Digital Change and Organizational Development: Views from the Public Sector in Papua New Guinea

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Abstract

This study explores the potentialof Internet-based technology to change the nature of work in the civil service sector in Papua New Guinea (PNG, specifically to contribute towards Organisational Development (OD). Immediately following and one year after an awareness-raising civil service conference on computer-mediated communication and its potential to help develop the workplace, 23 PNG public sector employees who had attended the conference responded to a range of closed and open-ended attitude questions regarding Information and Communication Technologies (ICTs). On balance, they reported that in their experience, ICT following the conference had been relatively empowering, had enhanced organisational communication and accountability, and had helped to improve the flow of knowledge within and between public sector groups. In PNG, digital technology might help to facilitate the development of intra- and inter-organisational unit teamwork. To that extent, digital technology in the longer-term may assist not only in OD, but also in the development of capacity more generally.

Introduction

In their book entitled *Organisational Development and Change*, Cummings and Worley (1993, p. l) define organisational development and change (OD) as "... a process by which behavioural knowledge and practices are used to help organisations achieve greater effectiveness, including improved quality of life, increased productivity, and improved product and service quality... Moreover OD is oriented to improving the total system – the organisation and its part in the context of the total environment that impact upon them." Cummings and Worley's definition implies that OD can assume, and therefore perhaps be catalysed by, multiple forms of organisational activity (Senior, 2002). This study focuses on two particular catalysts for OD – digital technology and the people who use it. The paper argues that industrial and organisational psychologists could be more interested than at present in ICTs as they appy to organisational digital development issues – in particular through interactions between people and technology in Pacific settings, such as the civil service in PNG.

Digital technologies are omnipresent. The invention of optical fibers allowed for the transmission of over 200-trillionths of digital information a second, 50,000 times faster than the previous transmission speeds using copper wires (Hearn, Mandeville & Anthony, 1998; Myers, 1990). Because of this fluidity of information flow, fiber optics are a linchpin of ICT

networks that enable people to exchange information by, for example, online conferences, online chatrooms, electronic mail, or tele-work via a computer connected to the Internet (Kendall, 1999). Such exchanges can play a role in organisations in developing economies like PNG.

During the early stages of ICT, Bradley (1989) at the University of Stockholm in Sweden (1974–1986) studied three main types of ICT systems. These three systems were related to three phases in the history of ICTs: (1) a batch-production system at a state-owned company; (2) an online system, with display terminals at an insurance company; (3) a microcomputer system at an electronics company. Bradley found the following problem areas were associated with the implementation of ICTs: Uncertainties about the work environment and lowered work satisfaction; concerns over information and participation in decision-making; workload; promotional and staff development pathways; working hours; education and training; evaluation of work roles; physio-ergonomic conditions; and making time for leisure and occupational health. Hence the introduction of ICTs into some Western workplaces has not been all plain-sailing, at least from the point of view of human factors.

Nonetheless, companies such as Wal-Mart, Levi Strauss and General Motors have all built new kinds of relationships with their suppliers and customers, through multi-faceted electronic linkages (Kendall, 1999). Today, all of the major digital ICTs, and software or database management in particular have become embodied (for want of a better word) in the Internet. The Internet provides a readily-available platform for streamlining business decisions and drastically reducing lead times required to bring products and services into the market (Kendell, 1999; Myers, 1990; Senior, 2002; Castells, 1996; Norris, 2001). Yet how doe sit affect an organisation's *internal* customers (its employees), and thereby OD?

Psychologists' insight into the interplay between digital technology and OD is important for both theoretical and practical reasons. From a theoretical standpoint, considering the digital psychology of OD in the organisation may enhance our capacity to theorise about the capacity-building and organisational learning aspects of ICTs (Argyris & Schon, 1975; Argyris, 1982). From a practical standpoint too, ICTs are intended to enable improved workflows and communication patterns among people. Hence researchers have argued that the effects of the digital technology should not be considered in isolation, but rather viewed as part of the total OD environment (Huber, 1990; Kendall, Lyytinen, & Degross, 1992; Nelson, 1990). Nevertheless, most contemporary empirical studies on the emergence of digital ICT and the latter's psychological concomitants have given OD issues relatively cursory attention (Kendall, Lyyntinen & Degross, 1992; Castells, 1996; Norris, 2001).

