

12-31-2002

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## Recommended Citation

Richardson, Helen; Peszynski, Konrad; Yoong, Pak; and Hope, Beverley, "The Role of Information Systems and Technology in Case Management: a case study in health and welfare insurance" (2002). *ACIS 2002 Proceedings*. 88.  
<http://aisel.aisnet.org/acis2002/88>

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# **The Role of Information Systems and Technology in Case Management: a case study in health and welfare insurance**

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## **Abstract**

*This study reports the role of information system and technology (IST) in supporting case management at the Accident Compensation Corporation (ACC) of New Zealand. Case management is a managerial approach that seeks to gain improved business performance by enhancing both employee and customer satisfaction. Despite millions of dollars spent annually by health, social, and insurance agencies in automating case management, little research has been conducted into the role of IST in this practice. The findings of this study show that for ACC, IST's most valuable role is enhancing the relationship between client and case manager rather than replacing it for, even after the addition of IST, the most valuable knowledge continues to accrue from the face-to-face interaction of client and case manager. The findings also show two distinct phases to the development of case managers as knowledge workers. The first phase focuses on control of the processes and the second on the delivery and sharing of information resources.*

## **Keywords**

Case Management, Knowledge Management, Process Management, Quality Management, Customer Relationship Management

## **INTRODUCTION**

Case management is a human-centred managerial approach that seeks to improve business performance by enhancing employee and client satisfaction. In the last decade case management has made a resurgence in a new form (Davenport and Nohria, 1994; Gemignai, 1999). The new case management incorporates process management practices and knowledge management (KM) enabled by information systems and technology (IST). In this form, it is being used in both the private and public sectors to help organisations become more responsive to customers.

IST is thought to provide case managers with insight into the support process. However, little empirical research has been conducted into the role of IST in Case Management (SRM, 1999). This study examines the research question:

How does information systems and technology support effective case management?

To address this question we undertook an organization-wide study at Accident Compensation Corporation of New Zealand (ACC), a major public sector health insurer. The study sought to determine the strategic objectives of IST use and how that strategy filtered down through the organisation. The work is founded in the theory of quality management and knowledge work, and the results are considered to have relevance to both practitioners and academics

The remainder of this paper is presented in five sections. First we review the relevant literature, and then we present the research design. The findings report on the transformation of public servants into knowledge workers, the role of IST in turning case managers into knowledge workers, the improvement of client relations through improved

knowledge, and concludes with eight necessary IST practices. In the discussion section the findings are related to the literature and to practice.

## LITERATURE REVIEW

### Case Management

Case management, like so many terms, can mean different things to different people. For example, in the health and social sector the focus is on the client's rehabilitation as in Gill (2000):

*A process directed at coordinating resources and creating flexible, cost-effective health-care options in collaboration with the treatment team for individuals and their families, to facilitate optimum care.*

(Gill, 2000:1)

In the newer business applications, where powerful IST systems are used to provide case managers with the information they need, the emphasis is on process efficiency as Davenport and Nohria (1994) describe:

*The case manager role represents a break with the conventional approach to the division of work. Individuals or small teams perform a series of tasks from beginning to end, often with the help of information systems that reach through the organisation. Case managers provide a way to increase organisational efficiency, timeliness, and customer satisfaction.*

(Davenport and Nohria, 1994:1)

To understand these differences, it is instructive to briefly review the development of case management. The practice first appeared in the 1920s in the health and social sectors (Biestek, 1957; Davenport and Nohria, 1994). However it was not an influential feature of welfare programmes until the 1960s when it became recognised and often directly funded (Walker, 1996; Gill, 2000). In the 1990s case management was taken up by some businesses that sought to compete, or merely to survive, following the 1987 stock market crash (Abell, 2000). New managerial approaches and restructuring sought to turn companies into lean, innovative and adaptive organisations that could fight to survive in the new environment. One of the most famous approaches was BPR. Case management in business came to be seen as a derivative of BPR in as much as both are process orientated, and both sought to improve efficiency and client service (Davenport and Nohria, 1994).

During the 1990's recession, governments realised that they, too, must downsize and focus on core competencies; it was no longer acceptable to run inefficiently (Blackwell, 1993; Johnston, Romzek and Barbara, 1999). This was particularly evident in New Zealand which led the world in economic reform (Myers, 1996; Eggers, 1997). Furthermore, the rise in welfare benefit claims during the recession placed an increased strain on the government resources (Halachmi, 1995; Walker, 1996). This led government agencies into an era of efficiency and they began to follow the lead of their private sector counterparts with new management approaches.

