, the generation of trust.

Therefore, it must be considered that when using language as a means of social transmission, doctor and patient play certain roles in the consultation, taking into account that the interaction does not refer to the patient and his psychology, but rather to the syntactic relationships. that occur when two or more people are in the physical presence of each other. However, these roles are dynamic and change according to the speaker's situation.

If we assume that language is not limited to the classic representational conception of the world, but rather becomes the inventor of realities, it is possible to create

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situations through therapeutic dialogue to build alternative spaces to understand how the patient creates his or her world of meanings and what expresses. From there, the doctor can strengthen the bond, capture the patient's attention and provoke changes in the attributions of meaning about the patient's situation.

In a sociocultural context subject to "postmodernity", [6] there have been changes in the scientific paradigm that supports the professional knowledge base and in the concept of legitimacy-authority that creates growing uncertainty, which - according to *Karl Popper* - makes science rest on quicksand. [7] Consequently, the practice of the profession is currently faced with two important difficulties: the mobility of the context and adequate communication with the patient.

Communication between doctor and patient is a widely studied topic that presents various approaches that are developed in the clinical consultation, but these studies have been carried out mainly in the Anglo-Saxon setting. It is necessary to analyze the discourse in Spanish to know how the doctor-patient interaction is carried out in Spanish-speaking individuals.

According to sociolinguistics and discourse analysis, medical exposure presents certain deficiencies in strategies that impact not only the lack of communication between the doctor and the patient, but also the patient's physical well-being. That is, as *Rita Charon* and others [8] propose in a 1994 study, that the psychosocial component must be taken into account to achieve, on the part of the doctor, a good diagnosis and a good interaction, and on the part of the patient, to increase the possibility of healing. This implies that the discourse in the consultation occurs in relation to other discourses already present in the context synchronically and

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diachronically, since the relationship between society and discourse is manifested in the constant transformation of the various linguistic events.

So we can consider that by using language as a means of social interaction, doctor and patient play certain roles in the clinical consultation, taking into account that the interaction does not refer to the patient and his psychology, but rather to the syntactic relationships that According to *Erving Goffman,* [9] are performed when two or more people are in the physical presence of each other. However, these roles are dynamic and change according to the speaker's situation.

As an encounter between two people, the doctor-patient relationship implies a communication that is established, in principle, to enable the diagnostic and therapeutic phase, but that ideally should promote interrelation processes in the participants, so it is important to identify the functions discursive and linguistic behaviors that are present in medical discourse so that this communication goes beyond an exchange of information and becomes a reciprocal and productive relationship.

Information by itself is not enough to explain what is happening to the patient, since the tone, manner and language—both of the doctor and the patient—will be essential to put communication into practice. Every communicative interaction involves a constant assessment of the speaker's verbal intention towards the listener to evaluate the effect of what is being said. *Penelope Brown* and *Stephen Levinson,* [10] following the image theory developed by *Goffman* , institute a set of positive politeness strategies whose intention is to preserve socially accepted forms of manifestation of our emotions. From this we can deduce that to achieve linguistic courtesy and the patient's trust it is necessary for the doctor to address his

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interlocutor with appropriate terms, tact and empathy, or involvement , as the English nomenclature calls it. But to achieve this, it must be taken into account that importance must be given to both the image of the sender and that of the receiver, as *Nieves Hernández Flores* proposes : "the image of the speaker is affected in the same way as that of the recipient, since Although courtesy tries to satisfy the image desires of the other, at the same time it is satisfying one's own." [eleven]

According to *Janney* and *Arndt*, [12] manifestations of affectivity are produced consciously and can be used in many social circumstances to influence the perception of the other and the interpretation of a conversational event, so that the tact that a communication professional must have Health must be used with a strategic sense to be able to influence the behavior of the interlocutor and modify it in order to achieve not only the treatment of the symptoms, but a possibility of improvement. So in a clinical consultation four linguistic categories must be met to achieve a participatory interaction on the part of the patient:

1. *Quantity* : be precise, brief and clear with the information.
2. *Quality* : do not say anything for which you do not have evidence, avoid ambiguity.
3. *Relationship* : talk only about what is pertinent to the case in question.
4. *Manner:* Be friendly and cordial when providing the diagnosis.

Marisa Cordella [13] identifies three fundamental functions or voices in medical discourse during the clinical consultation: the medical voice, the educative voice and the empathetic voice. Each of these forms of expression refers to a specific

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linguistic voice that has different communicative abilities and is related to a particular function.

The medical voice's function is to explore important information about the patient's health to make the diagnosis; The educative voice states the diagnosis obtained in scientific terms and the medical treatment to be followed by the patient briefly and clearly, and the empathetic voice expresses its capacity for emotional identification towards the patient, helps him formulate his opinions and feelings and provides the information that is required. Understanding the patient's subjective experience is something that the doctor is supposed to be trained to do; But on many occasions, whether due to lack of time, fatigue or some other reason, this is not put into practice.

The quality of the verbal stimulus must be reinforced with other non-verbal stimuli such as facial expression, posture, tone of voice, interjections and other oral manifestations that an empathetic doctor produces so that the patient understands what is being reported. This has led in some cases to consider empathy as a form of extrasensory perception that goes beyond the clinical cognitive process and makes the doctor alert to the patient's different emotional responses.

Diagnosing and understanding the patient's psychological state is only one aspect of empathy. Another important attribute is that the doctor must tune into the patient's momentary affective state, which can help therapeutic quality. Empathy is not, therefore, a feeling, but an attitude that arises from the effort to try to understand the patient's position during the care relationship, as *Borrell* states . [14] It is in this empathetic voice where the linguistic markers of the positive and negative

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politeness strategies that the doctor uses in the construction of the discursive text can be identified.

In Spanish these markers can be of different types: verbal, adverbial and adjectival, applied as discursive strategies, such as the use of the subjunctive mood instead of the imperative to qualify an advice or request, the use of the imperfect tense as a mode of courtesy, the use of adverbs and adjectives of manner, as well as the social relations of solidarity and power that result from the forms of treatment during the interaction of the speaker (doctor) and the interlocutor (patient).

There are many studies about the extent of the use of *tú* in Spanish-speaking society as a current phenomenon. According to *Brown* and *Gilman* , [15] most researchers attribute it to the explanation of the change in *semantics* of majority use in the linguistic community. *María Cristobalina Moreno* [16] proposes that in current Spanish there are various uses of the pronoun *tú* as a form of address: the reciprocal *tú* , which is used between close people - family or friends - and the non-reciprocal *tú* , which is used with people whom who consider themselves "inferior" in social hierarchy, and who—in response—will address the interlocutor with the respectful pronoun *you* . When the use of *you* is reciprocal, the interlocutors consider themselves equal on the social scale. That is to say, the function of empathy is basically carried out through contact out of solidarity with the patient through the use of positive courtesy *you ;* although unquestionably superimposed by the power situation of the interviewing doctor, who maintains the social hierarchy through this use of the non-reciprocal *you* , which contrasts with the negative politeness strategy of the educational voice through the formal use of *tú*, which implies the recognition of the identity of the patient as an individual.

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Another transcendental aspect for medical consultation is phatic communication, as *Coupland* [17] and *Valero Garcés* [18] have demonstrated in their research. This phatic communication or "contact language", as it is preferred to be called in Spanish pragmatics, is what is known in English as *smalltalk* and occurs in situations of customer service. In the field of medical consultation, the use of colloquial links (so, therefore, consequently, etc.) and conversational stimulants (let's see, look, look, etc.) facilitates interpersonal development and has the function of Establish trust between doctor and patient.

The application of these discursive strategies are speech acts that can and should be attenuated by the use of discursive modalizers to achieve, through persuasion, a better discursive practice that impacts the patient's greater recovery by provoking a favorable reaction. *Ducrot* and *Schaffer* call modality marks modalizers, which—according to the meaning they carry—can be subject to different classifications. The modalities of discourse show, therefore, through the modalizers, subjectivity in language. [19]

The doctor can use strategies to mitigate negative politeness using direct forms of the second person, such as the use of *you* and its correlatives or the use of the first name, which establishes a bond of trust and positive courtesy that reinforces the image. positive of the interlocutor.