In this study, the Internet is viewed from the perspectives of its end-users in the PNG Civil Service. It is also viewed through the lends of OD. OD is not, as some models suggest, a project planned and implemented by senior managers, a designated project manager, or a hired consultant with the assumption that other workers in the organisation will automatically go along with it (Argyris,1982; Myers, 1990; Cook, 2002). In PNG as elsewhere, the OD approach to change is above all an approach which cares about people and believes that people at *all* levels of an organisation are, individually and collectively, both the drivers and engines of change (Castells, 1996; Norris, 2001). The OD approach is firmly embedded in the assumptions that all who are or might be involved in any change should be part of the decision-making process. It is they who should decide what change might be, and ultimately bring it about (Senior, 2002). How then, if at all, does digital technology enhance OD?

The study aims to investigate the impact of the digital technology, and to determine the effects on organisational behaviour, and expectations, in state-run organisations in PNG. The research methodologies used in the study are those suggested in Whyte (1984) and Yin (1994). These writers suggest that the fullest understanding of work behaviour is gained by studying behaviour in its own context, i.e., as an interaction between globalising technology and local norms (Carr, 2004). Kaplan and Maxwell (1994) warn that the goal of understanding a phenomenon from an local, insider perspective is all but lost when textual data is quantified (Benbasat, Goldstein & Mead, 1987; Eisenhardt, 1989; Orlikowski, 1993). To help reduce that risk, the methodology chosen is fundamentally qualitative.

Method

Participants

The participants were drawn from the delegates who attended a large educational conference held in the capital of PNG, Port Moresby. This conference focused on the importance of integrating ICTs into the public service. The aim of the conference was to help public sector managers and other employees who normally specialise in centralised planning, look at their own management and leadership styles from a broader, digitalised perspective (Argyris & Schon, 1975; Argyris, 1982). The participants in the study, drawn from this conference, took part at two points in time, once immediately after the conference itself (phase one), and secondly one year after the conference had finished (phase two).

In phase one, 24 civil service employees representing local and central level administration in the public service took part in an evalaution-of-the-conference interview. One of the participants dropped out for personal reasons. In terms of educational qualifications, the majority held university degrees and five held college diplomas. Nine of the participants were men, and 14 were women. The participants included 15 managers (four CEOs, three product managers, three ICTs managers and four HR managers) and nine non-managers (three senior support specialists, two administrative assistants, an inside sales coordinator, a product sales specialist, a public relations specialist, and a financial analyst).

In phase two, there were 22 ex-delegate participants. Six of these prior conference attendees had not taken part in the first interview. As a whole, the second-round interviewees included 15 managers (five CEOs, four product managers, four ICTs managers, two HR managers) and seven non-managers (three senior support specialists, an administrative assistant, an inside sales coordinator, a public relations specialist and a financial analyst). In terms of qualification and functional areas, they were similar in all respects to the participants in the first interview. Ten of the participants were men, and 12 were women.

Materials

The research in this report formed part of a wider, multi-method investigation. Personal interviews are the primary source of the data reported for this particular study, however. The interview questions were developed by the author within guidelines set by Whyte (1984) and Yin (1994). For both phases, the questions were pre-tested first with academic colleagues, then with pilot interviews within another organisation which was undergoing similar ICT changes. The questions themselves are indicated in Tables 1 and 2.

Table 1
Summary of the First Round Interview Questionnaire

- What are those aspects of your job content that you consider most crucial? (warmup)
  - The opportunity to use one's own knowledge and ideas
  - The possibility of following a job from beginning to end, and of seeing how one's own work forms part of the organisation 's overall activities
  - The level of complexity/degree of difficulty required in the work
  - Thhe level of professional qualifications required by personnel
  - The degree to which an individual can be replaced
  - The opportunity for workers to influence methods of working, design of the work, and planning
- **Please outline your personal use of ICTs**
- **What work changes will the conference inspire in you?**

Note. Key questions are emboldened.