Case management philosophy centres on building a lasting and effective relationship between case manager and client (Biestek, 1957). A client focus is kept as one worker or one team performs a service rather than allowing it to pass through numerous functional units (Davenport and Nohria, 1994). Service quality is further enhanced through improved satisfaction of employees (Davenport and Nohria, 1994). This is consistent with Heskett *et al.* (1994) "Putting the service profit chain to work." In this organisational culture, the employee becomes an asset or 'human capital' to be supported, encouraged, and enhanced. Part of this support will be provision of necessary information to complete the job. Thus, case management combines the principles of quality management, process management, and KM, and IT provides the support.

### **Process Management and Case Management**

The economic transformation of post-war Japan was founded upon a focus on process control backed by a supportive management philosophy of customer focus, long-term focus, objectivity, and teamwork. In the 1980s Total Quality Management gurus such as Deming (1986) and Crosby (1979) began to popularise this approach in the United States. The new approach was shown to not only improve quality, but also to reduce costs.

Proponents of BPR subsequently picked up the process focus. BPR highlighted the process focus, paid some attention to customer focus, but tended in practice to overlook employee contributions and satisfaction. BPR was often used to justify mass redundancies or downsizing (Klein, 1994; Uzzi, 1995). In these cases IST was employed to eliminate, not enhance, the human component (Manion, 1995) and *dumbsizing* ensued as people walked out the door, taking their knowledge with them (Eggers, 1997; Rayburn and Rayburn, 1999).

Despite many failures, a small number of companies succeeded by adopting human-centred approaches (Senge, 1995). Case management was one such approach (Blackwell, 1993; Halachmi, 1995; Zaidifard, 1998). The human-centred focus of case management was enabled by new IST that could simplify procedures and centralise decision making knowledge (Carey, 1993; Hammer and Champy, 1993). Empowered employees became involved in decision making and created unique flexible solutions for clients (Hammer and Champy, 1993). The strategy was aided by the rise of knowledge work which some dubbed 'post-modern reengineering' (Manville and Foote, 1996).

### **Knowledge Management and Case Management**

The concept of knowledge work was spawned in 1966 by Peter Drucker, who observed job changes in white-collar work following the introduction of IST (Drucker, 1993). Computers allowed for the refining and organising of data such that it added value by producing information that could be used in new ways. To manage this new resource academics sought to define knowledge. Davenport and Prusak (1998:1) defined it as "information combined with experience, context, interpretation, and reflection".

Two types of knowledge are recognised: tacit and explicit. Tacit knowledge is "know-how possessed by individuals. It is often intuitive and demonstrated more in how someone goes about work in a knowledgeable way." Explicit knowledge is: "systematically documented know-how that becomes available to everyone in an organisation" (Cortada and Woods, 1999:xi).

Knowledge Management is based around three key notions: electronic information storage, the knowledge worker, and knowledge management (Lytras, Athanasia, and Poulymenakou, 2002).

IST is central to the concept of KM as it increases the ability to store, process, retrieve, and distribute knowledge (Thom, 1996). After an era in which database systems churned out endless reports that nobody read, academics and practitioners realised that knowledge was more than summarised data; it included sharing and development of unique insights (Thom, 1996; Davenport, De Long and Beers, 1998; Huber, Davenport and King, 1998). KM technologies include data warehousing, data mining, groupware, Intranets, Extranets, web portals, document and intellectual capital applications, and scanning technologies (Orna, 1999). But KM, too, has failed for many organisations and practitioners are beginning to realise that what is important is how the technologies are used (Bhatt, 2002). KM is not the sinking of information into a "hum of servers, software and pipes" (Hildebrand, 1999), but is the use of IST to transform data and information into knowledge.

The objective of KM is to make the knowledge worker more productive (Drucker, 1999; Gao, Li and Nakamori, 2002). Organisational success rests in the hands of competent, motivated knowledge workers who understand the importance of using information to further business goals. To achieve full productivity, knowledge workers need self-autonomy, the ability to innovate, the chance to continuously learn, and recognition that quality is at least as important as quantity (Drucker, 1999). Job satisfaction is also important. IST-enhanced case management can turn mundane tasks into satisfying tasks by empowering workers to be

proactive (Maniccia, 1999). In this environment, workers become an asset rather than a cost (Drucker, 1999; Ulrich, 1998).

