THE SOCIAL IMPACT OF COMPUTER NETWORKING ON THE RESTRUCTURING OF AN EXTENSION SERVICE

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Summary. Computer networking has been promoted nationally in the USA for revitalizing rural communities and the Cooperative Extension Service (CES). In 1991, the Illinois CES began to restructure its field extension services and upgrade its computer infrastructure aiming to create a less hierarchical organisation and improve services to clients despite staff reductions. A three year case study using qualitative methods examined the social aspects of this initiative. Extension staff working with traditional clientele (e.g. farmers) and relying on experimentally-based information derived by experts were most resistant to using computer networking. Those working with non-traditional clientele (e.g. urban poor) and more reliant on experientially-based expertise of a group were most open to using networking. Age, gender, office conditions and the commitment of team leaders to networking were also important. The traditional hierarchical nature of the CES reemerged in new forms and few new benefits to clients could be identified.

INTRODUCTION

The introduction of computer technology is having diverse social and political effects throughout society. Popular depictions associate it with positive social change. This *technological utopian* view of computer technology has parallels with the earlier idealistic visions that accompanied electrification last century (5). The acclaimed benefits of networked computers for organisations are a recent phase in this ideological movement (6, 8, 9).

The effect of computers within organisations is often difficult to measure, so generally-held positive community beliefs about computers can take on the aura of axioms in the absence of strong contradictory evidence. In addition, the personal benefits of using a computer tend to be extrapolated to the organisational level, but improvements in personal productivity do not necessarily mean improvements in organisational effectiveness (3). A more common outcome of computerisation is political: it tends to empower the groups within the organisation who are already the most influential (1). The original expectations of administrators who sanction the introduction of computers are often quickly outdated as uses of the new computer infrastructure evolve and are modified by powerful competing groups within the organisation (4). This study sought to address the beliefs of CES staff about computer networking and the ways in which this new infrastructure affected their work patterns.

MATERIALS AND METHODS

A qualitative case study was conducted over a three year period between 1991 and 1994. Findings were based on interviews, analysis of US Cooperative Extension documents and notes taken during a dozen local and national meetings related to CES restructuring and computer use. Most information gained was from 210,000 words of interview transcripts collected from 57 semi-structured interviews with 36 field and campus staff.

The study proceeded in several phases during which its focus progressively narrowed. After three pilot studies, it focused on computer use within a particular group of county extension offices (known in the CES as a *cluster)* and their regional office in a city given the pseudonym of *Burlington* in southern Illinois. Eighteen interviews of Extension field staff in the cluster were conducted in this final phase. In some ways this cluster was typical of others within the state, but it was also a unique case study of extension staff coping with organisational change.

The research methods used were based on a Constructivist research paradigm (2, 7). This assumes that several valid alternative views of what is happening in a complex social situation can be developed,

depending on the background the researcher brings to the study. Bias is inevitable, and must be acknowledged. My background as a white male Australian extension agronomist helped shape my conclusions. The final report presented the situation as much as possible in the words of those within it, so that readers could infer conclusions beyond those of the researcher. Validation was achieved by confirmatory cross-referencing of conclusions obtained by different research methods, regularly checking emergent findings with key organisational insiders, keeping a research log to track how my findings emerged and by written and verbal feedback on findings from twelve of the cooperating extension staff that I interviewed.

RESULTS AND DISCUSSION

Organisational context and values shape adoption

The US Cooperative Extension Service has been undergoing major changes over the last decade forced by repeated Federal government funding cutbacks, demographic changes in rural communities and shifts in the priorities of the Land Grant Universities. The Extension Service of the United States Department of Agriculture has recently promoted computer networking enthusiastically as a means of revitalizing rural communities and extension, and has positioned itself to implement the Clinton Administration's vision of a National Information Infrastructure.

It was within this broad ideological and political context that the Illinois CES began an unprecedented restructuring of its field extension services. Staff reductions and reclassifications began in 1991 and the short-term funding surplus that resulted went into upgrading the CES computer infrastructure. Its administrators saw this as a way of encouraging cultural change in the CES. As one described it, *"New computer uses are part of the whole cultural change that the CES is going through...and* [are] *part of the scheme to flatten the whole organisation."*

As a university-based organisation, the CES traditionally had a hierarchical social structure based on academic expertise, and the agenda for computer use was dominated from the start by campus academics. As a campus computer support person described it:

It seemed to us that administration was being very careful in protecting the prerogatives of these campus experts. The field offices wanted help with a lot of practical needs, but the specialists wanted to develop more flashy, high status software...We couldn't convince them otherwise. They were 'the centers of all knowledge and wisdom' and we couldn't reorient their priorities. An administrator described it: *We had a few ag. advisers who got enamoured with writing software and we became a little bit concerned that an adviser's job wasn't sitting at a machine punching in numbers but should be relating to people...we had people in the field who began to challenge the decisions that were being made in head office by our computer people who were running the show.*

Little of the software produced by campus academics has been used in the field.

Centralised control of the computerisation agenda continued during restructuring. There was a field advisory committee, but its role was a reactionary one. As two members of the committee described it, *We were a sounding board for what they wanted to do over at campus. We did very little creating as opposed to listening to thoughts and giving suggestions.* Many field staff consequently did not feel a sense of ownership of the new computer equipment or network. As one Extension educator said: *At the moment everybody is shoe-horned into using the same computer tools. It has to do with the central funding. It was always kind of centrally dictated what we'd get.* Despite this, many field people were happy with what they had been given because it was much better than what they had been using during a long period of underfunding.

