2001

ERP Systems as Facilitating and Confounding factors in Corporate Mergers: the case of two Canadian telecommunications companies

Duane Truex

Associate Professor, Georgia State University, USA; Leverhulme Fellow, The University of Salford, England, Visiting Research Professor, University of Aalborg, Denmark, dtruex@gsu.edu

Follow this and additional works at: http://aisel.aisnet.org/sim

ERP Systems as Facilitating and Confounding factors in Corporate Mergers: the case of two Canadian telecommunications companies

Duane TRUEX

Associate Professor, Georgia State University, USA;
Leverhulme Fellow, The University of Salford, England, and
Visiting Research Professor, University of Aalborg, Denmark

RÉSUMÉ

L'article concerne une recherche action conduite avec un syndicat de salariés dans le secteur des télécommunications ; les partenaires de cette recherche tentent de comprendre les conséquences humaines et sociales de l'installation d'un ERP De plus, pendant le déroulement de cette recherche, une fusion eut lieu avec un autre opérateur de télécommunication, utilisant le même ERP , on a donc aussi examiné les conditions dans lesquelles l'intégration des deux systèmes d'information a été facilitée, ou non

Mots-clés : ERP, Fusion, Intégration de SI.

ABSTRACT

This paper presents early findings from a research project in which the research partners, academics and a telecommunication labour union, are attempting to understand, learn from and anticipate further changes related to the implementation of ERP in an industry sector in the midst of consolidation via corporate merger enabled in part by the adoption of ERP systems in the merging partners

Key-words: ERP, Merger, Information systems' integration.

I. INTRODUCTION

This paper describes an ongoing action research project initiated to assess the impact of the introduction of an enterprise resource planning system (SAP R3) in a single Canadian telecommunications company, BCTel (British Columbia Telephone Company). In the midst of the research program it was announced BCTel would merge with another Canadian telecommunications company, TELUS, of Alberta. This development, while not surprising given predicted consolidation in the world telecom markets, is interesting given that both companies had each recently adopted SAP R3 using similar reference models and system components, albeit ones implemented quite differently at each company. The merger appeared to give further credence to the prediction that the use of common reference models and ERP systems would remove significant barriers to organizational integration and spawn industry consolidation. Thus it was expected that the integration of both companies would be relatively unproblematic with the presence of a common ERP assuring the subsequent success of the merger. A merger of Canada's second and third largest telephone companies was expected to create a western Canadian powerhouse with $4.8 billion in revenue, $9 billion in assets making it the second largest telecommunications company in Canada. A merger between BC Telecom and Telus was the most significant adjustment in Canada's regional telecom providers since the early 1900s when Bell Canada sold its stakes in Canada's three Prairie-based phone companies. The merger was thought to be able to save the combined companies $178 Million in operating costs. While the research is ongoing and, as of this writing the jury is still out as to the ultimate success of the corporate merger, it appears that the presence of SAP at both organizations has, contrary to expectations, presented significant problems for each organization. Moreover, the anticipated ease of transition arising from the shared use of ERP systems did not materialize as expected. One unique aspect of the project is that the research partner is the labour union representing workers at BCTel, the Telecommunications Workers Union (TWU). As a result of the merger the TWU found itself engaged in a certification election against the opposing union from TELUS, the International Brotherhood of Electrical Workers (IBEW). It won the election and currently represents all of the 17,000 unionized workers in the new company making it one of the twenty largest unions in Canada. Thus the study is occurring in a surprisingly dynamic and interesting context.

