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Re: Document Number D002205

Dear Mr. Motan:

Thank you for submitting your paper entitled "Introduction of Computerized Pharmacy System in a Multinational Environment" for the upcoming Eighteenth Annual Symposium on Computer Applications in Medical Care (SCAMC).

We have assigned document number D002205 to your submission. Please note this number, as we will refer to it in all future correspondence.

We will send all submissions out for review in mid-June and will notify you about acceptance or rejection of your submission by early August. We expect a large number of submissions for this meeting.

I appreciate your interest in SCAMC and look forward to seeing you in November in Washington, DC for an outstanding meeting.

Sincerely,

Judy Ozbolt, Ph.D, RN/gem

Judy G. Ozbolt, Ph.D., R.N.
Program Chair
Eighteenth Annual SCAMC

Introduction of Computerized Pharmacy System in a Multinational Environment

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ABSTRACT

We present in this paper the experience in selection, installation and training of a computerized Pharmacy system, its complexities in the requirement for the integration and the support for different types of nationalities in pharmacy whose experience comes from different backgrounds. The high volume of inpatients and outpatients demands a very comprehensive and stable pharmacy dispensing system that can do Drug to Drug interactions and Food to Drug interactions quickly. It also requires that the response time must be in subsecond. In particular there must be an arabization support on terminals and patient instruction labels must be generated in English as well as in Arabic.

INTRODUCTION

Many computerized Pharmacy Systems have been developed but most are for the US market where inpatient service receives more attention than outpatient service. Our institution is also interested in integration of Clinical computing systems, including pharmacy with other systems. There is a need to build clinical information systems with pharmacy data playing major role in the area.

King Faisal specialist hospital is a 517 bed tertiary care hospital and one of the most prestigious health care institutions in the Kingdom of Saudi Arabia. The hospital provides a variety of health services to the people of the kingdom, includes open heart surgery, bone marrow transplant, heart, kidney and liver transplant, etc. In addition to being a health care institution, it is also a research and educational center. Recently two hospitals have been added to the institution and expected number of beds could very well be over 900.

The Pharmacy department has a staff of 167 that includes 75 Pharmacists and 78 support personnel drawn from 20 different nationalities. This means we had to deal with strict training programs adhering to American standards of operating an automated pharmacy. At the time we started writing our Request for Information (RFI) there were very few integrated products available to support the four areas of our Pharmacy services: inpatient, intravenous admixture, outpatient and purchasing and inventory management. The inpatient services dispense over 700,000 unit doses and over 75,000 extemporaneous package doses while outpatients dispense over 330,000 prescriptions and over 25,000 Narcotics/controlled medications average per year. Computer services required that the system must be written in known language and operating system. Six years ago we required the Inpatient application to run on mainframe because it was believed that it would be easier for integration with other applications as well as the access for nursing personnel would be easier, since they had access to several HIS inquiries on mainframe terminal. However, this time there were no preconditions for hardware or operating system. We only concentrated on meeting user requirements. The second thought was that there must be ample evidence that the vendor can support the application 10,000 miles away.

Pharmacy system requirements
Features
The main features that were identified as essential in the selection of proper package were as follows:

-Pharmacy Formulary data base
-Drug to drug interactions
-Food to drug interactions
-Patient medication profiles
-Centralized/decentralized unit dose drug distribution

-Floor stock drug distribution
-Controlled substances distribution and control
-IV additive drug distribution
-Clinical monitoring
-Medication pricing
-Medication charging
-Nursing activities like medication administration
-Automatic stop order renewal
-Outpatient pharmacy
-Inventory and purchasing
-Reporting

Special features
-Support for tutorial and help feature
-User friendly
-Support for Arabic language on terminals
-Support for patient instruction labels in Arabic
-Integration support using HL7 specifications
-Data gathering for Clinical repositories
-The issued drugs must be automatically depleted from the stock with an automatic reminder to move the oldest stock first
-Automatic generation of Purchase requests for items on minimum levels
-Generation of statistical reports for Chairmen of different specialties highlighting high usage regular and control prescriptions and amount of prescriptions per patient by each doctor

Selection for site visits
Preliminary selection criterion was that each package must meet the above minimum requirements. Thirty-six (36) RFIs were sent to different vendors. Six (6) were received, others either did not respond or apologized. The sub committee reviewed each one of them and four (4) were selected for site visits because each one of them supported all of the above features.

Final selection
The KFSH delegation reviewed four packages, Cerner, HBO, Continental Healthcare and Megasource. Priorities were set up and each function was given a score based on the necessity declared by the user. Also main consideration was given on vendor support, user friendly product and support of help and tutorial features. Megasource was selected as the highest scorer. Six years ago during the same process of selection Megasource was the only product at that time that met KFSH requirements. This time it was decided to move the Megasource pharmacy system to Novel based network system instead of keeping it on mainframe. It was also decided that the Outpatient and Inventory home-grown modules will be kept in use as they were found to meet KFSH requirements and were more user friendly.

Training and installation
It is worth mentioning here that the user group in Pharmacy department had very little knowledge of the computers during the first introduction of Computerized pharmacy system six years ago. Vendor installation team was invited to do the initial installation and training of key personnel including computer staff. Several training sessions were then conducted by the computer coordinator to train pharmacy staff. The challenge was to train staff for English software using bilingual keyboard (Arabic & English). Then the problem was high turn over which has kept one computer staff and one pharmacy coordinator busy over the years in keeping the staff abreast with the changes occurring in the software.

Integration with HIS
Our HIS applications were running under VSE/CICS, Megasource ran under PICK and both of them under VM helped us to transmit data at operating system level. It was decided to make use of SPOOLWRITE commands in HIS applications which would spool data strings in the queue. VM was notified to look for certain types of queue and if found to transfer these queue members to PICK reader queue. Megasource in turn wrote a simple program to wake up as soon as some data showed up in their queue, read the data and wrote it to a temporary file. This would in turn start another program that would update pharmacy data base. An error log was printed on a Pharmacy printer to handle any errors manually. Even though we have decided to downsize Pharmacy system the interface can stay as it is, however, we are planning to use standard send and receive of HL/7 records over HCI/Link.

CONCLUSION

We are still not completely satisfied that pharmacy automation is up to the required level. However, it is not because of untrained staff, but rather that users now feel that response time must be in

subsecond. They are more demanding and are more supportive of downsizing and distributed processing.

Over the years our user requirements have changed. Our main objective today is not only to have more integrated solutions for all HIS packages but select the packages that support HL/7 and ASTM 1238 standards. These packages must follow JCAHO and other regulatory agencies' standards. We would like to feel comfortable in selecting packages following Open systems, and fault tolerant features.

Our training methodologies have not changed. New employees have to take four days of in-house training course on the usage of Computer and Pharmacy software.

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