Knowledge Management is a pre-requisite to any activity involving knowledge sharing (Rowley and Farrow, 2000). It involves not only the storage of information, but also the ability to retrieve it in a useful form (McCune, 1999). But this idea goes deeper incorporating an ability to have the best flow of information (Parsons, 1996; Fahey and Prusak, 1998; Gao, Li and Nakamori, 2002). Changing the information flows can solve problems of organisational change by breaking down functional stores of knowledge.

In summary, the new case management is a knowledge-based form of process management enabled by IST. Nevertheless, the primary focus in case management is not on IST nor on processes, but rather on the relationship between the worker and the client (Beistek, 1957; Gill, 2000). Many of the critics of BPR attributed its mass failure to implementations being technology-focused rather than human-focused. Case management is an approach that faces this criticism head on. In contrast to BPR, KM emphasises the freeing up of employees and creation of an environment for learning. Case management embraces both these views and thus may offer a new methodology for the knowledge age.

## **RESEARCH DESIGN**

This research was bounded by a three-month period yet sought to gain a holistic insight that would end in a rich description to portray the reality of the organisation. The chosen method was interpretive case research which allows for the study of contemporary events of a single social unit in a natural setting within a bounded time and duration whilst allowing for an intensive, holistic description (Yin, 1989; Merriam, 1988).

The principal researcher was the primary instrument for data collection and analysis. Data were mediated through the researcher, who clarified and summarised data as the study continued. This was enhanced by the researcher reflecting on her own work experience and using it to negotiate a shared reality with participants. This also aided in collection of sensitive data due to the trust-building associated with this activity.

### **Data Collection and Analysis**

ACC is one of several New Zealand government agencies that have adopted case management. It was selected for this study because it had experienced success with case management through investment in IST.

ACC is a government-administered organisation, established in 1974 to provide a comprehensive range of benefits for accident injuries. Compensation is payable regardless of fault, making it a form of compulsory social insurance. Changes to Government policy in the mid-90s placed ACC in an environment where they had to compete commercially. Survival required IST be brought up to the industry standard with specialised software, call centres, Intranets, and Extranets. Around the same time there was an internal shift in focus from claims processing to aiding recovery. ACC adopted the practice of IT-enabled case management and by 2000 had achieved business success.

Participants for the study were selected from different levels within ACC to gain a holistic view. These included the CEO, three IST/ business development managers, and four case managers. Clients were not included due to privacy concerns. Managers in ACC undertook the selection of case managers because of the highly sensitive nature of the work. A major criterion in selecting case managers was that they be competent with the computer system used. Two of the four case managers were power users of IST, while the other two were confident users. All had long-term experience as case managers within this or another organisation. Participants include both males and females and a variety of cultural groups.

Information was gathered from interviews held in a meeting room and from limited observations of computer screens and workstations. The hour-long interviews were semi-structured with open-ended questions designed to encourage disclosure. A grand tour question was used, with a series of subquestions designed to prompt participants if issues of interest did not naturally arise. Questions were developed using a combination of Merriam (1988) and Spradley's (1979) categories.

Data analysis occurred simultaneously with data collections, starting at first contact and ending on completion of writing of the rich description. Data analysis involved looking for patterns, which were not known in advance but were left to emerge from the analysis. Significant meaning was gained from single instances as well as from repeated comments (Stake, 1995). The researcher continually checked with participants to verify these patterns. This approach to analysis is taken from de Laine (1997), and involved the selection and definition of the phenomena, and the incorporation of individual findings into a rich description. Interviews were coded with single words or phrases that tied related concepts together (de Laine, 1997).

Internal validity for this interpretive study was viewed as the accuracy of information and whether it matched reality. Triangulation using different sources was not possible due to the sensitive nature of work and prohibition on observation and document collection. Instead the study employed:

*Triangulation within and across groups:* Categories were continually checked between members of the same group (same employment category) and across different groups. This led to categories being confirmed or deleted.

*Checking validity of interpretations:* This was achieved in follow-up meetings to ensure that the categories reflected the participants' reality.

