Chapter 5
Case study

> The task of leadership is to create the environment for managing knowledge. It requires less emphasis on what we own and more emphasis on what we know. It is not about managing hired hands, it's about setting context and energising hired minds (Bontis, et al., 1999, p 391).

5.1 Introduction

The Council for Scientific and Industrial Research (CSIR) is the largest of the South African research councils. This study could be seen as part of the evolutionary learning experience gained from an exercise by the larger organization (CSIR) to maintain its position as one of South Africa's leading examples of an efficient learning organization. According to Basson (1996, pp 139 - 142), this exercise started in 1985 when the White Paper on industrial development strategy was published. In 1991 the journey gathered momentum when a comprehensive international benchmark study was commissioned. The current phase of development can be attributed to the fact that all Western research organizations are adapting to the demands and pressures of the environment in which they operate. Obviously, entities within the organization need to do the same. The CSIR's information service (CSIRIS) has had to undergo significant changes, not only to keep track with the requirements for change within the organization but also to gain control over the changes within the information environment that held, and still hold, major opportunities. One such opportunity was for section leaders to choose the way in which they wished to lead and strategically position the section that reported to them. As manager of the Information Management and Information Procurement (IMPS) section, a decision was made to undertake a study of knowledge economy management tactics and, because of that study, to implement and test actions that could ensure the longer term sustainability of the section. The possibility of doing so was discussed with the CSIRIS Director and a proviso was set that activities that were not part of the common management activities would be discussed with him prior to implementation. All implemented activities are discussed in more detail in section 5.4 on page 5.16 but some examples of actions that were initiated are:

- an effort to benchmark skills and the subsequent skills development plan;
- the capturing of lessons learnt;
- the development of organizational memory;
- measuring staff and front line customer satisfaction;
- negotiations with 'new' suppliers;
- the introduction of a personal monitor; and
- the establishment of a benchmark intellectual capital report for the IMPS section (Attachment 1 of this report).

To provide the context within which this case study was developed, the section below provides general background information on the CSIR and more specific detail about CSIRIS.

5.1.1 The CSIR

The CSIR's website (http://www.csir.co.za) states the following: *Established by Parliament in 1945 as the central scientific research and development resource for South Africa, the CSIR remains the country's top technology and innovation agency. Today the CSIR is the largest research and development (R&D) organization in Africa, accounting for about 10 % of the entire African R&D budget. A staff complement of approximately 3000 include some of the top technical and scientific* *minds in the country, collaborating in multi-disciplinary teams, to put forward solutions of the highest standard in innovation and excellence.* Although its total staff complement is given as 3000 it is fair to say that not all of these can be regarded as knowledge workers. Only 1443 members of the full staff complement are registered as users within the library and information services (L&IS) system. These members of staff are the clients for the services provided by CSIRIS.

The CSIR prides itself on being a knowledge intensive technology organization (KITO). Its focus is the creation and packaging of innovative knowledge-based technologies. It is also a large consumer of knowledge. The CSIR is committed to supporting innovation in South Africa to improve the quality of life of all South Africans and support national competitiveness in the global economy. Technology services and solutions are provided in support of various stakeholders, and opportunities are identified where new technologies can be further developed and exploited in the private and public sector.

The core of the CSIR's activities can be grouped into the following:

- strategic management of innovation;
- research, development and implementation services;
- global science and technology links and perspectives;
- specialised technical and information consulting services;
- venture establishment;
- technology transfer and technology assessment;
- prototyping and pilot-scale manufacturing;
- software development and products; and
- policy and strategic decision support.

Clients in both the private sector (micro, small, medium and large enterprises; formal and informal), as well as in the public sector (national, provincial and local government), make use of the CSIR's services. Its staff members deal with public enterprises and institutions, national safety and security establishments, and development structures. Internationally, the CSIR has a network of clients and partner organizations as part of a global sphere of influence on matters of technology. With a strong emphasis on relevant and developmental work, it has strong roots in various communities, and collaborates with various donor and funding agencies. Finally, the organization also liases closely with tertiary educational institutions.

The CSIR's core technology focus areas include:

- food, biological and chemical technologies;
- building and construction technology;
- defence technology;
- water, environment and forestry technology;
- manufacturing, materials and textile technology;
- information and communications technology;
- mining technology; and

- roads and transportation technology.

It also drives the following collaborative initiatives:

- crime prevention technologies;
- support to small medium and micro enterprises;
- manufacturing support;
- environmental impact assessments;
- outreach programmes and national human resources development; and
- sport technology.

As is the case in many modern organizations, the CSIR has undergone a number of restructuring exercises. After 1990 but prior to 2000, the organization was highly silo-like in structure. A number of different divisions each functioned independently and often in competition with each other. Each had its own support services, which in effect meant that much duplication of effort was taking place. For example, each division (also known as strategic unit) housed its own L&IS. Although some services were conducted centrally, the divisional library and information services functioned independently. Traditionally these services were seen as part of the support function.

As one of the initiatives to improve internal structures it was decided during 2001 to appoint a senior CSIR director to drive an initiative to strategically align the CSIR's information services. The 10 divisional services were consolidated. Thus CSIRIS came about. Change brings about many opportunities. This study is but one of those. Another is that the Director was able to provide the relatively inexperienced managers, who were appointed to manage the function, with sufficient mentoring so that they could acquire the necessary skills to grow and build the service to its rightful position within the CSIR's structure.

5.1.2 CSIRIS

Each of the 10 divisional services brought with it its own mission and role within the various operational strategic units. Therefore, as a very first step, a unified vision was established. This vision is that:

> CSIRIS is a world-class, market-responsive **business** that is significantly **self-funding** and is characterized by its eagerness and ability to **adapt** to the demands of a changing environment.