An aspect of communication that certainly influences the relationship between doctor and patient is speech acts, as mentioned above, which are used in certain contexts according to the norms of the language. If, despite speaking the same language, doctor and patient do not share the same standards or do not recognize that these differences exist, misunderstandings may occur in the interpretation of

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what has been said and what has been done during the consultation. so that the expressive force of speech acts, as a form of compensation for the evaluative component in the speaker's communicative intention, must be effective.

The philosopher of language, *John Austin* , [20] was the first to present the idea of the speech act [20] (*speechact*) as a functional unit in communication, so that when someone says or states something, what is said can have two meanings: the literal meaning, or locutionary, and illocutionary meaning, that is, the effect that the speaker wishes to have on the listener.

Speech acts are only one of many linguistic factors that can affect communication; that to be carried out depend on a series of rules and characteristics that must be shared, both by the interlocutor and by the recipient, since during a conversation, and especially during the consultation, it is essential that the two parties can interpret the content of the same way to minimize the risk of miscommunication. Some linguistic variables that intervene in communication, and therefore in speech acts, are: tone of voice, facial expressions and body language.

If doctor and patient do not share the same norms or do not register that these differences exist, misunderstandings can occur in the interpretation of what has been said and done during the consultation, so that the expressive force of speech acts in the communicative intention of the speaker it must be effective.

To achieve the pragmatic function of the communicative intention of the clinical interview, it is important to consider a technique proposed in "Brief Therapy" [21] of Palo Alto, California, which—although it consists of a specific technique—is also

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a model of therapeutic language that encompasses everything from verbal interventions to behavioral rules.

One of the main points of "Brief Therapy" is the proposal that beneficial changes are observed in the patient when the doctor learns to speak their language, both verbal and body language; That is, understanding what patients say, how they say it, and what they mean.

Although this proposal consists of a specific technique, it is also a model of therapeutic language that encompasses everything from verbal interventions to behavioral rules, so that beneficial changes are observed in the patient when the doctor learns to speak their language, both verbal as well as corporal, that is: the doctor understands what the patients say, how they say it and what they want to say.

The Palo Alto researchers propose that human relationships, when they reach a certain development and stability, define roles and become behavioral systems, in which each role and position reinforces and feeds back the roles and positions of the other members in the system. ; that is, they tend to constitute balanced units.

The approach of this therapy is characterized by focusing on communication through feedback, better known as *feedback* . The patient is not simply a sender and receiver of information but also establishes a circuit that impacts and influences both him as a sender and a receiver, and vice versa.

If we take into account that the concept of *feedback* is the central core of communication sciences, then feedback is the essence of interaction; in the same way that the first principle of the pragmatics of human communication states that it is impossible not to communicate. In the doctor-patient interaction, the behavior of

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the sender delimits the response of the interlocutor and this is what regulates the behavior of the sender, and so on.

The first justification for incorporating a concept such as feedback in the study of interpersonal relationships is found when attempting to assimilate them into a system; in this case, an open system in which the reaction of the receiver in turn has consequences on the behavior of the sender.

So we can define feedback as the set of reactions or responses that a receiver emits regarding the sender's performance, which is taken into account by the sender to change or modify their message. Physiologists call feedback *homeostasis (automatic regulation).*

Therefore, *homeostasis* is the term applied to the set of self-regulatory phenomena that lead to the maintenance of permanence in the properties and composition of the internal environment of an organism. The concept was developed by the American physiologist *Walter Bradford Cannon* (1871-1945). This term transcends Biology, becoming part of the scientific vocabulary of various disciplines, thereby expanding its field of application and interpretation, to refer to the characteristic of any system, whether open or closed, that allows it to regulate the internal environment. to maintain a stable condition. Stability is enabled by different self-regulatory mechanisms and various dynamic adjustments.

This is how we consider that homeostasis should be one of the fundamental principles of communication, since a failure in interaction can cause little or no communication. Hence we can refer to the fact that the doctor-patient relationship must fulfill a homeostatic function in its generalized meaning of anchoring, palliation, balance; and this is achieved through the co-participation of the

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participants. Thus, on the one hand we can define the clinical interview as a transformation, both in its structural development and in terms of its ramifications; and on the other hand, we can assimilate it to a homeostatic system endowed with a certain stability and self-regulatory capacity.

CONCLUSIONS

Communication between doctor and patient presents various approaches that are developed in the clinical consultation. As a field of clinical action, this interaction must be a dynamic relationship, an interpersonal and intersubjective process, and be established within a transference-countertransference context. So, both doctor and patient, even if they are in contact for the first time, already have a prior collection of knowledge, attitudes and social, linguistic and cultural notions that lead them, on the one hand, to infer data from the context, and on the other. , to make an interpretation of these. If we assume that language is not limited to the classic representational conception of the world, but rather becomes the inventor of realities, it is possible to create situations through therapeutic dialogue to build alternative spaces to understand how the patient creates his or her world of meanings and what expresses. From there, the doctor can strengthen the bond, capture the patient's attention and provoke changes in the attributions of meaning about the patient's situation.

REFERENCES

GARDEN JOURNALS
Journal of Qualitative Research in Business Law, Eco-Fin, Accounting, and Statistics
ISSN : 1533-1520

1. Cassirer E. Philosophy of symbolic forms. Mexico: FCE; 1979.

2. Geertz C. The interpretation of cultures . Barcelona: Gedisa; 1997. p. twenty.

3. Acevedo de Bomba E. «Take care of the people of Cuenca... Speech acts, atopic and dystratic variants in the training of ELE teachers.» In: Lexicon and interculturality. New insights. Institute of Hispanic American Linguistic and Literary Research. Tucumán [Internet]. 2009 [cited October 18, 2012]. Available at: http/www.insil.com.ar/.../up.../Lexico-e-Interculturalidad.pdf

4. Twin F. Literature and illness. Barcelona: Plaza & Janés; 1979.

5. General Medical Council. Tomorrow's Doctors. London: GMC; 2002.

6. Lipovetsky G. The Age of Vacuum. Barcelona: Ed. Anagrama; 2010.

7. Popper K. Conjectures and refutations. London: Routledge; 2002.

8. Charon R, Greene MG, Adelman RD: Multidimensional interaction analysis: A collaborative approach to the study of medical discourse. Soc Sci Med. 1994;39:955-65.

9. Goffman E. Interaction Ritual. Essays on Face to Face Behavior. Nueva York: Doubleday Anchor; 1967.

10. Brown P, Stephen Levinson. Politeness. Some universals of language use. Cambridge: Cambridge University Press; 1987.

11. Hernández Flores N. Sociocultural pragmatics: studies on polite speech in Spanish. In: Studies of (dis)politeness in Spanish . Stockholm: Edice; 2005:95.

12. Janney R, Horst A. Universality and relativity in cross-cultural politeness research: A historical perspective. Multiling- J Cross-Cult Interlang Communic. 2009;12(1):13-50.

GARDEN JOURNALS
Journal of Qualitative Research in Business Law, Eco-Fin, Accounting, and Statistics
ISSN : 1533-1520

13. Cordella M. The doctor-patient interaction under scrutiny: an interactional sociolinguistics study [Internet]. 2002 [cited October 23, 2012]. Available at: http/www.onomazein.net/7/interaccion.pdf

14. Borrell F. Commitment to suffering, empathy and dyspathy [Internet]. 2003 [cited September 11, 2012]. Available at: http/www.ocw.ub.edu/ **medic** ina/ **medic** ina.../Compromiso-con-el-sufrimiento-03

[PubMed] 15. Brown R, Gilman A. The pronouns of power and solidarity. In: Sebeok TA (ed.). Style in language. Boston: MIT Press; 1960: 253-76.

16. Moreno MC. The use of the pronoun *tú* in contemporary Spain: Extension of a new use or continuation of a trend started in the Golden Age? Internet]. 2003 [cited October 23, 2012]. Available at: http/www.cvc.cervantes.es/lengua/coloquio_paris/ponencias /.../cvc_moreno.pdf

17. Coupland J. Small Talk. London: Longman; 2000.

18. Valero Garcés C. The contact conversation in institutional contexts: the medical consultation. In: Placencia ME, García C (eds.). Analysis of oral discourse. Oralia Monograph; 2008:11.