*Acknowledgment of researcher bias.* This was achieved by keeping a journal to acknowledge the researcher's emotional state at the time of interviews and later to debrief the researcher prior to transcribing and coding.

*Checking for plausibility and credibility.* The researcher drew on her own work experience in a similar job to test if findings were plausible.

Generalisability for this study comes from the ability of the rich description to create a portrait of reality for this organisation that allows the reader to reflect on their knowledge and experience and gain insight beyond this single case (Merriam, 1988). The second form of generalisability is seen in the ability to extract hypotheses from this research for future studies, both qualitative and quantitative (Yin, 1989). This research has provided multiple concepts in the areas of case management and knowledge work that can be later expanded with further research.

## **THE FINDINGS**

### **The Transformation of Public Servants to Knowledge Workers**

From a prior position of deficit, ACC has created budget surpluses in the past three years that are greater than Telecom's profits. This transformation is due to the vision of the CEO who has taken ACC on a journey that has transformed public servants into professional knowledge workers. One of the keys to success has been the supporting of case management with IST.

### **Turning Case Managers into Knowledge Workers with IST**

For case managers at ACC the use of IST has been empowering, but not in the traditional sense of increased flexibility and innovative work practices. Rather, IST has allowed case managers to present themselves as professionals to the clients they serve. As one case manager commented:

*Initially you get very intimidated by new systems, especially when you are used to working the old way – handwriting things down. You think, “This is the paperless world.” To me [the new system] is very helpful. It is so much easier to deal with the client on a professional level. You have it there at your fingertips – a full description of the [previous] conversation was with that client.... For instance, it brings up an automatic date, and you can say, “Yes, well I spoke to you on the 18th”. It portrays an image that we are accurate with information gathering – which is important... That we have taken notice.*

*In the past, when a client asked a question the case manager had to sort through paper files ... and often returned with the answer "I don't know." The client's response was "You don't know and don't care." This signalled the closing off of a cooperative relationship between case manager and client.*

(Case Manager 4)

Now case managers can type into their desktop computer and find out exactly what the situation is for their client or for a colleague's client As one case manager observed:

*I can access anyone's clients, if I am dealing with that client. [The system] is user friendly, I know what to do... It's time saving. Instead of having to go physically to find a file I can look up the activity log of the client – it is there, the whole activity log... When they phone, and we can answer them – it's much more helpful than "Er, hold on."*

(Case Manager 3)

It is also useful for managing the managers, as the CEO observed:

*It's putting in intelligence, and checking standards against the practice of case managers. So it can be used as a tool to manage claimants but also as a tool to manage case managers.*

So, the key to success has been the control of information. In the past information was lost. Not only accidentally – taken away by a cleaner or knocked down behind a cabinet – but lost in files, lost between case managers, lost in another branch. IST is being used to help locate information, by providing standardisation, control, and access. Asked about the role of IT in supporting case managers, the CEO responded:

*The main role is to provide information for the case manager that is fresh and current. The case manager is dealing with the individual in real time and information needs to be available in real-time. We are developing a system called Pathway where all interaction is available along the pathway nationwide to anyone. So if I go on holiday to Invercargill and hurt myself, but live in Whangarai – wherever I am – my details move with me... the real role of IT is to have information available. So the case manager can pick it up and say, "What does this woman need? Where's she at? Where are they in the process?"*

### **Improved Client Relations – Knowledge as a Relationship**

For some years, ACC has had to function in the shadow of their past image, trying to prove to clients that there is a new way of doing business. The information that IST provides is helping clients see the new corporation. So, IST has been an important part in rebuilding ACC's image. Electronic control of information has created stronger bonds with clients. As a case manager explains:

*[Frequently] when I write a letter, I cut and paste it into the system as well. It's really good because if the client phones and says, "You didn't send me that letter," I can go into the system and say "on the 17th of July I sent you this letter, and I've got copy here"... Or, if someone comes to see us they can see it on the system. The interview rooms down stairs all have computers, so we can show it to them, which is good. It makes them feel good because they think, "Oh, you are telling me the truth, you're not just saying to me that you did."*

(Case Manager 3)