Field uses of networking

The restructuring created two new classes of field extension staff: Unit leaders and Extension educators. The Unit leaders were located in the former County Extension offices and administered extension programmes for one or more counties. They raised funds to maintain the local extension service, working with local people to bring in experts to provide extension programming. Extension educators were located in new regional offices and were appointed in each of 16 new areas of specialisation to provide extension programming to surrounding counties. Extension educators in similar specialisations across the state were organized into teams with between 4 and 22 members. They were fully funded by the university and took over some of the former roles of campus experts. A new staff hierarchy began to develop. As one educator saw it: *The old advisers have upgraded to educators and they do much more of the teaching, and that leaves out the Unit leaders. I don't know whether they have lost out or not.*

The Unit leaders and Extension educators developed very different uses for the new computer infrastructure. Computer use in the Unit offices continued to be dominated by secretaries as it was in the old county offices. In all Unit offices studied, the secretaries downloaded e-mail, printed it off and provided it to Unit staff, handling all computer communications in much the same way as faxes or letters. In 1993, over half of all Unit staff in the state logged onto the CES network less than once a week through their personal accounts. There was very limited network communication between Unit offices and the regional office and computer communications were seen to have little relevance to improving services to clientele.

Extension educators used computers and the network more actively than Unit leaders. They more often had a networked computer on their desk: there were few secretaries to delegate work to, and they often had to gather resources and build confidence to manage their expanded educational roles. As one educator described it: *I think the role makes a big difference. The educators are always looking for information. I have to do that for 13 counties. The Unit leaders don't have the same need to do that. They tend to just glean it from us as needed.*

Network use differed significantly between individuals and teams. The teams which used it the least were those dealing with agricultural and environmental issues, who logged in an average of 100-150 times per person during 1993. Teams dealing with family, community and youth issues used the network twice as much. As one educator described it: *We use the e-mail for news about meetings and we share news releases and that sort of thing on it.* Teams which did not use the network claimed that other traditional communication media were quite adequate. The network improved the joint production of publications and project coordination for some teams. Many social factors contributed to active use. As the members of one team expressed it:

Dave: *It makes a big difference being able to type. My handwriting is terrible and I've been typing my own work for years. Some of these people in other teams just don't type.*

Jenny: *Well sorry guys, but that's a guy thing. A lot of the men in our organisation just don't know how to type. That's the main problem.*

Alan: *It all depends on how much the team leader and the team members were committed to making this new system work. Some people just didn't want it to succeed and they just don't commit themselves to it. We get on really well together but I've heard of one team where there are two or three people who never show up at events. They've got their own particular interests and aren't interested in a lot of the group activities.*

Jenny: *I think there was more support for the new system among the women. We had more to prove and we were going to make it work. A lot of the success of a team depends on how much they have bought into this new system.*

Peter: *I think one of the reasons that maybe we use the network more than the agricultural teams is that things are not so definite in our area. Like if you want to spray a weed it's more definite what you should do. Maybe it's clearer in our area for those who have PhDs, but none of us are in that club.*

CONCLUSIONS

The introduction of computer networking into an organisation is a social act. Its impacts in the Illinois CES were highly variable, depending on complex combinations of social factors. The motivation for adoption was driven by external social forces rather than perceived internal needs, and the form of adoption was determined by the existing organisational culture. The traditional hierarchical nature of the CES based on technical expertise reasserted itself in the new field positions, encouraged by organisational differences between offices and the different patterns of computer network use. Some educators felt that the network enhanced their educational programme development, but it appeared to be more commonly used for internal administration and for reducing some of the uncertainty associated with the reorganisation by making coordination between individuals easier. Network communications were used most by teams that were fostering interdependence instead of maintaining hierarchical control, where resources had to be jointly developed and there was a commitment to making the new CES organisation work.

REFERENCES

1. Burkhardt, M.E. and Brass, D.J. 1990. Administration Sci. Quarterly 35(1), 104-127.

2. Easdown, W.J. 1994. Unpublished PhD dissertation. University of Illinois, USA

3. Halachmi, A. 1991. Public Productivity and Management Rev. 14(4), 327-350.

4. Kling, R. and Iacono, S. 1988. Social Problems 35(3), 226-243.

5. Pfaffenberger, B. 1988. Anthropological Quarterly 61, 39-47.

6. Qvortrup, L. 1987. In: The Ideology of the Information Age. (Eds. J.D. Slack and F. Fejes) (Ablex Publishing Corp: Norwood, NJ) pp. 161-173.

7. Schwandt, T.A. 1994. In: Handbook of Qualitatitive Research. (Eds. N.K. Denzin and Y.S. Guba) (Sage: Thousand Oaks, CA). pp. 118-138.

8. Sproule, L. and Kiesler, S. 1992. Connections: New ways of working in the networked organization. (MIT Press: Cambridge, MA)

9. Tate, T.G. 1993. In: Rural America: Blueprint for Tomorrow. (Ed. W.E. Gahr). Annals of the American Academy of Political and Social Science. 529, 71-79.