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The Interdisciplinary Of Science And The Organization Of Knowledge In Curricular Information Management Systems

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ABSTRACT

Curricular information systems have become valuable instruments to obtain indicators for measuring knowledge resulting from different scientific activities, since they allow describing interdisciplinary behavior and its influence on the organization of knowledge of the institution or region where it is applied. . In this sense, experiences of regional and inter-institutional integration dazzle that set guidelines to follow for the organization of knowledge and the development of standardized and wide-ranging indicators. The present research delves into these issues, in order to highlight the problem of the interdisciplinarity of science and its influence on the organization of knowledge in this type of system. From a general point of view, the organization of knowledge is proposed in interaction with the development, application and analysis of measurement indicators that favor the visualization of the interdisciplinarity of knowledge.

Keywords : Interdisciplinary, curricular information systems, *curriculum vitae* , science and technology indicators.

INTRODUCTION

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The interaction of information and knowledge within the different processes of an organization, and its articulation and identification within institutional information management systems for decision making, has been a topic of interest for some time by various specialists. . There are different initiatives in the analysis and structuring of information systems (IS) depending on the nature of the information that is managed, the structure of the knowledge sector it covers, the types of processes involved, as well as the characteristics of the organization and its human resources.

In this scenario, the development of information and knowledge technologies (ICT) has been fundamental for the analysis of the volume of scientific knowledge that is currently generated. In this sense, scientific and technical information systems are developed that constitute a true support tool for research management, as well as for the constant support of decision-making in matters of scientific and technological policy. These tools are observed in practice in government projects. From this point of view, in the literature consulted, very tempting experiences can be studied from the institutional point of view and towards curricular management. This is understood as the analysis of information from the researcher's *curriculum vitae* as a source of information for the analysis of science and technology processes at the institutional and regional level.

In this work we try to offer a brief vision of the current situation of these tools. The main objective is to address some aspects related to the influence of the phenomenon of interdisciplinarity of science on curricular information management systems and its approach from the organization of knowledge, in interaction with the development of indicators.

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INFORMATION SYSTEMS: CURRENT CHALLENGES

Since the 1990s, information has been used in organizational environments as an economic resource; greater use of this by the general public is detected; and the economy sees the development of a sector whose function is to respond to the general demand for media and information services. [1] This statement corroborates the constant concern of different specialists in achieving efficiency in the production and application of IS aimed at promoting KM, developing the communication process in the organization and favoring decision making. The main objective is to maintain the systemic relationship of the organization with the environment that surrounds it and meet the objectives that it has proposed for society.

SIs in environments in which scientific knowledge interacts face challenges related to the diversity of knowledge, its systemic interaction and its multidimensional vision. In this scenario, the importance of the concept of "information phenomenon" comes to light or is resumed, since it reaffirms the influence of several social and historical-concrete manifestations that occurred as a whole in the formation, primarily of activities related to the organization. of information for various purposes and, subsequently, in the emergence of the disciplines that were in charge of its study and that cover, in addition to the organization of information, its representation and search . [2] The need to organize and structure the aspects related to information and knowledge in the IS oriented at the different levels of the institution is evident. This resource can be used to support and assist timely and accurate decision-making, based on the fulfillment of organizational objectives and in coordination with other organizational resources. This aspect is a common factor

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in the literature consulted; In addition, special attention is highlighted towards obtaining structures adjusted to the interdisciplinary nature of knowledge [3] and the constant evolution of the information needs of users. [4]

The so-called "information phenomenon" reaffirms the prominence of IS as essential tools for the management of resources related to information and knowledge in the organizational environment, which indicates that society's own need has influenced the emergence of tools, methods and disciplines that study the peculiarities of information and knowledge in the organization.

This shows that the conception of IS has had to evolve according to the demands of the times, from a purely informational approach (early nineties) to facing in this new century the challenge of resolving the semantic interoperability that present. In other words, today's problem is that a fact can be more than a simple description, if we want to achieve a true interpretation of the complex reality that converges in dissimilar organizational environments . [5,6] This approach defends a new concept of IS, in which it can be defined as the set of elements and processes that dynamically intervene in the exploitation of cognitive information, conceived within the framework of a specific social group and for specific areas. , whose purpose is to facilitate their access to knowledge and support them in making correct decisions . [7]

From this perspective, an IS, beyond being a data warehouse that collects all the available and necessary information, can become a true tool that supports and complements the activities that provide development, productivity and competitiveness, in the different areas of organizations. But to achieve objectivity in the IS, the implementation of tools is required to recover and visualize the

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information adjusted to the needs of the organization; Furthermore, it is a requirement to have systems that allow describing and structuring the inter and transdisciplinary nature of the information they compile, which allows giving structure to the organizational knowledge that each institution possesses.

THE PHENOMENON OF THE INTERDISCIPLINARITY OF SCIENCE IN KNOWLEDGE ORGANIZATION SYSTEMS

The issues addressed above point to the development of approaches related to the systemic interaction of disciplines, which has been named by several authors as "interdisciplinarity." This phenomenon has been analyzed as a response to the study of complex systems that promotes not only the specialization of scientific work, but also its recombination. For important authors, interdisciplinarity is the reflection of the complexity and universality of the reality itself on which we act . [8-10]

At the beginning of the 20th century, the interdisciplinary notion constituted a concern on the part of the world community regarding the breakdown of specialization and separation of sciences. Currently, the constant concern is the establishment of patterns and ways to achieve the correct systemic interweaving of the specialties, as well as a correct analysis of the complex reality that surrounds us, with the aim of solving everyday problems and making decisions. in the administration of the organization's tangible and intangible resources. In this model of generalized interaction, a process of bringing scientific research closer to other

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sciences occurs, which entails the interrelation between basic, applied and development-oriented research, called vertical integration of science. [eleven]

In the vertical integration of science, there is a tendency to involve scientific activity in the most diverse areas of socioeconomic practice (Fig .). There is a transition through several stages that promote the development of researchers and science itself towards society. As evidenced by *Núñez*, in 1994, from verticality an object is studied based on prior knowledge, but with greater depth and extension . [12]

In close relation to this trend, the horizontal integration of science is reflected, which consists of the interpenetration and interweaving of traditional disciplines for the solution of complex problems; for example, the study and use of the cosmos, environmental studies, among others, which require the unification of the efforts of the natural, technical and social sciences (Fig .). Forms of horizontal integration mean new relationships between science in search of a more complete understanding of complex systems, as an organized totality where multiple processes of interrelationships converge and that require a comprehensive study of the system. In solving complex problems of everyday reality, several integrated systems converge that require integrated solutions . [13]

This disciplinary approach, traditionally used, has come into contradiction by contrasting with reality, in which - to achieve the solution of certain problems - an assembled approach is needed, where disciplines tend to mix at their borders. Treating this problem in isolation in some cases can lead to erroneous interpretation of reality. In this regard, *Becher, 2001* , states that it is common for groups of neighboring disciplines to dispute the same intellectual territory, which

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can lead to a division of interests or, on the contrary, to a growing unification of ideas and approaches . [14]

Classifying fields of knowledge as disciplines or specialties has both supporters and detractors. Defenders of interdisciplinary research point out that the first option does not facilitate the investigation of important interdisciplinary areas, which respond to the resolution of problems that require the interaction of several results that come from several disciplines. In the specific case that this research addresses, another unfavorable aspect in the disciplinary classification of science appears when it is required to structure knowledge within the IS, as well as obtain indicators capable of measuring research results by areas of organizational knowledge. .

In this case, the curricular systems propose to use or implement the different taxonomies of knowledge that have been established by UNESCO, the Organization for Economic Development (OECD), etc. to reduce the complexity of classifying research results by different fields or specialties of science. In this way, by including the structuring and normalization of knowledge in these systems, the different scientific and technological results can be classified by all the areas of knowledge that intervene in their development. But this method has a disciplinary focus; In certain scientific studies, the results become more complex at the time of structuring knowledge.

