ADAPTING CORPORATE MODELLING FOR COMMUNITY INFORMATICS

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Article Type: Research paper

Purpose

To address the need for responsive methodologies to investigate how ICTs are used in non-business and non-corporate environments.

Design/methodology/approach

The article, based presents a case study on developing an IT strategic plan in a community organization using the process modelling and analysis methodology called 'Co-MAP'.

Findings

Co-MAP as a methodology is significant in being a participatory, responsive, and non-obtrusive tool to work with welfare workers in getting to articulate information, knowledge and technical issues for decision-making.

Research limitations/implications

The research provides a way of obtaining knowledge about structuring of social-technical relationships in a welfare organization through a sympathetic approach to its business and culture.

Practical implications (if applicable)

Co- MAP could be fruitfully used in other organizations, though whether this needs an external facilitator to carry out the process and manage the complex data analysis process is a moot point.

Originality/value
The significance of this case study is that it develops a model for adaptation of how to research and represent data, information, and knowledge flows within a social services organization, for which there are few other detailed case studies.

Key Words: case study, community-based organizations, community informatics, process modelling, structuration theory.

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1. Introduction

In this paper, we describe a case study on developing a strategic IT plan to improve information and knowledge management in a community organization, using the process modelling and analysis method that is called 'Co-MAP' by its developers (Kethers 2002). There is a demonstrated need for situated (Suchman, Blomberg et al. 1999) models and theory about how ICTs are used in non-business and non-corporate environments. This is in response to the view that research in Information Systems (and by extension, into Information and Knowledge Management), tends to work with a limited selection of cases, biased towards for-profit business and government.

Furthermore, the influence of managerialism and economic rationalism in Information Systems has narrowed the conceptual framework of social-technical research and this has resulted in a lack of an empathetic understanding of other social-technical formations, including community or non-profit organizations (Orlikowski 2000: 423; Avgerou 2002: 50). The perspective of Community Informatics consequently helps to widen the conceptual and discourse framework for Information Systems research.

Community Informatics is an emergent discipline with two foci: first, from a socio-technology perspective, drawing upon the information sciences, the conduct of research about system design for local communities. Second, from a socio-political perspective, it draws upon the social sciences to better understand the implementation and outcomes of ICT use in communities for community development purposes (Stillman and Linger 2009).

While the concept of community is endlessly debated, for our purposes, it the people and organizations (such as welfare organizations) who engage in problem-solving through the adoption and adaptation of ICTs that are of most relevance to Community Informatics (Jacobs 2001; Iacovino 2007).

The particular significance of this case study is that it develops a model for adaptation of how to research and represent data, information, and knowledge flows within a mid-sized social services organization, for which there are few other detailed case studies (Sandfort 2003; Zhang and Guitierrez 2007). Furthermore, the model is also intended for practical application or adaptation in Community Informatics.

The rest of the article is structured as follows. In Section 2, we discuss literature around community organizations and their use of Information and Communication Technologies (ICTs). Section 3 describes our case study methodology and one of the case studies in more detail. Section 4 reports on the findings from our case studies, and section 5 concludes the paper.

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2. Literature review/theory

2.1 Community organizations in Australia

One of the complexities of researching and discussing the activities of non-profit organizations in Australia or elsewhere is definitional, with differences in nomenclature and taxonomy between countries, and even within countries. (DiMaggio, Weiss et al. 2002). For the purposes of this research about an organization in Australia, we accept the following characterization of community-based services (often called community welfare services):

> Community services encompasses many of what are often identified as separate types of service. But what they all have in common is that they provide support, care, encouragement and advice for people in a way that is primarily determined by them, involves some enduring pattern of interaction and is designed to remove the need for support or to enable people to achieve maximum feasible independence or autonomy in their home and community, or a setting that as closely resembles this as possible (Lyons 2001: 33).

Community-based organizations also function as locales for 'solidarity and agency' (Bhattacharyya 1995), and 'bedrocks of community life' (Schuler and Day 2004: 13), and as such, are valued by government and community alike for their ability to act as a mediator between welfare and support services and families and individuals in need.

2.2 Community Based organizations and ICTs

Community-based organizations in Australia are overwhelmingly users of ICTs. While there is a lack of current, comprehensive data, according to a national survey conducted by the Centre for Community Networking Research, Monash University in October 2002, the proportion of organizations in Australia with at least one computer was 97%, with access to the Internet, nearly 90%, and with a website, 61% (Centre for Community Networking Research 2003). These figures are in line, and if anything, in excess of general patterns of computer use and access in business organizations, the figures being 85%, 74%, and 25% respectively in 2003-2004 (Australian Bureau of Statistics 2005).

