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Abstract

This paper describes how a method for evaluating organisational change based on the theory of logical types can be used for classifying organisational change processes to understand change after the implementation of an electronic documentation system in a residential aged care facility. In this instance we assess the organisational change reflected by care staff's perceptions of the benefits of the new documentation system at one site, at pre-implementation, and at 12 months post-implementation. The results show how a coherent view from the staff as a whole of the personal benefits, the benefits for others and the benefits for the organization create a situation of positive feedback leading to embeddedness of the documentation system into the site, and a broader appreciation of the potential capabilities of the electronic documentation system.

Keywords

understanding, piloting, logic, implementation, framework, change, health, process, organisational

Disciplines

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Piloting a Logic-Based Framework for Understanding Organisational Change process for a Health IT implementation.

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Abstract. This paper describes how a method for evaluating organizational change based on the theory of logical types can be used for classifying organisational change processes to understand change after the implementation of an electronic documentation system in a residential aged care facility. In this instance we assess the organisational change reflected by care staff's perceptions of the benefits of the new documentation system at one site, at pre-implementation, and at 12 months post-implementation. The results show how a coherent view from the staff as a whole of the personal benefits, the benefits for others and the benefits for the organization create a situation of positive feedback leading to embeddedness of the documentation system into the site, and a broader appreciation of the potential capabilities of the electronic documentation system.

Keywords: Organisational Change, Nursing Informatics

1.1. Introduction

Electronic nursing documentation is a significant part of the clinical information stream across the health sector. It provides a systematic way for nurses to assess and define patient problems, record their aims, and plan, execute and evaluate their tasks. To date there have been very few studies of organisational change related to the implementation of electronic nursing documentation. The two substantial case studies we have been able to identify are both PhD theses (Swinderman, 2005; Engesmo, 2008) examining organisational issues relating to electronic nursing documentation implementation in hospital settings as participant researchers. The research presented in this paper is by contrast observational interview research – the researchers did not have the capacity to change the approach to implementation. Our aim is to use a classification method published in the literature on organisational change to better understand a specific aspect of the change - how care facility staff members' perceptions of the benefits arising from the implementation of electronic nursing documentation creates and/or reflects organizational change. Using a classification-based approach allows us to constrain the amount of information that we need to use to perform analysis, thus helping prevent information overload, which is a common problem in qualitative research (Boyatzis 1998). We have found that our approach makes it relatively easy to identify important issues within the data, and the emergent phenomena that arise from examining these issues.

Several authors have identified different levels and types of organisational change. Drawing on the work of Bartunek and Moch (1987), and Watzlawick et al. (1974), Bateson Roach and Bednar (1997) developed a typology for describing organisational change processes. A summary of their typology is reproduced in Table 1. This modified logical types framework is described in detail by Roach and Bednar (1997, pp. 683-685). The fourth column of Table 1: "actual process" needs some clarification: as with all sociological research, data are viewed through the lens of the researcher's description, as a result the descriptions at this level are materialist accounts of observed phenomena (materialism being the philosophical position that events arise from the interactions of physical entities). "Action" refers to raw description, "lineal action" to a simple step-by-step account of cause and effect, "double interaction" to the identification of feedback loops or their potential, and the "interaction patterns" to the interaction between these feedback with the environment as a whole. Under the heading 'Actual process", inferences are made about causality based on observed behaviour rather than emergent issues. The phenomena listed in the 'description' and 'classification' columns encapsulate more abstract reasoning about the observed

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processes, aimed at developing an understanding of emergent phenomena, and general principles underlying the change process being investigated.

