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Health Information Systems: evaluation and performance of a Help Desk

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Abstract. A Help Desk (HD) is crucial in a computerized hospital. Objective: to describe the performance of a HD. Design: retrospective cohort study Results: the sociodemographic characteristics of users, as well as their relationship with the institution influence behaviour when requesting support to a HD. Also we observed a relationship between the flow of users request and the functioning of hospital services. Conclusions: complexity of HD process realizes the need to identify and define standards to ensure quality of service.

Keywords. Health Information Systems, Health Information Technologies, Cohort studies, Medical Informatics Applications

Introduction

The health information system (HIS) involved different Information and Communications Technology (ICT) and different kinds of users (administrative staff, physicians, nurses, physical therapists, pharmaceutics, and others) who should have an adequate support and training to ensure proper use of those systems [1,2,3]. The lack of support in complex scenarios like health care organizations could interrupt patients care workflow causing dissatisfaction on them and even more impacting in their health care [4]. Users work day by day with different software (SW) applications, need different kinds of support and required different response time based in their functions and needs [5]. This adequate support requires human and technological resources capable to serves, manage and solve all the possible problems of ICT. Several studies underlying that the support and the training are important components of the HIS implementation [6,7]. The Help Desk (HD) is a core component of the support system [8], however nowadays we have not found enough evidence that described support systems in these complex health care scenarios. The target of this study is to describe the performance of the HD at a university hospital with a HIS during 2013.

1. Methods

A retrospective cohort study of all HD tickets during 2013. The setting is HIBA network. A highly complex institution integrated by two hospitals (Central and San Justo) and 23 peripheral medical offices. The network has 750 beds, 900 home care

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beds, and give service to 3 million outpatient visits. The HIBA has 7000 members, 5400 health care professionals and 1600 administrative staff. In 1998 the Health Informatics Department (HID) started the development and implementation of a Healthcare Information System (HIS) that involves outpatient, emergency, in-patients and homecare patients, appointments, pharmacy system, hospital admissions between others. The HID has 150 members distributed in 9 areas. The informatics park consists in 4000 personals computers, 1500 devices (printers, scanners, tablets). The users of these informatics systems can request support to the HD when they have a problem with hardware (HW), SW, training, etc. Also they can do it to obtain information for research and management. For each request, users get a ticket that goes to a technician for resolution. HD workflow was described in a prior paper [4] The study variables are: **Tickets** (amount, hour, day of the week, month, priority, physic place, ticket modifications, closed ticket, amount of technicians, categories, derivation time and response time). **Users** that got at least one ticket (amount, sex, age, speciality, seniority, salaried work, amount of tickets, proportion of changed and qualified tickets). **Technical Support** (amount, age, sex, seniority, work area, closed tickets, derivatives tickets, priority, qualification). For data analysis we used descriptive statistic, mainly frequency measurements. All the information was extracted from the HD database.

Results

During 2013 were made 61.129 tickets. The 86% were made in the Central Hospital, 7% in San Justo Hospital and 7% in the peripheral medical offices. The tickets were classified by high priority (73%) or normal priority (27%). The tickets were grouped into categories (Table 1).

Table 1. Tickets categories

Tickets categories	Health care App systems	HW and networks	Administratives App systems	Basic SW
N	19.448	18.063	17.669	5.949
%	31,81	29,55	28,90	14,9

Applications systems tickets were 61% whereas 39% were due to HW and basic SW.

The 15% (9.150) of the tickets were modified before being derived. This means that the original problem didn't was the actual problem that user declare.

Help desk technician closed 12% (7.407) of the tickets without derivation. That means they know how to resolve the problem. More than one technician evaluated 25% (15.150) of the tickets; with an average of 2 technicians by each resolved ticket.

The distribution of the tickets oscillates between 6% and 10% by month (Figure 1). Tickets distribution by week is shown in Table 2.

Table 2. Tickets distribution by week

Tickets categories	Monday	Wednesday	Sunday	Weekends
N	12.835	12.471	593	1486
%	21	20	1	2,4

Time distribution is shown in Table 3. The largest amount of tickets was made 9:00 am and 10:00 am with 12.6% (7617) and 13% (107563) respectively.

