eEvidence: Supplying Evidence to the Patient Interaction

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Abstract. Nursing demands that all care offered to patients is appropriately assessed, delivered and evaluated; the care offered must be up to date and supported by adequately researched published evidence. A basic logic suggests that information and communications technology can help the nurse in maintaining his/her care provision to the highest level through presenting relevant evidence.

The nursing need for evidence to support the delivery of care is a global phenomenon. Within the project this is demonstrated by the fact that the project lead is resident in England and the project is being carried out in Singapore with the help of the National University Hospital, the Alice Lee Centre of Nursing Studies and the School of Computing at the National University of Singapore.

The project commenced in January 2008, this paper will present the background thinking to the project design and will describe the outcomes which will provide nurses with individual supportive evidence for their practice gleaned from quality assured sources. The project will use information and communications technology to provide the evidence on an individual basis.

The paper will outline the four key elements of the project, these being the development of user (professional) profiles; the design and development of an automatic crawler search engine to deliver quality assured evidence sources and software design; there will be some mention of hardware design and maintenance which is the fourth key element.

Within the paper, consideration will be given to the added value of the project to the nurses, their patients/clients, the research agenda and the employing organisation:

- The drive for information is determined by the nurses in clinical and community practice
- Evidence available immediately at the point of intervention with patient/client
- No patient information stored within structure
- All technology and almost all support software already available
- Additional information can flow both ways for quality and activity audits
- Identification of areas weak in evidence requiring supportive research will be driven by practice
- Immediate dissemination of new generic practices and principles can be delivered to each nurse on syncopation, removing the requirements for paper updates etc.
- Process can be transferred across all healthcare clinical professions

In conclusion, information will be given on progress to date in terms of technical applicability and user acceptance by the nursing staff. In addition, an insight will be given as to managing a multiprofessional, multi-organisational project from a distance.

Keywords: Evidence Based Practice, professional profile, crawler technology, research needs identification.

1. Introduction

Nursing is a complex role within the health and social care team. Nursing has a primary communication role with those in their care, sadly though it would appear [1] that due to covert pressures on nursing away from using a patient centred approach reduces the effectiveness of the nurse with patient communication and that will impact upon the opportunities for interaction during care provision. These covert pressures include increasing the turnover of in-patients in hospitals along with an increase in the dependency of these individuals, reduction in staffing numbers [2]; and then a similar

picture in the community, increased number of patients needing higher levels of care either in their own home or a community centre.

Nursing forms the largest single employee group in any hospital or community based health service. Nursing has been slow to embrace information technology [3] to support the delivery and recording of care in the community and in hospital. Part of the reason for this, is that many implemented systems have conflicted with practice and thus are held in low esteem by those dealing with patients, their relatives and friends on a daily basis.

Alongside these significant changes across health care is the need to ensure that the care given is of the highest standard possible, supported by the best evidence [4] possible from published peer reviewed research papers. This additional element requires long term commitment from both education and practice before it will become second nature to all professional practitioners. This project goes some way to helping in the process of using evidence with the interaction with patients.

2. Method

In agreement between the partners involved in the project a general outline was put into place, this included an agreed meeting schedule using Skype™ whilst remembering the partners were working at around an eight hour difference. In addition, extensive exchanges occurred using email and asynchronous discussion forums. Over the 12 months of the project one additional face-to-face meeting with all the partners took place in Singapore.

The project design included four key elements:

- user profiles
- quality assured evidence sources
- software design
- hardware design/maintenance

2.1 User Profiles

Each nurse was assigned his/her own file area seamlessly connected to the hospital intranet. Within the file area there is a professional profile on-line form for completion using a top and secondary level format, for example, if *orthopaedic rehabilitation* was the primary level, additional keywords could be added in a secondary form, such as *following planned surgery* or *after traumatic injury*; and additional information considered useful by the organisation. The additional information opportunity is an organisational added value feature of the project and could be used to maintain a record of required annual updates, other continuing professional development and communications to individual nurses from their managers/supervisors.

The file area holds basic demographic information about the nurse, gleaned from the hospital intranet wherever possible. The professional profile is in the form of a series of responses to questions associated with pull-down menus, but a free-text facility may also be used. The evidence is delivered to the appropriate file areas on a 3 to 5 day basis depending upon the occurrences of published material; for example if only two items were found then a repeat would be in 5 days, whereas if 50 items were found, it demonstrates a popular subject with a possible high amount of ongoing publications, then a repeat might be in 3 days.

2.2 Quality Assured Evidence Sources

In collaboration with the Alice Lee Centre of Nursing Studies (NUS) and the Nursing Directorate National University Hospital web-based sites were identified considered of the appropriate quality for inclusion. For the purposes of initially testing the processes and procedures within the project the following sites provided suitable copyright free material:

- Virginia Henderson Library (Sigma Theta Tau International)
- US National Library of Medicine
- MedlinePlus
- PubMed (Only when at least the Abstract is available)
- Mayo Clinic
- Healthy.net

Future links would include the source information held within the National University of Singapore's collection and any others deemed appropriate during the project, although a cost maybe incurred. A measure of usefulness and quality does need to be developed or applied if found elsewhere within intellectual property rights and copyright legislation.