Table 2
Summary of the Second Round Interview Questionnaire

- A number of aims have been derived from the ICTs conference last year. The basic objective is to achieve a work situation and work content that fulfill the needs and requirements of each individual at work.
- What changes do you think should take place in job content during the use of ICTs?
- What will be the most obvious changes in the formal organisational structure of your organisation resulting from the introduction of ICTs?
- Does this include the development of personnel on the job, by emphasising continuous personal and professional development?
- What changes in work content can be observed for existing occupations involved in ICT projects? For example, experts and users (individuals, work groups, managers)?
- The concepts of “power”, “influence”, “authority”, and “participation” in the workplace. Should these be redefined as understanding increases about the aspects of using ICTs?
- Is there an ICT-initiated “invisible revolution” happening in the civil service, helping to bridge previous “islands” in the organisation with low collective identity?

The questions presented in Tables 1 and 2 were designed for longitudinal application: The questions in Table 1 were posed immediately after the conference, whilst the questions in Table 2 were posed a year after the conference. The reasons for this separation in time can be found in a theory of learning on which the conference was based. The two questionnaires in Table 1 and Table 2 are anchored in Kolb's Learning Cycle (1984). According to Kolb, learning is cyclical and experiential, comprising concrete experiences; observation and reflection with formation of abstract concepts; and generalisation. In accordance with that experiential process, it was assumed by the researcher (Mosan), and by the conference organisers (below) that learning would start with the experience of the conference (an event or stimulus), on which the individual would subsequently reflect (Gill & Johnson, 2003). This period of reflection would hopefully lead to helpful generalisations for better work practices – which was the focus for both the conference organisers and the author of this study.

Procedure

The conference itself lasted two days, and was organised by the PNG Human Resources Institute (PNGHRI), a private institution. Featured speakers included university academics, as well as ICTs engineers and practitioners (from PNG and abroad). Various topics related to ICTs and the digital economy and organisation were covered, including: (a) a new mode of service delivery via email and ICTs, (b) new directions for OD; (c) the impact of ICTs on OD; (d) the new trend towards smaller and efficient agencies; (e) community demands for value-added services; and (f) the impact of the digital technology on the public service. Conference delegates discussed each of these topics in groups of four or five, e.g., from PNG Telecom and PNG Power, and then summarised their discussions into point-form, via a 15-minute poster or Powerpoint presentation to the rest of the participants. Hence, and broadly consistent with Kolb's Learning Cycle model, the conference was highly participative.

My data collection interviews were conducted in two parts (also, Yin, 1984; Eisenhardt, 1989). The first interview (Table 1) was conducted on site at the conference. The second round interview (Table 2) was conducted 12 months after the first. During the first-round, the interview began by putting the participant at ease with the question-and-answer process. As Table 1 indicates, each participant was first asked to describe his or her job duties, and then to move onto his or her ICT experience with the organisation and any changes anticipated following the conference. During the second-round interviews, the questions (Table 2) focused on the frequency and purposes of the participant's personal use of ICTs at work, and beyond in the wider community.

The main focus in the phase two interviews was the participants' reflections on what they had learned from the conference; their ability to look at their work tasks from a new perspective; and their fetl and experienced ability to put ICTs into use in their workplace. The analysis attempted to establish if and how, one year later, participants were able to practically show what they had learned, in terms of enacting general principles for workplace behaviour. In both phases, the interview proceeded until the data were saturated, i.e., until no new themes emerged.

Results

Immediately After the Conference

From Table 3, the conference inspired a range of aspirations among the delegates. These stem from the relatively concrete, participatory experiences of the conference itself, and appear to move, in the immediate aftermath of the event toward some reflective activities and

intentions. There is also an indication that the conference event, and the ICT ethos that it introduced, helped to increase expectations, namely about about participation and voice. An emerging issue therefore is whether these expectations had been bluntened or sharpened, and whether they were actually realised, one year after the conference had ended.