II. THE RESEARCH QUESTION

At one level this research seeks to understand the structural organizational and work process changes to be faced by labour resulting from the adoption of ERP systems. One expected outcome is for union leadership to structure programs enabling workers to acquire and maintain skill sets appropriate to the new work environment. A second and more difficult question is: do ERP systems, when ap-

plied in highly dynamic organizational settings, lead to greater long-term stability or do they imprison an organization and restrict its ability to adjust to dynamic environments. This study is unusual in that the point of entry to the organization, and the action research partner providing that access, is the Telecommunications Workers Union (TWU) of British Columbia. Research partnering with labour has not figured significantly in IS research since the early 1990s. At that time one Scandinavian ISD research stream examined jointly optimized union-management systems projects following socio-technical development principles. To the author's knowledge no other ERP research has engaged organized labour. Canadian labor unions are unique in North American settings as they have a more protected status than do the unions in the USA. And the TWU is unique among Canadian telecommunication unions, as there is language in the collective bargaining agreement that guarantees protections when technological change might have an adverse impact on its membership. The union was established in 1949 and has an unusual position in the telecommunications industry in that it represents bargaining units of technical personnel who are typically seen as managerial or exempt workers in most other settings. Many of these provisions, although common in Northern European collective agreements, are very unusual in North America. Hence this union has access to important data resources and the interest to engage in action research projects.

A. Current Research

There is a large, and growing stream of research on software system implementation (e.g., IS Development methods and tools, GroupWare). And there are numerous consulting and technical reports on ERP implementation. But published research studies on ERP projects still remain relatively sparse. Most are concerned with the successful implementation of ERP and those exclusively from a management centric viewpoint (Bond, Pond, & Berg, 1999; Glover, Prawitt, & Romney, 1999). Many are case studies of such successful implementation which try to extract principles for success in configuration or process reengineering (Harris, 1999; Jacob & Wagner, 1999; Riper & Durham, 1999). A few studies examine the impact on workforce size or the perceived success or failure of the implementation (Davenport, 1998; Larsen & Myers, 1998; Sawyer & Southwick, 1997). Studies exploring organizational change are largely descriptive reports of organizational restructuring and headcount reductions at selected SAP implementation sites (Bashein, Markus, & Finley, 1997; Davenport, 1996; Davenport, 1998). Occasionally an article examines the issue of the 'fit' of the ERP to the organization (Editorials, 2000; Soh, Kien, & Tay-Yap, 2000). But, in general, the early literature viewed success in a limited fashion, and did not study larger aspects of organizational and institutional change coinciding with the implementation of ERP systems. A number of articles in the 1999 special issue of *Systèmes d'Information et Management* began to reflect a change in that pattern. And there are special issues forth-

coming of the *Database for Advances in Information Systems* and the *Journal of Management Information Systems* which have promised to examine these issues more critically.

B. The Importance of the Research Question

The adoption of enterprise resource planning software (ERP) systems is one of the most important software implementation events of the past thirty years. When successfully implemented in a near majority of firms in an industry, these tools have the potential of reshaping whole industries and supporting a consolidation and concentration on an unprecedented scale. They are reshaping the way software is built and reshaping the basic social power structures in whole industries. Manufacturing in general provides such an example. In the garment industry, where supply chain management is critical to profitability, ERP has been essential and has reshaped the way companies do business. The dominant player in the ERP market is SAP (Systeme, Anwendungen, Produckte in der Datenverarbeitung, or in English, Systems, Applications and Products for data processing). In a market with six primary players SAP holds greater than a 66% market share and has more than 14,500 installed sites worldwide.

1. ERP Costs

In the U.S. ERP sales grew from under $1 billion in 1993 to more than $8 billion in 1998, the time of the SAP implementation at BCTel. For an im-

plementing company the software purchase cost is but the tip of the iceberg; total systems integration is 8-10 times the cost of the initial software price and they will typically spend 15-20% of the purchase cost annually to keep the ERP system up to date. In the US companies spent $80 billion on integration projects alone in 1998. ERP system sales are expected to grow at a 37% compounded rate to $52 billion worldwide within the next five years. This growth has resulted in an estimated 50 openings for every trained ERP systems integrator with average salaries for personnel with 2 years of experience topping $130k plus on-time completion bonuses.

Why are companies willing to incur such costs? Simply put, when implementation is successful, firms are reporting returns on investment ranging from 30-300% because ERP is business process infrastructure totally integrated in software. ERP systems are software mirror images of major organizational processes such as customer order fulfillment and manufacturing. These systems automate and integrate basic organizational processes from finance to the shop floor and eliminate complex and redundant legacy software systems that were never designed to talk to one another. When properly integrated and functional, ERP systems promise to deliver streamlined enterprise-wide business processes, information and data management. And, as ERP systems are built on 'best practice' industry reference models, they promise a reasonable degree of process competitiveness while providing the opportunity for inter-organizational

collaboration and intra-organizational data sharing.