Table 1 **Roach and Bednar's (1997) summary of the types and levels used to describe an organisational change process using the Theory of Logical Types**

Level	Classification	Type Description	Actual process
Content	Underlying assumptions and themes	Descriptions of interaction patterns	Interaction patterns
Context	Categories of feedback and relationship	Description of double interaction	Double interaction
Lineal[1] action	Causal schema	Description of lineal action	Lineal action
Simple action	Categories	Description of action	Action

1 A lineal view of causality clearly separates cause and effect and assumes that causality is a one-way process. The opposite of "lineal" is "recursive", as distinguished from the mathematical term "linear" whose opposite is "non-linear"

1.2. Research Site

As part of a broader multi-site longitudinal study, this paper focuses on a single residential aged care facility in the Illawarra region of New South Wales, Australia. The first author conducted 23 semi-structured interviews with management staff (6 interviews), registered nurses and enrolled nurses (5 interviews) and personal care workers (12 interviews). Interviews were conducted at pre-implementation of the electronic nursing documentation system (13 interviews) and at 12 months post-implementation (9 interviews). 11 further interviews were conducted at 6 months post-implementation, but these are not presented in this paper for reasons of space.

2. Methods

Interview responses were coded according to the content of answers to questions from the interview guide. In this paper, we were interested in answers to the open-ended question: "what are the benefits of the electronic documentation system", and other parts of the interview where the topic of benefits from the implementation arose. Figure 1 demonstrates the data analysis process and includes a section of original transcription notes. This approach is designed to provide a snapshot of the state of the organisation at any one time, while simultaneously providing an ability to overview the data. A synthesis report of of the summarised data at each time is presented in Table 2. This table can be considered a compact summary of the raw data after coding.

3. Results

Table 3 summarises findings pre- and post- implementation, applying Roach and Bednar's (1997) adaptation of the Theory of Logical Types. The tables should be read from the bottom right hand corner inward and upwards, as the actual/process/simple action cell contains a summary of the 'rawest' data available. The cells moving inward and upwards represent increasing levels of abstraction and interpretation. The 'metacontext' level seeks to explain the underlying phenomena based on the initial materialistic approach used in the "actual process" column.

In Table 2, the pre-implementation section describes the initial conditions at the site. The respondents appear to be focused on what the benefits were for themselves, in their job role, as well as benefits for others, and implied subsequent organizational benefits. At 12 months post-implementation, the system seems to have become embedded into the operation of the site, and some staff spoke about future benefits, and the way that they could adapt working routines to reap more positive outcomes from the system's presence in their workplace over and above the intended purpose of the documentations system, through the potential to improve staff's documentation skills and capability. This corresponds to *Actual Process/Simple Action* classification cell in Table 3.

Ideas about the staff's perspective of the benefits of the system – whether it's to help the organisation, or the individual worker, or both, fit with the level of *Simple Action/Description*. Awareness of the system's potential benefits at pre-implementation lead on to an ability to perceive those benefits on follow-up, which in turn allows staff to think about potential future benefits from the documentation system.

At *Classification* of *Simple Action* we see that the idea of the coherence of the approach to the new documentation system months. This in turn leads to, the development of a sense of ownership of the documentation system at 12 months

The remaining parts of Table 3 are somewhat easier to digest – at pre-implementation we see how the components of the organizational situation develop to provide preconditions where the operation of positive feedback loops can emerge into a reinforcing mechanism underpinned by staff's coherent view of how the system is beneficial. The mention of second order change (Watzlawick et al. 1974) arises from work we have published elsewhere (Diment et al., 2010). The distinction here is between first order change (e.g. changes to specific procedures) and second order change (e.g. changes to the nature of the tasks being done). There seems to be a realisation of the capability of IT to make strong positive changes to the workplace, at the study site, by allowing the system to become embedded into daily working life, which in turn provides the potential to realize second order change.