From this position, institutional information management systems operated through people's *resumes* constitute an alternative to structure the knowledge that an institution has. Another important aspect, in this type of system, is the possibility of developing indicators that show the interdisciplinary interaction of scientific

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results, given the comprehensive information provided by a researcher's *curriculum vitae* (CV). From this perspective, information systems with the researcher's CV approach can be a method to study the behavior of processes related to research, and be able to identify patterns in the classification of science with an interdisciplinary approach.

This is achieved, in the first instance, with the structuring of the knowledge coming from the institution's research results taking as a standard the existing and internationally approved taxonomies, from the disciplinary perspective. In the second instance, an interaction between these structures and the development and analysis of indicators that show the interdisciplinary interaction of the research results and the trajectory of the researcher and the institution can be achieved. This investigative work proposes the union of these two analyzes to achieve a better structuring of the knowledge resulting from the investigative process, at the institutional level.

THE ORGANIZATION OF KNOWLEDGE IN CURRICULAR INFORMATION SYSTEMS: CURRENT APPROACHES

Knowledge organization is a "discipline that studies the laws, principles and procedures by which specialized knowledge in any discipline is structured. [15] This concept is valid whenever knowledge is ordered within the framework of a discipline, as explicitly reflected.

In case of crossing the boundaries of disciplines, knowledge organization (KO) is the domain in which the organization of knowledge is at the same time the main paradigm of scientific research, whose basic application is the development of

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systems. These two topics intertwine, and there is a fairly strong discourse between knowledge organization theories and knowledge organization systems (known as SOC). [16]

When studying the traditionalist approach of the SOC, it is observed that it establishes its foundations in the disciplinary structuring of knowledge. Disciplinarity is a key element for SOCs, because they are basically structured according to disciplines . [17] Generally, SOCs are either framed in specific disciplinary spaces or, with a universalist approach, are ascribed to the disciplinary scheme established by science.

With the arrival of new ways of studying and representing reality, a new so-called multidimensional knowledge has emerged, motivating conceptual and structural terminological dynamics different from those known in disciplinary spaces. These interdisciplinary, transdisciplinary and multidisciplinary phenomena cannot be represented in traditional information systems. This new knowledge presents new characteristics and has generated a new system around it in which we can count on new content in documents, different users, different ways of accessing information, special needs for certain information, among other dynamic factors, which require a more integrative approach. [18] This situation makes the normalization of the different classifications of knowledge a real problem today, which in turn has an unfavorable impact on the management of science and technology at the institutional, national and regional level, an aspect that will be addressed in following sections.

The treatment of information resulting from science and technology processes through an IS becomes a complex and almost unachievable task when results from

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different disciplines are treated or when very complex topics (multi or interdisciplinary) are studied, since The parameters that allow structuring scientific and technological results with this systemic approach to knowledge are not clearly identified.

The implementation within the institutional IS of the classification of science in a disciplinary manner contradicts the results of interdisciplinary research (in certain fields of knowledge). However, SIs with a curricular focus have addressed this problem with the aim of establishing patterns to measure results based on the interdisciplinary perspective, by introducing knowledge indicators that allow dialogue between these processes. From this perspective, the authors propose the organization of information and knowledge (in this type of system), towards the following actions:

- Establish a balance between the structuring of the CV fields and the information resulting from the investigative processes, characteristic of each institution. This interaction must respond to important areas or processes within the analysis of science. These respond to the results that researchers have in various aspects of science. The results stand out in the following areas: research projects, scientific and teaching support publications, participation and convened events, among others.
- Carry out the structuring of knowledge in relation to the topics addressed in the research and the results achieved by the researcher, based on the classification of science, or the scientific disciplines established by internationally recognized nomenclatures. This aspect contributes to the classification according to current

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regulations and, in this case, it is carried out by the researcher himself in coordination with specialists and using patterns defined by the system itself.

- Develop measurement indicators that visualize the interactions of specialists, the collaborations of institutions with different scientific objectives and the execution of research projects, in addition to indicators that highlight the disciplinary structuring from non-standardized categories in the established fields. In this way, the analysis of interdisciplinary and multidisciplinary results is established, related to more interacting fields and disciplines. The establishment of patterns in these indicators and the benefits of curricular systems constitute important guidelines for the analysis of the interdisciplinarity of science.

These three actions guarantee the integration of the CV fields with the important research processes within the institution, the structuring based on established parameters and the analysis of interdisciplinary research and its evolution, using the application of measurement indicators. In this way, the researcher becomes familiar with the established nomenclatures and the disciplines that have been interacting in the socialization of knowledge are known in the institution.

At this point it is worth delving into the specificities of the most recognized nomenclatures in the structuring of science and technology at an international level. The UNESCO nomenclature can be cited, which is international in nature and the oldest; the OECD nomenclature, which belongs to the European region but has been widely used due to its benefits of application, and finally the approach of the Latin American region, which has been led by the areas of knowledge declared in the CvLAC System. These taxonomies, as they can be named in the specialized literature, respond to the disciplinary analysis of science.

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As a result of the complexity of the classification of science itself, difficulties still persist in structuring knowledge from certain disciplines or fields; for example, social sciences, engineering (specifically computer science and artificial intelligence), specialties such as biotechnology, nanotechnology, environmental studies, etc. This situation is reflected in curricular systems when certain research related to multidisciplinary approaches that are not framed within the borders of certain disciplines, but rather in their integration or combination, are classified. [19,20] For this reason, in this type of system, fields or disciplines with the category "other" are widely selected by researchers.

The work with researchers' CVs as sources of data in the development of indicators and as a source of information for information systems for decision-making in science and technology is a topic that has a high level of conceptual and methodological novelty. In the bibliography consulted, the consensus of certain authors on the existence of measurable potential in this type of document (CV) is recognized. The conditioning factor of standardization is one of the pending aspects of research. This phenomenon has been treated in international research and projects related to these topics. [21-23]

A favorable inclination has developed to use researchers' CVs as sources of data for the evaluation of science and technology, and decision-making on this topic. In this type of IS, the researchers' CVs constitute the ideal format to know, record and standardize the results of the research process and its impacts in different realities. In this context, examples of European experiences and highly recognized results in Latin America serve. The practical applications are evident from two perspectives: the institutional IS (mainly in universities) and the regional systems

of science and technology (which group the results of several institutions in the same region or country). These two aspects interact with each other, with the objective of establishing ways, methods and indicators to measure the impact of science and technology.

Representing the institutional IS in universities, the Scientific Information System of Andalusia (SICA) and the Global University Management System (Universitas XXI) can be mentioned. Both have a modular system intended for the management of researchers' CVs, in integration with measurement and decision-making in the research process. These platforms are developed in integration with several universities in Spain.

The Scientific Information System of Andalusia (SICA, http://www.cica.es) manages an authorized knowledge base that installs standardized and agreed criteria regarding the evaluation and quality of the results of scientific activity. SICA provides agile mechanisms for the management and maintenance, in a continuous and updated manner, of the individual CVs of researchers and favors the transfer of information results between different types of agents. The use of the system by the Andalusian scientific community has varied significantly over time. Currently, 10 Spanish universities are integrated into this platform. [24]

Another similar example is the aforementioned Universitas XXI project (http://academica.usal.es/investigacion), created by the Research Results Transfer Office (OTRI) of the Carlos III University of Madrid, and the Cooperation Office Universitaria (OCU), in collaboration with other universities such as, for example, the University of Salamanca, the University of Extremadura, the University of Burgos, among others. This comprehensive system is made up of

four modules: Human Resources, Economic, Academic and Research. This last modular platform has an area for the curricular management of researchers. Through this tool, the researcher updates his CV, using formats standardized by the Interministerial Commission of Science and Technology (CICYT), the Junta de Castilla y de León, and the National Agency for Quality Assessment and Accreditation (ANECA) and enables him the user to establish their personal structure of their CV. [25]

Among the regional SIs, which use the curricular perspective in their approach, two representative examples stand out (in Latin America): the Integrated Information System in Science and Technology of Mexico (SIICyT, http://www.siicyt.mx/) and the Argentine Science and Technology Information System (SICyTAR, http://www.sicytar.secyt.gov.ar). The latter has contributed to the construction of government indicators, focused on the (unified) *curriculum vitae* of Argentine scientific and technological researchers, with a relevant contribution towards the preparation of the Buenos Aires Manual, with a view to achieving the homologation of trajectory indicators. of human resources in science and technology. [26]

The systems discussed above demonstrate the feasibility of using researchers' CVs as a source of information, in science and technology evaluation studies, at the institutional and regional level. Actions are needed on the part of international authorities to promote the development of curricular systems that favor the management of CVs in a homogeneous way. In this sense, the importance of standardization and normalization of CV fields comes to light.