Table 3. Tickets distribution by hour

Tickets categories	07 am to 1:59 pm	02 to 5:59 pm	06 pm to 6:59 am
N	41.256	15.813	4060
%	67,5	26	6,6

The minor amount was made 4:00 am with 0,06% (38) and 5 am with 0,08% (51) (Figure 2). The maximum amount of tickets in one day was 357 and the minimum 2. To evaluate the derivation time was selected 51.564 tickets. The 94% (48.470) were derived within the first 30 minutes, and from those 47% (23.869) were derived within the first 5 minutes. The 90% (54.536) of the tickets were solved before the first 21 days, and from those, 43% (26.056) were solved the same day it was requested. The 31% (19.134) of the closed tickets were qualified. The physicians rate 21% (4.072), nurses 4% (805), the remaining of health care professionals 7% (1268), and 68% (12.989) of administrative staff. The 94% (18.026) were rated positively. Users and technicians characteristics data are shown in table 4.

Table 4. Users and Technicians Characteristics Data

Characteristics	Users (5065)	Technicians
Male	35.6% (n=1805)	65% (n=86)
Age range	19-70	22-67
Age average	44	38
Salaried workers	75% (3793)	100% (133)
Independents workers	25% (1272)	0
Seniority range	1-45	1-35
Seniority average	9	8
Health care staff	67% (3404)	21% (28)
Administrative staff	33% (1661)	79% (105)
Tickets average	12	460
High priority tickets average	8	336

Despite age range was between 19 and 70 years, users between 21 and 40 years old made 60% of the tickets. Most users were health care staff, but administrative staff requested more frequent: 64% (39.244) whereas physicians requested 24% (14.947) of total tickets. A great proportion of users tickets had to be changed by technicians: 13% (4944) for administrative staff and 20% (2917) for physicians. The remaining health care professionals requested 6% (3718) and 14% (516) had to be changed (Figure 3). Also 31% (19.146) of the tickets were re-categorized and 39% (23.855) were derived between technicians. Each technician derived 197 tickets. Tickets were qualified by 55% (2804) of users, 45% (1262) were administrative staff and 55% (1542) were health care staff (73% physicians, 15% nurses and 12% others).

2. Discussion

Central hospital was the place with greatest tickets of the HD. This could be due to the greater number of visits; hospitalizations and additional studies are conducted here. In fact, it had the largest number of employees and devices of computer equipment. The largest proportion of the tickets was high priority. This could be related to the impact of the disruption of the workflow during patient care and how the user perceives the need for a quick answer to their problems [4,5].

There were more tickets for applications systems that HW. This could be based on the failure of an application affects multiple users, while HW failure affects a single workstation. Technicians modified the fifteen percent of the requests made by users. This may be due to communication problems, lack of technical knowledge or the complexity of today's computer system. The amount of tickets to the HD was regularly throughout the year. Variations in the months of February, July and October could be related to vacation, entry of new residents and update of the computer park. Most tickets were made from Monday through Friday morning. This could be related to the operation of hospital services and the main administrative tasks. Half of the tickets were derived after 5 minutes of requested. It is probably due to the need of technicians to contact the user for more information and understand the problem. About half of the tickets were resolved on the same day. This does not allow us to infer that the response time is satisfactory to users or how impacts on the different hospital services [8]. The limited number of qualified tickets does not allow us to know the actual user satisfaction. Most tickets were made by young adult women who work as employees, with an average seniority of nine years, which could be related to smaller digital divide, the number of hours remaining in the institution (30-45 hours per week), culture and organizational commitment. Most users who made tickets were physicians while administrative did more often. This could be because there are more amounts of physicians and they use different applications. Technology and implementation resolved majority of the tickets. This is consistent with the main problems reported by users (applications and hardware). Half of the tickets needed two technicians to solve them due to the complexity of HIS and the technician necessity to clarify the user problem. There is little evidence in the literature to characterize HD in healthcare organizations with HIS. That's the reason why, although these results are closely related to the specific characteristics of our organization, we considerer share this experience and believe important that other institutions do the same in order to generate evidence to identify and define standards for such services in these complex scenarios.

References

[1] J. Aarts, H. Doorewaard, M. Berg. Understanding implementation: the case of a computerized physician order entry system in a large Dutch university medical center *J Am Med Inform Assoc*,**11**(3),2004,207-16.

[2] M.J.Van Der Meijden, H.J. Tange, J. Troost, A. Hasman, Determinants of success of inpatient clinical information systems: a literature review. *J Am Med Inform Assoc* [Internet],**10**(3),2003,235–43.

[3] J.S. Ash, P.Z. Stavri, R. Dykstra, L. Fournier, Implementing computerized physician order entry: the importance of special people. Int J Med Inform [Internet]. ,**69**(2-3), 2003,235–50.

[4] N.M. Lorenzi, R.T. Riley, Organizational impact of health information systems in healthcare. *Stud Health Technol Inform*, **65**, 2002, 396-406. Review.