Yet, there has only been limited research into how to actively support the development of effective use (Gurstein 2003) of ICTs in this important sector. For example, the study of Stewart-Weeks and Barraket observes how little grounded empirical evidence there is about the impact of ICTs, despite their importance for improvements to service delivery, overall organization performance, capacity building, and citizen participation and engagement (Stewart-Weeks and Barraket 2002). Furthermore, the Australian government commissioned a report, based upon desk research and extensive consultation into the establishment of a national advisory council or service on ICT issues for the community sector (Denison, Stillman et al. 2007), but no action has been taken by government.

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Burt and Taylor surveyed the intersection between values and technology in UK CBOs, and argued that there is a need:

> [To] go beyond the 'structural' associations which emerged from [their] survey towards an understanding of the organizational 'psyche' and the ways and contexts in which it is played out. Organizational biographies in the form of in-depth case studies permit these deeper insights to be revealed. (Burt and Taylor 2001: 56)

The reference to 'biographies' is an interesting one, suggesting the desire for in-depth, ethnographic, and interpretive methodologies to explore the 'inner life' of organizations through obtaining data that cannot be vivified through quantitative means. The work of Orlikowski and colleagues over the years certainly demonstrates the capacity of qualitative research to reveal socio-technical cultures, at least in the corporate sector (Orlikowski 1992; Orlikowski 2002). The key reason for this is that such methods produce data that is far richer than that found in conventional soft-systems approaches which typically, have a too simplistic and underdeveloped approach to what are known as 'human factors' (Rose 1999; Orlikowski and Iacono 2001). With some prescience, Orlikowski also suggested the suitability of her methods to non-corporate environments, as well as further study of what she suggests are 'the meanings and emotional attachments that users develop for the technologies they use' (Orlikowski 2000: 423).

Additionally, while Community Informatics, a field of research and practice devoted to promoting the use of ICTs for positive social change in local and linked virtual communities, has much to say about the creation of socio-technical networks within communities, there has been less research about informational and cultural processes within community services organizations (Zhang and Guitierrez 2007). However, there are voices for change. A recent editorial in the *Australian Social Work* takes an enthusiastic approach to the potential of ICTs, particularly Web2.0 applications, for creating new forms of information and knowledge activity in the social work field (Schembri 2008).

To adapt Orlikowski, community organizations are involved in a constant process of negotiation and innovation in response to client emergencies, crises, and endemic procedural or legislated reporting requirements. This requires organizational actors to be able to respond to 'everyday contingencies, breakdowns, exceptions, opportunities, and unintended consequences' (Orlikowski 1996: 65). The research challenge is to be able to document, give a particular language to, and to make sense of the diversity of such a range of socio-technical interactions. Community organizations which use ICTs can thus be considered as a type of socio-technical network (Kling, McKim et al. 2003: 48), that constitute and communicate meaning about very local concerns and then take action with intentional and unintended consequences, 'from the core of mutual knowledge whereby an accountable universe of meaning is sustained through and in processes of interaction' (Giddens 1976: 83).

The interaction of people, technical resources and informational or knowledge arrangements that constitute a network—subject to all the vagaries of power

relationships and degrees of agency of the different elements—results in the particular form of a network as a socio-technical artifact that is an ensemble of embodied organizational, community and technical interests (Orlikowski 2000; Orlikowski 2002). In the welfare environment, ICTs are but one technology in a mix of tools and processes in a particular, culturally-determined socio-technical network that serves community ends (Sandfort 2003).

This type of socio-technical network has been characterized as 'technologies of care' (Webb 2003), including procedural welfare processes as 'knowledge in action' (Fook, Ryan et al. 1997). This is akin to the Information Systems concept of 'knowing in practice' (Orlikowski 2002), the practices and techniques involving the use of enacted resources, incorporating a body of knowledge and practice which can be complemented, but not necessarily replaced by ICTs (Foucault 1988; Kondrat 1994).

In the next section, we describe the context and methodology for our case studies, and give a description of one of the case studies, including our findings.

3. The 'Doing IT Better' Case Studies

3.1 The Doing IT Better project

The 'Doing IT Better' project is a community-university partnership (2007-2010), in Melbourne, Australia, between the Centre for Community Networking Research at Monash University, and the Victorian Council of Social Service (VCOSS). One author's prior work with community organizations on IT issues and a continuing interest in working with the community sector led to discussions in 2005-6 with the Victorian Council of Social Service, the welfare sector's VCOSS, industry association. A foundation with a commitment to social justice agreed to fully-fund the project for 3 years for a university researcher and VCOSS assistant.

