

# Reforming Nursing with Information Systems and Technology

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## INTRODUCTION

Much of healthcare improvement via technology initiatives addresses gaining physician buy-in (Reinertsen, Pugh & Bisognano, 2005) and does not adequately address engaging nurses, despite the fact that nurses serve as the front-line caregivers and are a primary user group (Wiley-Patton & Malloy, 2004). However, the tide is changing, and visibility of nurses as information gatherers and processors in the patient care process is increasing (Romano, 2006). Nurses perform the majority of the data-oriented tasks involved in patient care and would benefit most from having access to information at the point of care (Bove, 2006). RADM Romano, Chief Professional Officer of Nursing and advisor to the U.S. Surgeon General concerning public health, recently addressed the American Informatics Nursing Informatics Association and stated, “This is the year of the nurse. The technologies that have the means to improve the efficiencies in patient care are in the hands of the nurses.” Nurses need to embrace technology in everyday work or continue suffering the consequences of antiquated methods of computing that take us away from where we work—at the point of care (Abbott, 2006).

Healthcare can benefit greatly from use of a diverse set of technologies as facilitators of change to improve quality and safety of patient care by decreasing errors made because of the lack of faster, more comprehensive, and more accessible patient documentation at the point of care (IOM, 2000). Healthcare institutions abroad share similar sentiments according to international healthcare reports by the International Council of Nurses (Buchan & Calman, 2004). In light of these concerns and a severe U.S. nursing shortage (i.e., an estimated 400,000 shortage by 2020) (Bass, 2002), institutions are beginning to consider employing point-of-care IT as a means to promote patient safety, decrease medical errors, and improve working conditions for overtaxed nurses (TelecomWeb, 2005). This chapter provides an overview of nursing reform and novel ubiquitous

computing integrating voice, hands-free, and mobile devices being researched or used to make nursing more efficient and promote the following:

- A decrease in laborious documentation aspects (i.e., decrease problems with access to information at the point of care, written errors or legibility issues precluding comprehension of medical regimens).
- An increase in recruitment and retention rates.
- Improvement in communication in which nurses are required to consolidate and process information during care.
- Promotion of involvement in systems analysis and design of information systems to increase the likelihood of technology acceptance.
- Baseline and continuing education in both professional training and on-the-job training to allay technology aversion and build computer self-efficacy.
- Development of standards for electronic documentation of patient interaction and processes for nursing that can be codified.
- Identification of role changes in the nursing community because of the use of information systems and technologies.
- More rigorous research concerning information research in the nursing community.

## BACKGROUND

This chapter provides an overview of tactics to reform nursing sponsored by leading nursing healthcare information systems research in professional organizations such as the American Nurses Informatics Association (ANIA), Association of Medical Informatics (AMIA), and the International Council on Nursing (ICN).

The sociotechnical systems framework (STS) (Bostrom & Heinen, 1977) will be employed to categorize tasks, technologies, people involved, roles,

and structure of aspects of the reform. STS emphasizes workplace interactions with various technologies and is espoused as a realistic view of organizations and a way to change them (Bostrom & Heinen, 1977). STS concerns the social system that is comprised of contributions of people (i.e., attitudes, skills, and values), the relationships among people and their roles in the organization, reward systems, and authority structures (Bostrom & Heinen, 1977). STS is also an intervention strategy in which technology implementations intervene within a work system to improve task accomplishment, productivity, and work quality of life, and to prompt supportive organizational structural changes. Innovative technologies may improve task efficiency and task effectiveness by automating or reengineering antiquated/manual processes, changing people's roles, and making organizational structures (Bostrom & Heinen, 1977). A graphical depiction of STS is displayed in Figure 1.

## DESCRIBING NURSING REFORM USING AN STS FRAMEWORK

STS is used as a frame to describe elements addressed in the nursing reform initiative, such as tasks, technol-

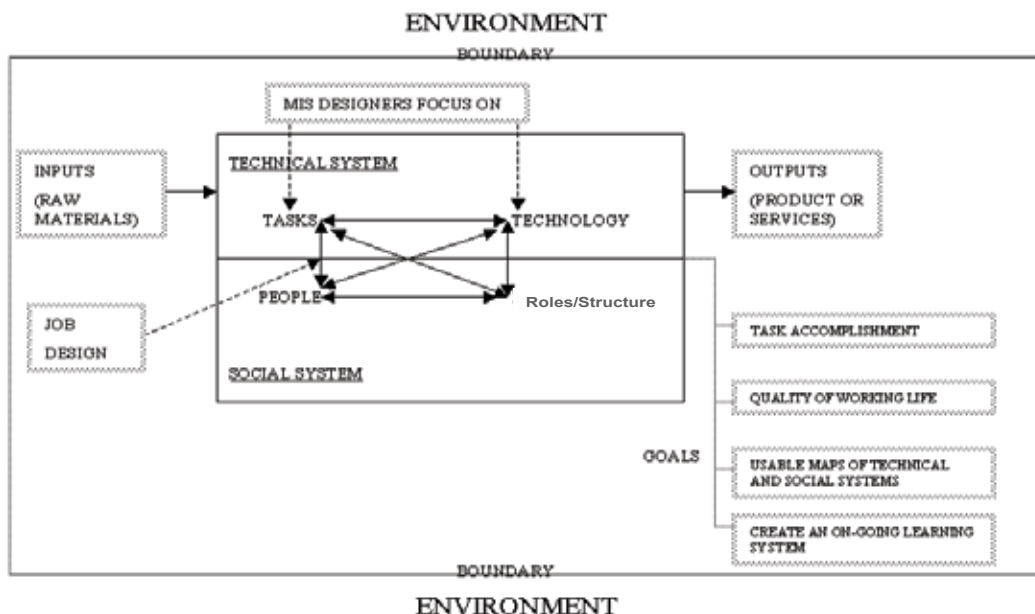
ogy, people involved, changes in roles, and structure in conjunction with their interplay, outputs, and goals.

### Task

The tasks in this reform are indicative of the pervasive problems plaguing nursing and healthcare in general. There is a critical nursing shortage crisis in the United States alone in which more than 90,000 nursing position vacancies were reported in 2004, and nearly 400,000 are expected by 2020, which has grave impacts on quality of care (JCAHO, 2004). Similar statistics reported by the International Council of Nursing (ICN) also highlights the great supply and demand disparities. Much of this is attributed to the problems recruiting new nurses and retaining seasoned ones. Nursing is an aging workforce in which the following is reported:

- One in five registered nurses plan to leave the profession.
- 81% say morale is extremely low.
- 64% do not have enough time to spend with the patient.
- 60% note the manual paperwork burden to document information about patient care tasks is "a necessary evil."

Figure 1. STS (Bostrom & Heinen, 1977)



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