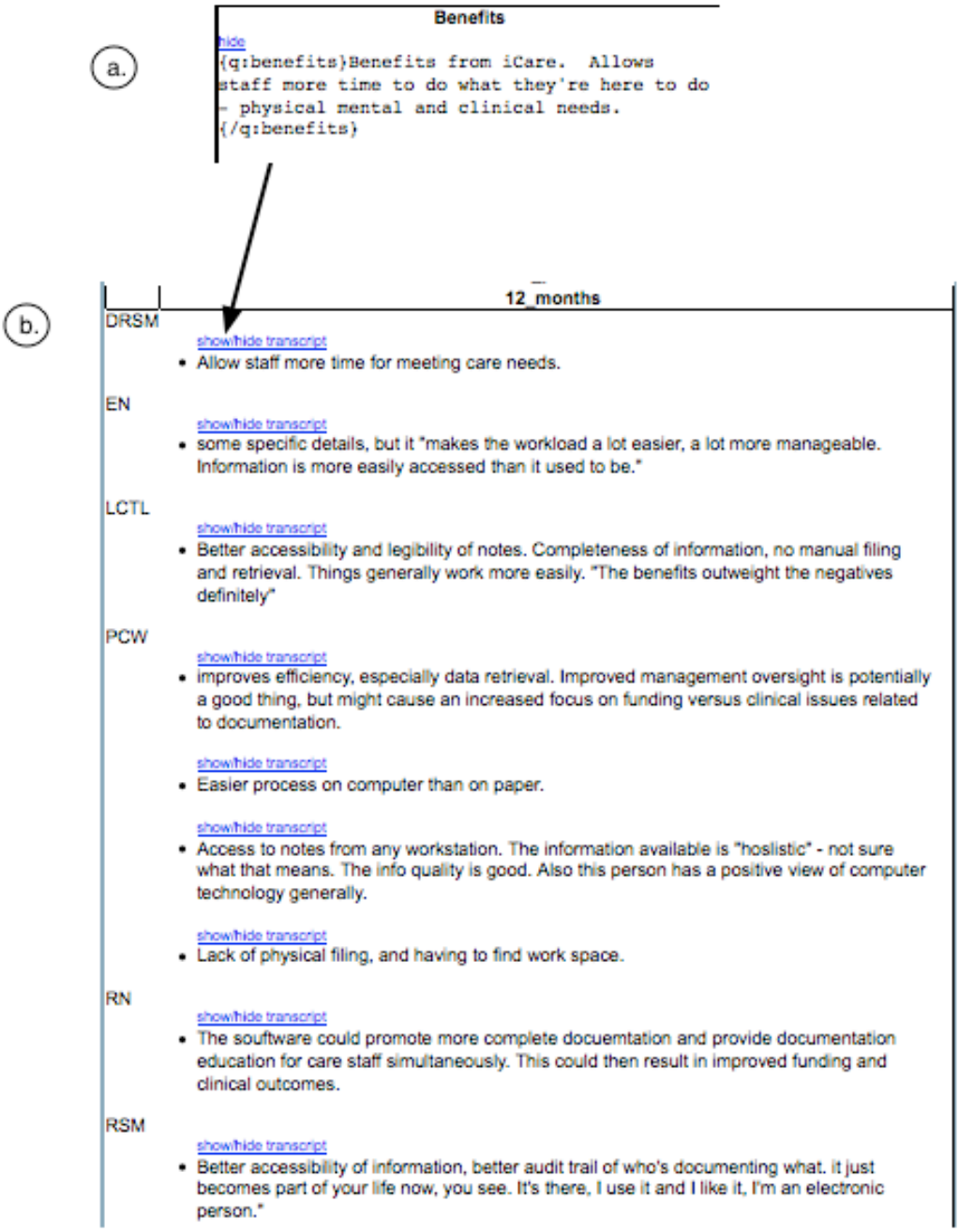

Figure 1 Example showing the data analysis process. Box A contains raw transcript notes (in this case for the deputy manager at at 12 months post-implementation. Box B contains the summary of transcript for each instance of the 'benefits of the electronic documentation system' code. The synthesis of the summaries is presented in Table 2.

Table 2 Synthesis report of coding summaries across time for “benefits” code for both sites at all stages.

	Pre-implementation	**12 months post**
Personal Care Workers	Decrease in chance of information loss. Quicker to do and more current documentation, Neater, lack of filing, Easier to review information, possible better career outcomes, "no reason" (positive). Decrease in double handling	Increase in efficiency, especially information retrieval. Increase in management oversight (although the downside of this is that it could cause a focus on funding rather than clinical outcomes). Easier process for documentation. Good quality information. Lack of physical filing required.
Registered & Enrolled Nurses	Discuss beneficial impacts on specific documentation tasks.	Makes the workload more manageable. Could possibly promote more complete documentation, and provide documentation for care staff via the software (with better cues to input information) resulting in better clinical and funding outcomes.
Managers	Better information flow into documentation and management reports.	Allows staff more time on care needs. Better accessibility (X2). Better legibility. More streamlined system. Better audit trail of documentation activity. “It just becomes a part of life”.