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An indisputable example for our region is represented by the Lattes Platform, of the National Council for Scientific and Technological Development (CNPq) of Brazil (http://www.cnpq.br/). This platform is a set of systems and databases for managing the CV analysis units of scientific experts, research groups, link engines and different modules such as a visualization system, in addition to the administration and support systems. Its main objective is to keep the database of researchers' CVs from the member countries of the network up to date; In addition, on the researchers' full-text publications.

One of the modules or pillars of the Lattes Platform is the electronic curriculum system Scienti, which contains the database on researchers and research institutions: CvLAC. The specialists of this platform work on the adaptation of taxonomies to the interdisciplinary interaction of science and the homologation of indicators and structures of CVs.

In this way, the possibility of interaction and interoperability of curricular information systems is evident. This interaction can be possible from the institutional level to the regional level. In this way, work can continue on the development of measurement indicators and conceptual structures of knowledge from institutional perspectives and towards regional perspectives, in order to obtain a better description of the reality that surrounds this type of system. The study of this topic from the institutional perspective, starting from the development and implementation of IS oriented to the realities of each type of institution, can constitute a very important step forward in achieving regional systems more integrated into the organization and recovery of knowledge. interdisciplinary science. Furthermore, it is a relevant contribution to the design and implementation

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of science and technology indicators that show the behavior of these processes, the results of researchers and the impact of knowledge on society, from the institutional level and towards regional integration.

PRELIMINARY CONSIDERATIONS OF THE CURRICULAR INFORMATION SYSTEM OF THE UNIVERSITY OF PINAR DEL RÍO

Currently, at the University of Pinar del Río (UPR) a curricular system is being developed by the Information and Knowledge Management Group (proGINTEC), aimed at the management of science and technology at an institutional level. One of the modules of this system is aimed at the management and evaluation of Science, Technology, Innovation and Postgraduate Studies. The user of the system is the professor, researcher or graduate student. Thanks to the updating of the CV, a set of indicators are developed that show the behavior of the science and technology process in the institution. [27]

From the point of view of the use of this powerful tool and with the objective of measuring the knowledge resulting from the research process, the main variable is the Research Results. These are present at various times in the researcher's CV. [28] The user is proposed to classify their results using existing taxonomies or at least the three most important ones: UNESCO, OECD and Lattess. This classification must be done in four moments within the structure of the CV:

- *Postgraduate academic qualification* : in this case, results are obtained related to the research carried out by the researcher based on obtaining the different postgraduate qualifications received. The researcher classifies the results of his thesis or research project.

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- *Assisted theses* : in this field the researcher obtains results related to his thesis advice, whether in the undergraduate or postgraduate degree. The results of these theses are classified according to the mentioned taxonomies. In this case the researcher serves as an advisor.
- *Research results associated with projects* : these results are related to the researcher's actions from the research project to which he is linked. The results obtained by the researcher in the development and implementation of a research project are shown. The results can be shown in publications of different types: in magazines, monographs, books, patents, among others.
- *Research results not associated with projects* : this aspect links the results that are not related to research projects and constitute results of relevance to the researcher and the institution. For example, they may be results more related to teaching variables or in relation to consulting processes.

The first three aspects can be related to the indicators of research projects. In this way, the results that are related to the institution's research projects are compared and the knowledge that comes from the research results that are interdisciplinary and can be shown through the indicators is organized. In the case of results not associated with projects, they can be contrasted with indicators of scientific publications, even in impact journals, and co-authored by specialists and collaboration of institutions; In this way, various nuances of transdisciplinarity can be shown.

Below are some indicators that can be developed through the implementation of curricular information systems; They are the combination of various data from the researcher's CV. With these indicators, the disciplinary structuring or classification

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by the user (using taxonomies) can be contrasted with other aspects of the research interaction, within the dynamics of the research projects. This activity of science is one of the aspects in which the interdisciplinarity of science can be shown (table).

Cuadro. Indicadores de proyectos de investigación

Indicadores: proyectos de investigación (relación porcentual)
1. Coordinación de proyectos por áreas de la institución.
2. Integración de proyectos en áreas de la institución.
3. Participación de miembros externos en proyectos de investigación.
4. Diversidad de especialistas en colaboración en el proyecto.
5. Publicaciones en relación con resultados de proyectos de investigación.
6. Publicaciones en revistas de otras especialidades en relación con el proyecto.
7. Líneas de investigación abordadas en proyectos de investigación.
8. Proyectos de investigación atrasados.
9. Proyectos interdisciplinares.

The example shown shows, in Abstract, the first steps in the organization of knowledge within curricular systems. This resulting knowledge is expressed in the research results of the members of the institution; It constitutes explicit knowledge that the organization must socialize to continue developing the science and technology process in a harmonious way. For this reason, it is very important to develop SIs that support the management of science and technology at the institutional level, that visualize the path to follow and facilitate the development and application of indicators for measuring the processes of science and the impact of knowledge. in society. Future research is directed towards these premises with the aim of achieving the implementation of a platform that supports the

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management of science and technology at an institutional level, in constant harmony with regional and international parameters.

FINAL THOUGHTS

In the analysis of the bibliography consulted, it can be confirmed the existence of a paradigm to follow towards the design and implementation of IS oriented towards the researcher's CV as the main source for the management of science and technology. With the use of this type of system at the institutional level, greater interaction of researchers with the scientific results of the institution can be achieved. The managed and monitored consultation of scientific CVs, using IS adjusted to these realities, can be very useful for the management of science and technology at the institutional level, as it can achieve a greater interpretation of the results of these scientific processes. In addition, it facilitates the updating of the researcher's CV as his resume in which his career is shown and increases the level of vision and recognition of his scientific and teaching results. Likewise, this perspective from the regional level facilitates the work of the organizations dedicated to the analysis and promotion of science in the regions. The harmonious interaction of measurement indicators can be achieved that facilitate decision-making in science and technology processes, at the institutional and regional level.

Curriculum information systems most frequently encounter problems with the management of data from groups and lines of research, whether research projects, reports, theses, etc. since a large part of the research carried out in research integration contexts shows an inter- and transdisciplinary nature of the scientific results. After delving into the issues addressed in the literature in this regard, this

work proposes to confront the organization of knowledge and the development of measurement indicators from a different perspective and proposes the integration of these two aspects within the structuring of curricular systems. The essence is in the careful structuring of the researcher's CV, using every piece of data that comes from the researcher's behavior, his/her relationship with the institution and the peculiarities of the science and technology process.

REFERENCES

1. Moore N. The Information Society. World information report. Paris: UNESCO; 1997.

2. Pérez NE. The information phenomenon in Cuba. Reflection within the framework of the nation's constitutional periods and its professional literature of the 20th century. Havana: Doctoral Dissertation. University of Havana; 2007.

3. Rocha Souza R, Tudhope D, Barcellos Almeida M. Towards a taxonomy of KOS: Dimensions for classifying Knowledge Organization Systems. Knowledge Organization; 2012.

4. Rojas Morales N. The organization and recovery of information according to the user's context. Report of the I International Symposium on Knowledge Organization: library science and terminology, August 27 to 29, 2007. Mexico City: UNAM, University Center for Library Research; 2009.