Table 3
Phase Two Changes Following the Conference (N = 23)

Knowledge about recent research	21
New ideas about ICTs	20
Increased scrutiny of own decisions	18
Pursue post-graduate studies	17
Broadened perspectives	15
Keen on reading journals	13
Knowledge of OD in public service	10
Re-focused interest in new fields	10
Theoretical understanding of practical phenomena	9
Start work on ICT projects	7
Read publications on ICT themes	6
Follow-up ideas generated in the study groups	7
Organise study groups	5
Participate in study circles	3
Launch participatory research	2
Develop own projects	2

One Year After the Conference

The outcome of a content analysis of responses to the questions in Table 2 is presented in Table 4 below. Table 4 identifies four key issues.

Power and influence

From Table 4, participants perceived that they were since the conference more able to share ideas, provide input, negotiate, and discuss alternatives regardless of organisational status, physical or geographical location, or functional affiliation. Most characterised the ICTs as inclusary, bringing "more people into the process," and establishing "the same sort of forum, regardless of your position." Thus, participation in decision making was perceived as becoming less dependent on functional, position and geographical boundaries in the organisation.

Not directly reflected in the table was a perception that email is more difficult to ignore than paper and voice equivalent. Several possible reasons for this were suggested by the participants. First, many prefer email, like to use it, and as a result, check their email often. They indicated that they check their email several times a day. The convenience and reliability of the ICT system may encourage a greater degree of responsiveness by reducing the need to play "phone tag" as well as reducing the risk of lost messages. The participants' webmail network includes a feature which, when activated, notifies the sender of the date and time when recipients open their mail. This

feature was perceived as making it more difficult for recipients to ignore messages, and as virtually eliminating the excuse, "I did not get the message." As expressed by some participants, users felt that they got a better, faster response to email than to alternative forms of communication. Interestingly, those who believed that they possessed strong writing skills also reported that email technologies provided them with increased opportunities to participate in and influence decision outcomes.

Table 4
Content Analysis of Responses One Year After the Conference

Item	*Percentage of responses*
Power and Influence	
Access to information/reduced uncertainty	100
Participation in decision making	86
Opportunity to exert influence	70
Access to persons/reduced power distance	51
Communication Patterns	
Increased volume of information	100
Preferred channel of communication	90
Increased sphere of communication	89
High level of dependence on the technology	89
Increased responsiveness from message recipients	48
Increased frequency of communication	25
Increased depth of information	20
Purpose for System Use	
Sharing/disseminating information	100
Organisational memory	90
Collaborative projects and processes	80
Work Practice	
Increased efficiency	90
Increased effectiveness/quality	80
Increased ability to exercise control	54
General changes in work practices	55

Most respondents specifically stated that the ICTs intra-webmail network not only encourages the contribution of ideas, but also elicits higher levels of responsiveness from management. A number of respondents expressed a belief that ICTs enabled them to have more of a voice in decision making and a greater opportunity to influence outcomes than they would otherwise have. However, most respondents also acknowledged that the ability to influence others and to be influenced by them again depend on the communication skills of the user. For those with weak writing skills, the technology may constitute something of a barrier to influencing others, and thus require careful management and development.

In a similar vein, some respondents remarked that the increased reliance on ICTs had made it more difficult to obtain physical access to organisational members. The change of communication settings from physical presence to "virtual" reduced the amount of face-to-face contact with other individuals. Other specific concerns included felt information overload. Information overload made it difficult for recipients to distinguish between important and unimportant messages. One remedy to this downside was to develop filters for message screening. However, if users from lower levels of the organisation began to sense that their messages were not being read, the local webmail system began to hinder rather than enable communication.

Communication patterns

Despite the glitches above, participants in general felt (1) that the volume, depth and frequency of communication increased with the use of ICTs and (2) that ICTs generally increased both the sphere of communication and the responsiveness of message recipients. In general, participants appeared to prefer ICT channels of communication to paper alternatives. Not surprisingly too therefore, the participants did tend to perceive that their organisation was developing a certain dependence on ICTs themselves.

Purpose for system use

All participants perceived that the ICTs were used to share and disseminate information. Most indicated that they used the ICTs system to work on collaborative projects. The prevalent use of ICTs as an organisational memory was another interesting finding. The ability of ICTs to provide an "audit trail" appeared to be important to most participants. ICTs provide a structure to organise correspondence, to follow a chain of events, and to demonstrate that particular directives were or were not issued. The ability to track information in this manner provided participants with a degree of control, by establishing a clear, indispensable way to go back and check previous activities, correspondence, and decisions and directives.

