AN EVALUATION OF THE MANAGEMENT INFORMATION SYSTEM AND TECHNOLOGY IN HOSPITALS (GESITI/HOSPITALS).

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ABSTRACT.

The research project "Management of System and Information Technology in Hospitals" (**GESITI/Hospitals**) has the purpose of mapping out the management of Information Systems (IS) and Information Technology (IT) in hospitals. By applying a multifocal prospective questionnaire in hospitals, the research aims to identify the hospitals need and demand, prospecting for unfolding, and generate a public integrated research report for supporting public and/or private decisions-makings. The ultimate result from this GESITI/Health research project should be a significant improvement on the hospital management and on the decisions-makings, which must reflect on peoples more satisfied regarding a better health care.

Therefore, this paper aims to publish the main ideas of the GESITI/Health project i.e., its "Methodology &original Prospective Questionnaire (PQ)". The methodology used is the Interpretative (or Introspective). About the PQ, we do not known, up to this date, who have developed a multifocal broad field tool -the PQ-, aiming wide hospitals management-. From 2010-16 the "methodology and PQ" have been implemented by about forty -40- universities -and increasing-, from Brazil and Abroad and, forty local research reports were generated. A book, published by the Brazilian Minister of Health [1], presents the results of a pilot project carried out by nineteen -19- out of these forty -40- universities, to know: sixteen Brazilian, one Mexican, one Argentina, one from Slovakia and one from Portugal. The chapter 25 of this book [1.A] presents an integrated research from all nineteen chapters -an integrated research report-.

Finally, in the oral presentation, we will briefly present the "Methodology and the PQ" presented in this paper and, also, we will present an integrated comparative analyzes -main results got with the field application of the PQ- regarding the case studies accomplished by the universities from Brazil & Abroad.

Keywords: GESITI/Hospitals, Management, Information Systems, Information Technology, Information Systems in Hospitals, Hospitals Management.

1. INTRODUCTION.

This research project "Management of System and Information Technology in Hospitals" (GESITI/Hospitals) has the purpose of mapping out the management of Information Systems (IS) and Information Technology (IT) in hospitals. By applying a multifocal Prospective Questionnaire -PQ- the research aims to identify the hospitals need and demand, prospecting for unfolding, and generate a public Integrated Research Report (IRR) for supporting public and/or private decisions-makings.

The reference [1.A] presents in its chapter 25 the first IRR. The reference [2] presents all Local Research Reports -LRR- already accomplished by each of forty the universities engaged in the project. From each LRR it becomes possible to undertake local decision-making regarding hospital management. However, the main purpose of the GESITI/Health project is the preparation, based on the integration of all LRR, of a public IRR for national wide decision-making support. The ultimate result from this research project should be a significant improvement on the hospital management and on the decisions-makings, which must reflect on peoples more satisfied regarding a better health care.

'As the IT is redefining the bases of the business; customer service, operations, strategies for product and marketing and distribution and even the knowledge management depend much, or sometimes even completely, of IS [3] '. In a globalized information society, understanding management and the responsible and efficient use of IS are a need for managers and others knowledge employees. As in any other organization, in a hospital both the IT, as the IS permeate the various hierarchical and functional levels. Thus, at the reception desk of a standard hospital is common to find recording systems (administrative systems) regarding all patients, while in specialized units of this hospital should have the most sophisticated diagnostic equipment of diseases (clinical systems). The figure 1 -showed in the next page-, presents a conceptual model of a Hospital Information System with its Administrative Systems and Clinical Systems [4].

In hospitals, the same way as occurs in others organizations, the utilization and management of IS and IT are varied and dependent on the maturity of hospital management. Based on the research results (**P**rospective **Q**uestionnaire - **PQ**, section 2), is being possible to make comparisons among the results obtained in Brazil as well abroad: the generation of an **I**ntegrated **R**esearch **R**eport –IRR-. This IRR should enable the public/private manager a more reliable and general decision-making process. So, the mapping of the management of IS and IT in hospitals has as a main purpose to get, in an exploratory way, the development, operation, maintenance, and the management of IS that contribute to the hospitals to reach their goals [5].
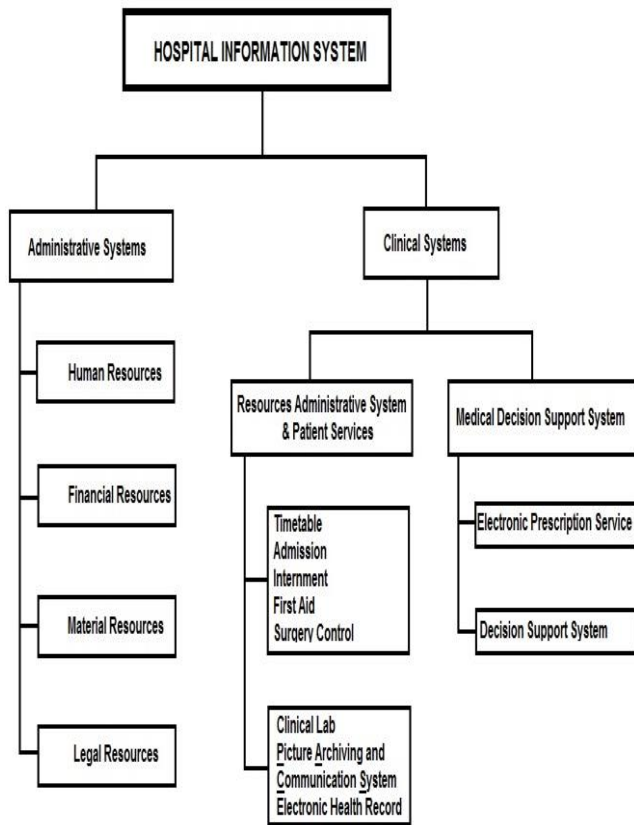
Figure 1: Conceptual Model of a Hospital Information System: Administrative and Clinical Systems. [4].

