

Linking the “social” and the “technological” together: a case study of a nursing information flow in the neurosciences ward of a public hospital

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Abstract

Business process analysis is one way of understanding organisational behaviour as a complex social system, where agents are engaged in purposeful activities by interacting with each other and using technology, including information technology. The full benefit of IT depends both upon being able to express the business processes in the context of a specific organisational environment and understanding how these processes can be supported by business information systems. This paper uses a case study of a nursing information flow in an acute care ward of a public hospital in Victoria, Australia to illustrate how graphical presentation of the patient care process combined with an interpretive analysis can assist process definition and provide some insights into the social issues that are instrumental in achieving the full benefit of IT in a hospital ward.

Keywords: *patient care process, information technology, flow diagram, interpretive analysis, hospital ward*

1. Introduction

The object of this study is the core business process of a neurosciences ward of a large metropolitan hospital – the Patient Care Process (PCP) – which belongs to the class of operational processes that create, produce and deliver products and services that customers (ie. patients and/or their family/carers) want. The PCP has a patient as its focus and is therefore differentiated from administrative processes that do not produce outputs for the customer but include strategic planning, budgeting and performance measurement (Garvin, 1998). Although coordinating these two types of processes is vital for an organisation to function effectively, this study is concerned with operational processes (eg. nursing, medical, clerical, and ward-management activities) that serve the patient flow and can be directly observed at the ward. Hospital administrative processes are outside the scope of this study.

The emerging view in literature is that “business processes have a mixed and apparently conflicting nature; they have technical and social, tangible and intangible, objective and subjective, quantitative and qualitative dimensions” (Melão, 2000 p.123).

It should be acknowledged that the *technological* and the *social* dimensions do not exist as separate entities and can only be abstracted as separate analytical categories. Technology is socially constructed, so there exists the duality of the “social” and the

“technological”. It can be argued that neither technology nor social forces alone can be assumed to be causal agents in re-designing business processes and developing information systems.

For the purposes of this study the technological processes are seen as possessing some “objective” properties in the sense that social interpretations and interactions that have produced any particular technology are already “cemented” there. Technology has the potential to control activities in a non-negotiable way, ie. certain tasks ought to be performed in order to produce an intended outcome (or to avoid undesirable consequences).

From a *technological* perspective, the PCP is defined as an established logical sequence of purposeful activities performed by medical, managerial and clerical staff in an acute care ward to manage patients’ progression from admission to discharge. The activities are supported by the information flow. Business process research is traditionally concerned with the technological side. For the purposes of this study the PCP is viewed as both a *technological* and *social* process. This extended definition adequately reflects the dual nature of the studied phenomenon. On the one hand, the PCP is a sequential re-occurrence of the purposeful activities performed by the ward’s staff in the context of the institutionalised norms and practices that determine the social order of the ward, but on the other hand the PCP is carried out by individuals with their own subjective understanding of the meaning of the process, its purposes and their roles as well as their individual ability to resolve “situational problems”¹.

The definition of the technological dimension of the PCP is consistent with the conventional view of the process as “the structured, patterned, purposeful activities through which organisations transform one or more kinds of inputs into outputs” (Kiraka, 2005). The conventional definition implicitly assumes that human actions are primarily driven by goals (Kuong, 1997). It then follows that an organisation is a complex system of interacting agents who each have goals (Warboys, 1999). In business process literature considerable attention has been paid to modelling certain aspect of the processes, such as roles, activities and interactions. Although there is agreement that defining organisational objectives is the first step in business process modelling (eg. Davis, 2001 Scheer, 1998, 1999) usually there is little discussion of what this involves (Niger, 2003) and “little attention is paid to the value of making goals explicit” (Kuong, 1997, p.17).

The exceptions are the Soft Systems Methodology (SSM) (Checkland, 1990), socio-technical systems design (Mumford, 1987) and “critical research” in IS (Iivari, 1998).