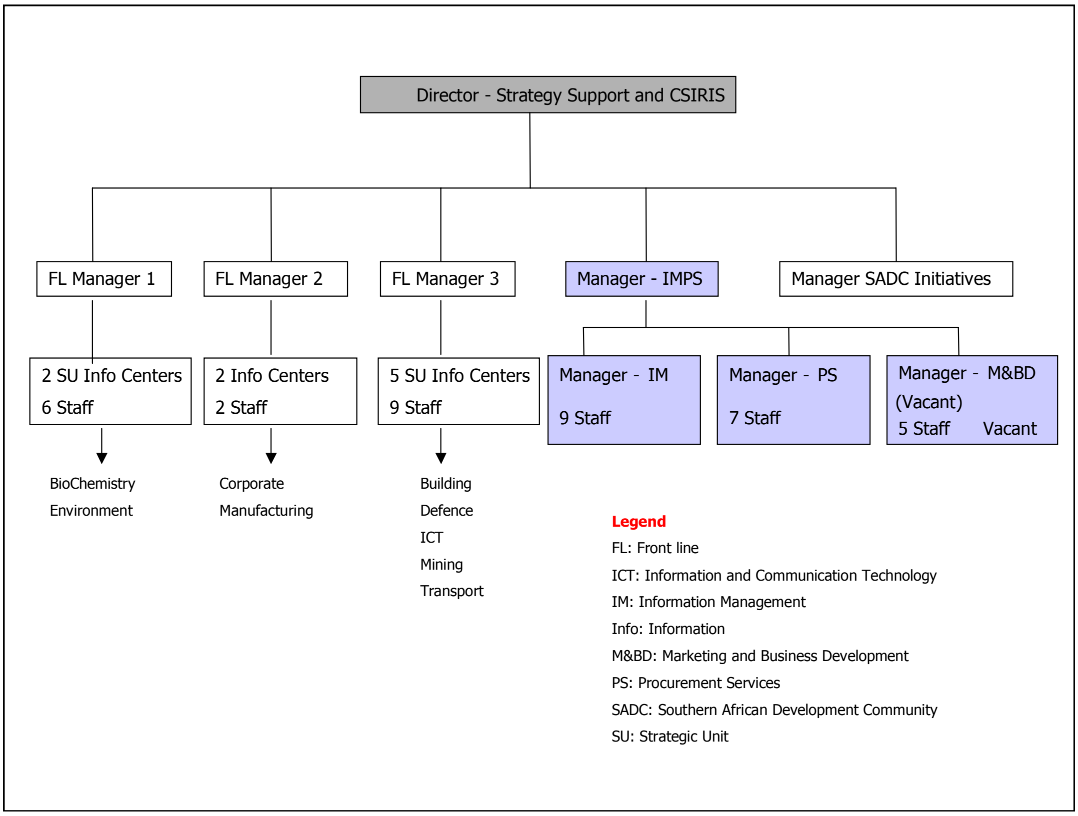
The mission of the service as a whole is to:

- Manage the delivery of appropriate information
- Facilitate tacit knowledge connectivity by for example:
    - Leveraging the efforts of knowledge workers
    - Finding the best minds
    - Connecting to the networks of minds
- Preserve intellectual property

To be able to live out the vision and accomplish the mission, it was acknowledged that there was a need to make provision for both front and back office services, and the service was structured to do this. It was decided that the traditional L&IS functions (labelled back line or back office work) would be performed centrally while the front line would be decentralized to provide personalized services directly to the researchers. Although not exclusively so, it is especially the first and the last points in the mission statement that have relevance to this study. Similarly, the second point within the mission statement directs the focus of the front line activities.

A decision was made to centralize all traditional L&IS functions (also referred to as back office tasks) as well as the paper collections within one building in Pretoria. It was also determined that it would be best to base the management team within the same building. The structure of the service was kept as flat as possible. The front line was distributed within a variety of buildings over a large area within Pretoria as well as at a number of remote locations. Figure 5.1 indicates that five managers were appointed. Three of these were tasked with the responsibility to take care of the relationships with the front line, one to take care of the back office (Manager IMPS) and the remaining one, SADC initiatives manager, to co-ordinate activities planned within the SADC region. Figure 5.1, on the next page, represents the management structure. The focus area for this research study is coloured blue.

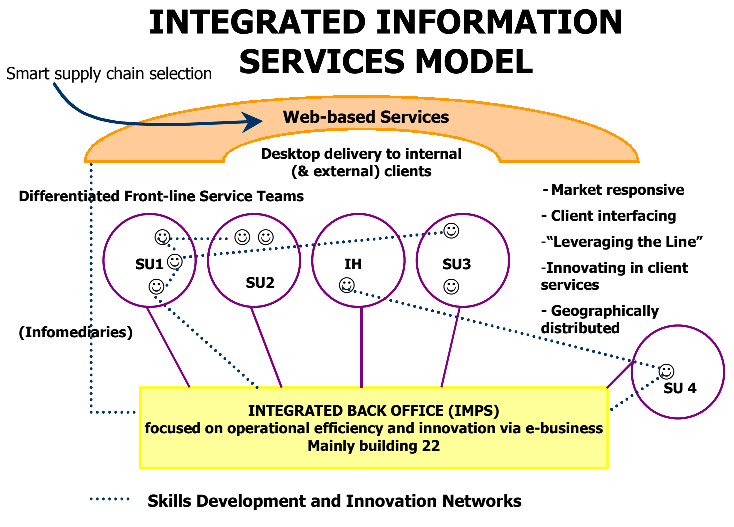
Fig 5.1: Structure of the CSIRIS



Instead of using the term library, the acronym IMPS (Information Management and Procurement Services) was adopted. Subsequently IMPS was subdivided into three sections and two project managers were appointed: one to manage the information management functions and the other to take care of information procurement. The third group (marketing and business development) was a diverse group, established with the purpose of developing both innovative products and the necessary customer relationship infrastructure. The management of this section was the responsibility of the IMPS manager, but with the proviso that the position would be filled at a later stage when one of the staff members had had sufficient training to add real value to the management team.

Figure 5.2, on the next page, provides more detail on the services model. The model (developed by Page-Shipp, 2001) makes provision for the fact that as many of the back line services as possible should be made available via a web interface. IMPS therefore needed to concentrate, besides carrying out their dedicated back line tasks, on processes that would enable CSIRIS clients to become independent from the presence of a dedicated member of the IMPS staff. It also meant that they were responsible for supply chain selection, especially where the supply chain allowed for Intranet integration or direct access via the Intranet interface. All SU information centres would provide front line services to their clients and would be able to rely on back office services directly from IMPS. The same would be true for on-site independent businesses such as the Innovation Hub (IH).