2. Organizational Implications

Some implications of this development are quickly becoming apparent. For instance, these organizations have fewer technical barriers to the integration of multiple work processes that can be out-sourced to less expensive labor markets anywhere in the world. In one instance at BCTel five previously independent jobs – order taking, credit checking, repair servicing, checking of available inventory, scheduling of installation or service – are now being performed by a single worker while on the telephone and while working at a computer terminal. This employee can service any orders from anywhere in the world as long as s/he is on the system. Thus types of work become transparent to the customer and wholly virtual; i.e. unconstrained by location and removed from specific geographic, cultural, political or institutional settings. Such developments increase the potential for industrial globalization and consolidation.

Other changes may appear less apparent at first glance. For example, ERP software has an impact on the way systems are built and introduced into organizations. Whereas, in the past, the prime goal of a software development project has been to fit the shoe to the customer's foot, with ERP the customer is forced to reshape his foot to the ERP shoe. Organizations are redesigning work processes, discarding old practices organizational structures and legacy systems to fit the demands of the ERP master. Furthermore, because ERP systems allow for the capture of virtually any type of information at the point of entry, and then make it available to any process or authorized person in very powerful ways, these technical exigencies now have the potential to generate enormous social change. For instance, having data both available and useable allows for sophisticated data mining and business knowledge discovery. With its end-to-end data sharing it provides access to many powerful analytical tools and models for supply chain analysis, logistics and production planning and supports the ability to monitor organizational processes at any degree of detail a manager might like. The work of functional management specialists is now performed in software, making much of management a virtual process. The result is an enormous concentration of power in top management. Those with access to the data are empowered. Those without access will be marginalized.

ERP requires changes in management decision structures, evaluation and measurement systems. These changes in turn affect organization authority, role responsibilities, job structures, and incentive schemes. This affects organizational culture, values, beliefs as well as modes of thinking about, and solving problems. The sheer scale and complexity of organizational and technology change suggested by SAP is unprecedented in the history of Information Technology (Ngwenyama, 1998).

3. *Wider consequences: ease of merger?*

An historical barrier to merger in industries heavily dependent on information technologies has been the incompatibility of organizational systems and the near impossibility to integrate incompatible enterprise data models. SAP greatly alters an industry's environmental landscape because it removes a significant barrier to integration. It becomes much easier to integrate operations of two large telecommunications companies when the workflow, process, and most importantly, the data models are the same in both organizations. We may see such consequences with the merger of the GTE-owned BCTel and Telus of Alberta. Both firms were SAP users, each had 'gone live' just months prior to the public announcement that merger talks were under way in October 1998. Moreover GTE and its other subsidiary telecom organizations are SAP users. In August 2000 Telus purchased the cellular company Clearnet, a user of SAP version 4.0. A further consolidation with the Prairie (Manitoba and Saskatchewan) phone companies is reported to be under consideration. The consolidation trend is being discussed by the professional community of ERP integrators and users under the guise of Industrial Resource Planning systems (Fingar, 1999). In such a discourse the company becomes nearly irrelevant because there are no longer barriers to end-to-end data sharing. Hence it becomes interesting to study and document the joining of firms which were each ERP users prior to the merger. Does having an installed ERP impede or facilitate the process?

III. METHODOLOGICAL APPROACH

A. Data collection

This project is an example of Action research which began mid 1998 and continues as of this writing. In May 1998 the author and co-researcher, Ojelanki Ngwenyama, of Virginia Commonwealth University, were invited to help the Executive Committee of the British Columbia Telecommunications Workers Union understand the nature of ERP and to summarize the experience on SAP implementation as reported in the academic literature. This led to our acquiring a complete set of documents covering the proposed system and change that had been provided by BCTel management. We were asked to provide an independent assessment, and were subsequently invited to study the transition at BCTel. Thus began an unprecedented opportunity to study an ERP implementation from the bottom-up and from within the ranks of labor. For example, we had access to key documents and personnel and the opportunity to be participant observers in meetings which dealt with the consequences of the implementation process. This afforded the opportunity for participant observation in numerous union decision-making forums. In short it has provided access to the types of organizational texts and perspective

that is simply not typical of implementation studies.