¹ A “situational problem” arises when particular, often patient-specific, circumstances cannot be resolved through the routine activities and channels of communication (eg. as regulated by protocols, guidelines or established practices) and require use of extra resources, eg. additional funding, special negotiations with external providers etc. Only those situational problems that present a risk of discontinuation of the patient progression through the stages of the PCP are of interest here. The notion of a “situational problem” should not be confused with the notion of a situational activity or situational work practices where a single work episode is viewed as a project rather than as a set of routine tasks (Suchman 1987).

Application of the SSM to a process modelling approach puts technical issues in a social context, such that the success or failure of the proposed technology is linked to the collective or individual goals of the process participants. According to the SSM, business processes are “human activity systems” that are difficult to understand and portray. The most essential characteristics of the human activity systems are that they can be analysed from different points of view, according to the perspectives of the different “interest groups”, such as nurses, hospital managers and doctors. The SSM is an application of systems thinking to issues arising in social organisations where unequivocal solutions cannot be identified and where there is a requirement to reconcile competing perspectives (Warboys, 1999).

Understanding that “organisations are socio-technical systems, ie. that they have both a technical and a social dimensions and that the effective performance depends upon both of these subsystems” (Wastell, 1994 p.25) is a central idea of the socio-technical systems design that influenced various methods of “participatory design” (Mumford, 1983).

“Critical research” addresses the problem of goal diversity of organisational actors by means of exposing inherent conflicts, contradictions, hidden structures and mechanisms involved in a complex relationship between IS and their social, political and organisational contexts (Cecez-Kecmanovic, 2001)

In the practice of business process modelling the “social” is typically identified with goal diversity. The goals are categorized as *functional* – specific to the technological side of a business process and derived from the ultimate goals of an organisational unit (eg. restoring a patient’s health to the best achievable level) – and *non-functional* goals that do not add value to the client outcomes but ensure compliance to certain rules (eg. complying to medico-legal requirements when making an entry to the medical record).

Business analysts and model designers are predominantly concerned with improving process efficiency in terms of *functional* goals, while treating *non-functional* goals as “restrictions”. The *social* or “soft” issues are believed to be sufficiently addressed if the redesigned process somehow accommodates the employees’ “specific targets, wishes, desires and purposes” (Kueng, 1997, p.18). Among this category is employees’ interest in obtaining “high autonomy” (*ibid*, p.19) and/or having a meaningful and integrated job and possibilities for informal communications (Scherer and Zolch, 1995). The “social” goals are treated as secondary to the overall concept of the redesigned business process. Though occasionally an increase of autonomy for individuals and/or teams does occur, this outcome cannot be guaranteed if the goal of “high autonomy” is inconsistent with the role assignments assumed in a business model (Kueng, 1997).

This approach indicates a deterministic conceptualization of organisational behaviour “as ordered and sequenced in order to achieve rationally declared ends and where actors behave mechanically and altruistically in the pursuit of organizational goals” (Pettigrew, 1990 p.268) and implicitly assumes that the relationship between technology and social structure is orderly and holds regardless of context, and it ignores the

possibility of “emerging” factors grounded in site-specific idiosyncrasies (Orlikowski 1996).

In this study the *technological* dimension is complemented with the *social* dimension. The social is assumed to relate to the following assumptions:

- Institutional templates and social norms guide the social order in the ward. These are likely to relate to professional hierarchies (eg. subordination rules within the medical profession) and local culture (eg. professional ethics) that determine informal practices;
- Within the constraints of organisational policies, rules and regulations social actors may have differences in interpreting the PCP and understanding their role in it. “The meanings that the study participants attribute to their activities, as well as the purposes (objectives) and a participant’s own role in achieving those objectives may vary between the individuals depending on a participant’s position in an organization and his/her values and perceptions.” (Boland, 1985 p.194).
- Individual responses to the “situational problems” may result in a slippage of established templates and result in emergent practices substituting the established routines. (Barley,1988; Beynon-Davies, 1995)

This study has a practical goal of analysing the *technological* and the *social* sides of the PCP as a way of obtaining the process definition as a necessary condition for a successful IS implementation. It produced a number of suggestions towards improving efficiency and effectiveness that would, at a minimum, eliminate obvious deficiencies such as information bottlenecks, redundant procedures, etc. and may also assist in developing a number of alternative solutions for redesigning the PCP using suitable IT. This study also aims to provide some insights on the social aspects of the PCP that need to be considered to achieve the best fit between the selected IT and the PCP.