Fig 5.2: Integrated information services model (Page-Shipp, 2001)



In line with the vision to be market responsive, the knowledge economy trends identified in section 2.2 on page 2.5 were taken into consideration while planning the 'new' service. Additional trends that were seen to be specifically relevant to information services within the CSIR were identified to be the following:

- Institutions are no longer able to afford the luxury of acquiring information sources 'just in case' someone needs to gain access to that source. Within the knowledge economy, it is much more important to facilitate and build networks that enable 'just in time' delivery. The move from just in case to just in time information is continuing to accelerate and is in actual fact migrating to 'just in time - just for me'.
- The fact that the knowledge economy makes increased demands both in terms of speed and scope is applicable to both research staff and information specialists.
- There is an over-supply of information but much of it is not validated. The CSIR, as a reputable research organization which is functioning within a global economy, cannot afford to allow its researchers to make extensive use of invalidated information sources because these sources are more easily accessible than those that are validated.
- Validated information as a rule requires dollar denominated payment.
- A trend where individual strategic units were able to cut budgets for information access indiscriminately could not be tolerated if the interests of the wider CSIR needed to be the focal point.
- There is no value in designing services that are not aligned with the drive towards increasingly more e-business. This trend influences not only service delivery to clients but also the services available from information suppliers.
- E-business implies desktop delivery. Web technology was seen as the most current and appropriate tool for this but it was necessary to form an alliance

with internal computing services to ensure that future developments were monitored.
- The role of the information specialist as info-mediator is diminishing significantly. However, not all researchers (customers) have the time or inclination to do their own information research. The solution is therefore to build a virtual bridge between customer and supplier and to 'walk' across the bridge to meet the needs to the satisfaction of the customer. This trend holds significant training implications.
- Suppliers in general have a 'package' approach to subscriptions. This allows for multidisciplinary research but it also provides much additional under utilization as well as duplication in efforts if products are not scrutinized carefully.
- It is and will become even more difficult to keep track of rapid change both in terms of technology and product development. It is therefore essential to put in place a network of reliable colleagues who will assist in monitoring developments.
- There are cost saving implications to being associated with the rest of Africa or consortia when negotiating supplier contracts. There are however also consequences to being locked into such a grouping. These consequences need to be monitored.

The traditional trend of developing L&IS as a support function was seen to be inappropriate. It was therefore decided to develop CSIRIS as a line function, which was accepted by managers as a more appropriate role within the organization. As a result of the changed role, actions aimed at being able to establish an income-generating line operation were identified for further exploration. The largest obstacle in this process was the perception by information staff members of their own role and importance in the organization. A second challenge was to change perceptions of the services on offer as well as the contribution that CSIRIS was able to make to the organization. These challenges became the goals to concentrate on during the first year of existence.

The service was already contributing directly to both the knowledge acquisition and the knowledge maintenance or corporate memory phases of the information flow cycle (see Figure 2.1 on page 2.16) within the organization. It was also contributing directly to both the tangible and the intangible value chains of the organization (see Figure 4.2 on page 4.24). As such, it was decided to use that responsibility and accountability within the programme area as the basis for interactions with service level agreement managers as well as to build confidence. This is similar to how core business programmes are expected to operate within the CSIR.

To become significantly self-funding was seen as a vehicle to cross boundaries within the organization and assist in developing and/or enhancing the variety of information based services and products already on offer. It was assumed that assistance from the information services group would enable other line programmes to develop new services and products. An ability to provide the necessary link back into the organization with identified enquiries and needs from external clients was also seen to hold possibilities.

Keeping these goals in mind, it became essential to acquire the necessary skills and insights into managing the information service in a 'business' responsible way. It was decided to investigate the modern management literature for suitable management philosophies. Because of its holistic approach, intellectual capital management appeared most attractive. It was seen to be in line with both the developments within the organization as well as the expected needs of the CSIRIS staff members. It was decided, as a start, to implement and measure the methodologies of intellectual capital management at IMPS, as it was a relatively controlled environment where the results and impact of a changed methodology would be most visible. The work environment within IMPS was, towards the beginning of 2001, still very much typically production style with strict hierarchies and by nature very compartmentalized. In addition, the typical jobs identified within IMPS were not, to any degree, what authors such as Stewart (1997, pp 90-91) regard as knowledge worker jobs. That fact was part of the reasoning why it was not feasible to attempt to develop each aspect of intellectual capital as identified in the Skandia model (Figure 2.5 on page 2.42). However. it was expected that the principles and methodologies of intellectual capital development would make a real change in the working lives of the staff members and, in doing so, impact positively on the relationship with customers.

5.1.3 CSIRIS IMPS

As was mentioned in the previous section, IMPS refers to the traditional L&IS functions within the CSIR's information services: the grouping of staff established jointly that they did not wish to be associated with either the 'back office' or 'library' concepts. It was therefore decided to adopt the acronym IMPS (Information Management and Procurement Services).

As could be expected IMPS is responsible for intermediary services performed on behalf of research staff members. IMPS staff members are also responsible for information product contract negotiations and the maintenance of services that may have started out as special projects but which then became part of the routine operations. The activities performed for or on behalf of the front line are depicted in Table 5.1 on page 5.10. Because both finance and human resource development activities relate to the internal functioning and management of IMPS, these items were excluded from the table.

During the second phase of this research, it was decided to revert the responsibility for the archives and the PROATIA[1] infrastructure to corporate administration. This was mainly due to the fact that a decision was taken not to replace the archivist when she left the employ of the company.

[1] PROATIA: Promotion of Access to Information Act. The Act requires that institutions such as the CSIR create the appropriate infrastructure to deal with requests that come about as a result of the Act. More detail about the Act at http://vpo.ccii.co.za/articles01/hard-won_access.html.

Table 5.1: IMPS services

Complete List of Tasks		
Information Management	**Information Procurement**	**M&BD**
System maintenance •technical and content Stock maintenance •weeding and 'shelving' •issue desk •maintaining the reference collection Cataloguing and indexing •purchased and CSIR reports •journals •paper and electronic Intellectual property •database •collection	ILLs •national and international •internal and external Buying Stock •books •CD-Roms •journals - all formats •document delivery •databases	Marketing Communication, the creation of leaflets/newsletters for: •staff •clients Negotiation of supplier contracts •service level agreements •electronic journals Innovative web-based products General Procurement •IT equipment •L&IS equipment

Excluding the IMPS manager, the total staff complement responsible for the tasks listed above is 21: two managers and 19 members of staff. Although divided by function (Management, Procurement and Business Development), all staff have been constantly made aware of their interdependence and of the joint service provided either directly to CSIR staff or to the front line teams. From the list provided in Table 5.1, it is clear that it is especially the 'Manage the delivery of appropriate information' and to some extent the 'Preserve intellectual property' aspects of the mission which are the focus areas of IMPS.

Table 3.2 on page 3.14 identified the requirements to adhere to; the steps to take; a strategy to follow; and the phases to expect when developing intellectual capital. As a first step, it was decided to take stock of the status quo (as it was in April 2001 when IMPS was established) prior to making any changes. The techniques used to collect the situation analysis information were observation, semi-structured interviews (with selected members of staff), group discussions and available documentation. The result of the situation analysis is reflected below.