Our relationship with the TWU allowed us to monitor and study ongoing developments in the merger. The researchers, with study team members drawn from the union leadership, have jointly developed research protocols and structured interview questionnaires. Those were used to conduct intensive two-hour interviews with labor and management users, and implementers of both pre-ERP and post-ERP systems. Interviews continue as developments unfold. The project is thus consistent with classical action research. One organizational learning goal was to train members of the TWU study team so they could conduct the ongoing interviews. Accordingly, interviews were conducted by members of the action research team, typically with one of the academic researchers present and involved. But the presence of the academic was not always required since members of the project team were trained and participated in all interviews. All interviews are being tape-recorded. The tape recordings, field notes, and meeting minutes and drawings are being transcribed for analysis. The researchers have pledged to stay with the process until a mutually determined conclusion. Interviews are now expected to continue through 2001.

B. Data Analysis

The mixed character of the data requires several approaches to the analysis process. Archival documents and meeting minutes were examined using discourse analysis and served to shape the questions used in the interviews as well as provide contextual background data for the study. Additionally, we have begun a critical deconstruction of company documents, made available to the union. Interview texts and notes are being content coded using a textual analysis software tool, Hyper Research, and are analyzed for structural themes and patterns. These analysis techniques are now well accepted in our research community and have been successfully used in work in print, in press and under review (Beath & Orlikowski, 1994; Truex & Baskerville, 1998; Truex, Baskerville, & Klein, 1999; Truex, Baskerville, & Travis, 2000; Truex & Ngwenyama, 1998).

IV. PRELIMINARY FINDINGS

As our research partner is the TWU it is not a surprise that one of the goals of the work is to learn and be able to anticipate the impact the changes wrought by SAP and the merger will have on the union workers. Knowing and ultimately predicting likely events will allow the union to frame training and bargaining responses to use in protecting and preparing its membership for a future changed by the technology. The early and exploratory interviews suggested that the SAP transition was having impact on four areas: 1) job loss and transition; 2) unanticipated organizational changes; 3) structural change in work; and 4) decision-making. While the first three topics may be self-evident the last needs a bit of explanation. The inter-

views we conducted suggest an altogether different view of how work is accomplished and how day-to-day decisions are made in the provision of telephone service. We were surprised to find that major decisions, often involving very significant sums, were regularly made by non-management bargaining unit (union) employees. Hence, it became a point of interest to see how the introduction of ERP and it concomitant work process reengineering would impact authority, decision making and the organization of work. Thus the four areas listed above became themes to be explored in subsequent interviews and provided a framework for the ongoing analysis. From this material we excerpt several key points for discussion below.

A. Primary reasons for the move to ERP

The reasons given for early moves to ERP systems centered on the desire to consolidate processes and achieve competitive advantage via the 'best of practice' industry reference model available in the ERP system. From our interviews we learned that the Y2K concern became the primary argument that BCTel management used to gain support for their SAP acquisition decision. Interoperability of system components and of shared data were also strong motivators, as was the planned savings to be realized in head-count reductions. However, by early 1998 Y2K fears began driving the ERP implementation. These points are made in the following excerpt from one interview.

DT: OK, I'm very interested in this, I'm guessing as we hear themes that the Y2K was one big one.

M1: For us it would be the biggest because most of the systems that we had, some of them were 25-30 years old, and they were all written either in Cobol or they were written in other old machine languages that definitely were not Y2K compliant, they were all into the 2 digit...