The scope of this paper precludes a comprehensive presentation of outcomes. Interested reader may find more in Gospodarevskaya et al (2005). This paper uses an example of a nursing information flow² to demonstrate how linking the *social* and the *technological* together can assist requirements definition. It is argued that in order to obtain the best fit between IT and the PCP, the interpretive schemas, norms and values of organisational actors as well as emergent practices that have the potential to improve effectiveness of the PCP need to be researched.

2. Methods

A “mixed and conflicting nature” of the PCP, which includes both the *technological* and the *social* dimensions, implies that the epistemological assumptions of neither the

² Information flow involves activities relating to obtaining, using, generating and exchanging information. Information is meaningful only in the context of a particular task/case/problem. (eg. results of a pathology investigation make sense only if interpreted in relation to the previous readings, results of other examinations, a patient’s medical history and current state of health).

“technological” nor the “social determinism” (Barley, 1988), if taken separately, can satisfy the purposes of this study. The traditional methods of business analysis and modelling need to be complemented with non-positivist methods in order to overcome the “deterministic” approach to business process analysis and design.

For this reason a *combination* of techniques of graphical representation of the PCP (business process modelling) and an interpretive analysis of the data are employed in this study. This is known as methodological triangulation (Sawyer, 2001). Langley (1999) argued that visual mapping analysis of a process offers a means of data reduction and synthesis that is less radical and more flexible than that used in models based on quantification (eg. factor analysis). However, “unless supported by other methods the conclusions derived from it can have a rather mechanical quality, dealing more with the surface structure of activity sequences than with the underlying forces driving them.” (*ibid* p.702-703).

Empirical investigation of the PCP took the form of an ethnographic field study (Blomberg, 1993), which included participant observation, opportunistic interviews and document analysis (Dingwall, 1997; Fulop, 2001) that are recorded in field notes in the first instance. A combination of these methods was used in studies of information systems in organisations, including development of information systems (eg. Shapiro, 1992; Holzblatt, 1993).

The *technological* side of the PCP was captured in a format suggested by Curtis (1992) based on the following dimensions that inform a business process model:

- **Functional:** represents *what* activities are being performed;
- **Behavioural:** represents *when* activities are performed by outlining the *conditions* under which they are performed, i.e. through feedback loops, iteration, decision making criteria, entry and exit criteria, etc;
- **Organisational:** represents by *whom* (a staff member from an organisational unit) activities are performed and what physical media are used to manipulate and store the entities and their location;
- **Informational:** represents the informational entities (data) produced or manipulated in the process and their relationships.

The algorithm for obtaining a process description suggested by Curtis (1992) does not rely on the pre-defined objectives. Instead, the process objectives are derived from its functionalities using “bottom-up” observations rather than relying on structured interviewing of the process participants. The advantage of this approach is two-fold: it is not compounded by political games, which are believed to be a problem with the methods of eliciting objectives through interviews and group discussions (Landry, 1992), and it also avoids “occasioned accounts” of routine practices. “Occasioned accounts” are given by a participant to (implicitly) justify the performed activities in the context of an interview and/or the particular circumstances. Tomlie (2002) questions the validity and generalisability of these accounts. The disadvantage of the algorithms (Giaglis, 1999) is that the method relies on the observers’ competence. Also, only functional and non-functional (ie. *technological*) objectives can be captured this way, whereas the *social*

objectives – such as the specific interests of a professional group – would still require an interpretive analysis.