[5] A. Baum, S. Figar, J. Severino, D.Assale, B.Schachner, P.Otero, D. Luna, A.Gómez, F. Gonzalez Bernaldo de Quirós. Assessing the impact of change in the organization of a technical support system for an Health Information Systems (HIS). *11th World Congress of Medical Informatics*. San Francisco, USA, MEDINFO, 2004.

[6] R. Sharma, P. Yetton. The Contingent Effects of Management Support and Task Interdependence on Successful Information Systems Implementation. *MIS Quarterly* **27**(4), 2003, 533-556

[7] A.M Sumner. Critical success factors in enterprise wide information management systems projects. Proceedings of the ACM SIGCPR conference on Computer personnel research, 1999

[8] M. Dumay , R. Groeneweg, Implementing a help desk for the CUSAT with use of ITIL, Project Report, Delft University of Technology, Faculty of IT and Systems, Dept. Computer Science, 2001, Available from: http://www.markd.nl/content/reports/in3019.pdf.

Annex 1 – Figures

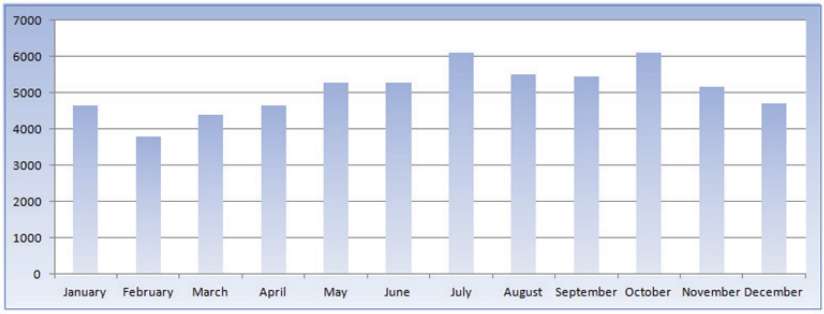

Figure 1: Monthly distribution of the tickets

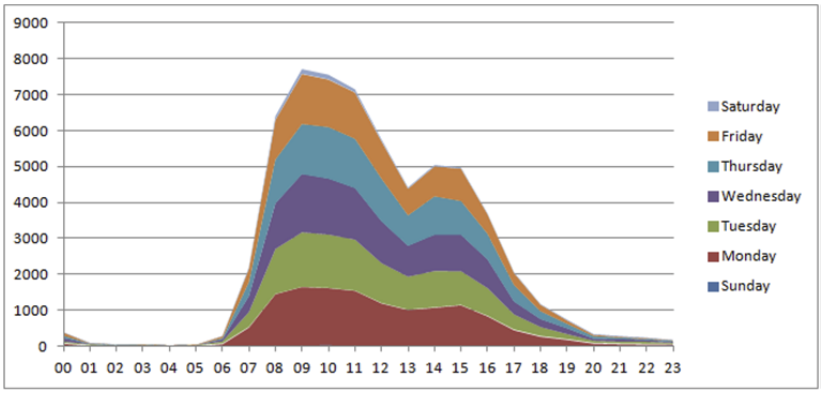

Figure 2: Daily distribution of the tickets

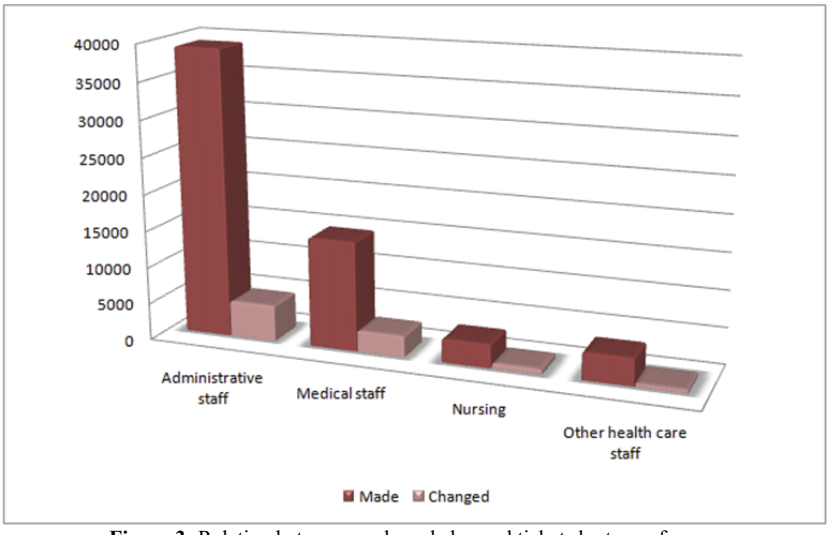

Figure 3: Relation between made and changed tickets by type of users