The 'Doing IT Better' project is working through a combination of case-study work and a community of practice to develop a better understanding of how community-based organizations can change their practices and knowledge to make better use of ICTs and, additionally, to explore how to share this knowledge more widely, both within the community sector and with government, to influence policy development and funding decisions. So far, we have been conducting case studies with a variety of community organizations in metropolitan and regional Victoria. In this paper, we mainly report on one case study, conducted at Springvale Community Aid and Advice Bureau (SCAAB), but also draw upon findings from the other case studies.

3.2 Case Study Design

For our case studies, we developed a seven-step process:

1. Initial contact with the organization
2. Short introduction at a staff meeting (optional)
3. In-depth interviews with staff members, using Co-MAP, a formal process modeling method (see below)
4. Analysis of the interview data and additional documents

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5. Staff workshop
6. Internal reporting to different constituencies–staff, committee of management (optional)
7. Final report.

After the initial contact, which often included a face-to-face meeting between representatives of the community organizations and one or two members of the project team, we interviewed key staff from all relevant areas individually. In these interviews, we used Co-MAP (Kethers 2002), a comprehensive methodology for capturing, modeling, and analyzing cooperation processes (see below) to model interviewees' work situations. For the analysis, we combined Co-MAP with a Grounded Theory approach. To validate our findings, we presented the results at a plenary staff meeting, where staff had the opportunity to comment on, add (or subtract) from our tentative results.

Co-MAP

Co-MAP, described e.g. in (Kethers 2002), provides a formal, integrative framework that covers four relevant perspectives of a cooperation process, i.e. activity-oriented, based on the Event-driven Process Chain (Keller, Nüttgens et al. 1992), strategic, based on Yu's i* framework (Yu, Mylopoulos et al. 1996), service-oriented, based on an Action Workflow-style approach described by (Schäl 1996), and information flow-oriented, based on the approach described in Nissen and Jarke (1999). Co-MAP has been used in case studies in different contexts, e.g. SMEs (Kethers 2002), or healthcare networks (Kethers, Gans et al. 2005).

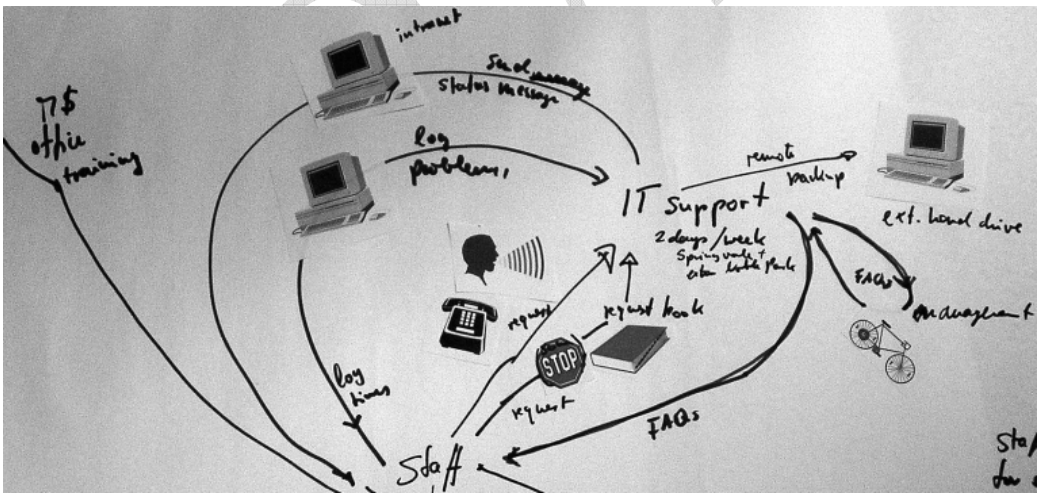

Figure 1: Sample Co-MAP diagram (excerpt)

Information flows between agents are captured as arrows between sender and receiver of the information, written down as role names (e.g. 'IT support'). Graphical symbols are used to represent the media for information flows (for example, phone, formal document, or meeting), and the recipient's perception of the quality of the information flow (e.g., a tortoise for 'too slow', or a stop sign for 'does not occur at all'). An excerpt from a sample Co-MAP diagram is shown in Figure 1, and a more detailed description of the different graphical symbols is given in (Kethers 2002).

Co-MAP is usually used in group meetings, where participants together develop a shared representation, and, through discussion, a shared understanding of the process in question. However, in this study, one of the interviewers drew the Co-MAP diagrams based on the interviewee's statements. The diagrams thus served as a visual representation of the interview, with the following advantages. First, the method helped us to structure the interview. Second, we could see at a glance which areas we needed more information on and could ask additional questions. Third, we used the diagrams to summarize the interview with the interviewee, particularly with regard to 'bad' information flows, and received instant feedback on how well we had understood the interviewee. In addition, several interviewees liked the idea of having some graphical representation of their work—as one interviewee put it, 'yes, my situation is that messy, I wish my manager could see this'. Individual interviews also offered the opportunity for views which otherwise might not be expressed in a group setting to be documented.