Field notes, including opportunistic interviews, clinical protocols/pathways, minutes and other relevant ward documents were studied in-depth to firstly, describe the PCP according to the above dimensions; and secondly, to outline issues and topics that suggested the various interpretations of the PCP from the multiple viewpoints of the study participants. The attractiveness of the participant observation method is that it allows researchers to experience work practices first hand, while observing the participants as they go about their daily routines. Eventually the researcher achieves the stage of “interpretive understanding” (Lee, 1991), and is able to make sense of the observed activities as the participants’ views on social reality becomes more and more transparent. Re-reading and analysing field notes and other documents resulted in cycles of analytic elaborations where emerging themes were contrasted with “negative” cases, and through the resolution of these “breakdowns”, an understanding of both social and technological sides of the PCP emerged. This interpretive method of analysis of empirical data extracted from field notes and various documents is known as a hermeneutic circle (Klein, 1999).

The *technological* side of the PCP was captured in flow diagrams. The ward staff are familiar with this form of graphical presentation of the PCP, which helped in establishing construct validity of the PCP model. Holzblatt (1993) noted that users are at a disadvantage if the model translates their experiences into unfamiliar terminology. Representation of the technological side of the PCP was complemented with *interpretive analytic narratives* that represent the *social* side of the PCP.

3. The study site

The neurosciences ward of one of the large teaching hospitals in metropolitan Melbourne was selected because the setting combined a number of features that made it attractive for study purposes, such as a fairly large scale of operations (in 2003 the ward admitted 1809 neurosurgery patients, 865 neurology patients and 443 patients from other clinical specialties), a complex PCP involving a multi-disciplinary team, and an IT/IS structure which was long overdue for replacement (the software for the Clinical Information System was 20 years old and no longer supported by the producing company).

The neurosciences ward admits two types of patients according to its specialty: neurology and neurosurgery. In addition, during the periods of increased demand for emergency admissions the ward accommodates non-specialty patients, dubbed “boarders”, and provides nursing, administrative and managerial services for these patients, while specialist clinical services are provided by respective hospital departments.

Specialist doctors, neurologists and neurosurgeons, share a few resources with limited capacity, including 26 ward beds that need to be allocated not just between these specialties but also according to the urgency of patients’ condition (elective admissions and emergency admissions). The two specialties also share with other departments a

number of expensive hospital resources, such as diagnostic imaging and the services of a palliative care team.

The ward is a highly efficient unit. During the 2000-2005 period, budget cuts resulted in a 29% reduction in the number of beds available to neurosciences patients, while at the same time the ward's throughput has been increasing by 20% annually.

This study was approved by the hospital's Human Research Ethics Committee. Informed consent was obtained from staff, who demonstrated a high level of cooperation throughout the study (the rate of refusal to participate in the study was 4%). The data collection took place from 2003-2005.