According to the registration in the "Management Information System and Technology" (**SIGTEC**) [6] –from CTI Renato Archer-, this Project GESITI/Hospitals as presented in this paper, has been developed since 2003 but, its effective implementation (application of the PQ) was compromised in favor of other activities in research and management, such as the Internationals Workshops GESITIs Series, 2013-16 [7]. Therefore, the Project GESITI/Hospitals as well the application of the PQ –in spite of the PQ was ready around 2003- effectively started in the early 2010s with the involvement of nineteen universities as a Pilot Project. The GESITI/Health project utilized an original tool known as PQ (Section 2), which has more than 100 closed and inter-related issues [8]. This PQ has its registration in the National Library -Rio de Janeiro- as no published knowledge and so, its copyright is protected [9].

Sections descriptions:
- Section 2: presents the main characteristics of the data collection instrument called PQ.
- Section 3: presents all researchers and respective universities engaged in the research and data collection by using the PQ aiming to map out –multifocal perspective- the existing technological park in hospitals and at the same time, identifying the way in which the hospitals make the management of theirs IS and IT.
- Section 4: describes the methodology Interpretative (or Introspective) utilized.
- Section 5: presents the expected results the GESITI/Health project.
- Section 6: presents the references.

2. PROSPECTIVE QUESTIONNAIRE [8, 9].

The development of an integrated research called "An evaluation of the management IS and IT at hospitals" in Brazil and Abroad has been possible by action of the GESITI/Health project of CTI. GESITI/Health project has created a data collection instrument called "PQ" which must be implemented as a field research in hospitals. This PQ, original and innovative -in creation since 2003-, was generated through adjustments, additions and modifications and/or exclusions made in generic databases obtained through the Organization for Economic Co-operation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), Industrial Research of Technological Innovation (PINTEC/IBGE) as well as ad hoc Google survey. It is not known, up to this date, the existence of a similar tool –and methodology- which had had the focus or object proposed: the exploration of the management of IS and IT in hospitals in multifocal character and the look for unfolding. Figure 02 shows the contents of the research project GESITI/Hospital, "Prospective Questionnaire ", which has more than one hundred (100) closed questions [8, 9].

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Figure 2: Summary of the Project GESITI/Hospitals, "Prospective Questionnaire – PQ": 52 pages and one hundred (100) inter-related issues [8]. To have access to the PQ, a term of cooperation –Research Level Agreement-, must be signed between the Project GESITI from CTI and interested university/research institute. The questionnaire contains all definition of technical terms. [8,9].

3. RESEARCH PARTICIPANTS.

The field research and **local** data analysis are from responsibility of all participants who have signed the **R**esearch **L**evel **A**greement (RLA). In each **local** where the research is being developed there are the corresponding team with a respective Local Coordinator. It is understood by **local** a region or niche where the research will be applied in at least five (5) hospitals and the generation of LRR. There is not any distinction in the kind of hospital, see reference [1.B].

The Table 1 presents the universities, which currently are members of the GESITI/Health Project. These members have signed the RLA since the PQ [8, 9] is confidential -see figure 2-.

TABLE 1 – LOCAL COORDINATORS.

The table 1 presents the <u>Local Coordinators and their Collaborators</u> in the Project GESITI/Hospitals. These -Local Coordinators and Collaborators- are the responsible for applying the PQ in the hospitals and they must -in collaboration- carry out the analysis and interpretation of the data gathered. Below are identified each Local Coordinators - **posted in bold-**. It is understood by **LOCAL** a region or niche where the research will be applied in at least five (5) hospitals and the generation of LRR. These hospitals are choose at random by the Local coordinators and, therefore, there are not any distinction in the kind of hospital -i.e., Public, Private, Foundation –nonprofit, Philanthropic, any other-, see reference [1.B]. The goal is to reach about one hundred (100) universities (see section 5 – Expected Results) committed with the research and generation of a LRR -it is necessary to have the RLA signed, [1.B].

