

Viewpoint ■

Challenges and Issues Related to Implementation of Nursing Vocabularies in Computer-based Systems

PATRICIA BUTTON, RN, EdD, IDA ANDROWICH, RN, PhD, LYN HIBBEN, RN, MSN, VALERIA KERN, RN, MS, GAY MADDEN, RN, BSN, KAREN MAREK, RN, PhD, BONNIE WESTRA, RN, PhD, CHRIS ZINGO, RN, MS, CHARLES N. MEAD, MD, MS

Abstract As key stakeholders from the clinical setting and vendor communities, the authors share a summary of their collective experience related to the challenges and issues associated with implementing the vocabularies recognized by the American Nurses Association in several installations of commercially available clinical information systems. Although the focus of the article is on summarizing the challenges and issues, it is of note that the authors' experiences across care settings suggest that the experience and effort of using one of the ANA-recognized vocabularies in a computer-based system are essentially worthwhile and positive. The issues and challenges fall into two categories: 1) those related to the developmental status of nursing vocabularies, and 2) those related to the adoption or implementation of new technology.

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In the past ten years, progress in the development of nursing vocabularies has been significant.¹⁻⁵ Much of this development has taken place in parallel with the articulation of the requirements for the integration of clinical terminologies into computer-based systems.^{6,7} As a result, the development of nursing vocabularies and the various efforts to use nursing vocabularies in clinical systems have not been guided by a comprehensive set of requirements aimed at ease of im-

plementation and integration in computer-based systems.

In this article, as key stakeholders from the clinical setting and vendor communities, the authors share a summary of their collective experience related to the challenges and issues associated with implementing the vocabularies recognized by the American Nurses Association (ANA) in several installations of commercially available clinical information systems. The clinical settings, vocabularies, and computer systems that provide the framework for the discussion are summarized in Table 1.

Although the focus of this article is on summarizing the challenges and issues, it is worth noting that the authors' experiences across care settings suggest that the experience and effort of using one of the ANA-recognized vocabularies in a computer-based system are essentially worthwhile and positive. In particular, the progress toward the capture of clinical data in a structured, standardized manner that documents nursing practice and facilitates analysis of its contribution to health care outcomes is of prime value.

Challenges and Issues

The challenges and issues of each clinical setting are from the perspective of a dyad consisting of a nurse

Affiliations of the authors: Oceania, Inc., Oakland, California (PB, VK); Loyola University, Chicago, Illinois (IA); CareCentric Solutions, Duluth, Georgia (LH, CNM); ERGO Systems, Mission, Kansas (GM); University of Pennsylvania, Philadelphia, Pennsylvania (KM); Epsilon Systems, Minneapolis, Minnesota (BW); Kaiser Permanente Southern California Region, Pasadena, California (CZ).

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Correspondence and reprints: Patricia Button, RN, EdD, Oceania, Inc., 5203 Leesburg Pike, Suite 900, Falls Church, VA 22041. e-mail: <pbutton@oceania.com>.

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Table 1 ■

Summary of Settings, Vocabularies, and Computer Systems Represented

Clinical Setting	Vocabulary	Computer System
Penn Nursing Network Philadelphia, Pa. Nurse-managed community-based programs providing family-focused care for all ages	Omaha System ¹	Epsilon Systems CareFacts
Parish Nurses Chicago, Ill. Health education, personal health counseling, referrals to church and community services	Nursing Interventions Classification ²	ERGO Systems CareManager
Kaiser Permanente Southern California Region Ambulatory care nursing in cardiology and family practice	North American Nursing Diagnosis Association Taxonomy 1 ³	Oceania, Inc WAVE
All Saints Home Care Fort Worth, Tex. Hospital-based home care	Home Health Care Classification ⁴	CareCentric Solutions Smart Clipboard Home Care System

from the clinical organization and a member of the vendor's development or implementation team. As shown in Table 2, the issues and challenges fall into two categories: 1) those related to the developmental status of nursing vocabularies, and 2) those related to the adoption or implementation of new technology. The issues and challenges related to the development status of the nursing vocabularies concur with the formal evaluation literature reviewed by Henry et al. in this issue (see p. 321); because nursing vocabularies were designed primarily for the purpose of classification, they do not fully meet requirements such as those of the Computer-based Patient Record Institute Framework⁷ that are focused primarily on concept representation.⁸ Of particular interest in the second category are the challenges that occur when both a new technology and a new "language" are implemented simultaneously.

Implications

The authors' experiences viewed within the current context of evolving requirements for implementation of health care vocabularies in terms of both vocabulary-dependent and human factors support two implications. First, and primary, is the need for education of all of the key stakeholders in the nursing vocabulary efforts (e.g., vocabulary developers, nurse informaticists, clinical implementors, and vendors) regarding the evolving framework for health care vocabularies. In this effort, it is important that the U.S. nursing community continues to collaborate with and learn from the experience of others, including our colleagues in medical informatics and in nursing at the international level.^{9,10} The AMIA Nursing Informatics Work Group has taken the leadership role in providing educational offerings at both basic and advanced

Table 2 ■

Challenges and Issues Related to Implementation of Nursing Vocabularies

Developmental status of vocabularies:

- Differing levels of granularity within and between vocabularies
- Lack of atomic-level terms
- Absence of combinatorial rules for constructing complex terms
- Absence of encoding rules
- Lack of assessment terms in ANA-recognized vocabularies
- Not domain-complete for continuum of nursing care
- Lack of expressiveness in terms of speaking the language of practice

Technology adoption/implementation factors:

- Resistance to change in general
- Resistance to change related to intolerance for the process of learning and associated decreased efficiency and productivity inherent in incorporating a new methodology into practice
- Awkwardness of implementing both a new technology and the vocabulary simultaneously
- Lack of benefits realization
- Demand for higher level of accountability in documentation of computer-based systems compared with manual systems

levels in conjunction with the AMIA Annual Fall Symposium and Spring Congress. Second is the need for a framework or model of implementation that is comprehensive and addresses both categories of issues and challenges—the required features of vocabularies suitable for implementation in computer-based systems and the pragmatic issues of use. Such a framework and research regarding the role of the various components in the framework are necessary in order to produce valid, reliable data regarding “what nurses do” within the multidisciplinary provision of health care.

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