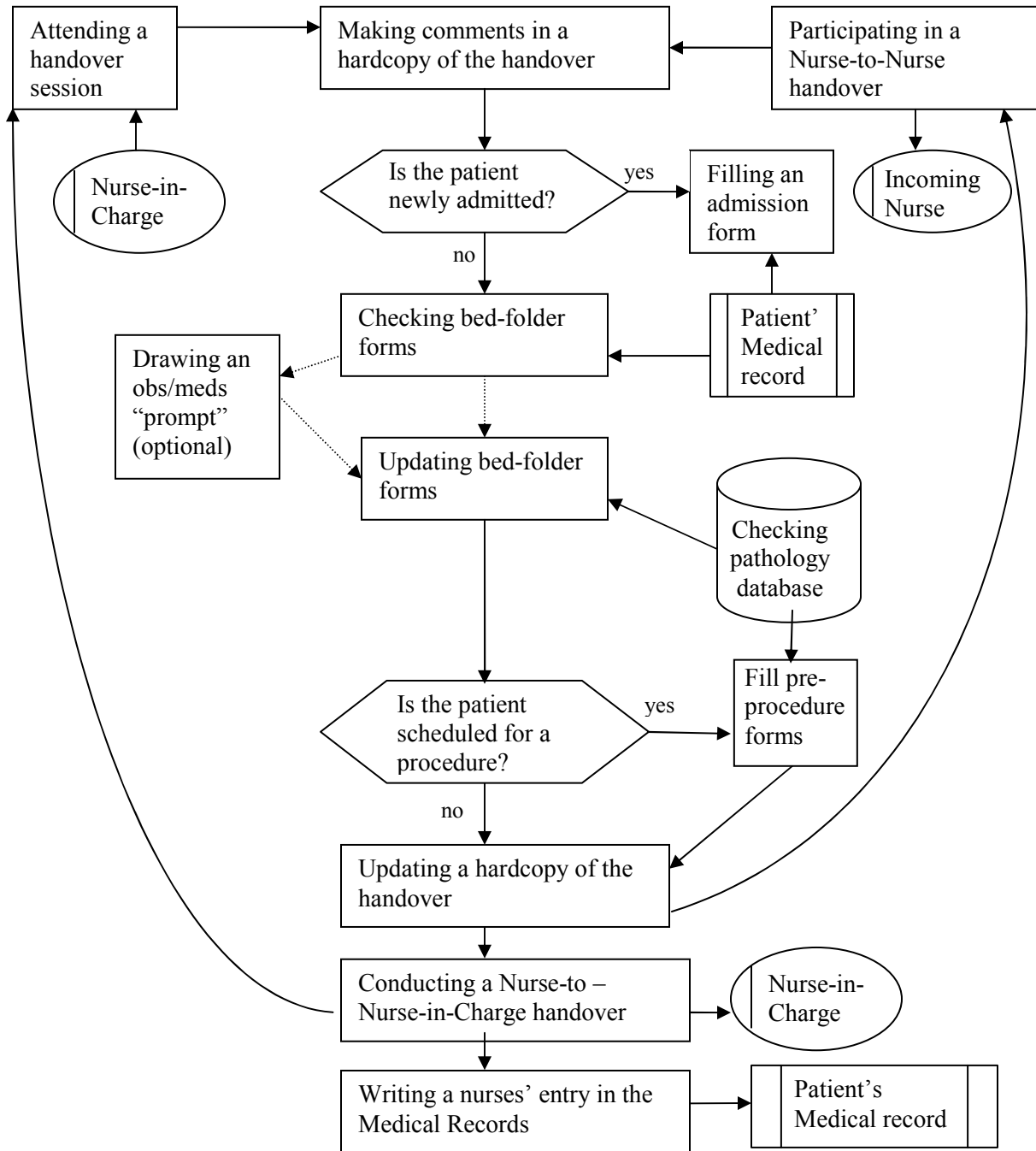
4. Results

A large modern hospital is a special kind of service organisation, both in terms of the number of different services it delivers and because of the range of different occupational groups and technological systems which need to work smoothly together. Health care organisations do not have a simple line of command structure, but are characterised by a number of autonomous and semi-autonomous groups whose concerns with health matters differ (Packwood, 1998). There are five professional groups on the ward: doctors, nurses, allied health professionals, clerical staff and nurse-managers. Nurse-managers combine managerial tasks (ie. tasks that support the patient flow) with supervising other nurses on the shift and also, on special occasions, providing direct patient care. This happens if a shift is understaffed, or when an advanced level of expertise and authority is required to provide care for clinically or psychiatrically challenging patients. Each professional group is characterised by a different information flow, which needs to be captured to obtain a description of the whole process. The scope of this paper is limited to describing the technological and social dimensions of a nursing information flow.

4.1 The technological side of the PCP

The main inputs, outputs and basic characteristics of the nursing information flow (as one of the sub-processes of the PCP) are presented in Figure 1.

Figure 1: Flow diagram of a duty nurse information process.