5.2 Situation analysis

Besides the IMPS manager, staff members from three of the strategic unit information services (four members from Bio/Chemtek, one from Environmentek, and one from Defencetek) were transferred to the centralized site. Here they joined the 15 staff members who were previously part of a small core L&IS and information service group. As could be expected, almost 30 % of the staff members (six of the 21) felt as if they were joining a new company.

At that time the following, in terms of each of the forms of capital, was established:

5.2.1 Human capital

In the original analysis of the staff complement, it was established that staff members come from a variety of cultural backgrounds. White females staff members were professionally qualified while Black staff (with one exception) did not hold tertiary qualifications. As a result all Black staff performed purely administrative tasks while the White females were responsible for all the professional work. One of the Black males was professionally qualified but was responsible for what could be regarded as non-professional tasks. Two of the White staff members were on the verge of retiring.

Although job descriptions were available, the performance evaluation system was used as a job description activity. There was little evidence that performance reviews were used as a learning activity. The CSIR-wide rewards and recognition system was in use but no objective, transparent criteria were clearly visible. Previously, the department (with only 16 members of staff) was structured around five managers but not all the managers were functioning at the same level of expertise. This had a negative effect on staff morale. Other issues that were evident was that:

- The 'informal' management structure was top heavy. Seven members of staff attended management team meetings – some were formally appointed as managers and some not. Because of varying skill and responsibility levels, it made operational meetings time consuming and inefficient rather than being an effective means of sharing information and making joint decisions.
- Most staff members had been employed by the service in excess of 10 years and many had been doing exactly the same job for that many years.
- There was very little participation in professional society activities other than attending meetings. Service benchmarking was limited.
- A considerable number of professional journals were circulated to staff members. No sharing of knowledge gained from the literature was evident.
- Although there was a joint staff room it was an inhospitable place, only utilized by Black members of staff. Upon further investigation, it was also found that there were clear racial tensions within the group. Although the staff room was used for social interaction, there was definitely no cross-pollination or learning taking place between staff.
- The e-mail system was inundated with personal communications that were shared amongst selected group members.
- There was no visible sharing of learning. Neither were mistakes or lessons learnt being recorded.
- All staff members had access to the latest office software available but few felt themselves competent to use any software other than the standard systems necessary to perform their routine tasks.
- There was no clear evidence of innovative activities or that new or improved products and services would be forthcoming.

5.2.2 Structural capital

The CSIR as a whole has a very stable network infrastructure as well as a well-defined and managed equipment and asset management policy. Fortunately the service as a whole benefited from this practice. In addition it was found that:

- The venue consisted of a series of offices of varying size and in need of maintenance.
- The L&IS system was in the process of being transferred to a new joint catalogue. The usual pressure in terms of exporting and importing data in such large databases was clearly visible but the process was under control.
- Stock was systematically being transferred from the divisional services. It was found that at least two classification systems were in use and that these systems were not utilized similarly. Journal stock was weeded prior to the move and therefore very little overlap in the collection was anticipated. Because of the mammoth task to integrate the collection, these items were unpacked in an available but separate section of the building. (This became one of the first areas in which the cross team dependence became clear. Once the integration of the collection started, it became very difficult for the inter-library loans (ILLs) staff to pinpoint the exact location of documents and temporary staff were employed during phase two to assist in fast tracking the process.)
- An enterprise-wide document management system was just being implemented but staff members were not utilizing it at that time.
- The enterprise-wide e-mail system was implemented and being used but its advanced features, such as the electronic diaries, were not.
- An information services home page and a number of linked pages were available on the CSIR Intranet but they mainly gave access to brochure ware.
- The PC infrastructure was adequate. Most PCs were better than the minimum standard required by the local area network administrators. The latest available office software was available via the desktop.
- Due to the nature of ILLs, reliable photocopying equipment was a prerequisite. Unfortunately the supplier was not rendering the required service and equipment was continually malfunctioning.

5.2.3 Customer capital

There appeared to be very little emphasis on customer activity. The relationship with suppliers was fairly one-sided where the supplier determined the basis and terms of set agreements. Other facts to take note of are:

- Contact with clients was mainly aimed at selling services to clients.
- An address list, mainly used by the document delivery staff, was available.
- Marketing was seen as an 'add-on' task of the manager.
- There was very little evidence of branding or relationship building.
- Although price, quality and turn-around time standards were in place, the customer had no insight into how these standards were set and the staff

members had no proof that the standards were appropriate or acceptable to the customers.

5.2.4 Financial capital

Financial accountability was primarily a management responsibility. Although the strategy was mainly to save costs, most staff members were not aware of the scope of the income generated or where funding came from. There was very little financial control over expenses such as the private use of telephones and access to stationery. All internal customers were charged handling fees, for which a standard pricing list was available. These prices were based on actual costs and therefore very little discussion other than communicating new prices took place between the staff members and the customers. External income was being generated but the rationale or formulae used for determining fees were not documented.

The reason why stakeholders are regarded as 'financial capital' was discussed in section 4.5.5 on page 4.29. In terms of stakeholders, it did not appear that relationships with CSIR Strategic Unit representatives were intact. There was also a definite need to communicate with the labour union, as it appeared to play a key role in the lives of many of the staff members.

With knowledge about the status quo intact, the leadership phase, as identified by Edvinsson (1997, p 370) and reflected in Table 3.2 on page 3.14, could commence. The first step during this phase is to learn from the insights gained during the measurement or situation analysis phase and to set strategy.

5.3 Strategy

A great number of changes were necessary. It was therefore clear that it would be appropriate to use a phased approach in introducing the principles of intellectual capital management. It was thought that three phases would be appropriate. This research report covers only the first two of these phases and refers to the period April 2001 to August 2002. Although phase three, the next development phase, does not form part of this research, recommendations for the phase are provided in section 7.4 on page 7.13.

It was decided that phase one would stretch from April to December 2001. At the end of that period, IMPS staff members were consulted to test their opinion on progress as well as to set strategy for the second phase. The review was conducted informally, in workshop-mode, as part of a staff meeting. The result of the review was incorporated as staff satisfaction in section 2.4 on page A1.20 of Attachment 1.

The second phase started in January 2002 and stretched to August 2002. It was seen as appropriate to end the phase prior to the new business planning cycle that started in September. At that stage a variety of actions were taken to review progress as well as to establish the suitability of rolling out intellectual capital management principles to the front line staff. The result of the review process (reflected as Attachment 1) is to serve as input for the 2002/03-business plan.