5. Sheth AP. Changing focus on interoperability in information systems: from system, syntax, structure to semantics [Internet]. 1998 [citado 15 de junio de 2010]. Disponible en: http://lsdis.cs.uga.edu/library/download/S98-changing.pdf

6. Barchini G, Álvarez M, Herrera S, Trejo M. The role of ontologies in information systems. Computer Engineering Magazine [Internet]. 2007 [cited May 25, 2011]. Available at: http://www.inf.udec.cl/revista/ediciones/edicion14/barchini.pdf

7. Codina L. Web 2.0, Web 3.0 or Semantic Web?: the impact on Web information systems. I International Congress of Cyberjournalism and Web 2.0. Bilbao: Pompeu Fabra University; 2009.

8. Lage A. Intervention in the National Workshop on Knowledge Management at the New University. Havana, Cuba: 2005.

9. Morin E. On interdisciplinarity [Internet]. Rev Complex. 1995 [cited February 30, 2010]. Available at: http://www.pensamientocomplejo.com.ar/docs/files/morinsobreinterdisciplinaridad.pdf

10. Motta R. Complexity, education and transdisciplinarity [Internet]. Rev Univ Boliv. 2002 [cited January 30, 2012];1(3):1-21. Available at: http://www.revistapolis.cl/3/motta3.pdf

11. Salazar D. The interdisciplinarity, result of the historical development of science. 2004. In: Gonzalez A, Capiro R, Fernandez Diaz C (eds). Notions of Sociology, Psychology and Pedagogy. Havana: People and Education; 2004. p. 257-6

12. Nuñez J. Science, Technology and Society. Social Problems of Science and Technology. Havana: Editorial Félix Varela; 1994.

13 . *op. cit.* reference 11.

GARDEN JOURNALS
Journal of Qualitative Research in Business Law, Eco-Fin, Accounting, and Statistics
ISSN : 1533-1520

14. Becher T. Tribes and academic territories. The intellectual investigation of the cultures of the disciplines. Barcelona: Gedisa, 2001.

15. Barité M. Dictionary of organization and representation of knowledge [Internet]. 2000 [cited April 21, 2009]. Available at: http://www.eubca.edu.uy/diccionario/diccion.html

16. Smiraglia Richard P. Knowledge organization: some trends in an emerging domain. The information professional [Internet]. 2012 [cited April 21, 2009]:21(3). p. 225-7. Available at: http://dx.doi.org/10.3145/epi.2012.may.01

[PMC free article] [PubMed] 17. Gnoli C, Bosch M, Mazzocchi F. A new relationship for multidisciplinary knowledge organization systems: dependence. León, Spain: Paper presented at the VIII ISKO Congress; April, 2007.

18. López-Huertas MJ. Epistemological dynamics in scientific domains and their influence in knowledge organization. Roma: 11th ISKO International Conference [Internet]. 2010 [citado 2 de julio de 2013]. Disponible en: http://www.iskoi.org/rome2010/index.html

19. ScienTI Network. Normalization of Classifications. Buenos Aires, Argentina: III Regional Coordination Meeting of the ScienTI Network; 2004.

20. Carrizo G. The problems of the Organization of Social Sciences. Alcalá de Henares, Spain: V Society for Knowledge Organization (ISKO) Congress; 2001.

21. Navarrete Cortés J, Banqueri Ozáez J. Scientific information systems: tools to measure the impact of biomedical research. Barcelona: Rev Med Clin. 2008;131(Suppl. 5):71-80.

22. Martín-Simpere MJ, Rey-Rocha J. The *curriculum vitae* and the survey as data sources for obtaining indicators of the scientific activity of researchers

[Internet]. 2009 [cited April 16, 2010]. Available at: http://www.ricyt.edu.ar/interior/normalizacion/III_bib/Simpere_Rey.pdf

23. D'Onofrio G, Solís F, Tignino MV, Cabrera E. Trajectory indicators of Ibero-American researchers: Advances in the Buenos Aires Manual and results of its technical validation. Buenos Aires: Report of the Ibero-American and Inter-American Network of Science and Technology Indicators (RICYT); 2010.

24. de los Ríos R, de Assis P. The virtual space for exchanging information on human resources in Science and Technology in Latin America and the Caribbean. From CV Lattes to CvLAC. Brasília: Rev Cienc Inform. 2001;30(3):42-7.

25. Salamanca University. Researcher Portal User Manual [Internet]. 2005 [cited May 25, 2009]. Available at: http://campus.usal.es/~infouxxi-inv/archivos/manualuxxi.doc

26. Network of Science and Technology Indicators. Towards the Buenos Aires Manual. Indicators of Human Resources Careers in Science and Technology in Latin America. Buenos Aires: I Ibero-American Workshop on developed topics [Internet]. 2009 [cited March 23, 2010]. Available at: http://ricyt.org.elserver.com/docs/taller_rrhh/informemanualdebuenosaires.pdf

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Design And Implementation Of The Internal Information System For The Imaging Department Of The "Manuel Ascunce Domenech" Provincial Hospital, In Camagüey

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ABSTRACT

Introduction : at the Provincial Hospital of Camagüey, the Imaging Service provides statistical information stipulated by the Diagnostic Media model; However, this does not satisfy the internal needs of the department. **Objective** : improve the internal statistical information of this agency. **Methods** : A technological innovation study was carried out between January 2011 and November 2012. An interview was applied to the workers of the Imaging Department and the 132 internal data models of the service were analyzed to identify the necessary statistical information. Subsequently, models were designed that collect information by services, through software that implements the processing of data not stipulated in the official model. **Results** : The models and their subsequent automation refined the information in terms of coverage, completeness, reliability and inclusion of necessary data. The software made it possible to calculate positivity rates of the cases studied, as well as control resources and repeated examinations, which contributed to the efficient processing and recovery of statistical data, while favoring the rational use and exploitation of technological resources. . Users expressed high levels of satisfaction with the information provided.

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Recommendations : It is recommended to carry out the corresponding cost analysis to determine the feasibility of implementing the software from the point of view of efficiency and generalize its installation in health units that use diagnostic means.

Keywords : statistical models, ultrasonography, information technology, automation, computer programs.

INTRODUCTION

The automation of information systems constitutes an aspect of vital importance for the correct development of dissimilar activities, which is why software, as equipment or software for a computer, has become an essential tool. This represents the set of necessary components that allows the performance of specific tasks. Hence, the significance of the processes linked to its development, which deal with all the technical tasks and basic procedures to create and carry out a certain procedure effectively.

An aspect that is given great consideration when directing software development is customer satisfaction; That is, the program must adjust to time, cost and quality limits, as well as normative standards for the functional specifications of the applications, according to those established for each field of research. [1]

A software evolves through many versions, and as errors are corrected, its operation is improved, while modifications are established that arise according to the requirements established by the client. In this way, each version is created through a development process that is generally divided into four main phases:

1. The analysis and specification of requirements, which establishes what the product must achieve.

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2. The design, which determines how the software will meet those requirements.
3. Implementation, which analyzes the designed product. This combines the development of new components with the reuse or modification of previous elements.
4. Testing, which guarantees that the product works as intended. [2]

This is valid for any type of software, which includes application software, which are those programs that allow users to carry out one or more specific tasks in fields of automated or assisted activities, such as applications for system control. and industrial automation, databases, assisted design (CAD) software, and educational software. [3-9]

The systems in charge of information processing rely on application software to process their data. Among these systems in Cuba are health statistics, which have been designed to collect information, either daily or for indicated periods, and subsequently report it to the National Statistics System.

These systems process essential information to know the health status of the population. Likewise, they are used as tools that allow planning, evaluating and controlling the progress of the prioritized programs in the sector, so they only collect information on the variables for which they are designed, since it is considered that these are the that are needed to carry out the analysis of health indicators, as well as annual comparative studies about the behavior of some event or disease in the population, according to the requirements of the Ministry of Public Health. [10-12]

However, it happens that sometimes health professionals need to collect information that is not stipulated in traditional statistical models, with the aim of

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carrying out specific research about a health phenomenon, or to improve the information flow.

In this sense, in the province of Camagüey a series of projects have been carried out that are based precisely on proposals for new designs of statistical models. This is the case of the Registry of Clinical Laboratory Activities, and the Registry of Microbiology Activities, which respond to the diagnostic means model 241-475, stipulated by the Ministry of Public Health. [13,14]

Now, any proposal to improve statistical information must be consistent with the needs of the health units; needs that, according to the particularities of the research presented, include those that are specifically related to the Imaging Service.