LEGEND:

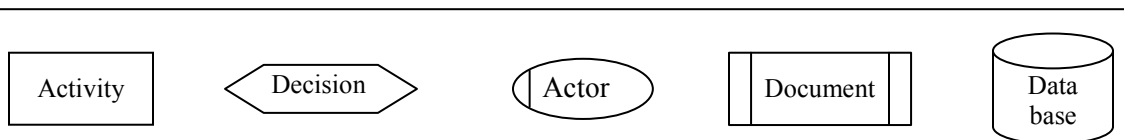


Figure 1 depicts the circular order of a nursing shift which begins with a formal handover session, usually of 0.5 hour duration. Handover (as a communication act rather than a document) also enters the PCP on two other occasions: at the end of a shift duty nurses hand over information about their patient to a nurse-in-charge, and may also have an individual Nurse-to-Nurse handover chat with incoming nurses. While bed-folder forms and multiple pre-procedure forms that contain clinical and personal patient information (eg. a prosthesis that prevents the use of an MRI procedure) were designed to assist medical decision making (these are outside the scope of this study), the single most essential document with information that supports and coordinates the daily tasks – not just of duty nurses but also of the nurse-in-charge – is a “Handover” document.

A Handover document is a time-honoured, structured and highly cryptic document based on the carefully balanced trade-offs between the comprehensiveness of clinical information and the need to be parsimonious in presentation of patient data. The generic format of a Handover (permanently stored on the Ward PC) and a fictitious entry for a neurosurgery patient are presented in Table 1.

Table 1. Generic handover document and hypothetical entry for a neurosurgery patient.

Bed number	Line one: Surname/name	diagnosis	type of surgery (date);	medical history (PHx)
	Line two: UR number (patient unique ID)	procedures (completed/requested)	risk factors	clinical tasks
	Line three: Age/gender Specialty (Dr)	dietary regime	personal & clinical care	discharge plan
33 NFR	Smith John	SAH	coiling 4/10	PHx ↑ Chol, arthritis
	44556677	Daily LP?	Dizzy Na 133	4 Ψ rev
	75 M N/S (Y)	SWD/No free H2O	Amb+1 IV AB	4RASP letter ✓

Some of the functionalities of a Handover document are obvious from its content (see Table 2), while others can only be derived through direct observations. For example, during a handover session all nurses insert hand-written notes in the empty spaces or margins of a Handover and these notes reflect a nurses’ interpretation of a patient’s condition. Individual notes are updated throughout the shift as nurses consult the clinical database, medical records (MRs) or doctors. Finally, these hand-written notes are used as prompts for an oral Nurse-to-Nurse-in-charge handover and for making an entry to a MR.

The highly cryptic format of a Handover was designed not only to economize on space, such that a single piece of paper essentially provides a profile of the entire patient population of the ward and the whole range of activities that the duty nurses perform, it

was also designed to protect confidential medical information by means of codifying it. Even if a handover is accidentally misplaced, a lay person without medical training and local knowledge of conventional abbreviations would not be able to discern much of the personal health-related information from the handover.

The compact format (a single double-sided A4 page) is essential to ensure patient data stored in a Handover is kept “at hand” (actually in nurses’ pockets) for prompt access at any time during the shift. This functional characteristic was evident as the researcher frequently observed nurses consulting a Handover throughout a shift. Nurses particularly appreciated a document that lists all the patients’ IDs, as became evident from the following incident involving the researcher studying an alternative externally designed electronic document called a “Nurses worksheet” that was available on the mainframe computer but was never put in use on the ward. The duty nurse, who realized the researcher’s interest in the “Nurses worksheet”, seemed to become concerned and, without any prompting on the part of the researcher, felt that she needed to defend the ward’s own Handover:

“Look, this one [pointing to the computer screen] does not even have a UR [patients unique identifier] number! How I am supposed to check the pathology results? No, our handover is good, it has everything we need and it is always here in my pocket. If someone asks me [a question] anywhere, I just look at it and tell this person all about the patient.”

