# Assessing the impact of change in the organization of a technical support system for an Health Information Systems (HIS)

**Analía Baum, Silvana Figar, Jorge Severino, Diego Assale, Bibiana Schachner, Paula Otero, Daniel Luna, Adrián Gómez, Fernán Gonzalez Bernaldo de Quirós**

*Department of Medical Informatics, Hospital Italiano de Buenos Aires, Argentina*

**Abstract**

*Objective: Evaluate the impact of the implementation of a new model of Help Desk and technical support in HIS users of the hospital.*
*We carried an anonymous survey on a random sample of 150 users of the new system. The administrative staff (A), doctors (D) and nurses (N) were analysed by strata. We assessed the accessibility both to phone calls and through the institutional intranet; the understanding of the problems; the time taken to fully answer requests; and the degree of satisfaction concerning the change.*
*The results showed that 94%, gained access through the intranet and that it was very satisfactory for the medical group (D80% vs A34% vs N8.7%). The different kinds of users were satisfied with the response time, above all the administrative stratum (A42% vs D38% vs N14%). All of them commented on their satisfaction with the change, above all, the doctors (D68% vs A46% vs N22%), who before this new implementation had expressed dissatisfaction with the old system.*
*Conclusions: operational changes in the Help Desk contributed to improve how the service was perceived by its users; nevertheless both doctors and nurses required even faster response time.*

***Keywords:***

Help Desk, Hospital Information System, Support and training, Accessibility.

## Introduction

The Italian Hospital of Buenos Aires (HIBA) is a high complexity institution with a 150 year old history: it possesses the latest technology for health care. The incorporation of informatics technology is not exempt from these features. The HIBA currently comprises two hospitals with approximately 600 in-patient beds, 2500 monthly admissions and 16 peripherical centers that make available 200 decentralized consultation facilities. The Out-Patient Department receives 120.000 visits monthly. The growth of informatics equipment and its multiple applications has steadily increased and there are now 2000 PCs distributed around the city.

This technological development and its availability has gained a larger number of users not only for administrative procedures but also for computerized provider order entry (CPOE) that involved doctors and nurses [1,2]. Each group of users employs a wide variety of software applications; require different support systems and the need for a specific response time according to their functions and needs. It has been well said that to ensure a successful implementation of HIS, there must be an adequate support system and training for its users [3-9].

Since 1996 the institution has a Help Desk that has mainly supported the administrative users. In 1999, doctors started to use electronic registries and in 2001 medical records on paper were dropped. At the same time our institution created the Department of Hospital Informatics integrating the latest software and technological advance. A Residency in Medical Informatics was also created and it is now fully dedicated to implementing electronic medical record (EMR) systems at different levels [1,2]. This has generated new users and has multiplied the requests for specific support and training [10]. During their day-to-day work both doctors and nurses were not totally satisfied with the current Help Desk. Their main complaints were poor telephone communication during the busiest hours of work, and also the possibility of getting through to an answer machine, which although at first had seemed to be a solution, was in fact a source of complaint. On top of this the timetable of the Help Desk which was Monday to Friday 8 to 20 hours did not cover the hospital timetable. Finally the lack of records of how the problems were resolved prevented us from making an adequate evaluation of the support system we were providing.

To back up our perception, we carried out a survey to evaluate the degree of satisfaction with the support system we were providing [11]. We used strata analysis studying the administrative staff, doctors and nurses. The three groups were not satisfied with the telephone accessibility to the support system and its response time. In both cases the doctors group showed the highest level of dissatisfaction. That was the main reason that prompted a change in the Help Desk operational methods, which until then had been a record of calls. A new application was launched using the institutional intranet as its platform. It decentralized the sup-

port bases and modified the response time to the users, with the hope of meeting their requirements for better accessibility and shorter response time (See Diagram) [11]. Three months later we assessed the users' level of satisfaction with the new Help Desk and compared it to that with the old system.

