

The negative impact on nurses of lack of alignment of information systems with public hospital strategic goals

Lucy A Firth, David J Mellor and Peter S Francis

Abstract

The objectives of this study were to investigate the degree to which hospital information systems are aligned with hospital strategies and how they impact on nurses. Semi-structured interviews were conducted with nine hospital staff from a range of disciplines in a large public hospital in Australia. The interviews revealed that the focus of hospital information systems on administration has meant that applications to support the patient's clinical journey have been deemed unaffordable. A consequence is that the historic use of the nurses' station as a source of verbal information about patients has continued, with negative impacts on nurses' perceived role and status, and the possible exacerbation of the clash between administrative and clinical cultures. We conclude that hospitals need clear strategies, with alignment of information systems. To do otherwise can undermine culture and morale, while disrupting workflows and patients' clinical journeys.

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CONVENTIONAL UNDERSTANDING of organisational strategy and the strategic use of information technology (IT) and information systems (IS) stems largely from the work of Porter.¹⁻³ Porter's concept of strategy is "the creation of a unique and valuable position, involving a different set of

What is known about the topic?

Despite the widespread introduction of information systems into hospitals, there has been no investigation of the degree to which they are aligned with hospital strategies and how this may impact on nursing staff.

What does this paper add?

This paper reports on an investigation of the alignment of information systems strategy and organisational goals in one public hospital, and the outcomes for clinicians in general and for nurses in particular, with the finding that the information systems strategy was not well aligned with the broader organisation strategy.

What are the implications for practitioners?

Where the culture of core professionals is not easily reconciled with the culture of economic rationalisation, there is potential for a clash of cultures that may be worsened if the information systems align with strategies that support one at the expense of the other.

activities ... different from rivals".³ (p. 68) Following from Porter's early work, others⁴ have identified three fundamental strategies for competitive advantage: low-cost outputs, product differentiation and niche marketing. These have been expanded to six strategic uses of IT:⁵ break-through unit costs for customers; service-based differentiation; micromarketing management; shorter time to market; transfer of experience; and new levels of partnership. The idea of strategy as a way of positioning the organisation to attract customers and compete with rivals is central to these approaches.

The commitment of public hospitals to clinical excellence and community service suggests a broader concept of strategy may be required. In a study of hospital strategy, it was found that a market-driven strategy, which emphasises efficiency and profitability, is not appropriate in a hospital environment.⁶ In public hospitals, there

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may be little thought of attracting patients as these hospitals tend to be under-resourced and over-used; and there may be little thought of competing with other hospitals other than for kudos. The lack of relevance of Porter's approach to strategy is partly due to the hospitals' public responsibility and partly due to clinical values of care and treatment of patients. Clinical effectiveness, rather than efficiency and cost minimisation, is the overriding consideration. Financial considerations are of interest to clinicians to the extent that they impact on good clinical practice.

It has been suggested⁶ that the work of Andrews⁷ may be useful. Andrews argues that there are four questions relevant to organisational strategy:

- Q1 What might the organisation do in terms of market opportunities and threats?
- Q2 What can the organisation do in terms of competence?
- Q3 What does the organisation want to do in terms of the key players' preferences?
- Q4 What should the organisation do in terms of social responsibility?

If we accept the suggestion that in the hospital context the key players' preferences in question 3 relate to clinical preferences, documentation related to information system goals⁸ provides indicators of answers to the four strategy questions:

- A1 Public hospitals aim to meet the demands of their community by being "consumer focused" within the regulations.
- A2 Public hospitals aim to practise within their capacity. A network of metropolitan hospitals ensures that patients outside a hospital's area of expertise are directed elsewhere.
- A3 Clinical vocation is central to the practice of public hospitals.
- A4 Public hospitals fulfil a public obligation to provide treatment and care to all.

Ideally, the information systems strategy should be well aligned to the goals of the organisation⁹ as lack of alignment to organisational goals makes goal attainment difficult. However, there has been little work undertaken into the existence and the effects of such alignment in the public health

sector. In fact, the concepts of strategy and the strategic use of information systems have made few inroads into the health care sector.⁸ It seems that few public hospitals would be able to define their strategy in the sense of Liedtka⁶ and Andrews,⁷ let alone to identify what information systems are strategic. This may be because much of the conventional work on strategy is ill-suited to the not-for-profit sector in which professional practice is paramount to the organisation's objectives.