Case managers now have more knowledge at their fingertips, and they are using this knowledge in intelligent ways. They do not use the system to make decisions; they use it to negotiate with the client. A client may want something that ACC cannot deliver, but the case manager can access the client's file to identify other areas to work on. So, IST has aided the

human face of case management. People come in battered, bruised and bewildered, case managers help them gain their legal entitlements, get help, and re-motivate them back to work. A difficult task when you are managing 100 clients, but a task made possible by IST. A case manager explains:

*In my team, the tail team, we are dealing with people who have been [clients] 10 to 15 years. It has become the longest job they have ever held, ACC. You have to be patient and work with them and all the service providers as well. We work with vocational assessors. We try to maintain good relationships with clients' GPs... like, where can we refer clients for specialist reports so we can get a full picture for the claimant and the GP... IT makes it easier for us.*

(Case Manager 1)

So at the front line, case managers have found IST provides them with the ability to function professionally and develop closer relationships with clients. However, the system at ACC was not developed by chance. Behind this improvement has been a story of putting in place the right IST practices.

### **The Right IST Practices**

Sound IST management practices have helped ACC achieve the transition from public servant to professional knowledge workers. These practices are: leadership and vision, linking IST to the vision, inculcating a human centred strategy, harvesting IST, employing a flexible architecture, standardising business processes, understanding the core business, and fostering the right culture.

#### **1. Leadership and Vision**

Change management and system development literatures call for a champion to lead the change. ACC's CEO is such a champion. He has played an important role in inspiring workers to move forward into a new era of professionalism. His vision for the company sees a 'virtuous circle' of staff satisfaction, customer satisfaction, and improved business performance, and IST has been used with this vision in mind. The CEO understood that IST was the only effective way to achieve standardisation and control. Furthermore, he inspired case managers so that they recognised that the new controls were designed not to hinder them but rather to cause the corporation run smoothly:

*It is no good having case management if you do not know what you're doing or you do not have good control systems... As we've tightened our control systems, we've had remarkable gains. We have reduced costs by about 50% in 3 years ... and that's due to case management. But you need clarity concerning what you want to do. We spent a lot of time talking to the case managers so that they understand the vision of the company... You cannot be beside them all the time when they are making those calls.*

And later...

*What we have found is that if you do it right the first time, if you do it quickly the first time, you are very likely to reduce cost and get greater customer satisfaction – a happy customer, a virtuous circle. The IT part of this is to provide a tool to support case managers.*

A case manager confirms this, with:

*IT has made us more conscious of our statistics on the KPIs by which they measure our performance [so] it is not only helping case management, it is helping at head office.*

(Case Manager 4)



## 2. Linking IST to the Vision

From day one, IST has been linked with business strategy. Initially the IST people worked in the same building as the business people – each learning from the other. Now separated, the bonds remain strong. Each has a rich understanding of the other's expertise. On the business side, care was taken to be not only 'top down,' driven by the CEO and general managers, but also to go back to the case managers and see how IT is working. So, ACC has achieved the normative model of IST strategy, top down/ bottom up. Employing a former case manager as head of the business team has helped in understanding case managers' needs.

*As a result of restructuring we ended up working here alongside the technology people... That was a key thing – that we had business people and technology people in the same place, working together. The technical were learning about the business, and the business were learning about the options.*

(Manager 1)

Asked about future IST plans for ACC, the CEO responded:

*Making more and more systems available on-time, online to case managers... Another plan is to use e-Commerce more and more – that's the big strategy. Most of our interfaces with doctors, such as ordering forms and receiving forms, are online. Which is quite good. We get claims in real-time and notification of accidents in real-time. So, instead of waiting 7-8 days for the practice nurse to bundle them up and put them in the envelope, we are getting them the next day.*

## 3. Supporting a Human-Centred Strategy

IST has enhanced the way people work. It has helped managers to handle large numbers of clients whilst still focusing on each one as an individual. As previously mentioned, IST has been linked with business strategy, and the strategy at ACC is focused on supporting employees in performing their job. The CEO commented:

*If you just let God do his work and let people motivate themselves... a large proportion will make it back [to work] themselves. We are looking at the marginal peoples who need a bit of a hand to get that way.*

*The other issue is that people have an entitlement, in law, to ACC care. But some people get confused and bewildered by the process. If you have a traumatic brain injury as a consequence of a car accident or severe concussion and you need physiotherapy or help to re-jig your life, you really do need assistance... The earlier we can get people in to be re-crafted, the better.*

## 4. Harvesting IST

ACC has adopted a lot of the latest technology including Intranets, and Extranets. Their aim, however, is to keep current without using risky technology.