At that point a nurse-manager joined the discussion, commenting that the “Nurses worksheet” is a protected document and could not possibly be used on the ward by the following reason:

“See the notes here [pointing at a hardcopy of the handover]? This is how I reach every single nurse from every shift. You cannot type anything in this “Nurses worksheet”, or adjust it to how we want it on our ward. I would not want to print 12 copies and then write at the bottom of each everything I want nurses to know”.

The notes that the nurse unit manager referred to contain messages about the dates and time of social gatherings, staff meetings and staff training sessions, reminders to apply for a new computer password, and various requests concerning adherence to safety regulations. These notes that typically were reproduced over a period from one day to a couple of weeks converted a handover into a universal communication device. For example, “All staff must wear a gown when entering room 45 – per infection control!!!” (The message referred to a patient with a particularly dangerous infectious disease).

The functionalities of nursing documentation that were identified during this study are presented in Table 2. The researcher’s own interpretation of the corresponding functional objectives is also provided.

Table 2. Functionalities and objectives derived from nursing documentation.

NURSING DOCUMENT	Functionalities	Possible Corresponding objectives
Handover document	organises clinical data with respect to each patient	patient data organising
	alerts nurses about the urgent tasks and the clinical risks with respect to each patient	task prioritising; risk management (minimising)
	provides a “snapshot” of the current mix of the patients and their clinical conditions	informing nurse managers about factors determining the workload
	provides doctors with information about the present location (i.e. bed number) of the patients	informing doctors about the current location of the patients
	provides doctors with information about completed and forthcoming nursing activities	Inter-discipline activity coordinating
	informs nurses about forthcoming professional and social events	professional training (<i>non-functional goal</i>) socialising (<i>group-social goal</i>)
Obs/meds “prompt”	assigns medication administration and neurological observation tasks for each patient to the appropriate one hour time slot	organising administration of medication and observations in a chronological order
Nurse entry into a medical record	informs other nurses, allied health professional and (occasionally) doctors about the changes in patients’ condition unfinished tasks and patients’ complaints	ensuring the process continuation and legal liability risk management (<i>minimising the perceived legal liability</i>)
Bed-folder forms	contains updated clinical data	informing clinical decisions
Admission form	contains a brief “patient profile” ie. demographic, contact details, diagnosis etc.	<i>not determined</i>

Not surprisingly, a Handover document has multiple functionalities that, in the researcher’s view, correspond to various functional, non-functional and group-social objectives. However, the researcher was unable to determine the functionality of an “admission” form, which is filled by duty nurses for each admitted patient using data already recorded elsewhere in MRs, the Hospital admission form and, in the case of elective surgery admissions, in the pre-admission questionnaires. No member of the multi-professional team seems to have consulted an admission form for any purpose. When approached directly, doctors stated that computer-printed labels with names and ages of the patients are on every patient document they need to consult, the admission diagnosis on the admission form is merely a nurse’s “educated guess”, while patient contact details are available from other sources (eg. clinical database), should they need them. Doctors and nurse managers used the Hospital admission form, filled out before the patient is admitted to the ward (eg. at the emergency department), as this information is believed to be more accurate. The most accurate information referring to the pre-admitted state of the patients is believed to be recorded in pre-admission questionnaires that are reviewed by the ward residents at the pre-admission clinic. Nurses confirmed that they

only fill in the admission form and never use it. The researcher also noted that some MRs contained either empty or part-completed “admission” forms and that these are never finalised. The admission form appears to be a redundant document.

The list of functional (means) objectives presented in Table 2 can be expanded towards the higher level (fundamental) objectives (eg. maintaining continuity of care and ensuring patients safety) by employing techniques such as suggested by Clemen (2001). Finally, the functional and non-functional goals can be compared with outcomes of interpretive analysis that identified individual or shared interests, interpretations of the technology, and potential of emergent practices that have a potential to improve effectiveness of the PCP.