There is a need for research to investigate the alignment of information systems with organisational strategic objectives in public hospitals. Where that alignment relates to the competitive market-place concept of strategy rather than to the strategy of clinical values, there is a need to investigate the repercussions of the lack of alignment for clinical staff. This paper reports on an investigation of the alignment of information systems strategy and organisational goals in one public hospital, and the outcomes for clinicians in general and for nurses in particular. The focus of the current study was the management of the patients' clinical journeys.

Methods

The study was undertaken in a large public hospital in the state of Victoria, Australia, where public hospitals provide world-class services to the population, at no cost to the patient. Private treatment is also available in public hospitals or in private hospitals, at the patient's expense. While the level of comfort and privacy may be better in private wards, the clinical standards are comparable. A large public hospital (including associated clinics and facilities) would typically admit 100 000 inpatients with 400 000 bed-days annually; see 600 000 outpatients; employ 4000 effective full-time staff, with a budget of A\$400 million.

Nine hospital employees, including clinicians (doctors, nurses, and allied health), support staff and administrators, participated in the study. All except one of the interviewees were clinically trained, although two were working as managers.

Approval to conduct the study was obtained from the University of Melbourne Ethics Committee and from the hospital ethics committee. Potential participants were identified by the heads of various departments within the hospital and provided with a written description of the study with an invitation to engage in a semi-structured interview about the current information systems. All those approached agreed to participate. After being asked to describe the purpose of their role at the hospital and how the information systems supported them to achieve that purpose, participants were also asked to report on its uses and problems. Interviews were recorded and ranged in time from 45 to 60 minutes. The interview data were supplemented by documentary data from the hospital's own publications, including Annual Reports, Business Plans and Strategic Guidelines.

Data analysis

The interviews were transcribed and analysed for meaning and patterns, as is the practice with qualitative research. The transcripts were read by two researchers several times to establish agreed-upon themes in the responses to the questions. These themes are summarised below. Firstly, the information system at the hospital and its use are described. Secondly, the strategic goals of the hospital are described. Then, three unintended outcomes that were evident in the data are summarised.

Results

The information system

While the hospital is a high-level user of up-to-date technology for a range of clinical purposes (eg, life support, imaging, etc.), there is no hospital-wide, networked information system to record the clinical journey from admission to discharge and to support the associated clinical decision making. Information systems to record tests, diagnoses, treatments, and changes to health status and to support the associated decision making were uncommon in Australia at the time (June 2004).

The patient administration system (PAS) at the hospital (HOMER) dates back 20 years to when it was implemented for administrative/recording functions. In 1993 when the government introduced diagnosis-related groups (DRGs) to improve hospital efficiency, the inpatient billing code was added to HOMER's functionality. This means of classifying hospital patients to provide a common basis for comparing cost effectiveness and quality of care across hospitals is popularly known as "casemix", and the state's hospitals are funded on the basis of the diagnosis and treatment mix of cases. So, for example, a normal, no-instruments labour and delivery of a healthy baby would attract a certain sum of funds regardless of how long the mother and baby stayed in hospital. Therefore, the funding emphasis is on patient throughput. HOMER enables patient data relevant to billing and tangentially relevant to treatment to be accessed throughout the hospital. While the database can be interrogated for many administrative purposes, it is considered to be cumbersome, slow and not user friendly, as is consistent with its age.

Because HOMER is hospital-wide (though not integrated) and there is a continuing focus on economic rationalisation of inpatient care, funds for an integrated clinical support system have not been available. Instead, clinicians are encouraged to use the DRG with work-arounds to approximate a clinical resource. Clinicians regard entering DRG data as a compliance requirement, rather than as a knowledge-management opportunity. The use of the DRG is increasingly unpopular among clinicians as they learn from journals and conferences about easier systems that are tailored to what they see as the primary objective of the hospital: clinical care of patients. Doctors, in particular, are reluctant to use technology that is not directly linked to their vocation of patient treatment. This is consistent with findings¹⁰ that doctors will only comply with medical record data entry to the extent that it will facilitate patient treatment.

The clinical information system is still largely paper-based, with reports and notes filled sequentially and filed on ring-binders. A patient

who has required a range of procedures over a period of a few days might have a current health record 6cm thick. This quickly becomes unwieldy as still-relevant data are buried. Clinicians tend to resort to two practices rather than read through the current report for each patient each time. They:

- ask the nurses for an update, and/or
- assume that there has been no history and they start from scratch with tests, diagnosis and treatment.

