I.T. at St. Joseph's Hospital, Koforidua, Ghana.
Report by David Lewis
April 2007

When I first began my investigation into the IT facilities at St. Joseph's hospital, by absolute pure chance I happened to meet a technician/programmer from a company called Daviran Computers Limited. The technician was on site at the request of the hospital to sort out some issues on the hospital director's computer. This computer has access to the internet, via a dial-up modem, and due to out-of-date anti-virus software, had contracted multiple viruses.

It also transpired that this computer had been supplied with a 60 day trial of Microsoft Office, which had also expired. The hospital director no longer had access to his saved documents.

Within a couple of days the anti-virus software issue had been fixed and a full working version of the office software installed. However, due to the viruses, many of the director's documents had become corrupt and remain irretrievable.

P.H.I.S.

I was impressed to learn that the hospital is equipped with a networked computer software package called P.H.I.S. (Patient Health Information Software) which is designed and supplied by the afore mentioned Daviran Computers Limited.

The programme is modular, one module for each of the following :-

- Registration
- Consulting Room
- Receipts
- In-Patient Billing
- Inventory
- Clinical Search
- Patient Search
- Statistical Reports
- Management Reports

Registration Module

This is where patient's personal details are entered such as name, address, age, religion etc. Once a patient is entered into the system a patient number is generated, this number can be then be used for searching from within other modules.

Consulting Room Module

This module is where doctors/medical staff notes and diagnoses details are entered, together with treatments and drugs prescribed. These notes are entered from the paper notes some time after the consultation has taken place.

Receipts Module

This module is where details of costs of drugs, x-rays etc. and payments received are recorded; the system has the facility to then print out a receipt. This module interacts with the stock/inventory module and updates the stores records.

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In-Patient Billing Module

This module, surprisingly, is not currently used but it is for the recording of stock/costs used for patients that are admitted to the wards. The module can also produce printed receipts and it too interacts with the stock/inventory module.

Inventory Module

This module is basically a stock control module and is capable of supporting stock items for up to 20 departments. The stock is managed by the system in such a way that any out-of-date products/drugs cannot be used. Out-of-date products are effectively removed from the available stock list. Stock items that are used/sold, within the receipt module, and the in-patient module (if it were to be used), is reflected in the inventory module. The pharmacy department is responsible for inputting/updating the stock data.

Clinical Search Module

A search can be made using clinical data as the search criteria to recall a patient's details/records, or, groups of patients having similar treatments can be recalled.

Patient Search Module

If an existing patient fails to bring his/her notes or patient number with them, their records can be searched for using any personal details as search criteria.

Statistical Reports Module

This module can produce government driven statistics as well as customized statistics for the hospital's benefit. Reports are designed and built by the software company.

Management Reports Module

This module can produce all manner of reports useful to the hospital management/admin department. Reports are designed and built by the software company who can build any report required on request. Because the software has been sold to many other hospitals, whenever a new report is built or update is made, this is rolled out to all the existing customers of the software.

Out Patients Department

The OPD has the following areas with computers with access to P.H.I.S. :-

- OPD Cards/Records Room
- Dispensary
- Voluntary Counseling and Testing (VCT)
- Health Insurance

In the Dispensary there is a separate computer, which acts as the server for the P.H.I.S. system. *Technical bit* - The hard drive of this computer has been partitioned and a back-up of the database is saved onto the partition. If this computer/server were to suffer a hard drive failure, not only could the database information be lost but the back-up would suffer the same fate as

they are effectively the same hard drive. The data is however, also backed up to another separate computer located in an unused room on the first floor of the administration department.

Laboratory

An ancient computer exists within the laboratory which I was informed was broken. It transpired that it requires a password, which the staff does not know, in order to sign in, so it is therefore never used, i.e. broken! This computer requires replacing and networking. It must surely be beneficial for laboratory results to be recorded on patient's records.

Administration Department

The administration department has three computers that have access to P.H.I.S. located in :-

- Admissions Department/Reception
- Personnel/Admin office
- Hospital Director's office

There is a further computer located in the General Accounts office however, this is not, as yet, networked and therefore does not have access to P.H.I.S.