One of Co-MAP's strengths lies in the fact that it combines seemingly informal process diagrams representing the information flows and interactions of the interviewee(s) with an underlying formal semantic that allows for mapping the process diagram into the different perspectives listed above, thus creating representations of the process from different angles. The kinesthetically rich process adduces interest and participation in a creative, cognitively rich, and controllable process. Furthermore, if the same process is investigated with different interviewees at, the resulting process diagrams can be contrasted to uncover misunderstandings, differing goals and priorities, and other issues that can cause a process to run less than smoothly.

The Co-MAP methodology is thus a means of identifying the core of mutual knowledge as well as gaps in mutual, systemic knowledge. Additionally, through the lens of structuration theory (Giddens 1984:40), Co-MAP is a means of representing the order as an emergent, fluid dynamic process of social reproduction and variation. Using Giddens' language, social-technical networks can be understood as 'instantiated' and 'embodied' social products that are 'in use', in particular, reproduced cultures, in which multiple players (whether human or artifact) adopt different roles. The Co-MAP methodology is able to capture the embodied multiple roles and perspectives, providing a multi-leveled representation, akin to 3-D chess, which consists of both formal symbols (i.e. chess players or Co-MAP icons) that map conceptually and spatially to actions, roles, and the flow of information and knowledge across time and space. For example, in the SCAAB case study, we investigated how ICTs support information flows for a culture and thus business operation that supports 'solidarity and agency' in the community.

While the need to present complex work patterns or information flows in relatively simple process forms such as flowcharts or diagrams may not be considered a quantitatively accurate means for measuring and capturing information flows (and for which other, more resource-intensive means may be available), for the researcher engaged for a relatively short amount of time with a subject in an organization that is strapped for resources, including time and money, the ability

to capture and present in relatively simple ways key insights should not be underestimated. In fact, the representation of findings in such a form for the active utilization of stakeholders has, for example been a key interest in practice fields (Patton 1990; Patton 1997; Owen and Rogers 1999; Patton 1999). Managers, policy makers, politicians and others need 'action heuristics', effective simplifications and communication of research and other conceptually-significant results (McClintock 1987).

Grounded Theory

Grounded Theory aims to generate theory—as the name suggests—from a bottom-up natural setting of inquiry, through a rigorous and carefully articulated process of data creation, collection, management and interpretation, akin to an algorithm, that is, a regularised and successive process. The stimulus to the development of conceptual and theoretical insights is tested through what Glaser and Strauss call the 'constant comparative method': the rigorous testing of 'data slices' or the construction of categories, propositions and new theories (Glaser and Strauss 1967: 55ff.).

Data slices offer meaning because they have conceptual and higher theoretical implications. However, not all slices of data will be equivalent in either word count or the quality of the discourse that they contain. In fact, in any qualitative process, where the interview is the primary source of evidence, the quality of what is said will vary, notwithstanding any preparations or efforts to engender 'talk' put in place by the interviewer. The informants' mood on the day of the interview, ability to open up in an interview with a stranger, or capacity to describe complex detail or particular personal insights is inevitably variable. Some people in their efforts to be helpful may embellish reality, or tell stories. Furthermore, of course, some people are much better at abstracting, have better vocabularies, or are more skilled at explaining and describing situations than others, but it is the researcher's skill to interpret the data and develop representative categories and descriptions that adds value to the data.

In the next section, we describe the SCAAB case study and how we utilized Co-MAP and Grounded Theory.

3.2 The Springvale Community Aid and Advice Bureau Case Study

In this case study, we helped SCAAB, a medium-sized community organization, to analyze its current situation with regard to its usage (and non-usage) of ICTs, and to develop the foundations for a strategic IT plan. SCAAB has been in operation for over 37 years and receives funding from a variety of funding bodies at the local, state and federal levels. SCAAB provides information, support and targeted community services for people in the City of Greater Dandenong and surrounds in the mid-to outer regions of Melbourne in a regional of high-socio-economic need.

The organization also provides services to recent refugees from countries such as Sudan or Burma, as well as longer established immigrant communities from countries such as Vietnam or Cambodia. SCAAB's Information, Referral, Advocacy and Support Service (IRASS) supports nearly half of its 16,000 client

services each year and is complemented by a range of specialist services such as financial counseling, support for people to overcome barriers to employment, youth housing support and settlement services for new arrivals.