4.2. The social side of the PCP

Through opportunistic interviewing, the commonalities and differences in interpretation of functional and non-functional objectives of the PCP became explicit. This is another way of establishing validity and completeness of the derived objectives listed in Table 2 (methodological triangulation).

For example, the researcher believed that nurses’ entries into an MR are used as another back-up in terms of communicating the most essential patient information. The MR can be consulted whenever the incoming nurse fails to attend a handover session. However, direct observation failed to confirm this guess: the incoming nurses who missed the formal handover session preferred alternative sources of information (eg. a nurse with whom they shared responsibility for eight designated patients or a nurse-in-charge). One interview with a senior nurse revealed a non-functional goal that would otherwise have escaped the researcher’s attention. In case of litigation arising as a result of a patient complaint, the correct entry into an MR protects nurses from legal liability if they are able to demonstrate that either “no complaints were voiced” – the standard phrase for the entry – or alternatively, if it was raised, the nature of a complaint was adequately recorded, along with the steps undertaken to address the problem, with an adequate follow up. The senior nurse commented:

‘I always put it in the notes because... Do you know for how many years after discharge we are still liable? ...It’s seven years for an adult patient and 18 years for a youngster [under 18 years old]. So, when I write “no complaints voiced” I am covering my butt against any possible litigations’.

Apparently not all nurses are concerned with the possibility of facing legal liability. Some nurses do not follow this risk-minimising strategy and provide instead a detailed account of major patient-related events, such as investigations undertaken during the shift, relatives visiting a patient, change of a patient’s mood etc. It appears that the content of a nurse’s entry into the MR reflects, among other qualities, the individual perception of the risk of legal liabilities, which may vary depending on the nurse’s and patient’s personality and the relationship established between the nurse and patient. It was concluded that although there is an “institutional template for minimising the risk of legal liability” it is applied at a nurse’s discretion.

Discussion and Conclusion

From a systems analysis perspective, the information flow that includes a handover (both as a communicative act and as a document) consists of two equally important components: the model for organising patient data, and a user of this model – a nurse (Pidd, 1999). The handover provides a set of important “signposts”, on the assumption that a competent “user” would be able to make sense of the entry for each individual patient. It is also possible that important information can be inferred from what is omitted from the handover entry as much as from what is included (Heath and Luff 1996). This sense-making process starts when nurses fill the spaces in the printed Handover with their own abbreviated notes while listening to the Nurse-in-Charge at the start of the shift. Later throughout the shift, additional sources are used to retrieve the relevant clinical information and make abbreviated notes on the margins of the Handover document.

It appears that the elicited functionalities and local practices reflected in the format of a Handover present a conceptual challenge should there be an intention to replace a paper-based document with an electronic one.

The paper illustrates how graphical representation of the PCP combined with an interpretive analysis can assist in capturing a process and providing some insights into both the technological and social issues that can assist in IT development.

Understanding the PCP as both a technological and social process more adequately describes a hospital ward as a social system where technology, including IS, is employed to achieve functional and non-functional organisational goals and where organisational actors, while generally complying to institutionalised norms, still exhibit considerable diversity in interpreting the “meanings” of their work, their roles in the business process and demonstrate different propensities and abilities to address emerging “situational” problems. (Space limitations do not permit examples of the differential abilities of individual staff members to respond to “situational problems”. Interested readers are referred to Gospodarevskaya, 2005)

Orlikowski and Gash (1994) argue that an understanding of people’s interpretation of technology is critical to understanding their interaction with it. Weick (1990) notes that “cognition and micro-level processes are keys to understanding the organisational impact of new technologies.” (p.17). The failure of IT developers to adequately recognise and incorporate end-users’ expectations and assumptions about technology into system requirements and design results in a large number of applications either not being used at all, or not used as intended, or not to the full extent of their functional capacity (Beynon-Davis 1995; Quaglioni, 2000)

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