## Materials and Methods

An anonymous survey was carried out to evaluate the degree of satisfaction with the Help Desk. The validity of this was measured by the internal consistency with Cronbach`s coefficient alpha (0,7986) [11]. The population of this survey comprised the users who had contacted the Help Desk in July/August 2003. As support requirements are different in the three groups (administrative staff, doctors and nurses), we analysed the results by stratum. During this period, 518 administrative staff (A), 237 doctors (D) and 124 nurses (N) contacted the help desk. We selected 60 users trough table of random numbers in each group, expecting to find 50 answers. The surveys were carried out on working-days during three consecutive weeks. Only one doctor declined to answer. The survey consisted of 7 questions assessing telephone accessibility; institutional intranet accessibility; the understanding of the problem on the part of Help Desk staff; the time taken to fully answer requests; and the degree of satisfaction with the change. One of the questions asked for Help Desk performance to be assessed on a 0-10 range. A further modification to the original survey included a request to state whether access was gained by phone call or by Intranet (See Survey). For the statistical analysis, the options in the ordinal scaled answers (very satisfactory, satisfactory, little satisfactory and not satisfactory) were compared to chi^2 test of the three groups. Global score is expressed with the median and SD and is compared with the Kruskal Wallis test. This new administration of the survey was re-evaluated for its ability to measure the change, comparing the global score before and after the introduction of the new tool that modified the operational method of the Help Desk.

## Results

The entire group of 150 people was surveyed as a whole. Their baseline characteristics can be found in Table 1.

*Table 1 – Baseline Characteristics*

| | Administrative Staff | Doctors | Nurses |
|---|---|---|---|
| N sample | 50 | 50 | 50 |
| Age (X, range) | 34 (21-53) | 35 (24-63) | 42 (22-65) |
| Sex F (n,%) | 46 (92%) | 19 (38%) | 32 (64%) |

The global score attributable to specific group scores is shown in Table 2.

Table 2 – Global Score

| | Administrative Staff | Doctors | Nurses | p |
|---|---|---|---|---|
| Final score (median, sd) | 8 (1.32) | 8 (1.34) | 8 (1.33) | 0,803 |

The three groups contacted the Help Desk mostly using the forms provided by the institutional Intranet (94% vs 6%).

Regarding the 6% that accessed to the system through phone calls, 33% was very satisfied with the accessibility, 55 % was satisfied and the remaining 11% was little satisfied.

Concerning the accessibility through the intranet, the administrative staff and nurses were satisfied but doctors were more satisfied in a proportionally higher range (M 80% vs A 34% vs N 8.7% p 0.000) Figure 1.

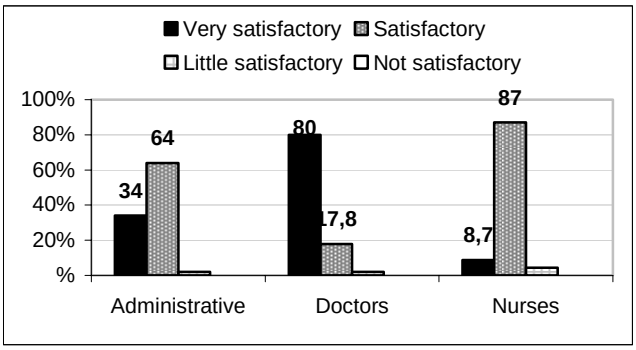



*Figure 1- Satisfaction with Intranet accessibility*

When we analysed the understanding of the users' needs on the part of the Help Desk, the three groups showed satisfaction, although the nurses less frequently declared themselves to be very satisfied (A 26% vs D 44% vs N 4% p 0.000017) Figure 2.

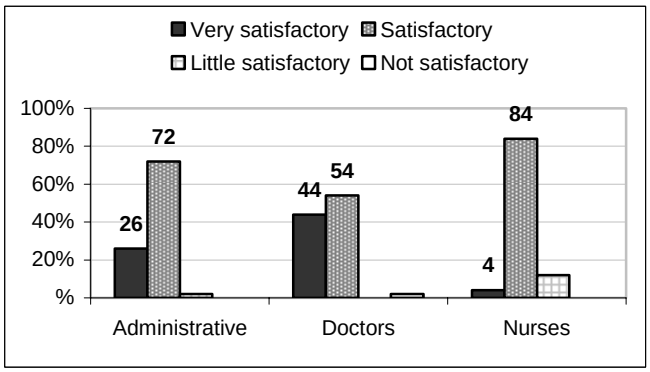



*Figure 2- Satisfaction in the understanding of the users' needs*

Regarding the response time given to the users' requests, the three groups were again very satisfied, with the administrative group more often answering that it was very satisfied (A 42% vs D 38% vs N 14% p 0.0048) Figure 3.