DT: So that was actually voiced as one of the primary [reasons]

M1: Absolutely, that was the selling point of SAP, because what you've got is how much money do you spend to remodify home built systems, or do you take that to modify and make it Y2K compliant, and then there's the odds and sods if you have to add to it, or do you get one that's already built that's got that large footprint that can take those various pieces of information and deal with it, maybe in a different way, and that's what happened to our business plan within BCTEL because we had to adapt within the SAP framework.

DT: Ok, Year 2K would be [reason] one, the second would be...

M1: Well, the second would be shared [data] access. And third would be more or less a continuity, so that when you put in a project number or if you put in an invoice number, ...if you put in 1, 2, 3, 4, 5 and at the far end of the system where it may be

the last time you see it it's still 1, 2, 3, 4, 5.

B. Impact on work force

Our early findings are consistent with other reports in the literature (Jacob & Wagner, 1999; Larsen & Myers, 1998), showing wholesale elimination of job classes and functions, and increasing worker stress. At BCTel the financial accounting and control functions were especially hard hit with reports of staff reductions ranging from a low of 12.55 to 100% in some departments. The turmoil appears to have been spread throughout the organization with departmental consolidation and other structural changes. The stress of change and of job reductions is being shared throughout rank and file and management. Those departments hit early were charitably spared the worry associated with not knowing what to expect. Interview after interview revealed that the stress of dealing with a shrinking workforce, increased workload and with having 'the Sword of Damocles hanging over one's head' was having a detrimental impact on employee morale and productivity. One manager we interviewed expresses it as follows:

M1: So I think there's going to be a huge transition, some people will be impacted only in the respect that their lives will be put in turmoil for quite awhile as they go through this. At the end of it, if it's successful and should it be successful, it has to be successful in order for the new company to be competitive, …

The business plans always state that, they say when we implement it SAP, that there was always a head count associated within [some period] of a fairly radical new process, because of the work that changed. You suddenly no longer need that support, you suddenly maybe even in the middle management side, don't need the staffing required that was there to support the various systems that were there before, I mean this is one of the sound points of SAP. Not only does it cost you $56 million, but when you can [recoup] your $56,000,000 by laying off or firing 28 managers and 15 clerical, or whatever, there's an offset. … I don't think [release] 4.6 or 4.5 is going to make any more of an impact on what we've got right now.

Moreover the workload was increasing for those who did survive the cuts. We continue to be told that the increase in workload is not necessarily offset by improved system support.

JP: [before SAP] "9 of us supported 30 sales people where we now 5 support 80 salesmen".

C. Implementation Issues

The implementation of SAP was unlike any other previous systems implementation at BCTel. In previous large-scale development projects management had assembled project teams of bargaining unit personnel (union members covered by the union contract), management and IS staff to

be involved in the whole range of requirement identification through implementation, training and evaluation lifecycle activities. As a result interviewees reported that legacy systems were well liked and served their intended purposes very well. Moreover people reported that the process of systems-organization integration in the past had been relatively smooth and unproblematic. The SAP project stands in sharp contrast to the systems development activities of the past. In the transition to SAP R3, bargaining unit personnel were precluded from early participation. Indeed, more than 15 months of planning and preparation by management and SAP consultants had been completed before the union was informed of the intended transition to SAP. Although there is a legal requirement for management to provide adequate notice of technology change so that the union can plan for retraining and transitioning those of its affected members, they were not notified until only four months prior to the going-live date of the SAP system. The results of this management action are the subject of considerable interest and will be more fully explored in later work. However for the purposes of this paper it is important to note that management ultimately found it necessary to turn to the very persons excluded from pre-implementation activities to sort out and make the delivered system configuration viable. In the weeks following the go-live date normal work ceased. SAP as implemented in many areas was radically different from previous systems and way of thinking about the work at hand. What little training had been offered workers