The service operates two sites, the main one at Springvale, and a youth-specific site at Noble Park some kilometers away, as well as outposted staff at other locations. There are 31 EFT paid staff, and approximately 50 volunteers contribute about 6,000 hours of work each year.

The SCAAB case study was conducted in accordance with the process outlined above. Initial contact was made with a SCAAB Programs Manager who had attended several meetings of the Doing IT Better project in 2007, and expressed general interest in SCAAB being a case study for the project. After some preliminary conversations with this manager to clarify what SCAAB needed, the project team made a short presentation at a staff meeting in mid-February 2008, in order to provide an overview of the project goals and allow for a brief brainstorm.

To facilitate the brainstorming, we had asked participants to write down main issues and concerns with their ICT usage before the meeting. Staff then read out their prepared statements and these were put on a board for grouping. Some discussion ensued, which confirmed the direction of research as suggested by the SCAAB manager. In addition, this meeting let us get to know each other and secure some 'buy in' to the process.

We then conducted thirteen interviews in March and April 2008. Interviewees included coordinators and key staff from the different program areas, management, and support staff, including administration, IT support, and reception/intake. One interview was later considered irrelevant and discarded. One interviewee did not want to be audio-taped, and we lost one interview recording because of technical issues, but reconstructed key issues that were raised.

Each interview lasted between about 45 and 75 minutes. In the interviews, we asked introductory questions about the interviewee's role and program area, and then asked the interviewee to describe her work, including capture, management and storage of client data, interactions with other programs and agencies, use of computers, mobiles, and other ICTs, and current gripes and issues with ICTs. With the exception of one interviewee, all participants agreed to let us audiotape the interview.

During the interview, one interviewer drew a process diagram on a large sheet of paper using the Co-MAP methodology. Figure 1 shows an excerpt from one of the Co-MAP diagrams, depicting the interaction between staff and the IT support person (note that the actual diagrams are appealingly multicolored but are reproduced here in half-tone). For example, staff would make requests to IT support by phone, or by talking to the person (telephone and 'talking head' icons next to the arrow labeled 'request' in the middle of the picture) but not via the request book (book icon next to the arrow also labeled 'request', but carrying a stop sign to show that this does not happen).

After the interviews, we took photos of the diagrams to conserve them, and one person listened to the audiotape of each interview and wrote a 3-4 page summary of the interview's main points. For the two interviews where we did not have an audio recording, the Co-MAP diagrams served us well as the basis for our notes. Both diagrams and interview notes were then sent to the interviewee, asking for their comments and feedback.

4. Results, analysis and discussions

After conducting all interviews, the two lead researchers read through the amended interview notes, diagrams, and some additional documents, e.g. blank client forms, meeting notes, using Grounded Theory to identify relevant issues. We consolidated the 12 interviews through a combination of close reading and highlighting of transcripts, diagrams, and additional documents, and the creation of more than 100 Post-it notes (the 'data slices') listing the major issues mentioned by interviewees.

Following Grounded Theory method, these Post-it notes were then grouped thematically on a white board into emerging categories, producing a series of originally 15 descriptors for the categories (plus one for 'miscellaneous', smaller issues that did not fit elsewhere but did not warrant their own category). The goal was to make each Post-it note only contain one general concept or piece of data, 'interpretable in the absence of any additional information, other than a broad understanding of the context in which the inquiry is carried out' (Lincoln and Guba 1985: 345). The use of Post-it notes on a white board also made for a very fast and neat process of data sorting and matching with the two lead researchers working and critiquing each other at the same time.

Finally, we added two more categories that we wanted to prompt staff to have a think about: Staff Outcomes, and Community Outcomes. Figures 2 and 3 show the categories and their interrelationships. Figure 2 was initially developed to illustrate the relationship between categories.