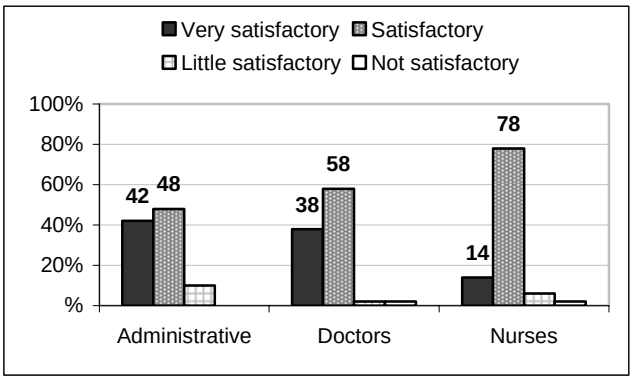



*Figure 3- Satisfaction with response time to requests*

Even though the three groups were satisfied with the change introduced to the Help Desk, the doctors group more frequently answered that it was very satisfied (A 46% vs D 68% vs N 22% p 0.000023) Figure 4.

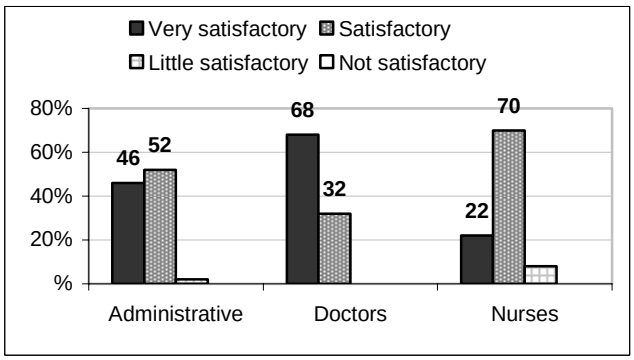



*Figure 4- Satisfaction with the change*

The reliability of this survey was confirmed as its ability to detect change was evidenced by comparing the global score before and after the implementation of the new support system Table 3.

*Table 3* – Global score before and after implementation

| | **Administrative Staff** | **Doctors** | **Nurses** |
|---|---|---|---|
| Prior score (median,SD) | 7 (1.95) | 6 (2.5) | 6 (2.1) |
| Current score (median,SD) | 8 (1.32) | 8 (1.34) | 8 (1.33) |
| p value | <0.001 | =0.001 | <0.001 |

## Discussion

We believe that the analysed sample is representative of the users who have contacted the new Help Desk, disregarding timetables as it now works 24 hours a day a week. The fact that most users gained access to the support system through the institutional intranet leaves access through phone calls as a contingency procedure.

This is also reflected in the satisfaction showed by all users concerning the system's accessibility, above all the doctors group, who in the previous survey had been dissatisfied with both the accessibility and quality of telephone assistance. Even though in different proportions, all the groups seemed to be satisfied with the understanding of problems on the part of the Help Desk staff. The doctors group was again very satisfied. Regarding the response time to the requests of the users, the three groups agreed that it was satisfactory, the administrative staff being the most satisfied .This showed that there are different requirements according to the type of user and the response time has still to be improved within the health care area. When assessing the change that has recently been implemented, all groups showed their satisfaction. Above all, the doctors group was very satisfied. The global score that qualifies the Help Desk was significantly higher for this new system. In the near future this survey will be carried out again to re-evaluate the cycle of improvement that has recently been implemented as well as to continue with the process of its validation and reliability.

## Conclusions

The validated survey allowed us to assess the old system of Help Desk, to develop a tool that improved the users' satisfaction with it and to re-administer the survey after the implementation, in order to measure impact. The doctors were very satisfied with the change that provided them a tool with fast accessibility and availability 24 hours, a day a week. The use of appropriate software for the institutional intranet that allowed us to get to know the requirements and to measure response time plus the implementation of a pattern of decentralized response, contributed to improving the system image on the part of the users. Even so, response time affects both doctors and nurses and is a condition that we must improve.

## Survey

Here is the transcription of the survey used in this work.

… Mark only one answer that best reflects your opinion, with a cross in the appropriate box.

***1. Contact with the Help Desk***

The last time you used the Help Desk, you contacted it by:

1-Telephone 0-Intranet

If the answer is "telephone", go on to the following question. If your answer is "Intranet", go directly to question 3.

**2. *Telephone accessibility***

The last time you contacted Call Center, the delay in response was, in your opinion:

3-Very satisfactory 2- Satisfactory 1- Little satisfactory 0- Not satisfactory

### *3. Intranet accessibility*

This new system that allows you to gain access to the Help Desk by means of a form provided by the Hospital Intranet is:

3-Very satisfactory 2- Satisfactory 1- Little satisfactory 0- Not satisfactory

### *4. Understanding the users' needs*

Do you think that the Help Desk staff understands your problems or requests?