*We are leading edge, not bleeding edge.*

(Manager)

ACC has plans for advancing the technology available to case managers and for supporting processes but it is not rushing into new initiatives. Rather, ACC is working to understand business needs and ensuring functionality prior to purchase. This is seen in their adoption of the Internet. Access has been tightly controlled so that the business is supported, not hindered, by access.

## 5. Employing a Flexible Architecture

Businesses in rapidly changing environments need flexible IT architectures. No New Zealand Government agency has had to change more than ACC to meet the needs of new legislation. In many respects, their environment is more chaotic than that of businesses downtown. Their flexible IT architecture allows rapid adaptation. As one manager said:

*[Our IT system] has to be responsive to changing business requirements. Particularly at ACC, where changes of government result in complete changes in legislation, so we have to completely rip out what we put in a few years ago... We have to be very adaptive. Saying we can't change it till a year's time is not good enough. Fortunately we have a platform that is very flexible. It can talk to completely different databases all over the place. And that was not accidental.*

(Manager 2)

## 6. Standardising Business Processes

In the past case managers steered away from adherence to the relentless stream of legislated requirements that is part of being a government department. However non-standardisation led to less efficient work practices that could delay recovery for a client or result in underpayment or overpayment of claims. In the new standardised system, the more routine aspects of claims such as required legislative payments are calculated automatically, making for improved accuracy and adherence to legislation. In addition, the system keeps track of case managers, enabling supervisors to identify and support those who are not working productively. The application of ISO 9001 standards helps ensure that established good processes are maintained. As the CEO commented:

*One of the keys is to get control over processes. You can have flexibility when you have the process in control. Chaos is not flexibility; chaos is always chaos. There is a huge misunderstanding, that flexibility is good. Flexibility is good, but only when it should and ought to be applied... When I took over this organisation it was in chaos, not in control. The guys were trying to run self-managing teams. No one was taking responsibility for anyone. So there was heaps of flexibility, but there was heaps of fear because people did not know the right way to do things.*

## 7. Understanding the Core Business

One of the ways ACC has coped with change is by separating the core business from the change. Staff felt proud that throughout recent changes they managed to keep going – business as usual. This has been possible because of their ability to isolate the change in a project. For example, when the new Labour government brought back lump sum payments, ACC's reaction was, "It does not effect day-to-day business. It is just another system." As the CEO described it:

*The classic to date is the reintroduction of lump sum payments for accident victims... That will require development of an entire new IT system to support case management of lump sums, which is a fun exercise... [But] that's all right. The last change in legislation we ran something like 32 projects... Governments come and governments go, the main thing is to make sure you are not running on the spot all the time. We had a good run last year. We managed to keep focused on the key dynamics, while changing at the top. We tried to protect the organisation from [the change] and to keep them focused on the core discipline.*

*...It's easier if you are project orientated. We were able to set up project teams to isolate the change process from the operational process... The greater the extent you are able to keep them separated the greater the efficiency you get during the change.*

## 8. Fostering the Right Culture

In moving from a public service culture to a business culture, ACC has maintained the most important requirement of those serving the public's interest, interest in helping people. Case Managers have chosen this career not only to make a living, but also to make positive changes for the people they manage. In other privatised agencies, privatisation has often led to a bottom dollar focus.

Asked why they became case managers, one responded:

*I ask myself that question (laughter). Um, probably because I was a claimant myself. I know what it feels like to be on the other side of the door. I want to help people and I enjoy what I do.*

(Case Manager 2)

And from another...

*Many of the clients are agro (aggressive) and volatile. But there are a lot who aren't. And there are people who are very grateful. And that is wonderful – a huge pat on the back. "Hey, I have made a difference to that person. It has gone smoothly while he hasn't been able to work." ...I just like to know I made a difference. End of story. I don't know how else to explain it.*

(Case Manager 4)

The reason for success has been that ACC understood that cost savings could be made by doing things more quickly – that by gaining faster access to surgery, people could get back to work sooner. Case management ensures that information does not get lost between departments and IST has taken this further by allowing claims to be managed, no matter where the client is located.