Work practice

ICTs were perceived as making the organisation more effective and efficient. Because of improved communication, it was perceived that communication domination or other governance-related drawbacks were able to "fall through the cracks", and in many instances, ICTs enabled the "right" person (rather than the most available one) to be included. Participants perceived that they were more informed, had a higher level of control, and were more involved in OD activities than they would have been without the ICTs. They also perceived that the use of ICTs increased both the pace and the nature of what they were able to accomplish.

ICTs were perceived as enabling users to have increased control over the execution of some job duties, and generally increased effectiveness and quality of decision-making. Hence they became more productive, were able to avoid unnecessary interruptions, and could exercise control over when certain job duties were carried out.

Participants within every subunit of the organisation that responded perceived that they were highly linked to other organisational subunits through the use of ICTs. As perceived by the participants, linkages to other subunits appeared to be tightly interwoven in the respect that all subunits share information in the organisational database. Because the ICTs search engine is centrally available and accessible, there was less dependency on someone from another subunit to provide the information needed. This codependence was perceived as an equalizing force, in that individual subunits were generally not in a position to control or limit access to

organisational information. As a result, ICTs were felt to have been helpful in facilitating the flow of knowledge within the organisation, and ultimately in building capacity.

Discussion

Perhaps the most complex labour issue in PNG during the Independence process of the 1970s was engendering employee participation in decision making, at the workplace. However, the issue of engendering employee participation changed form over the years, in response to changes in the society to enhance the individual's influence over his or her own working situation. State institutions such as the PNG Banking Corporation (PNGBC) and PNG TELICOM have attracted attention because of their efforts to improve the design of ICT work systems and job content; to create a better working environment; and to increase the opportunities for employees to influence their work situation. These very factors seem to have been the kind of expectation that the conference, and ICTs in general, engendered in our own (and the conference's) participants.

There were signs in the data that ICTs, in the public service, are still encountering an "old-style management," with its emphasis on centralised planning and its invariable structure, a pyramid-like affair with instructions, information and motivation passing down from the management apex to the workforce beneath "barrier" (Nye, 1996). Above all however, the participants have become motivated to use ICT to challenge and push back those boundaries. People were thus motivated by the learning experiences of the conference, towards organisational change and development.

In OD terms, the conference delegates who participated in our study felt relatively empowered (compared to prior to the conference) to help shape their organisation's future in ways that will benefit PNG, not just themselves as individuals. This last pointer is critical, for as Harrington (1962) observed, technological advance without social advance runs the ris of creating in its wake an increase in human misery, and an exacerbated level of impoverishment. Some authors have thus chronicled the darker side of ICTs and the evils they have visited upon unsuspecting users (Dery, 1996; Slouka, 1995; Stoll, 1996; see also, Negroponte, 1995). According to Bradley (1989), positive outcomes to technological change depend on successfully re-organising work roles, and training for enriched job requirements (see also Senior, 2002; Castells, 1996).

Limitations & Future Directions

There are some rather obvious points of bias in our data, from their restriction to civil service organisations to possible Hawthorne effects (or "smile factors") arising from the provision of conference time per se. Yet these potential disadvantages are arguably outweighed by the reltively unusual nature of othe same and the study. The findings of the study suggest several directions for future research. These include examining other organisations and other similar technologies in PNG, information systems and operations technologies such as data warehousing, artificial intelligence (AI), hypermedia/hypertext, client server systems, and knowledge work productivity. Additionally, a number of specific questions that can be approached more quantitatively. For example, perceptions that (a) the lost message rate for electronic communications is lower than for paper and voice alternatives, and (b) that there are differences in responses to electronic versus paper or voice messages, can be tested inferentially. Future studies can also address directly the relationships among user preferences for written communication, actual writing skills levels, and the use of digital ICTs.

Last but certainly not least, all of these ideas and suggestions - focused on the interface between organisational psychology and technological development - can be explored in other countries and organisations within the Pacific region.

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