3-Very satisfactorily 2-Satisfactorily 1-Little satisfactorily 0-Not satisfactorily

### *5. Response time to your requests*

From recent experience, you consider that response time to your request provided by the new Help Desk system is:

3-Very satisfactory 2- Satisfactory 1- Little satisfactory 0- Not satisfactory

### *6. Scoring the Help Desk*

Please on the basis of your recent experience with the Help Desk, give a score between 0 and 10 on an ascending scale of satisfactoriness

-10- -9- -8- -7- -6- -5- -4- -3- -2- -1- -0-

### *7. Assessing the change*

We have introduced changes that try to increase our users' satisfaction. This new Help Desk system is:

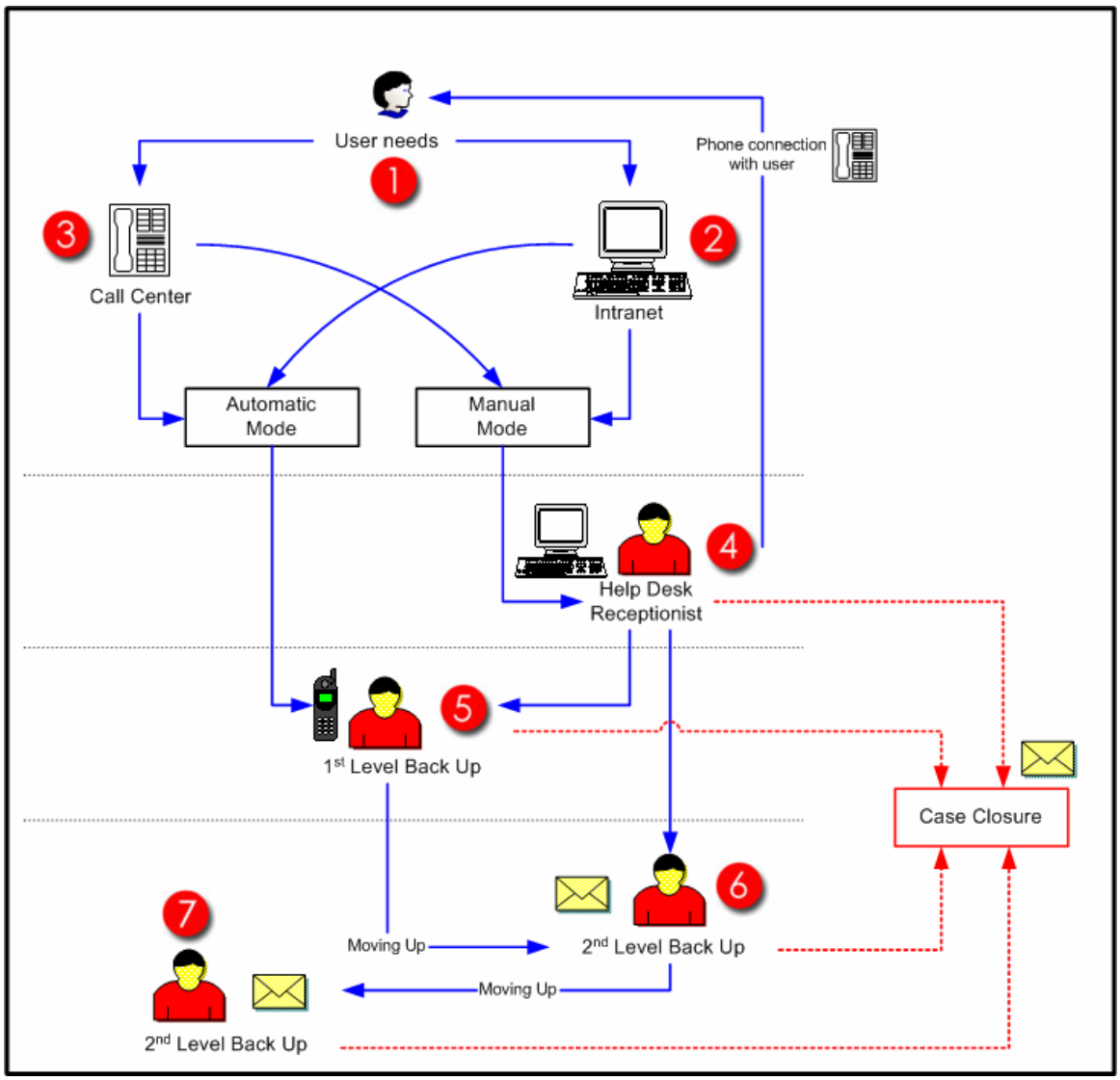
3-Very satisfactory 2- Satisfactory 1- Little satisfactory 0- Not satisfactory

### 8. *Checking system*

If you have been contacted by the staff checking the Help Desk system, that contact is:

3-Very satisfactory 2- Satisfactory 1- Little satisfactory 0- Not satisfactory

## New Help Desk Diagram



**(1) User needs:** 24-hour, 7 day a week.

**(2) Institutional Intranet:** Any user who forms part of the master table of the institution has access to this. This identification of the user enables him to be notified by e-mail of his request and to follow its development until its resolution.