was of little use for two reasons. First, it simply was not very good. We had many examples of how trainers could not answer basic questions about the system use and how pieces related one to another. It soon became clear that the configuration was not up to par and that consultant and management trainers knew neither the work processes nor the system well enough. Second, the training as offered was during the workday with its normal demands and interruptions and in many cases was given long before workers had the opportunity to connect and actually use the system. Thus the material provided in training was lost as it could not be immediately applied or because system elements had changed. The apparent corporate strategy to exclude user communities from the configuration community and to rely instead on management only had backfired. As a result in a number of instances users were left to fend for themselves and learn largely by trial and error. This had a very interesting consequence. A number of users began to master system use and some began to record the procedures they followed in so learning and using the system. As word spread in bargaining unit circles other workers began to call and email the more adept workers and ask for instructions and assistance. Eventually management learned of these people and in two instances tapped them to create 'users manuals' for general distribution on company intranets and the like. We interviewed three of these people. Management identified and recruited these persons without telling them that their particular job classes had been targeted for eli-

mination. Once the task was completed these people were made redundant. This provides but one illustration how the SAP implementation is much more instrumental in its approach to the worker/user community and less sensitive to organizational surroundings and culture than had been past practice. As of this writing numerous subsystems remain in disarray and even so the newly merged organization is not moving to update to R4.6 and move to a common SAP footprint for the new organization.

D. Integration issues: difficulties despite being SAP R3 users

Both BCTel and TELUS continue to face significant and traumatic transitions since the merger. For BCTel, these began with the move from well-liked legacy systems to a major SAP implementation that went live in Mid-1998. The integration of the two companies (BCTel and TELUS) after the formal merger necessitated a consolidated SAP implementation in order to integrate the data and work processes of both organizations. To bring this about the management decided in 1999 that the BCTel organization should upgrade to SAP release 4.6 to match TELUS. The implementation was expected to have been completed in the first quarter of 2000. Nominally the transition to the integrated SAP system in the British Columbia (BC) and Alberta (AB) operations happened in two stages following preparatory upgrades to hardware and facilities were in place for the new combined operations. Alberta moved to the new operational setting in March of 2000 at the

same time they changed from SAP V3.1 to V4.6d. BC made the first transition to the new integrated system with AB in June of 2000. However, as of this writing the combination of operational systems is not complete and actually remains in dispute. The current and historical data from BC were not brought into the new system. For instance the former BC operations center continues to house the data warehousing. The BC historical and 'actuals' data remains in an SAP v3.1 on the old operations complex. Respondents report that there are many data conversion problems and describe the merger and the SAP integration project as a "work in progress." A central problem persists; namely, that the processes used by each former provincial company are different.

Table 1 provides a summary of how reference modules were interpreted and used at BCTel and the mapping of modules at each organization. This points out an interesting fact. Namely, while both organizations were using SAP there were significant and unexpected differences in the particulars of the implementation at each site. The BCTel approach was one they called the 'big footprint' where a set of modules were acquired and imposed on the organization. Business process reengineering was accomplished in concurrence with and was driven by the software. The organization remains in the midst of wrenching changes as it seeks to adapt its new processes and structures to the demands of the software. In the instance of Telus the organization configured highly customized modules which more closely matched the organizational culture and

work procedures at Telus. The result for the newly merged company was additional trauma. Each company had adopted SAP. It was therefore expected that consolidation of process and data would be swift and relatively painless. But the significant differences which existed in the procedures and corporate cultures of the two companies were exacerbated by the residual of the differing cultures in the remaining legacy systems and in the customized modules and the embedded cultural assumptions of the ERP itself.

Respondents report process integration problems as being territorial disputes.

"There remain lots of turf fighting ('our process is better than yours'). Until someone makes the decision to align the processes, there really isn't a common system." DG 2/15/01.

Operational imbalances reflect the very different managerial and operational styles of the old partners. For instance, as an artifact of the labor history and labor contract, in BC bargaining unit (union) employees have higher levels of operational control and systems access than do their counterparts in Alberta. As a result of the historical contract provisions it was more difficult for management to replace unionized workers with access to the system by non-unionized or 'exempt' employees. Interestingly this has meant that in BC there remain more employees working with the SAP system who retain a sense of organizational operational history than in Alberta. The unionized employees handle their side of the operation more efficiently than the newer nonunion management

designated hires. As it applies to the SAP integration, in BC two bargaining unit employees run the capital budgeting system for BC whereas in Alberta around 20 'management professionals' (non union) provide the same function for Alberta.