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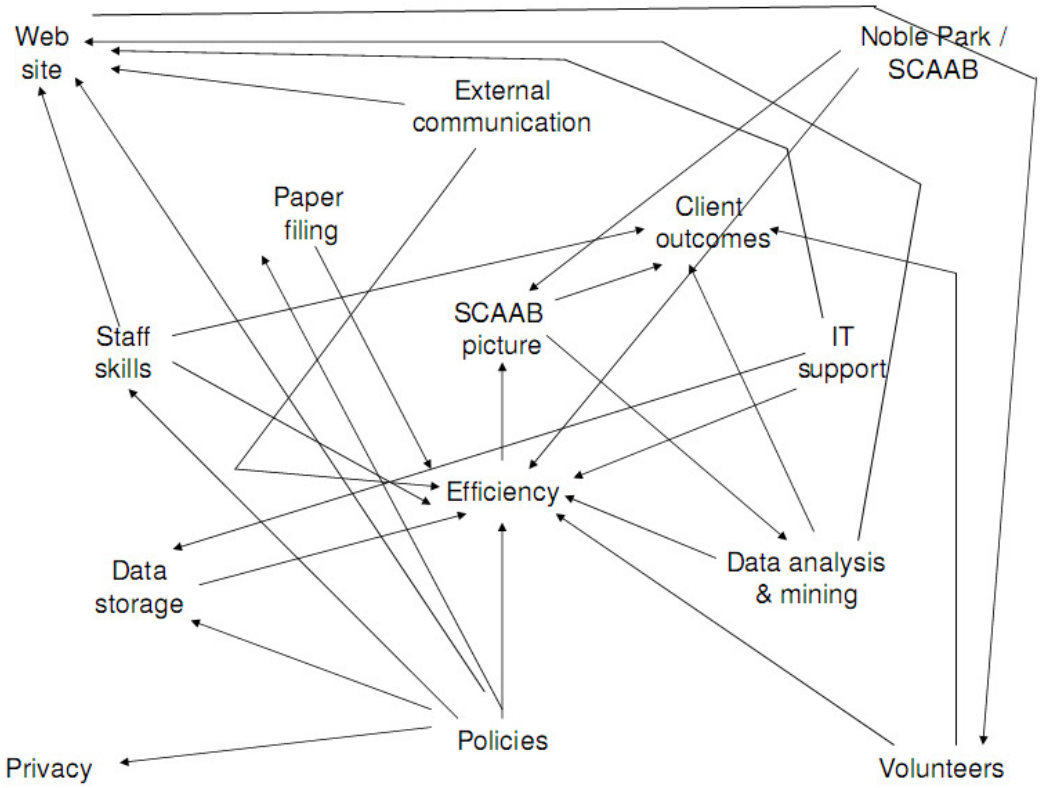

Figure 2: First Representation of category relationships

As can be seen, this version of the diagram is complex and not well-suited for easy explanation. Instead, we developed a parsimonious second version for presentation to SCAAB staff and committee represent how IT underpins policy, action, and outcomes. It has been slightly modified for this paper as Figure. 3.

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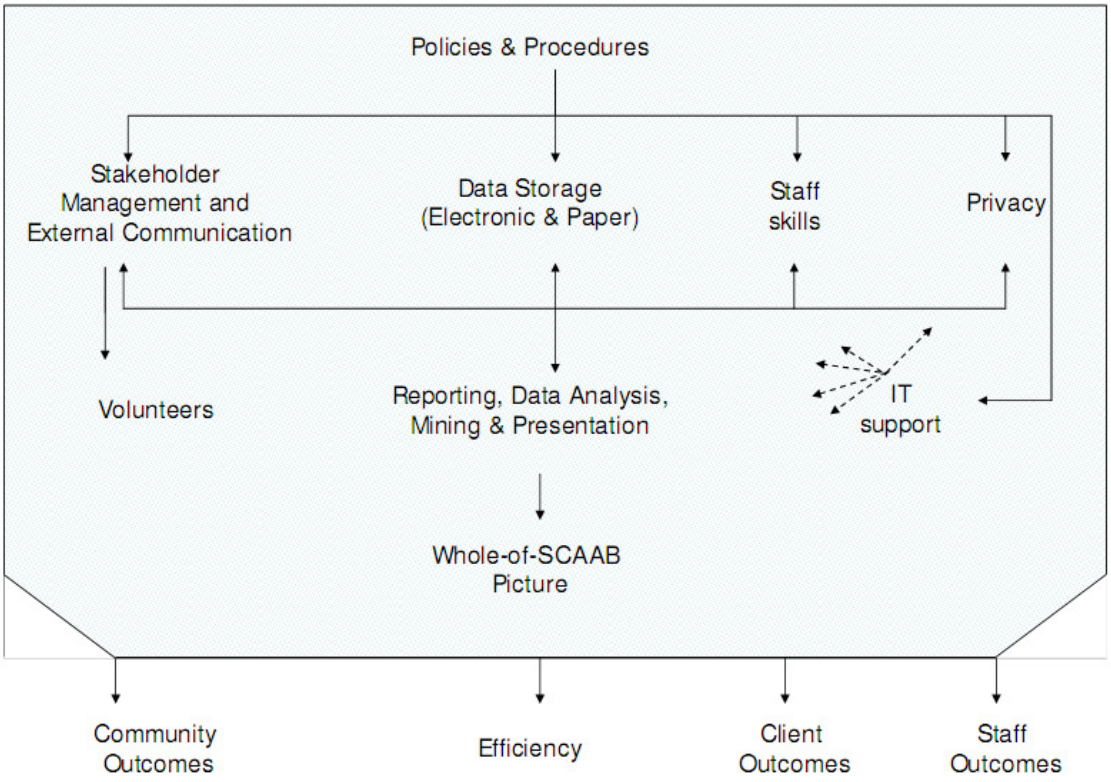