The professional profile is matched to the sources and resources and the results 'dropped' into the individual nurses' file area. It was anticipated that some will receive many resources and they will have to develop an information management system for dealing with such quantities. Others may receive nothing. The lack of evidence will quickly identify a need for research to be carried out to fulfil evidence requirements and thus nursing will be leading the research agenda, this is significant added value aspect to the project.

The nurses were allowed to view all source material in his/her file area and then retain, discard or reconsider the material. An archive of decisions made would be retained.

2.3 Software Design

It was agreed that the bespoke software designed within the School of Computing, National University of Singapore (NUS) would pick up the professional profile information then at a pre-determined time (after 11p.m. and before 4a.m.) the pre-identified databases of peer-reviewed articles would be 'crawled' – thus preventing any inaccurate information being collected. The resultant articles were then returned to the individual file areas.

There was general agreement that further degrees of sophistication would be required and some of these were implemented, such as a form of article grading for usefulness or closeness to the original profile request; another, not implemented would be the aggregation of articles into a genre format allowing for some form of enquiry for audit and management purposes.

2.4 Hardware Design

The diagram below outlines the hardware design. It is imperative that this project avoided all patient related information and in no way compromised the security of the hospital intranet.

To reduce the purchase of additional bandwidth by hospitals and to reduce the need of additional terminals in the clinical areas, the web searching would take place at night when there are less demands on the bandwidth available and less activity generally on the hospital ICT resources.
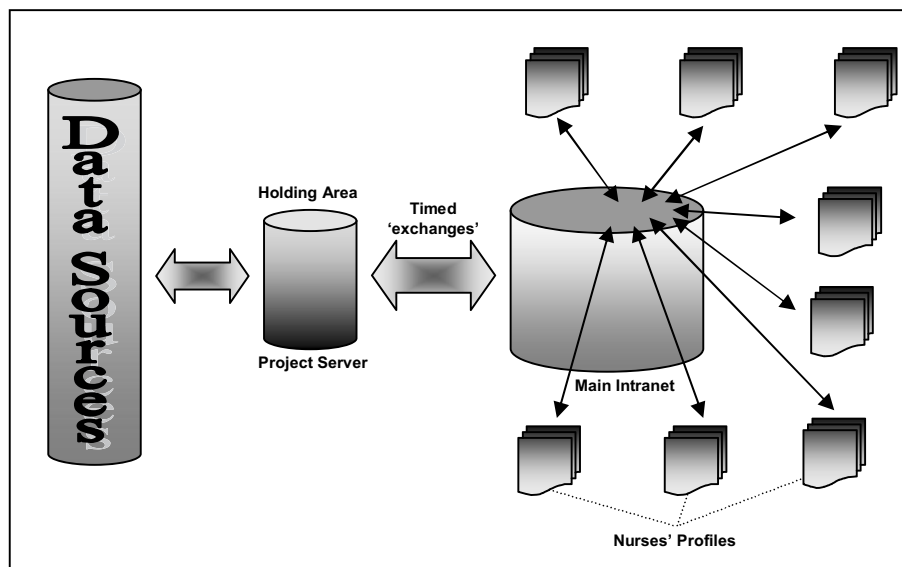

Figure: 1. Diagrammatic representation of hardware design

Although not a requirement within the bounds of the project, it was considered that it would be useful to include some testing of PDA synchronisation with the individual nurse files so that the nurse can take the evidence to the bedside and discuss it with the patient. .

3. Outcomes

This project was carried out following general belief in the idea by all parties, thus there was a bias towards making it a success, in order to try to reduce the bias as much as possible regular communications took place between the UK and Singapore. In addition formal academic meetings took place within NUS between Professor Kan and his PhD student – the software engineer for the project.

Overall, the nurses found the system worked extremely well and assisted in their sharing evidence with each other and their patients. For the Chief Nurse Mrs Lee, she considered the importance of her nursing staff having the up-to-date evidence an excellent point in audit and as a strong marketing tool. Further work is ongoing to refine the basic processes, these will be reported at the conference.

3.1 Added Value

We found during the project that using this system, not only did the nurse have at his or her finger tips the evidence to support his or her practice but there were many significant value added outcomes, some of which are listed below.

- The drive for information is determined by the nurses in clinical and community practice
- Evidence available immediately at the point of intervention with patient/client
- Has potential to improve patient/client care through well informed practitioners
- No patient information stored within structure
- Additional information can flow both ways for quality and activity audits
- Identification of areas weak in evidence requiring supportive research will be driven by practice
- Immediate dissemination of new generic practices and principles can be delivered to each nurse on syncopation, removing the requirements for paper updates etc.
- Process can be transferred across all healthcare clinical profession

4. Acknowledgement

5. References

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