Although at the "Manuel Ascunce Domenech" Provincial University Hospital in Camagüey, said service provides the information stipulated by the National Statistics System through the official model of diagnostic means, it does not satisfy the internal information needs of the Department of Imaginology.

This situation constitutes a concern raised by the Ministry of Public Health at the national level. Camagüey stands out as the most affected province, which points to the need for this agency to design statistical information models in which the services provided are processed, which adjust to its internal research needs while continuing to inform the Department of Statistics of the hospital the data necessary for the Diagnostic Media system stipulated by the National Statistics System.

What has been expressed above makes evident the fact that imaging professionals report their services to a statistical information system, through the official model of diagnostic means, which does not provide everything necessary for the analysis of internal statistical data.

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Hence, the objective of this research has been precisely to improve the statistical information of the Imaging Department of the "Manuel Ascunce Domenech" Provincial University Hospital in Camagüey, so that it responds to the interests of the internal control of said department.

The improvement of the statistical information provided by the Hospital's Imaging Department, from the point of view of internal control, will allow the saving of material resources, the optimization of services and the application of modern techniques in data tabulation. This will promote rational decision-making from the point of view of the effectiveness of the system at the institutional level. Hence the importance of the research presented.

METHODS

A technological innovation study was carried out that addresses the levels of efficiency and effectiveness, in the Department of Imaging of the "Manuel Ascunce Domenech" Provincial Teaching Hospital, in Camagüey, between January 2011 and November 2012. For this, the following were used. methods:

A) Empirical methods:

Observation : it allowed the obtaining of data that reflects the actions of the studied phenomenon as it occurs in reality, while guaranteeing the objectivity and uniformity of the results.

Structured interview : it was applied to the five workers linked to the processing and analysis of statistical information from the Department of Imaging, with the objective of determining the efficiency and effectiveness of the designed

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models. Reliability in data processing was guaranteed as a fundamental ethical principle.

Document analysis : the 132 internal data models of the Imaging Service provided in the hospital according to diagnostic means were subjected to study during the analyzed stage. Access to information was carried out with prior authorization from the head of department.

B) Software engineering methods:

Semantic data modeling : made possible the design of Relational Data, Persistent Classes and Entity-Object diagrams.

Methods and tool layers : the incremental model was used for the implementation of the generic phases, which cover the current state, problem definition, technical development and solution integration.

C) Development, design and programming tools:

- *Microsoft Office Excel 2003* : allowed the design of statistical tables.
- *Microsoft Office Access 2007* : allowed the creation of the database.
- *Visual Studio* : it was used to program the applications using the C++ programming language.
- *ADO (Access Data Object)* : made it possible to create a database connection interface to perform queries.
- *Framework.net 3.0* : was used to visualize the application environment without having to install Visual Studio on each PC where the software runs. The pre-made component testDataTableSet.mod was used to make the interface more user-friendly.

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- *Adobe Photoshop 7.0* : allowed processing and manipulating the images included in the software design.

The work algorithm was based on the establishment of three stages that included the initial diagnosis, the software design and the analysis of the degree of user satisfaction, both with the information added for the internal control of the department, and with the operation of the electronic tool developed for processing.

FIRST STAGE. DIAGNOSIS

With the objective of diagnosing the efficiency and effectiveness of the statistical information provided by the diagnostic means model, in the Department of Imaging of the "Manuel Ascunce Domenech" Provincial University Hospital, of Camagüey, in relation to internal control, it was applied a structured interview with human resources related to its processing and analysis.

The staff interviewed was made up of three radiologists, a secretary and a statistician. In the case of the former, it should be noted that they are the ones who carry out the studies and examinations on the diagnostic equipment. For their part, the secretary and the statistician are in charge of collecting and tabulating the information.

SECOND STAGE. SOFTWARE DESIGN

Table design

For the design of the software, a work team was created made up of the personnel in charge of processing and analyzing statistical information, previously interviewed in the diagnosis stage.

With the objective of automating the statistical information, table work was carried out, which made it possible to specify possible solutions to the research problem

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based on the application of statistical concepts. This work was complemented with a process of information collection, design and statistical analysis, according to the data provided by the charge sheets and tables designed for this purpose.

It is necessary to point out that there are primary information records stipulated by the National Statistics Directorate (DNE) for some of the diagnostic means; However, as already indicated, these do not collect the information that actually needs to be processed. In this sense, the work team designed new charge sheets for data collection in departments that did not have them. Likewise, some existing ones were redesigned in accordance with the internal needs of the department. In this way, the aim is to improve the collection and subsequent processing of the necessary primary information.

Once the information associated with the problem under study was collected, the team took on the task of designing output tables in which all the information from the Imaging Service would be reflected, according to the departments and their respective diagnostic means. The guiding principle of this process was the adjustment to the needs of statistical information.

The prepared tables were processed with the Microsoft Excel electronic tabulator of the Office package with the objective of formulating them, inserting arithmetic functions and linking them, thereby achieving quick, comfortable and reliable results.

Once this was done, the design and programming of a database that would allow statistical information to be interrelated and converted into a collection of time-varying data began. The Database Manager, Microsoft Access, was used for this purpose.

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This coincides with the work methodology established by Reyes [15] in an investigation of a similar nature. As this author expresses it, even though the databases designed in Excel are protected, this does not exonerate users from making errors when manipulating said electronic tabulator, a situation that determined, in their case, the creation of a database. for the control of health collaborators in the province that supports its operation in a form environment, which results in a much more comfortable work environment for the user.

Design of the topic base

To create the base, the data design was framed and analyzed using software engineering. The definition, development and support of the software to be designed was taken into account in this regard. In addition, the standards established according to the functional specifications of health care applications were respected; That is why attention was paid to the use of light colors, as well as a graphic environment that was pleasant, comfortable and easy when designing the interface.

Generic functional characteristics of systems, such as technological functions, were also applied when designing the modules. These include the ability to update fields, the design of management reports to control and plan the institution's business and clinical functions, edited values in tables, record searches, as well as the use of a password. that allows access control to the information system and contributes to computer security. According to this, the following work algorithm was established:

1. The relational data diagram was designed, which allows non-duplication of records through key fields, while guaranteeing referential integrity.

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2. The relationship of the tables was created, which enables a certain dependency between entities, as well as their association.

3. The entity-object diagram was made. For this, the following requirements were taken into account:

- Possible entities or attributes.
- Possible relationships and cardinality of these.
- Possible restrictions.

4. The persistent class diagram was projected, for which the set of classes, interfaces, collaborations and relationships between them was designed, which in turn allows the visualization, specification and documentation of the structural model, as well as the construction of executable systems.

Business modeling

After having concluded the previous work stages, we proceeded to determine the actors with which the business interacts. For this, business use cases were established and its processes were described, as well as its interaction with external elements (actors).

The functions that the business intends to perform and its basic objective were also described. The borders of this were also identified, that is, who and what will interact with it. This was carried out according to the following sequence:

1. Request the processing of the Imaging Service data for each diagnostic device that interacts with the Imaging Department actor.

2. Request the consolidated report from the Imaging Service that interacts with the actor (Statistics Department of the Provincial Hospital).

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Later, the system activity diagrams were created in relation to the actors, which include the use cases: request for the Imaging Service data and request for the consolidated report of the Imaging Service. The methodology used in this regard coincides with that established by *Hernández* . [16] Below is a detailed explanation of each of them:

- Use case "Imaginology Service data request":

Function : request the processing of the Imaging Service data for each diagnostic device that interacts with the Imaging Department actor.

Actors : clients.

Abstract : The use case begins with the customer requesting data about the service provided by each diagnostic media device. The information manager processes them. The process ends when the client receives the data.

Purpose : request data on the service of each diagnostic media device.

Preconditions : none.

- Use case "request for the consolidated report of the Imaging Service":

Function : request provincial consolidated report.

Actor : Statistics department of the Provincial Hospital.