Figure 3: Second, simplified representation of category relationships

For the staff workshop, which took place during a plenary staff meeting in late May 2008, we printed each of the resulting categories: Policies and Procedures, Web Site, Stakeholder Management, Electronic Data Storage, Paper Filing, Staff Skills, Privacy, Volunteers, Reporting, Data Analysis, IT Support, Noble Park / Springvale, Efficiency, Client Outcomes, and Whole-of-SCAAB Picture, with a few explanatory bullet points in large font and pasted them onto big sheets for participants to edit, and comment on in small groups.

The meeting was introduced by the SCAAB director who gave an overview of the project and the intent of SCAAB to introduce technological changes with the ultimate intention of benefiting the client and improving the quality of work for staff and volunteers. We presented our findings, and, after a very brief discussion, four groups were 'counted off', and people were asked to add/subtract, edit, comment on the categories and descriptors. Participants agreed with most of our categories, with some debate around the right terminology for 'No Whole-of-SCAAB picture', and a lively discussion in the four groups provided additional valuable insights relating to our categories.

After the workshop, we evaluated staff contributions and further consolidated our categories to yield the final categories, which are summarized here:

Policies, Procedures, and Privacy – relating to of the need for more policies and procedures, in particular around electronic data management including privacy and how to develop and implement those.

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Stakeholder Management and External Communications – maintaining relationships with current and future clients, other workers; other organizations in the service area and in the sector, both at a local, state and national level, funders at all levels of government, philanthropists, media, politicians, and members of the Committee of Management, as well as 'friends' of SCAAB. Means of communication should include a full range of current and potential information resources for stakeholders, including media releases, reports, blogs, online audio /video, or strategic emails as appropriate, used for awareness-raising, advocacy, reporting, and inviting people to use SCAAB or participate in particular SCAAB events. External communication also includes the Web site, which, is currently no-one's specific responsibility and whose large potential is therefore not fulfilled.

Data Management – SCAAB currently has a mix of paper-based and electronic systems for managing client data, which can make finding and accessing files difficult. As described under 'Policies' above, there is also a need for more comprehensive policies and procedures for storing, maintaining, protecting, and disposing of electronic data. Due to the number of different programs at SCAAB, there is no common and accessible repository of key information about all clients, nor is it easily possible to generate stats on all clients. To bring together even the most basic data across the agency is a cumbersome and difficult task and is only done once per year for the annual report. This difficulty in obtaining 'overview' knowledge about SCAAB and its clients we called **'No "whole of SCAAB" picture'**. This issue has several major implications: first, workers often have to rely on informed 'guesstimates' and anecdotal, rather than hard evidence, and data mining is practically impossible. This affects advocacy, reporting, research, funding applications, service evaluation and direct client service to different stakeholders. Furthermore, even extracting existing data for reports can be a time-consuming and tedious exercise, which sometimes has to be repeated by different workers for the same report.

Staff Issues and Outcomes – (Note that by staff we mean both paid staff and volunteers). Current ICT systems do not support staff very well in their work. This has implications for the efficiency of the work done, and also increases staff stress. Furthermore, a variety of work practices currently co-exist, because people have not been well supported by current tools, and a huge amount of time is lost because of systems being out of date. Some cultural shifts are required in that new tools and systems and thus new work practices will have to be introduced to improve the situation. This applies to data storage, policies, and other areas.

IT Infrastructure Support – At the time of our interviews, SCAAB had just experienced difficulties with its IT systems, with a much higher breakdown rate than normal. Consequently, staff stated the lack of a reliable system with good back up mechanisms as the main IT support issue. Staff members also felt that systems failures needed a more prompt response so that necessary resources (including e.g. email or the Internet) could be accessed again. On a strategic level, the current (responsive) IT support approach should be complemented by a more proactive, preventative approach including strategic planning for IT improvement. Better planning and proactivity could save workers' time that is now

lost when problems need to be fixed. However, staff pointed out that this would need a proper, in-house IT department.

Springvale and Noble Park Sites – The two sites at Springvale and Noble Park are currently not fully integrated, and neither are the other outposts that SCAAB has at various sites. At the time of our case study, this was a major issue, as staff from one location could not access their email or files at the other. (This has since been improved). IT support is not sufficient, either. There is a strong need for a common IT landscape including emails, computer drives, policies, support, etc. These issues are going to be addressed when the Noble Park site relocates in 2009.

