



Training as regulation and development: An exploration of the needs of enterprise systems users

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ABSTRACT

The view of the organization as a system that 'processes' information or 'solves' problems is at odds with the dynamics of change associated with the development and use of IS in an organization. A significant consequence of this mismatch is in training that does not meet the needs of either the user or management communities, giving rise to sub optimal organization performance and inertia. We explored such issues by examining recent research into organizational development and training. The particular challenges presented in the development and implementation of large-scale enterprise systems were explored to reveal a discontinuity in the constructs underpinning a development. A theoretic model that bridged some of the gaps between the bodies of research was developed and a brief empirical study provided a proof of concept for the model. The paper concludes with a discussion of the model's implications for theory and practice.

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1. Introduction

One particularly difficult aspect of enterprise-wide implementation efforts is in providing appropriate training for groups of users whose specialized work and occupational orientations provide little in the way of a universal skill set or knowledge base. Collaborative features of enterprise applications complicate the development of effective training; i.e., tools that are intended to foster cross-functional dialogue and shared responsibility for outcomes. Such tools have the potential to change the way work is performed across an organization if users know how to adapt and apply them in their work.

We identified the training needs that arise as new tools span increasingly diverse user communities. We began by summarizing recent research into organizational development and training. A brief empirical study was used to articulate and develop the constructs. A model that highlighted the congruence of the major constructs underpinning the research was then developed to provide a proof of concept and highlight some of the challenges faced by developers, trainers and users of enterprise systems.

2. Organizational development and training

Porras and Robertson [20] suggested that change in an organization's behaviour was at the core of organizational change, and that an individuals' behaviour was altered when aspects of their work setting was changed.

Four groups of factors affect behaviour: organizational structures and procedures; social factors; technology, and the physical setting. This categorization guided much research in organizational change, but it masks the interdependence of the factors [13]. Do managers know what behaviour their employees need? This question separates *ability* from *skills or expertise* [3]. Understanding the ways in which individuals and technology affect one another is an essential pre-requisite for effective organizational change.

It is necessary to avoid the tensions and cognitive dissonance that arise from the persistence of these assumptions. Effective change is characterized by compatible goals, where users and their managers understand their attitudes and values: the interconnection of the change 'factors' and synergy that arise from their interdependence must be addressed [1]. Training is, of course, critical.

Working hard, taking responsibility, showing initiative, being creative, etc., will increase the likelihood that the organization performs well. There is thus a need to foster the development of individuals' knowledge and skills. Missed development opportunities are bad for the organization, but the theory does not provide

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Order of Change	Change Category	
	Unplanned	Planned
First	Evolutionary	Developmental
Second	Revolutionary	Transformational

Fig. 1. Types of organizational change.

sufficient help in determining techniques to use to prevent this [14].

Two dimensions – mode or category of change and order of change – provided a basis and starting point for our reconsideration [9]. Change that is planned is prompted by an internal decision to improve the functioning of an organization and often focuses on developing general capabilities to deal with demands. Unplanned change, on the other hand, is characterized by response to pressures outside the organization [21].

First order change is continuous, evolving, and incremental and characterized by cause-and-effect relationships—such as effort and reward. In contrast, unplanned change is episodic, discontinuous, intermittent, and sometimes radical due to a shift in policy or legislation. If organizational conditions are altered in ways consistent with previous changes, they are first order and the frames of reference are maintained. However, if the change is radical, the organization experiences second order change: and the frames of reference are replaced. These dimensions can be combined to identify four types of organizational change (Fig. 1).

In attempting to isolate and measure causal factors, prior research identified the results of a single intervention: however, this has tended to miss the wider ranging effects that ripple through the organization. Change gives rise to perceptions among those affected; the *inter-subjectivity* is important to both the design and use of the IS but also in training prior to their introduction and use.

Most research on training relies on theories of individual learning and assimilation theory [26]. The focus on the individual does not generally, however, address the challenges of inter-subjectivity. Organization-wide change affects the training needs of departments, teams, and other social groupings [4,18]. Efforts to address reciprocity have highlighted the need to explore the sense-making and learning processes common to organizational change, development and training [11,22].

Gnyawali and Grant described four types of sense-making and learning and discussed how they may serve as strategies for acquiring knowledge [10]. They identified two primary types of knowledge: existing knowledge of the individual (especially about the organization and its policies, etc.) and new knowledge acquired through interactions during the course of the work. Nonaka in his theory of organizational knowledge creation [16] argued that while new knowledge was developed by individuals, the interactions between them in teams, departments, etc., articulated and amplified it. This resulted in four modes of knowledge creation—combination, internalization, socialization, and externalization. Externalization and socialization are not as dependent on organizational development as the others. Inter-subjectivity provides for a means of examining such *tacit knowledge* to make it shareable.

The cohesion of teams, departments and similar groupings are important features of organizational structure [25]. However, theoretic frameworks do not readily accommodate the dynamics of change at this level. In order explore the interdependence of organizational and knowledge development at this level we carried out a study to identify the nature and significance of the developmental challenges faced by team members.

3. Study

We needed to examine a cohesive task environment supported by one or more enterprise systems and chose a clinical setting because the mission and values of clinicians are acknowledged to be coherent and well understood [6,27]. The Sarasota Memorial Healthcare System (SMHCS) in Florida is a publicly owned Level 1 care center with 691 beds. It provides acute, ambulatory, rehabilitative and tertiary care. In addition, it has three remote rehabilitation clinics, two sports medicine clinics, a freestanding preadmission testing center, an ambulatory surgery center, and a physician clinic. The patient population is approximately 70% under US Medicare. SMHCS uses a substantial suite of clinical applications, integrated through an enterprise-wide system (the Eclipsys Sunrise Clinical Manager™—SCM). The system's applications support specialties, such as cardiology, special care, obstetrics, and respiratory care, as well as departments that serve the broader SMHCS, such as pharmacy, radiology, and pathology.

Non-clinical and clinical support work have a suite of applications integrated into a PeopleSoft™ system that includes payroll, patient scheduling, staff scheduling, and finance.

The two major enterprise systems are supplemented by a number of generic and specialist stand-alone systems. SMHCS is typical of regional health care facilities in the USA; it provides a range of IS to support the work of its staff. They in range from self-contained, stand-alone productivity tools (such as a spreadsheet to monitor and report a budget) to enterprise-wide systems that support the collaboration between medical specialties on which the continuity and quality of care for chronic and critical illness depends.

The wide range of IS at SMHCS is compounded, as usual, by the range of roles, responsibilities and specialties of the staff. Hospitals are governed and managed according to values and rules from inside and outside [19].

Our challenge was first to assess the degree of commensurability among the constructs. Our research question posited the existence of a-priori constructs. In crafting our instruments and protocols, we sought to avoid their dominance and bias in order that the participants defined the issues, concerns, and constructs. We set out to retain theoretical flexibility and constrain external variation by building and testing our framework in a specific setting. We followed the process advocated by Eisenhardt [7] in attempting to build our theory from empirical case studies.

We selected three candidates for the study: a clinical nurse manager, a pharmacist, and a respiratory therapist. Although these were by no means a representative sample of the population of SMCHS, they represented different administrative and clinical responsibilities, engagement in collaborative work, and use of both stand-alone and enterprise-wide IS.

This approach enabled within-case analysis that allowed preliminary theory generation. A recursive approach to data analysis also allowed us to revisit our initial interpretations and consider the results from different perspectives [17]. This reduced the possibility of a-priori constructs dominating the analysis, thus ensuring internal validity. Our unit of analysis was work-task: individual, discrete actions that comprised the participant's job.

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