Internet Access and Anti-Virus updates

Within the hospital, only the hospital director's computer has access to the internet and, because this terminal had acquired multiple viruses, when I first arrived, the ability for the computer to access P.H.I.S. had been blocked by the system (this is a security feature/firewall built into P.H.I.S. to protect the database). This issue is now resolved...until the next time! It should be bourn in mind that viruses can, and do, spread throughout whole networks of computers from a single infected machine, which would most likely lead to other computers having P.H.I.S. access denied. Why this hadn't already happened, unless unknown to me it had already happened, is not yet clear.

In order to keep the anti virus software updated it will require connection to the internet on a regular/daily basis. As there is only dial up access this will prove extremely problematical. It has also to be established where precisely, the anti-virus software is installed. Ideally it would be on the server where it can provide protection to the whole network and the server would have an internet connection. If it is a separate anti-virus installation, for each computer, then there will be a huge problem keeping all the machines updated.

I was informed by the hospital administration manager that Daviran upload updated virus definitions via a disc, which they manually bring along to the hospital, approximately every three months. This suggests to me that the software is probably server based, but is only a suggestion. Whichever it is, it is nowhere near good enough. Viruses are released on a daily basis and if the protection is not kept current the next time the computer goes out on the internet it will get infected...again...and again, and the whole network once more, becomes at risk.

In theory, if the only computer with internet access is kept up-to-date then no infections will be allowed onto the network. In reality, it only takes one infected floppy disc or any other plug in device to be innocently brought in from outside by a member of staff, for a virus to sneak onto the network via a computer with out-of-date protection.

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Unfortunately, the technician had left the hospital before I was able to gather all the information I required and I have so-far been unable to contact him on the telephone numbers printed on his business card - which I tried several times while I was in Ghana - or the e-mail address, which returns 'mailbox unavailable'. Not too reassuring. I will nevertheless continue to attempt to track him down with the help of the hospital administration manager and, enquiries are currently in hand.

RECOMMENDATIONS

1. A purpose built server to be purchased with multiple hard drives, where protection such as Anti-Virus, Anti-Spyware, Worm Checker, Firewall etc. can be installed and, correct back-up procedures maintained. (This is also the recommendation from Daviran Computers Limited.)

2. Broadband internet connection at the hospital is essential as this would greatly assist in protecting the network to the best possible level, as software updates will be installed automatically. (Research will be undertaken to find the best service provider once the decision is approved)

3. Install a suitable encrypted wireless router to allow internet access to visitors who use wireless enabled laptop computers, especially useful when Motec provides educational sessions.

4. Networked computers to be installed in the consulting rooms in OPD. This would give medical staff access to patient records during consultation sessions. The ability for records to be updated 'on-the fly' rather than waiting for them to be input at a later stage would also be possible. A networked computer in the laboratory and another somewhere within the operating theatre would be also beneficial.

5. Basic I.T. safety/best practices awareness training session's for all relevant hospital staff.

6. Eventually, the creation of an intranet site for the hospital where advice and training can be shared and accessed easily and, the ability for staff to have their own work email accounts.

CONCLUSION

The level of I.T. at St. Joseph's Hospital was far better than I was expecting to find. The P.H.I.S. software seems to be a very good hospital/patient management tool, although it is not being used to its full potential. With the addition of a few more computers, the upgrading of some of the existing ones and the implementation of Motec's recommendations, I feel that St.Joseph's will have an I.T. infrastructure for other hospitals in the region to aspire to.

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Special note/warning to Motec members visiting St. Joseph's

During my visit in April I was accommodated in a house (the one closest to the hospital, there are about three) within the grounds of the hospital/monastery. There is a PC in this house. **Beware!!** it has a virus/viruses, so be careful if you have a memory stick you wish to use, like I did. Possibly due to once being borrowed by the Out Patients Department when one of their computers was faulty, it became infected. Luckily for me the anti-virus software in the hospital had just been updated (you may not be so fortunate) so when the infected memory card was plugged into a computer in the admin block, in order to print out a document, the virus was captured and deleted off the device.

The virus had also infected my digital camera's memory cards, as I was viewing my daily photo-shoot on the computer by connecting the camera via a USB cable. The viruses were however, cleaned up by my own computer's anti-virus software on my return home. On my next visit I intend to take some utilities with me that I can use to clean up the computer and make it safe.

Needless to say, this computer has no internet access, so at least it shouldn't contract any further viruses, unless someone brings another one in on a memory stick!! (which of course, is another possible explanation why it got infected in the first place)