Client Outcomes – Staff members see that a major goal of an improved IT landscape at SCAAB should be an increase in empowerment for clients through greater and more applicable access to IT. A more holistic case management would also be supported by the implementation of better data storage and data management strategies. Better transmission of data, and better logging of client information should also help to decrease waste and increase time that can be spent with clients.

Figure 3, together with a summary of the workshop, were also used to inform a Committee of Management Meeting and this has resulted in an informed decision to invest in a new internal information system and the services of a consult to assist with the change management process.

Coincidentally, our research was concurrent with a decision by the State government to call for applications to fund large-scale ICT innovation in the SCAAB service region. We have been able to assist SCAAB with submitting its application, but in addition, SCAAB itself now has the knowledge and authority to make informed decisions and negotiate with others about partnering in the proposed projects. We also hope that our continuing interest in researching ICT effects in community agencies in the region will be of interest to the State government.

5. Conclusions

We believe that many of the issues we found in this case study are common to other welfare agencies, and this has been confirmed by our other case studies conducted since. Most of our categories listed in section 4 have resurfaced in these case studies, as well.

But what is also important here is that our consultative process of identifying problems at SCAAB using a formal process modeling and analysis approach coupled with Grounded Theory has resulted in awareness-raising; staff buy-in; familiarization with new ideas and terminology about technology; the identification of particular issues; and a degree of optimism, rather than despair or defeatism about ICTs in the community welfare workplace!

Our experiences using a rather formal process modeling and analysis method have been positive. Co-MAP turned out to be very helpful during the interviews and at later stages of the analysis. During the interviews, the emerging process

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diagram represented a visual model of the interview, and thus of the work situation of the interviewee with regard to our areas of interest. We found this helpful as a prompt for both interviewers to ask additional questions, or to clarify issues. Furthermore, we used the diagram to summarize aspects of the interview and gain immediate feedback from each interviewee about our understanding of what she had said. At a glance, we also gained quite a strong feeling for the interviewee's view of her work situation with regard to our questions. For example, a large number of bulldozers on information flow arrows pointing to the interviewee can indicate a feeling of being overwhelmed with 'stuff', whereas a large number of bicycles mean that the interviewee has to go to a lot of effort to obtain information that she requires for her work.

During the analysis, we used the diagrams in combination with the interview notes to also elucidate major issues with regard to SCAAB's current situation. Due to the nature of the interviews (individual rather than group, resulting in a mass of data), and time constraints, we did not make full use of Co-MAP's analysis capabilities as described e.g. in (Kethers 2002). However, we felt that our combination of Grounded Theory approach and Co-MAP yielded good results, and so far, staff feedback at our staff workshops have confirmed this for all our case studies.

While we believe that the Co-MAP method could be fruitfully used in other organizations, we have been considering the question whether Co-MAP could be utilized by a community organization on its own, without any expert to help with the modeling and analysis. This would empower the organization to investigate its own processes without the need for outside help, and certainly be in line with the desire in Community Informatics research and practice to promote community-based research methodologies for self-empowerment (Stoecker 2005; Day, Farenden et al. 2007).

At the moment, we believe that this would be difficult, particularly in larger organizations where the process would become quite complex and quite time-consuming. While, after an introductory presentation of the method, Co-MAP has been used in group workshops by the participants themselves as described in Kethers (2002), the groups always had facilitators skilled in the use of Co-MAP to assist them. Furthermore, only a very cursory analysis was performed by the groups themselves, while the bulk of the analysis was carried out later by the facilitators. Still, we are thinking of trialing Co-MAP as a group tool, without facilitation, in another case study, and at community sector forums there is strong interest in the methodology being made available more widely in the future.

From a theoretical perspective, our activity represents a modest first step in the direction of providing a body of more in-depth knowledge about the internal organizational culture and structuring of social-technical relationships in a welfare organization. We have been able to capture something of the daily reproduction of information, knowledge, and service flows as mediated with different technologies and skills, based on active research participation with an organization's workers.

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Because it is a form of practice embedded and respectful of the culture and technology of care, empirically and conceptually it begins to provide a necessary vocabulary for new initiatives and more robust middle range theorizing (Merton 1968: 5) about ICTs in community-based organizations. It also provides a basis for decision-making and change management within organizations on their own terms. The aggregation of such a body of knowledge on the basis of different case studies and speculations could result in other valuable contributions to practice and the literature about the situated use of ICTs in non-profit or community sector settings.

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