Phase three, which will not form part of this report, relies heavily on the strategy that CSIRIS, as a whole, will decide to follow as it is not advisable to continue developing one section independently of the rest.

The adapted balanced scorecard framework (Kaplan and Norton, 2001a, p 100) which was discussed in section 4.5.5 on page 4.30 was utilized to set objectives for each of the first two phases. Given that the wider objective was to lay the foundation for intellectual capital management, it was decided to, concentrate within the first phase, on establishing the necessary structure. During the second phase, the focus would be on the issues associated with populating the structure, measuring contribution and augmenting the existing reward and recognition system with one that encourages knowledge economy behaviour. In accordance with the requirements of the adapted balanced scorecard methodology, the strategy was to use the mission as the guiding principle and to focus all activities so that those that will enable the organization (IMPS) to accomplish the mission would receive priority implementation status. Still following the balanced scorecard lead, the following indicators and targets were identified:

Human Capital

Phase 1:

- Staff members would understand the necessity of contributing by doing more than just narrowly focused tasks.
- All staff members would have the necessary skills to use and contribute to the available infrastructure.

Phase 2:
- Personal growth and skills development would be encouraged, leadership skills would be developed and teamwork would be supported.
- A fair and transparent measuring system would be developed that could be utilized to measure personal progress and that could be implemented as a reward/monitoring system.

Structural Capital

Phase 1:
- Stock would be integrated.
- Available equipment would be effective and adequate for work to be done efficiently.

Phase 2:
- The e-collection would be built while the paper collection would be maintained efficiently.
- The analysis capacity within the existing systems would be developed to provide useful management information.
- The collection of statistics would be automated as far as is possible.

Customer Capital

Phase 1:

- An effective relationship with internal customers would be established.

Phase 2:

- Available market research would be evaluated, to establish the extent and needs of the external market.
- The results from the market survey would be utilized to identify suitable products and services to sell to an appropriate market segment.

Financial Capital

Phase 1:
- A budget that could tolerate investment in intellectual capital activities over and above normal running costs would be negotiated before implementing any activities.
- A budget with realistic income targets would be set within three months of establishing IMPS.

Phase 2:
- A continuation budget to ensure the continued move to the development of e-only information resource infrastructure would be negotiated at the beginning of the financial year.
- The usage of information assets (journals specifically) would be encouraged. This should result in improved utilization by researchers.
- Structures to market and generate external income would be set in place during the 2002/2003 financial year period.
- Growth in external income would be visible at the end of the 2002/2003 financial year.

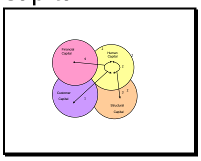
A variety of actions and initiatives were identified to ensure that the set goals, indicators and targets could be reached. The first action taken was to obtain principial buy-in from senior management for the project. After securing sufficient budget for most of the planned actions, the focus turned to human capital activities. The first step was to ensure that all staff members were treated equally and that they were undergoing the same experiences. As a result, a major revamping exercise was started. All offices were transformed into open plan areas (one of the success factors identified in section 2.4.2.5 on page 2.32 is that staff members who need to share information should ideally be placed in the same space). In the process of planning the new office space, it was ensured that each and every member of staff was moved to a different location. All staff members were required to clean out their working areas (to dispose of 10 years' worth of accumulated but often unnecessarily collected paper). Office allocation was done as a joint effort amongst all managers while space allocation within open office areas was done by the affected staff members. The idea was to allow for the sharing of ideas as well as for impromptu learning activities to take place when and where necessary while the revamping was taking place. It was also necessary to make sure that all understood the etiquette associated with open plan offices.

Other actions and initiatives taken were, for the purpose of this study, grouped together and discussed in detail within section 5.4.

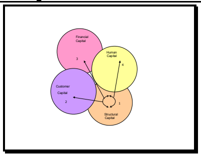
5.4 Actions and Initiatives

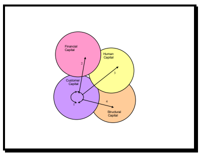
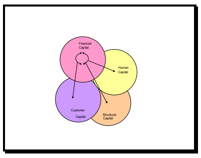
Although the adapted version of Sveiby's Affärsvärlden model (Figure 3.2 on page 3.17) was utilized to identify specific actions and initiatives, care was taken to accomodate both Senge's (1990) disciplines and laws (see section 2.4.1.3 on p 2.12) and Davenport and Prusak's (1997) ecology model (see section 2.4.2.3 on page 2.24) when the initiatives were implemented. The questions identified within the adapted model are repeated for ease of use. All identified initiatives were associated with the guiding questions. Table 5.2 displays the initiatives taken as well as the main phase during which the actions were taken. The rest of this section is utilized to provide further details on the initiatives.

Table 5.2: IMPS Initiatives

Capital	**Guiding question**	**Identified initiatives**	**Phase**
Human Capital 	How can IMPS staff members improve the transfer of competencies between people in IMPS?	Create a supporting environment to stimulate knowledge transfer Make effective use of the staff tearoom Appoint appropriate managers Encourage communication by using a variety of communication channels Identify and focus on developing value addition skills Redo job descriptions Evaluate the utilization of staff Set appropriate KRAs for performance evaluation Establish CoPs Support collaborative conversations Capture lessons learnt Develop organizational memory Conduct innovation projects Publish a staff newsletter Encourage active participation at staff meetings	1
		Conduct a skills analysis Benchmark skills Establish a skills development plan Implement a mentoring process Encourage tertiary training Support teamwork	2

Capital	Guiding question	Identified initiatives	Phase
	How can the IMPS employees improve the competence of customers, suppliers, and other stakeholders?	Implement induction training Develop training material and opportunities Provide progress and status feedback to customers Provide regular feedback to suppliers Establish and participate in networks Create a referral database Provide 'advanced' end user training Implement marketing and promotion strategies Develop customer relationship strategy Develop supplier relationship strategy Present papers at conferences and seminars	1
		Participate in consortia Develop information literacy material Identify and design suitable measuring instruments	2
	How can the IMPS staff members learn from suppliers and other stakeholders to improve the competence of the employees?	Identify all stakeholders Identify suppliers	1
		Include suppliers in networking exercises Attend training sessions Attend conferences Implement formal training Test trial products	2
	What/How should the IMPS staff members communicate to assist the stakeholders to make the right decisions with regard to human capital development?	Actively participate in strategy sessions Provide regular progress feedback Analyse results from targeted activities Create reliable sources from which to extract statistics regarding: • staff complement; • training needs; • skills levels; and • customer product use. Communicate: • timesheet information; • policies; • trends analysis; and • product and supplier analyses.	1
		Ensure that e-mail marketing reaches stakeholders Participate in Information Services Forum discussions	2
Structural Capital	How can IMPS improve the conversion of individually held competence to systems, tools and templates?	Establish an appropriate infrastructure Make significant documents available via the DMS Implement a reliable scheduler for the group	1