A manager explains:

*I see IST as providing a system to enable case managers to track and manage claims. To manage rehab to the optimum. The ultimate goal is to get people to work and get them well... Making sure that a standard rehab for an injury is happening... So getting the right entitlement is a key objective... It's all driven by [the CEOs] vision of reducing costs and through reduced durations of claims, achieving customer and staff satisfaction.*

(Manager 2)

In summary, case management has resulted in a more proactive stance at ACC. Clients are assessed both physically and vocationally. Without IST, the successful coordination of treatments would be difficult. Appointments might be missed, claimants might sit forgotten at the bottom of a pile of claims, and an environment of information chaos could exist. With IST, they have the information they need to do their jobs. IST has enabled standardisation by supplying all workers with core knowledge. Furthermore, converting information into an electronic format has speeded up information flow. But above all, IST at ACC has enriched the manager-client relationship. Case management, coupled with IST has converted public servants into knowledge workers who care.

## DISCUSSION

We have seen little discussion of case management in the business literature, particularly in terms of how IST is applied to this practice. Yet, every year, in hospitals and social welfare agencies, millions of dollars are spent on automating this practice. This study provides some insight into this phenomenon.

Theoretical discussion of BPR and KM is prolific but it has been difficult to translate this into practice (Davenport, Eccles and Prusak, 1992; Harkness, Kettinger and Segars, 1996). Case management brings these two streams together in a cohesive practice and addresses many of the shortfalls that practitioners have found with them individually. BPR and KM can be seen to be at opposite ends of a spectrum, with BPR 'dumbsizing' organisations while

KM creates workers who are innovative and creative. BPR ignored the humans in the system and KM did not control the information flow leading to potential information overload (Knights and McCabe, 1998; McCune, 1999; Orna, 1999). Together, as in case management, they provide balance, allowing managers to focus efforts on caring, going beyond client satisfaction to relationships formation and mentoring (Biestek, 1957).

Projects to implement IST on the scale undertaken at ACC cannot be achieved overnight. Not only must the workflow change, organisational culture must change. From our study of ACC, we learned that KM is a two-stage process. First the organisation must get control of their information, and only then can it move to the next level, that of providing access that develops individual knowledge. The first phase is the long haul and includes getting workers to use the system and getting them to standardise practices. This research provides a picture of a company moving into the knowledge age. It demonstrates the two phases to knowledge work and suggests some best business and IST practices to be followed. By building pictures of such cases, a useful methodology can be articulated. In this way, we can provide a clearer picture of what needs to happen to achieve success.

This study also provides insight into the concept of knowledge itself and how best to leverage it. The study supported the view of knowledge as a social phenomena (Polanyi, 1958; Nonaka and Konno, 1998), that knowledge in its richest form is not stored in an individual's head nor held electronically, but is created during face-to-face interaction. Face-to-face interaction cannot be stored electronically but can be supported by IST through provision of accurate and timely information. In the past too much emphasis may have been placed on the electronic side of KM, and too little on supporting the face-to-face relationship.

The research has implications for ACC and the industry as a whole. ACC has managed to change public servants into knowledge workers, clerical workers into professionals. Recognition of their professional status is needed. Case management associations are calling for professional standards worldwide to help ensure that people are appropriately qualified and trained to undertake a job that carries with it a social responsibility (Richardson, 1997; Gill, 2000).

The study showed that case managers are an important source of ideas. Once focused on rehabilitation, they seek tools to help them do their job more effectively. In an age where people understand the potential of technology, case managers can provide suggestions not only of their needs but also of how technology can be applied to these needs. As their skills in handling client relationships develop, successful interactions may be shared on internal systems. This will enable valuable tacit knowledge to be shared, particularly with novice case managers. ACC may wish to be more active in collecting this valuable information.

In summary, IST has been used at ACC as part of a case management approach that has enabled public servants to become knowledge workers. This has been achieved by gaining control of the underlying processes that support case managers, freeing case managers to concentrate on their clients. IST systems are built around this relationship to enable rather than eliminate it.

This research was exploratory, and a more in-depth study of case management is needed, particularly to see how widespread are the practices found at ACC. Comparisons with other organisations who have used IST in case management would add further to our knowledge. It is recommended that data be collected with interviews. In the current study, interviews were found to be effective providing rich information that would be hard to elicit from surveys because knowledge is highly personal and is best negotiated face-to-face.

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