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The membership of the research is voluntary, but it is required the signature of a RLA since the PQ is confidential. Currently, the number of employees participating still does not cover all the Brazilian Federative states and, the goal is to broaden the research (Table 1) to about one hundred universities (local coordinators). For that we have stablished the following goals: a) by the year 2020 the goal is to have up to 50 participating institutions; b) by the year 2025 is to have 75 participating institutions; c) by 2030 the goal is to reach 100 participating institutions.

The figure 3 shows the five major Brazilians regions (geographical distribution of participating institutions) where the research has been concluded (PQ application). Also presents the others countries where the research was finished.

Figure 3 – Geographical distribution of the participating universities. At each **Local** identified on the map, the PQ [8,9] should be applied in at least five (5) hospitals. The goal is to reach about one hundred universities in this research project. There is no distinction on the kind of hospital, see reference [1.B]. The universities showed above means the ones where the research has been concluded. **This Figure3: a courtesy from Prof. Dr. Ruy Ferreira/UFMT/MT.**

Finally, as presented in Table 1, the Project GESITI/Hospital involves dozens of researchers -Ph.D., Master of Sciences and technicians-. The participation of sixteen Brazilian micro regions and three abroad –figure 3-, has generated an inedited mass of data, both on the management of IS and IT regarding Brazilian, Portuguese, Argentina, Mexican and Slovakian hospitals. A book publication- sponsored by the Minister of Health-, comply all the results [1]. The Research Gate site presents the Scientific Reports as well more advanced indexed publications [10]. In the oral presentation, we will explore some practical results obtained in this research.

4. – METHODOLOGY.

The research is characterized as qualitative and exploratory. "The exploratory studies or formulators have as objective to familiarize or to achieve understanding of the phenomenon, often to make or to express a more precise research problem or to create new hypotheses (unfolding)". This research fits in these characteristics. [11].

The chosen of hospitals are at random and are from responsibility of the Local Coordinator. (See Table 01). The numbers of hospitals where the questionnaire is applied are, where possible, at least five (5). A formal procedure (Informed Consent – See reference [1.B]), must be used to obtain access and permission to carry out the research inside of each hospitals. This letter -Informed Consent-, must signed by the hospital and the university -Local Coordinator-. The hospital must point out which representatives is going to follow up the application of the QP. This representative must know in the best the respective sector to respond the QP -the number of representative depends on the size of the hospital-.

The research –application of the PQ- occurs through direct interview with the representatives of each sector in the hospital and, the representative must answer the questions accordingly the item or theme described by the PQ. The PQ must be applied in person by the interviewer towards the responsible – representative- by the sector of interest in the hospital – see figure 2-. It is important to clarify the PQ must not be left to be answered without the presence of the interviewer. This is an important procedure since it will avoid distortions or bias in the results, reducing the responses reliability –as well the concern with QP Copyright, [8, 9]-.

There are three factors, which determine the kind of search strategy are three:

"1.3 - the kind of research question;
  2.3 - the degree of control that the researcher has on the behavioral events and,
3.3 - the degree of focus on contemporary or historical event [12]".

This research aims to analyze the management of IS and IT in hospitals, through the study of contemporary events, which do not require control: the strategy of the case study is appropriate.

In short: the methodology to be used in this research is Interpretative (or Introspective), [13]. In the interpretative approach, we have the qualitative study [14].

5. – EXPECTED RESULTS.

The main expected results are divided in two approaches:

1.2 – **Region or niche:** the region chosen for analysis of the IS and IT management in hospitals are from Local Coordinator responsibility as it is the generation of the LRR. The Local result of the analyses (Local means application of the questionnaire in at least five (5) hospitals in the region surveyed) can be used for local decisions making. Several local research reports may be found in the references [1, 2].

2.2 – **Integrated results:** these results deals with an integrated analysis from all regions surveyed (the integration of all LRR). The goal is to reach about one hundred universities (local coordinators) committed with the PQ application for a best Integration Research Report –IRR- generation. These hundred universities as scheduled within the following proposal goal:

a) - by the year 2020 the goal is to have up to 50 participating institutions;
b) - by the year 2025 the goal is to have 75 participating institutions and,
c) - by 2030 the goal is to reach 100 participating institutions.

Regarding the IRR, it is strategic since it will facilitate the public and/or private managers to make a more comprehensive and assertive decision regarding hospitals management. The reference [1] presents a Pilot Project –GESITI book sponsored by the Brazilian Minister of Health- and, the chapter 25 of this book, reference [1.A], presents an integrated research from all nineteen chapters -an integrated research report-. In the oral presentation, we will show some of these results.

The Pilot project GESITI/Hospital aims to map the management of IS and IT in Hospitals. It has covered the themes presented in PQ – see figure 02-. Among the several expected results for this research: to bring timely and integrated qualified information to the public and or private hospital managers. This will be the great merit of this project: an IRR document as a source for decision-making support for public and or private managers interested in the theme.

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