**(3) Call Center:** To use in case of informatics failure.

**Manual Mode:** Role of Help Desk Receptionist who is logged into the system. During his work hours he is responsible for moving up.

**Automatic Mode:** Through WAP signals the user needs are sent to a cellular phone. There will always be someone logged in to provide help.

**(4) Receptionist:** He receives all the user needs on line and sends them to the back up.

**(5) 1st Level Back Up:** They are geographically distributed among the different sectors of the hospital and try to resolve the problem on the spot.

**(6) 2nd Level Back Up:** Junior and Senior programmers of the hospital information system and heads of the different areas that make up the department.

All those user needs which have been moved up more than 3 times or have not been resolved within 24 hours are seen by a controller and then discussed in the weekly meeting of the department. The objective of this is to improve the process and the service to our users.

## References

[1] Luna D, Otero P, Gomez A, Martinez M, García Martí S, Schpilberg M, et al. Implementación de una Historia Clínica Electrónica Ambulatoria: "Proyecto ITALICA". In: Argentine Conference on Computer Sciencie and Operational Research - 6to Simposio de Informática en Salud - 32 JAIIO; 2003 2-5 Septiembre 2003; Buenos Aires, Argentina: SADIO; 2003.

[2] Gonzalez Bernaldo de Quiros F, Soriano E, Luna D, Gomez A, Martinez M, Schpilberg M, et al. Desarrollo e implementación de una Historia Clínica Electrónica de Internación en un Hospital de alta complejidad. In: Argentine Conference on Computer Sciencie and Operational Research - 6to Simposio de Informática en Salud - 32 JAIIO; 2003 2-5 Septiembre 2003; Buenos Aires, Argentina: SADIO; 2003.

[3] Van Der Meijden MJ, Tange HJ, Troost J, Hasman A. Determinants of success of inpatient clinical information systems: a literature review. J Am Med Inform Assoc 2003;10(3):235-43.

[4] Ball MJ. Hospital information systems: perspectives on problems and prospects, 1979 and 2002. Int J Med Inf 2003;69(2-3):83-9.

[5] Ash JS, Stavri PZ, Kuperman GJ. A consensus statement on considerations for a successful CPOE implementation. J Am Med Inform Assoc 2003;10(3):229-34.

[6] Kuhn KA, Giuse DA. From hospital information systems to health information systems. Problems, challenges, perspectives. Methods Inf Med 2001;40(4):275-87.

[7] Tonnesen AS, LeMaistre A, Tucker D. Electronic medical record implementation barriers encountered during implementation. Proc AMIA Symp 1999:624-6.

[8] Teich JM, Glaser JP, Beckley RF, Aranow M, Bates DW, Kuperman GJ, et al. The Brigham integrated computing system (BICS): advanced clinical systems in an academic hospital environment. Int J Med Inf 1999;54(3):197-208.

[9] Massaro TA. Introducing physician order entry at a major academic medical center: I. Impact on organizational culture and behavior. Acad Med 1993;68(1):20-5.

[10] Ash JS, Stavri PZ, Dykstra R, Fournier L. Implementing computerized physician order entry: the importance of special people. Int J Med Inf 2003;69(2-3):235-50.

[11] Baum A, Montenegro S, Severino J, Assale D, Figar S, Luna D, et al. Mejorando la accesibilidad de una mesa de ayuda en un hospital de alta complejidad. In: Argentine Conference on Computer Sciencie and Operational Research - 6to Simposio de Informática en Salud - 32 JAIIO; 2003 2-5 Septiembre 2003; Buenos Aires, Argentina: SADIO; 2003.

**Address for correspondence**

Dra.: Analía Baum

analia.baum@hospitalitaliano.org.ar

Medical Informatics Residency. Department of Medical Informatics. Hospital Italiano de Buenos Aires. Gascón 450. Ciudad Autónoma de Buenos Aires. Argentina. (C1181ACH)