Table 3 Application of Roach and Bednar's (1997) logic based approach to understanding change from with the theory of logical types for the site at pre-implementation and 12 months post-implementation.

Pre-implementation

Levels	Types: Classification	Types: Description	Types: Actual Process
Metacontext	Initial focus on positive outcome	All staff are engaged in the implementation	Potential for positive feedback
Context	*Feedback*: reinforcing *Relationship*: coherence.	Personal as well as communal benefits create vision for good outcome.	Understanding of and perception of benefits interact.
Caused Action	Positive views of new system	Initial conditions favour development of positive feedback	Clear understanding of benefits leads to confident approach
Simple Action	Coherent approach of staff to moving forward with the system.	Broad awareness of benefits of the electronic documentation system for self, others and the organisation.	**PCWs**: Personal and organisational benefits. **Nurses:** Improvements for specific tasks. **Managers:** Emphasise information flow through the organisation

12 months post-implementation

Levels	Types: Classification	Types: Description	Types: Actual Process
Metacontext	Effective use of IT resources into the future	Engagement leads to positive outcome	Positive feedback cycle with emergent phenomenon.
Context	*Feedback*: reinforcing *Relationship*: coherence	Feedback cycle facilitates emergence of potential for second order change	Feedback cycle causes perceived efficiency gains and potential second order changes in the future.
Caused Action	Integration of system into daily working life.	Virtuous cycle of approach to ideas	Confident action leads to embedding the documentation system into daily life. In turn this may lead to creative use of system.
Simple Action	Sense of ownership of the documentation system. Awareness by staff of the relationship between their role, and others relationship with the documentation system within the organisation.	Widely perceived benefits result in positive job outcome including recognition of potential for future second order benefits	**PCWs**:. Efficiency improvements at different levels of the organisation including for themselves. **Nurses:** The existing benefits of the system could lead on to newer benefits that would generally improve carers' documentation capability. **Manager:** Identifies increase in available time for care needs, and a range of benefits applicable to managers and staff. "It just becomes a part of life".

4. Discussion

Our analysis suggests using Roach and Bednar's Logical Types technique for understanding the process of organizational change provides a useful way to understand the organizational dynamics which mediate the outcome from change. This is achieved by a combination of developing a synthesis of the behavioural attributes of the situation undergoing change. At the higher levels of classification, we are lead to both more specific conclusions from the data (e.g. that the critical mass of individual benefits leads to collective benefits at the *classification* of *caused action)*, and ultimately a positive feedback loop that helps maintain a "low friction" adaptation to the introduction of this new documentation system. Further work is required to understand whether the perceived benefits reflect objective benefits realized from the system, or whether these are presumed benefits resulting from a subjective perception only.

4.1. Conclusion

This paper illustrates an application of Roach and Bednar's (1997) use of the Theory of Logical Types to perceptions of benefits from a technological change. The theory, which is based on a mathematical approach to the logic of language, provides a coherent and systematic description of the change processes. For the present study we found that these secondary descriptions are particularly useful for making sense of observed process within the site, but that at higher levels of analysis we become concerned with the more generic presence or absence of feedback loops, and the outcome of the operation of these loops. Future research on this topic will first examine how staff perceive benefits at two other sites under the same management group where we have observed quite different positive and negative outcomes relative to the results presented in this paper. Following this we will need to make sense of how perceived benefits relate to other change issues identified in the interview data such as: frustrations, whether the documentation system is perceived to be used well, impacts on the care environment, and issues arising from the training approach used at each site. The technique outlined in this paper has the potential to provide a rigorous approach to making sense of our large corpus of qualitative data.

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