Chapter 4
Innovation in ICT-Based Health Care Provision

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ABSTRACT

This paper describes a project redesigning psychiatric services for children and adolescents, introducing a new decentralized model into the ordinary structures of health care services in rural areas in Norway by using mobile phone technology. The authors apply a multilayer and dialectic perspective in the analysis of the innovation process that created the ICT solution that supports this treatment model. The salient challenges of the project were related to the contradictions between the existing, dominant power structures and the emergent structures in the different layers of the design structures. As a result of the development process, a new model emerged with a larger potential for creating a new innovation path than if it had been linked to existing structures. This paper contributes to the understanding of how user-driven innovation can break with existing power structures through focusing on different layers in the change processes.

1. INTRODUCTION

The provision of health care services in rural, sparsely populated areas entails a number of challenges, not least in the field of psychiatric care. The use of ICT has become a mantra for providing decentralized health services, and through the last 15-20 years, substantial efforts have been done to build an ICT infrastructure for telemedicine in the north of Norway. The infrastructure is based to a large extent on broadband networks to be used for traditional computer applications which cannot necessarily support all types of decentralized health services. However, health care is not primarily a matter of technology. Close collaboration with health care providers and between health professionals and patients is essential for achieving better health care. In Norway, as in many other Western countries, we emphasize decentralization

and patient empowerment, along with the recognition that future care models must change in order to be economically feasible and sustainable. The mobilization of patients' own resources, as well as family and community resources can contribute significantly to the healing process (Brennan & Safran, 2003; Ball & Lillis, 2001). In particular, patients should be provided with adequate care and support in order to manage their health problems to the greatest extent possible.

This paper reports from the introduction of one such health program in Finnmark[1] based on the Parent Management Training-Oregon (PMT-O) model. This is a treatment and prevention program for families with children displaying antisocial behaviour.[2] An important part of this project has been the development and implementation of an appropriate technical solution based on mobile phones, which can help the care providers as a well as the patients in their communication and information handling routines supporting the treatment. The users were involved to a large extent in this design work. The term "users" in this case means health care workers, team members and "CYP" specialists (clinics for Children- and Youth Psychiatry), as well as parents, adolescents and children. The result has been the development of a new technical solution along with the organizational changes required to support the implementation of the PMT-O treatment model.

The research focus in this paper is the innovation process that has taken place in this developmental work. We draw upon the concept of path creation (Garud & Karnøe, 2003) combined with a multi-layered dialectics perspective, developed by Henfridsson et al. (2009) for an explanation of the critical factors that gave rise to this innovation. We thus claim that one cardinal moment in the design process was the decision to break with the existing technical and organizational power structure, and rely instead on the mobile phone infrastructure and services. However, this implied both the need to develop a new technical solution, establishment of

a new technical support group and implementation of a new health care organization. In this way the project was able to implement the PMT-O model in close cooperation with the users. We claim that a multi-layered dialectics perspective can be fruitful for explaining innovation outside the product development context in which it originally was applied. We thus pose our research question in the following manner: How can a multi-layered dialectics perspective explain innovation processes in ICT-supported health care?

In the remainder of the paper, we first outline the theoretical framework; next, we present the research methodology, followed by analysis and discussions. The last section concludes the paper.

2. THEORETICAL FRAMEWORK

Traditionally, research on diffusion of ICT innovation has regarded such diffusions as sequential processes unfolding over specific periods of time (Attewell 1992; Cooper & Zmud 1990). However, more recent studies of ICT innovations have shown that they need to be understood as network- and socially constructed, and not as occurring in homogenous and stable social ether among autonomous adopters (Damsgaard, Rogaczewski, & Lyytinen 1994). One such research current focuses on path-creation activities which influence technology adoption in organizations.

There is an ongoing work in developing new models related to understanding the innovation process with different focus like knowledge, product processes, design, user participation, organizational change, economy etc. One conceptualisation of the innovation process is presented by Miller and Morris (1999), which acknowledges an appreciation of knowledge as part of the process of creating new products and processes. Von Hippel (1994) introduces the term "sticky information" to describe information that is expensive to obtain, transmit and employ in another location than where it originated.

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