V. CONCLUSIONS

This paper reports on research in process. Indeed we expect to follow developments in these organizations for some time to come. As such, preliminary findings reported above reflect a small piece of a dynamic picture. By its very source the focus of this research differs from extant work on ERP systems research. This work has caused us to reconsider traditional views of implementation success from that of a management-centric view to one encompassing both the local narratives of workforces and communities in transition because of a software system change. It has also caused us to modify our conception of how easily ERP allows for integration of organizational data and processes and presumptions that the merger of firms using similar ERP would guarantee smooth and successful transitions. For instance, two benefits of ERP systems are suggested that may actually work against successful integration of ERP systems and be an inhibiting element in corporate mergers. One of the chief benefits of using industry reference models is taken to be that the implementing organization can feel confident that it is using 'best of breed' work processes. Such implementations have become quite common. Indeed, the SAP pro-

duct ASAP was developed to help firms that choose to adopt standard implementations of the software systems do so as easily as possible. Such implementations provide a degree of standardization that it appears is thought to allow a relatively painless integration of companies using SAP. But some companies choose to take advantage of a second important and lauded facility, that is the ability to highly customize the ERP to reflect a firm's distinctiveness and cultural differences. Such was the case of Telus of Alberta before the merger. In such instances the benefits of standardization are given up making the integration of multiple ERP implementations far more problematic. Moreover, as was discovered at Telus, a move from a full software release to a higher version, particularly one involving architectural change, is not a trivial transition.

Not all SAP initiatives have been successful. Examples of limited success and outright failure (Davenport, 1998) indicate that the means to correctly implement such software systems are not yet well understood. This on-going research, as such is limited in several ways. First the findings are descriptive of an unfolding and dynamic set of events. Hence any report is going to present an image frozen in a time which by the nature of events is out of date. It is a study that looks at organizational and institutional issues, from the bottom up. It is not a view infor-

med solely by managers, although some former organizational managers were interviewed and provided valuable corroboration of our data. Rather it is a view principally informed by the experiences and observations of engaged line workers some of whom were elected to key representative positions within their labour union. Thus their view could be expected to privilege human versus organizational goals. But it is also a view that places the impact on whole communities above that of a single business organization. As such this is a refreshing and unique and perhaps even holistic view of a major ERP implementation affecting the lives of hundreds of thousands of customers and thousands of employees. Finally, because this is a study drawn from a single site in a cultural, legal and political setting that is very different from that in the United States and in Europe, its uniqueness makes it impossible to generalize to all ERP implementations. However, given that the setting has elements similar to both American and European legal and cultural conditions some lessons and cautionary notes may be gathered in examining the events as they unfold in Western Canada. Ultimately it will be up to the reader to decide whether or not, in examining the impact on a competent and engaged professional, technical and blue-collar workforce, one may have a better understanding of the ERP implementation process.

| MODULE as used | Modules in use by at time of merger: | |
	BCTel	*TELUS*
Financials (FI) (accounting) All financials, managerial and financial statements	Accts. Payable; Accts Rec'ble; Accts. Mng't; Reconciliation	A/P, A/R, A/M
Controlling (CO) (overhead cost and product cost) All operating budget by cost center and work center	Clerical	Clerical
Investment Management (IM) (Capital investment) Capital structure and capital budgeting	Capital mngt.	C/M
Project System (PS) Project management planning work and resource allocation budgets and tracking plan through implementation	Networks: techs, clerks	PM, Tech, Clerks
Work Flow (WF) Way of handing off work to be done; electronic distribution; manage signoff; managerial function, do we have the $$ and people?	Net OPS	na
HR Human resources Training completed, skill set tracking. Currently PeopleSoft provides benefit tracking and management	[PEOPLE SOFT]	na
Plant Maintenance (PM) Maint. of test equipment, truck maint., switches…	Tech Craft	na
Sales and Dist. (SD) Salesman sells, generate warehouse picks, billing and charging, work scheduling, PBX orders	Clerks, sales, techs	na
Materials Management (MM) Ordering, materials stocking at warehouse, pick tickets (Catalyst used at BCTel)	[Catalyst] plant, drivers, clerks, buyers	na

Table 1: SAP Modules as used at two firms

REFERENCES

Bashein, B., Markus, L. & Finley, J. (1997), *Safety Nets: Secrets of Effective Technology Controls*. Morristown, N.J.: The Financial Executives Research Foundation.