Capital	Guiding question	Identified initiatives	Phase
		Implement 'easy-to-use' capture mechanisms Create an environment that is encouraging Identify and develop appropriate measuring systems Develop an appropriate reward and recognition structure Establish personal monitoring system	2
	How can structural capital improve the IMPS staff members' competence by using systems, tools and templates?	Identify and develop suitable systems, tools and templates Do process re-engineering Identify and capture best practices Develop computer based training material Establish corporate memory Carry out competitor and supplier analysis Establish service levels, pricing models and other material that will guide the relationship between the organization and the customer. Introduce new technology where appropriate	1
		Introduce benchmarking	2
	How can structural capital improve the conversations amongst the customers, suppliers and other stakeholders so they improve their competence?	Integrate stock from all SUs Initialise the move to e-products Establish an effective Intranet interface Provide Intranet-based training/supporting material for products	1
		Ensure ease of access to: • analysis of available statistics; • results of implementation of enhancements; and • requests from customers for further enhancements. Market existing products to all customers Introduce trial runs of supplier products Train clients to utilize products effectively	2
	What should be available in terms of structural capital to assist stakeholders in making decisions with regard to continuous development of the infrastructure and finding alternative funding models?	Develop an effective Intranet interface	1
		Develop 'easy to access' usage statistics Provide concise and reliable information pertaining, for example, to: • funding models; • benchmark studies; • competitor analyses; and • market surveys. Utilize communication channels to keep stakeholders up to date with regard to developments of strategic importance	2

Capital	**Guiding question**	**Identified initiatives**	**Phase**
Customer Capital 	How can the competence from the customers, suppliers and other stakeholders improve the IMPS systems, tools, processes and products?	Make available common training material Assist with information literacy training of research staff Provide legal advice for contract negotiation Gain feedback from SLA managers and implement advice Gain feedback from the labour union and implement advice	1
		Integrate feedback from customers into new systems, tools, processes and products	2
	How can customer's, tools, processes and products improve the competence of fellow customers, suppliers and other stakeholders?	Encourage participation at the Information Services Forum	1
		Utilize push technology processes Ensure regular enhancements in line with explicit needs	2
	How can customers effectively integrate the IMPS systems, tools, processes and products?	Design effective Intranet interface Provide effective training Create 'support' documentation	1
		Attend training sessions State requirements for ease of access and personalization	2
	How can the IMPS customer capital assist stakeholders to make the right decisions in terms of their need to gain access to global information?	Provide reliable feedback Identify core resources and make that information available to IMPS	1
		Actively participate in appropriate forums such as the Information Services Forum 'Market' identified core subject area resources to stakeholders	2
Financial Capital 	How should stakeholders measure success and invest strategically to ensure that they are able to ensure access to important information?	Evaluate core resource collection Analyse user statistics	1
		Utilize their knowledge about KITOs and scientific excellence and integrate that with feedback received at the Information Services Forum, available usage statistics and interaction with L&IS staff	2
	What is the stake-holder's responsibility with regard to setting standards, participating in workgroups and utilizing infrastructure?	Ensure labour union participation to represent staff members' interests Provide sufficient budget to support required actions and activities	1
		Encourage active Information Services Forum participation Encourage active participation at interactions between labour union representatives and IMPS management.	2
	What can stakeholders do to ensure that IMPS human capital development is possible?	Evaluate available statistics, Provide financial assistance Provide 'mentor' guidance	1
			2

Capital	Guiding question	Identified initiatives	Phase
	What is the stakeholder responsibility with regard to investigating technology alternatives, financial support and technical expertise to ensure the development of effective infrastructure?	Conduct measurement against the mission of the group Development of strategic objectives of the organization Provide infrastructure to enable the implementation of e-business strategies.	1
			2

As could be expected activities did not always proceed strictly according to plan. Sometimes it was possible to switch an initiative from phase two to phase one. In other instances, it was necessary to delay implementation. The introduction of CoPs, scheduled for phase one is an example of the latter. On the other hand, the change in the perception about and contribution by the labour union occured mid way through phase one. The success of the actions taken is reported in the *IMPS Intellectual Capital Report* (see Attachment 1) and the set of initiatives that were identified as priority actions are reported in section 6.4 on page 6.12. The initiatives identified in Table 5.2 are discussed in more detail below.

5.4.1 Phase one initiatives

Although many actions were launched simultaneously, it was decided to focus on and address the issues relating to human capital development as a first priority. This does not mean that other capitals were not addressed. Rather it is that more activities associated with human capital development were initiated than in any of the other capitals. It was especially the knowledge of Senge's disciplines (as discussed briefly in section 2.4.1.3 on page 2.12) and the awareness of the inter-relationships of the various components within the environment, identified in the work of Davenport and Prusak (as discussed in section 2.4.2.3 on page 2.24), that formed the basis for the actions implemented.

5.4.1.1 Human capital

As was mentioned briefly in section 5.2.1 on page 5.11, the informal management structure was top heavy and had to be changed. Only two of the seven staff members who had previously attended management team meetings were appointed in managerial capacity. Both these managers were experienced and were appointed to lead the largest two projects: information management and information procurement. Staff members who no longer had management or management team meeting responsibilities were informed and their tasks were re-defined. The marketing and business development project was managed by the IMPS manager but with the intention to use the position as an area into which new talent could be appointed. Managers decided to make a concerted effort to lead rather than manage but, given the environment, this was initially very challenging.

Because staff at that time felt unmotivated and suspicious of any actions taken, it was decided to communicate as often and as much as was feasible. Besides a daily newsletter, which is discussed in more detail below, monthly staff meetings were scheduled and an open door policy was followed where staff members were invited to discuss problems and suggest possible solutions to problems whenever necessary. This resulted in a stream of visitations where almost each and every member of staff shared problems mostly of a personal nature. Personal issues relating to work relationships or task distribution were resolved as quickly as was possible. However, the resolution of problems relating to pension funds, medical aid contributions or personal financial management usually required the involvement of either the corporate human resources section or a financial consultant and took longer. As a next step individuals were requested to discuss problems only if they were prepared to include the manager of their project area. This resulted in the nature of the conversations changing as well as a slight increase in the willingness of staff to become involved in the planning of their sections of work.