Both of these options were said to be wasteful by several interviewees, and agreed to be so by those who were directly asked the question "Do you think that your current practice is wasteful?" With several clinicians from various disciplines on rotation in a day, repetitive enquiries of the nurses' station disrupts the nurses' workflow, which could then impact the patient's clinical journey (this disruption was not explored in this research). Rediagnosing and retesting slows the patient's clinical journey and wastes resources. Given casemix-based funding, a slower patient journey with duplicated attention is counterproductive to the hospital's financial goals.

Given the lack of an integrated clinical information system, the various clinical disciplines and allied health professions maintain their own information systems that do not integrate with each other or with the PAS. That is, patient records are decentralised, and typically paper-based, though they may be entered onto a stand-alone (not networked) computer. Data are routinely printed and sent by fax, often to the next office or ward. The outcome is a proliferation of paper-based records not only on each patient but on the activities of clinical professions. These records are not generally shared between disciplines. Therefore, in order to "keep up with what is going on with the patients" (clinician's comment), professionals from the various disciplines gather at the nurses' station to seek information.

Hospital strategic goals

The hospital has a range of clinical goals expressed in the vision statement, purpose statement, and value statement. For reasons of confi-

dentiality, these are not quoted here, but comprise working with community, maximising workforce resources through attraction and retention, managing knowledge, clinical excellence, treating patients, with respect and compassion, and accountability through performance. Although considerable space and attention are applied to financial issues in the Annual Report, and there is a need for compliance with state fiscal requirements, financial strategies are not core to the hospital's stated strategic direction, nor are they central to the strategic goals expressed as purpose and intention of the hospital by the interviewees. Rather, the interviewees discussed issues of clinical excellence, "humanity", "respect for patients' needs both social and clinical", and developing own and others' professional capacities. One ward nurse said, "It may not be strategy, but it is about everyone working together to get the job done, both now and in the future. It is not just about the patients and exec. Without us, there would be no patients. So, it is about getting it all together, and keeping it together."

Overall, the data indicate that the information system is aimed directly at efficient administration, which is apparently not of strategic importance. It may be indirectly aimed at financial accountability and cost rationalisation, which are related to non-core strategic goals. The information system is not aligned with goals identified by the hospital's documentation or those identified by the key players interviewed. Therefore, the information system appears to be poorly aligned with the strategy of the hospital.

Unintended outcomes

The unintended outcomes of the early investment in administrative information systems and tardy investment in strategic clinical information systems are threefold. Firstly, the nurses' stations remain a hive of social interaction between ward nurses and other clinicians (including nurses). While much of the discussion is directly or indirectly related to patients' clinical journeys and to other work issues, it tends to be couched in social banter. The constant enquiries mixed with social banter distract the nurses from their clinical duties, absorb con-

siderable time, and may lower the nurses' apparent status. Rather than being identified as a key clinical professional they can be seen in the traditional role of helpers supporting the functions of other clinicians. All the nurses interviewed, including the Director of Nursing, indicated that they believed that their status had increased as a result of their educational upgrades over the last decade. They were ambivalent to the incessant requests for information, arguing that while they distract them from their duties, they are necessary given the alternative sources of information, vis-a-vis the information system.

Secondly, there is a clash between cost rationalisation and clinical values. The former is supported by the hospital's PAS. The provision of an administrative information system that is primarily aimed at cost rationalisation, and the establishment of an empire of professionals around that information system, has shifted the focus of a large part of the hospital's workforce away from patient care towards costs. The tendency for information systems, to change organisational culture, attitudes, and behaviour is well documented.¹⁰ Currently, the hospital has two distinct cultural pulls: one is the clinical culture; the other is the culture of cost rationalisation. As only one of these is well supported by the PAS, the interviewees argued that this indicated a prioritisation of administration over clinical activities. All of the interviewees indicated a level of frustration and a reduction in morale among their colleagues as their culture of clinical excellence and professional pride rubs against the supported culture of administration. The three ward nurses indicated that this had led to a further lowering of morale when coupled with the associated "dumbing down" of the nurses' role to "data source". This was described as a "double edged source of grievance" for nurses.