Beath, C.M. & Orlikowski, W.J. (1994), « The Contradictory Structure of Systems Development Methodologies: Deconstructing the IS-User relationship in Information Engineering ». *Information Systems Research*, December 1994, Vol. 5, n°4, p. 350-377.

Bond, B., Pond, K., & Berg, T. (1999), *ERP Scenario* (Strategic Analysis Report): Gartner Research and Advisory Service.

Davenport, T. (1996), « Holistic Management of Megapackage Change: The Case of SAP ». *Paper presented at the Third Americas Conference in the Americas, Phoenix, Arizona*.

Davenport, T. (1998), « Putting the Enterprise into the Enterprise System ». *Harvard Business Review,* July, p. 121-133. Editorials. (2000, May 1). « ERP Apps Must Preserve Flexibility ». *Internetweek*, p. 39.

Fingar, P. (1999), « Enterprise Architecture for Open Ecommerce ». *Component Strategies,* February, p. 44-48.

Glover, S.M., Prawitt, D.F. & Romney, M.B. (1999), « Implementing ERP ». *Internal Auditor,* February, Vol. 56, p. 40-46.

Harris, J. (1999), « Designing change management strategies for ERP systems: observations from Alamedia County, California ». *Government Finance Review,* August, Vol. 15, p. 29-31.

Jacob, G. & Wagner, T. (1999), « Rapid ERP Implementation: the Tuolumne County, California experience ». *Government Finance Review,* August, Vol. 15, p. 33-38.

Larsen, M.A. & Myers, M.D. (1998), « BPR Success or Failure? A Business Process Reengineering Project in The Financial Services Industry ». *Paper presented at the Proceedings of the Eighteenth International*

Conference on Information Systems, 14-17 December, Atlanta Georgia, USA

Ngwenyama, O. (1998), « Enterprise Resource Planning and SAP: an occasion for organizational change? », *Technology Change and Contracting Out Joint committees of the TWU and BCTel.* Vancouver, British Columbia.

Riper, K. & Durham, M.J. (1999), « Phased ERP implementation: the City of Des Moines experience ». *Government Finance Review,* August, Vol. 15, p. 37-43.

Sawyer, S. & Southwick, R. (1997), « Transitioning to Client/Server: Using a Temporal Framework to Study Organizational Change ». In A. Lee, J. Liebenau & J. DeGross (Eds.), *Research on Qualitative Methods in Information Systems* (p. 343-361). New York: Chapman-Hall.

Soh, C., Kien, S.S. & Tay-Yap, J. (2000), « Cultural Fits and Misfits: Is ERP a Universal Solution? », *Communications of the ACM,* April, Vol. 43, n°4, p. 47-51.

Truex, D. & Baskerville, R. (1998), « Deep Structure or Emergence Theory: Contrasting Theoretical Foundations for Information Systems Development ». *Information Systems Journal,* 2 April, Vol. 8, p. 99-118.

Truex, D.P., Baskerville, R. & Klein, H.K. (1999), « Growing Systems in an Emergent Organization ». *Communications of the ACM,* August, Vol. 42, n°8, p. 117-123.

Truex, D.P., Baskerville, R. & Travis, J. (2000), « Amethodical Systems Development: The Deferred Meaning of Systems Development Methods ». *Accounting Management and Information Technologies,* Vol. 10, p. 53-79.

Truex, D.P. & Ngwenyama, O.K. (1998, May 8-10), « Unpacking the Ideology of Postindustrial Team-Based Management: Self-governing Teams as Structures of Control of IT Workers ». *Paper presented at the Work, Difference and Social Change: Two Decades after Braverman's Labor and Monopoly Capital, Binghamton, New York*