Abstract : The main flow of the use case begins when the Statistics Department requests the consolidated report. The information manager processes and verifies it. The process concludes when the department receives said report.

Purpose : obtain the consolidated report.

Preconditions : none.

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Software Description

To design the interfaces, a color scheme was used based on the colors gray and blue, generally used by Office windows. This favors rapid familiarization with the software by the user. The use of these colors gives rise to a work environment that is pleasant to the eye. The characteristics of the main interfaces are detailed below:

Presentation interface : sets the system with images associated with the diagnostic media activity carried out by the Department of Imaging. Establishes access control to the information system through user authentication, which responds to the generic functional characteristics of health systems with respect to the application of computer security codes.

Main data entry interface : it has a main menu through which the corresponding submenus are activated. These allow the entry and processing of data, according to the information needs to be processed.

Data reporting interface : as its name indicates, it allows the reporting of statistical data from output tables designed for this purpose.

THIRD STAGE. USER SATISFACTION

Once this process was completed, and after the implementation of the software, the structured interview was applied again to the same personnel consulted in the

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diagnosis stage. On this occasion, the respondents reported high rates of satisfaction with the solution provided to the research problem.

RESULTS

According to the respondents, the current system in the hospital for collecting data linked to the service is not entirely effective, which has a negative impact on the processing of information. In this sense, the main dissatisfactions stand out:

1. There is no record of the statistical data of the positivity rate, percentages, final diagnoses, number of studies and examinations performed, according to each diagnostic means.
2. The information that is processed does not express a logical result of the medical operations or activities that are carried out.
3. There is no effective control of exams, which implies the unnecessary repetition of these on high-tech equipment. This increases expenses for the provision of health services as a result of the unnecessary consumption of contrasts, X-ray films and other resources. In this sense, existing models do not allow data to be collected as close in time and place to where the event that caused them occurs, which has an unfavorable impact on their reliability. In fact, the models do not reflect the essential data in relation to the need for information. Likewise, a high percentage of dissatisfaction is observed in this case.

The models and their subsequent automation refined the information in terms of coverage, completeness, reliability and inclusion of necessary data. The software made it possible to calculate positivity rates of the cases studied, as well as control resources and repeated examinations, which contributed to the efficient processing

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and recovery of statistical data, while favoring the rational use and exploitation of technological resources. . Users expressed high levels of satisfaction with the information provided.

Other contributions given by the implementation of this project, from the point of view of its technical and economic feasibility, were the following:

- Time savings in carrying out statistical work.
- Saving office auxiliary means, such as paper, pencil, calculator, among others.
- Savings in personnel to carry out the work.
- Facilitates information management.
- Makes it possible to share technological resources.
- Provides necessary statistical information for health professionals.
- Offers greater protection and security of the processed data.

DISCUSSION

The research of *Segares* [13] and *Cossío* [14] focuses on a redesign of the clinical laboratory activity registration model in traditional format. The purpose of these coincides with that of the present investigation with regard to the collection of information. The merit of the latter is fundamentally given by the process of automation of the designed models, which streamlines activities linked to the processing of statistical information, so that it responds to the internal control interests of the Department of Imaging.

It should be taken into account that this project not only contemplates the design of records and statistical tables for the collection and processing of information, but also allows the professionals of the Imaging Service to calculate the positivity rates of the cases studied, as well as the evaluation teacher based on service. In addition,

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it makes it possible to control unnecessarily repeated exams on high-tech equipment, a fact that implies high economic costs for the country. Hence its social impact.

On the other hand, the automation of the statistical models corresponding to the data necessary for the internal work of the Imaging Department has led to the reduction of unnecessary expenses caused by X-ray plates and contrasts used for said examinations. It should be noted that previously it was impossible to calculate the economic loss caused in this regard; Hence, the automation and inclusion of this statistical data in the software design allows measures to be taken to avoid the loss of resources.

The automation and inclusion of these statistical data not stipulated in the official model has been very useful for the professionals of the Imaging Department of the "Manuel Ascunce Domenech" Provincial Hospital, since it makes possible the analysis of the necessary data at the level of that department. thus it is possible to express a logical result of the operations carried out in this unit.

In this sense, the possibilities of processing statistical information offered by the implementation of this software are considerably enriched compared to that designed for the control of clinical imaging diagnosis at the Provincial Oncology Hospital of Camagüey. [17]

It is concluded that the preparation and implementation of this software for the internal information system of the Imaging Department of the "Manuel Ascunce Domenech" Provincial Hospital, of Camagüey, allows the processingment and retrieval of statistical data effectively, leading to the rational use and exploitation of technological resources.

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Taking into account that users expressed high levels of satisfaction with the information it provides, it is recommended to prepare a manual for the exploitation of the tool, as well as the training of the personnel who will use it. Likewise, it is necessary to carry out the corresponding cost analysis in terms of saving diagnostic resources resources, with the objective of determining the feasibility of the implementation of the software from the point of view of efficiency, which would allow its installation to be generalized. in the province's health units that use diagnostic means.

REFERENCES

1. Presume R. Software engineering: a practical approach. Mexico City: McGraw Hill; 2001.

2. The establishment of information systems in health care services. Guide for requirements analysis, application specification and acquisition. Part D. Division of Health Systems and Services Development: PAHO/WHO; 1999.

3. González Fragal MJ, Herrera Rodríguez ON. Design and development of the nursing care process electronic book (educational software). Rev Cubana Enferm [Internet]. 2007 [cited November 17, 2009];23(3):[approx. 10 p.]. Available at: http://bvs.sld.cu/revistas/enf/vol23_3_07/enf02307.htm

4. Abril Trujillo H, Saavedra García MA, López Duque A. Creation of educational software as an auxiliary tool in health pharmacology [CD-ROOM]. Santa Clara; 2006.

5. Corona Martínez LA, Núñez Blanco A, Monzón Pérez M, Cruz Pérez NR, Olite Montesbravo ME. Simed: a new software for the application of case simulations in medical teaching. Rev Cubana Inf Méd. 2003;3(2):12-27.

6. Betancourt Enríquez J, García Alonso JC. Development of educational software on normal electrocardiography. Mediciego. 2006;12(2):24-33.

7. Atria A, Cornejo M, Salinas H, Naranjo B. Obstetric software for personal digital assistant (PDA); [CD-ROOM]; 2007.

8. Mas Camacho MR, Febles Rodríguez JP, Orue Carmona M, Vargas Crespo C, Rodríguez Quesada JG. Experiences in the application of software engineering in management systems. Rev Cubana Inf Méd [Internet]. 2000 [cited April 19, 2008];8(1):[approx. 9 p.]. Available at: htpp://www.cecam.sld.cu/pages/rcim/revista_1/articulos_pdf/r0100a01.pdf

9. Ramentol Martínez E. Implementation of a tool to obtain graphs and reports in automated dashboards. Camagüey: University of Camagüey. Faculty of Computer Engineering; 2008.

10. Vidal Ledo M. First strategy for the computerization of the Cuban Public Health sector. A proposal for development. Havana: Ecimed; 2006.

11. Rodríguez González F, Alemany Ramos S. Strategic approach, direction and planning. Concepts and methodology. Havana: Coordinating Center for Management Studies of the Ministry of Higher Education; 2001.

12. Round Pupo GA. The concept of strategy. Health management. Online library for postgraduate training [CD-ROM]; 2003.

GARDEN JOURNALS
Journal of Qualitative Research in Business Law, Eco-Fin, Accounting, and Statistics
ISSN : 1533-1520

13. Segares Marfull Z. Integrative registry for laboratory information of the "Ana Betancourt de Mora" Gynecobstetric Hospital. Camagüey: University of Medical Sciences; 2009.

14. Cossío Torres M. Integrating registry for laboratory department information. "José Martí Pérez" Polyclinic, 2008. Camagüey: University of Medical Sciences; 2009.

15. Reyes Almanza R. Database of health collaborators in the province of Camagüey. Results of its implementation. Camagüey: "Carlos J. Finlay" Higher Institute of Medical Sciences; 2008.

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Journal of Qualitative Research in Business Law, Eco-Fin, Accounting, and Statistics
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