Thirdly, information systems to support the clinical journey are considered unaffordable. Although clinicians are central to the core operations of the hospital, their areas of expertise are growing as knowledge and technology increases, and the hospital is largely judged on its clinical care (perceived and real). The cost of investing in

a clinical information system to record the clinical journey and to support the associated decision making has been considered unaffordable. When the decision to adopt the HOMER was made some 20 years ago the prospect of an information system to support the clinical journey would have seemed remote. Nevertheless, we see that as a consequence of that decision it has been argued since that clinicians can make do with add-ons and work-arounds. The hospital has not measured or investigated the possible loss in clinical effectiveness. It is apparent from this research that resorting to the nurses' station for information is draining time and energy from those nurses, and that resorting to retesting, rediagnosis and retreatment involves delays, risks to patients and added expense.

Discussion

The findings from this study suggest that where the culture of core professionals is not easily reconciled with the culture of economic rationalisation, there is potential for a clash of cultures that may be worsened if the information systems align with strategies that support one at the expense of the other. The outcomes of the misalignment impact negatively on those who value the non-supported culture. Where those negative impacts include role ambiguity, and decrease in status and esteem, as they do for the nurses in this study, they are likely to be associated with stress, lack of job satisfaction and low commitment to the organisation.¹¹

While the value of social centres within workplaces is well identified¹¹ it is possible that identifying this as a function of the nursing profession appears to be inappropriate given their recent upgrade in status and expectations. This is notwithstanding the fact that the nurses' stations work very well as a clinical information system and have done so historically. The data indicate that it is a question of balance and role definition to avoid ambiguity in the minds of the nurses, other clinicians and patients.

The historic adoption of information systems that support economic rationalisation appears to

have created the image that the subsequent adoption of information systems to support clinical goals is not affordable. However, the impact of that decision on the stress and commitment of staff may be the more costly,¹¹ with absenteeism and staff turnover likely to follow such outcomes. Coupled with the disruption to nursing duties from persistent enquiries from clinicians and the wasteful duplication of treatment and slowing of the patient journey, this mocks the intended economic rationalisation.

The findings also suggest that failure to provide an information system appropriate to knowledge management in knowledge-intensive contexts may necessitate the development or maintenance of an historically relevant information system (the chat at the nurse station) that is now considered inappropriate. Where that knowledge is central to clinical outcomes for which the nurses have been employed, an untenable situation may arise that is both frustrating and counterproductive.

While the messages were clear among the participants in this study, the sample was small and was derived from only one hospital. Clearly, a larger multi-site study would shed further light on this issue, particularly if hospitals with a variety of information systems strategies were included. However, the findings do point the way for both future research and policy considerations.

The clinical workforce shortage is well recognised in Australia. A report in 2004¹² indicated that by 2011–12 the state of Victoria would face a shortage of 8500 nurses, particularly highly trained nurses in hospitals, aged care, community care and mental health. While the figures are disputed by politicians claiming to have increased the number of nurses on the ward, the workforce shortage is global. Although this project did not investigate it, there is some likelihood that lowering nurses' perceived status will reduce retention and worsen the shortage, as was found in Canada.¹³

This study did not consider the impact of the information system on other clinical staff (eg, doctors and allied health professionals). It may be, for example, that the retention of the nurses' station as the information centre adds to the perceived status of doctors to such an extent that

it enhances their morale. The study also did not constitute an investigation of intention to quit among any staff members. It may be that while "dumbing down" of the nurse role is perceived to be the apparent favouring of administrative tasks and cultures over clinical needs, this is not leading to an intention to quit and associated workforce management problems. However, from the authors' previous work in service industries,¹⁴ this seems unlikely.

Conclusions

The problem with poor alignment between information systems and organisational strategy is that it makes it all that much more difficult to achieve the organisational goals.¹¹ Public hospitals need to adopt an approach to the strategic use of information systems that is consistent with their (at least) dual objectives and those of their key knowledge workers (the clinicians). Previous research^{6-7,14} provides an appropriate conceptual path that considers clinical objectives along with market-driven objectives.

Today, most major hospitals are moving towards clinical decision support systems. However, these remain piecemeal in all but a few hospitals. The replacement of legacy systems with integrated bespoke clinical systems may overcome the issues raised here, but will not negate the broader issue of the need to ensure that information systems align with the strategic goals of the organisation. With clinical workforce shortages recognised as a major limitation to health services, it is imperative to use clinical resources efficiently. For nurses, this implies systems that not only enable them to focus on their clinical duties, but also imbue them with the status consistent with those clinical duties.

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Competing interests

The authors declare that they have no competing interests.

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