Monthly staff meetings were very one-sided during the first three months. As a start, agendas were set but as staff started to participate in the meetings an open agenda policy was introduced. Two items are always included in the agenda. The first is a 'gripe and whine' session, relating to work related matters that are causing unhappiness. If problems cannot be resolved immediately, the items are referred to the next management team meeting and reported on as soon as action is taken. The second fixed agenda point refers to team building. After participating in a CSIRIS-wide team building exercise, it was decided to include a team building activity at each of the meetings. Minutes of all meetings, which included the results from the 'gripe and whine' sessions, as well as the team building exercises, are posted on the intranet where they form part of the corporate memory but they also allow staff members, who are not able to attend the meeting, to gain insight into the items discussed.

It was decided to utilize the staff tearoom as the meeting venue for staff meetings - as a first attempt to integrate the tearoom. Racial issues were addressed as part of the team building exercises but it soon became very clear that the issue would not be easily resolved and that ample time and much wisdom and patience were required to resolve the problem. It appeared that ample communication and transparent, fair and good leadership does build the trust relationship necessary to find a long term solution for the problem.

In an attempt to ensure that all staff members were kept informed, a daily 'state-of-affairs' communication newsletter was established and sent to staff, via e-mail, while many changes were taking place. Contributions were mainly from CSIRIS management team members and issues relating to both the front and back line were addressed. The newsletter was later changed to a weekly issue that is published via the Intranet. Management then became responsible for a regular slot but much of the newsletter reflects contributions by staff members. A deliberate attempt was made to encourage learning by including regular contributions relating to personal as well as professional growth. Lastly, a fun section was added to take care of the e-mail traffic amongst staff members. The newsletter contributions as well as its progress from social information sharing to learning tool were evaluated. The result of the evaluation is reported in section 2.3 on page A1.17 of Attachment 1. After ensuring that communication channels were improved, it was decided to pay dedicated attention to the administration associated with staff development.

The Hay job-grading scheme[2], which is known to be very suited to the knowledge worker environment, is used within the CSIR. As part of the CSIRIS initiative, staff members were required to assist in preparing job descriptions that reflected their responsibilities. In line with what was occuring throughout the rest of CSIRIS each job category was re-evaluated to ensure that jobs were benchmarked. Also in line with the requirements of the organization, six-monthly performance objectives were and are being set. Objectives are set and initiatives are identified within the framework of the mission of the IMPS programme area and the personal (human capital) development targets. As standard practice, reviews are benchmarked during an IMPS management team meeting held specifically for that purpose. The results of the reviews are then analysed for the group, as a whole, to identify weaknesses and strengths as well as for specific training needs. As was mentioned in section 3.4.1.3 on page 3.28, when the obstacles to human capital development activities were discussed, staff members without tertiary qualification found knowledge sharing difficult. Staff members with secondary qualifications were not able to distinguish between knowledge sharing and knowledge giving. Here the assumption is that 'sharing' requires two-directional activities while 'giving' is the traditional one-directional training style of learning. It was and still is difficult to grasp that with 'sharing' the learner has as much responsibility as the master. With giving it is the trainer who has to ensure that the learner acquires certain skills. After the first round of performance reviews, deliberate actions were taken to ensure that all staff members understood their own responsibility for personal growth.

In a further attempt to understand the skills levels of staff, it was decided to establish a skills register (database) for IMPS staff. The register provided the necessary information to establish the group's skills level and it formed the base of the skills development plan, which was identified as one of the second phase activities. Most importantly, it provided essential input for the personal monitor, which was also designed during the second phase of the project and which is reflected in Figure 5.4 on page 5.39.

In terms of the requirements for a staff development plan, it was decided to firstly ensure that all staff members have the required skills that will allow them to do their tasks effectively. Secondly, provision had to be made for the creation of opportunities to use current staff more creatively. Instead of retrenching inappropriately skilled staff members, it was decided to re-skill where necessary. Because three of the re-skilling positions were within the information procurement section, it was decided to employ one additional professional member of staff to assist the project leader. In doing so the project leader was able to provide additional assistance and guidance while her own time could also be utilized to assist in re-engineering processes and in investigating improvements to, for example, the

[2] E. N. Hay and Associates developed the Hay job-grading scheme in the early 1950's. The Hay system allows jobs to be evaluated in terms of its know-how, problem-solving, and accountability requirements. More detail available from http://www.haygroup.com/

financial administration process. The following serve as examples of re-skilling that took place:

- the photocopy clerk was trained and utilized as an ILLs assistant;
- all staff members responsible for ILLs and the delivery of items from the stock in centralized collection were trained to utilize new scanning equipment so that scanned documents, attached to e-mails, rather than photocopies became the norm for journal article delivery;
- after the retirement of the administrative assistant, an ILLs assistant was transferred and taught the tasks;
- as a result of transferring an acquisitions officer to the front line, the opportunity was utilized to allow a member of staff from the information management team to grow into the position, rather than to employ additional staff.

The two positions that became vacant when an ILLs clerk and an information management assistant were transferred to new positions were not filled. It was decided to utilize the opportunity to create client-facing jobs. Both positions were aimed at improving the contact and the relationship with customers. The first position created has already been referred to: that of a professional employee appointed to assist the information procurement project manager. The job focus for that position was to take care of document delivery where there is considerable contact with external customers and to provide the project manager with spare capacity. The second position was utilized to appoint a client liaison officer who could serve as a single point of contact for clients, establish a contact and referral database and co-ordinate marketing activities.

The activities mentioned above could very well also have formed part of a change management drive. They were, however, deliberately focused around building human capital capacity while keeping the organizational mission as well as individual skills and abilities in mind. Obviously activities did not occur in isolation. While the focus was human capital development, much also occurred in terms of structural capital development and these activities are discussed in more detail below.

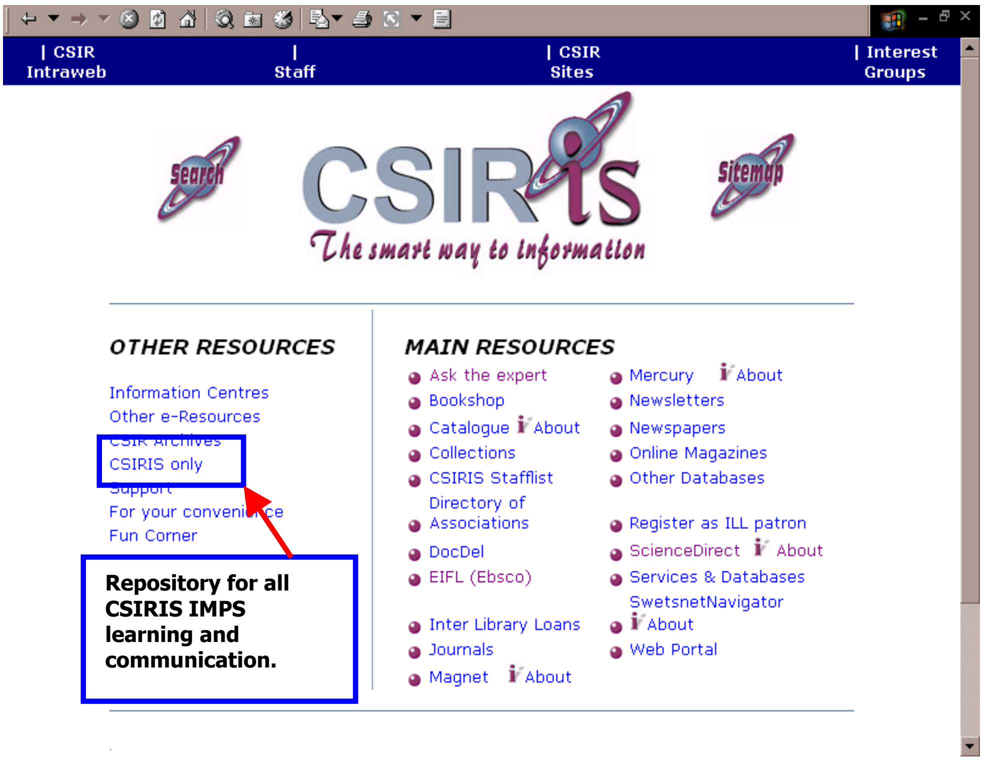
5.4.1.2 Structural capital

Building structural capital within the IMPS environment has two components. In the first instance the group is responsible for building the CSIR's structural capital. This refers specifically to the L&IS collection (both paper and electronic) and to populating enterprise-wide information systems (for example the workflow and project management systems). In the second instance there is also structural capital that refers specifically to the way things are done within IMPS. In terms of building CSIR structural capital, the following were carried out:

- Given the trends identified in section 5.1.2 on page 5.7, it was suitable to not only centralize but also rationalize the paper collection as far as was feasible. The rationalization was done in conjunction with a selected partner (the Academic Information Service of the University of Pretoria). As an extension of this, it was decided to concentrate on building the CSIR's virtual collection by negotiating favourable access with a variety of national and international suppliers of reliable electronic information collections.

- A concerted effort was made to shift to an e-business approach for service delivery. This was not only to provide CSIR staff members with access to electronic information on the desktop but also to make internal work processes more efficient.
- The CSIR's Intranet was in the process of being transformed to a second-generation site (database driven). Fortunately the CSIRIS section of the Intranet was already following suit, and it was mainly the internal branding that needed to be finalized. It was therefore identified as one of the 'quick-win' items to complete and introduce. Selected customers were approached and with their assistance the new brand was launched. The content of the site was revised and as a result, besides giving access to a variety of information products, the intranet also became the single repository of the IMPS minutes, agendas, lessons learnt, policies, and procedures. Figure 5.3 is a graphical representation of the interface that was launched in May 2001.

Fig 5.3: CSIRIS on the Intranet



To assist users with the various products that were made available, a quick user's guide as well as tips (and if necessary passwords) were added and labelled 'About'. This ensured that the required information was always available. It was also negotiated with suppliers that the URL to their products was, where possible, always a direct IP authenticated link. Staff members who require access to products from home are therefore required to gain access by dialling into and registering on the CSIR local area network (LAN) where the LAN software takes care of authentication.

- In an attempt to introduce new services and in conjunction with front line staff members, the structure for subject-specific 'portals' was put in place. The enterprise portal software had to be used for the activity. Due to hiccups in implementing the software, an alternative route had to be followed. This led to the development of html pages with a portal look. The thinking required for the development of true portals was captured so that minimal effort would be required to transfer to the new technology when that became available.
- A concerted effort to make available electronic full text content to research staff resulted in the introduction of three products, ScienceDirect, EbscoHost and SwetsnetNavigator. These products were not selected at whim. Porter's model (see Figure 3.3 on page 3.38) was utilized in the process of identifying possible products and carefully evaluating each of these. A process of deliberating the advantages and disadvantages and running trial periods followed prior to the introduction of the products. Usage statistics for the chosen products are reported in section 5.1 on page 38 of Attachment 1. Having had to negotiate contracts with the selected suppliers as an individual institution during phases one and two of this research (contracts as a rule run for three years), the focus during subsequent phases would be to evaluate the feasibility of joining national and perhaps international consortia. Such consortia are often able to negotiate better value for money deals than can individual institutions. Financial constraints led to a strategy to delay acquiring access to electronic commercially available reference material to a later phase.

Meeting the requirements to assist in building CSIR structural capital was relatively easy. Building structural capital for the IMPS environment held a different challenge. Therefore, in terms of what was required to build IMPS structural capital it was decided to:

- Make all significant documents available only via the enterprise document management system. As part of the skills development programme, staff members were expected to attend the regular training sessions and familiarise themselves with the process to be able to utilize the system effectively.
- Schedule all meetings via the e-mail system. Staff members were expected to keep their electronic diaries up to date. This took a major burden off scheduling meetings and posting reminders. In return it added a training burden, as staff had not previously found it necessary to make use of the advanced features of the e-mail system.
- Introduce alternative technology that could enhance desktop delivery rather than make better photocopies. (Efforts in trying to upgrade the photocopying equipment were seriously hampered due to existing long term contracts with the supplier.)
- Re-engineer processes where necessary. The first process targeted (ILLs and document delivery) was initiated during the consolidation phase and not as a result of this study. The results of the re-engineering process were however

utilized for staff re-allocation and formed the basis of the way in which the services within information procurement were structured. Both operational processes as well as the associated financial processes were targeted during the re-engineering exercise. The project leader, responsible for the area, led the investigation, which was done with the assistance of an external consultant as well as the chosen partner: the University of Pretoria Academic Information Services (UP AIS). The investigation involved a workflow analysis. This meant that the internal process was also benchmarked against that of the UP AIS. The result of this study is reported in Attachment 1, section 3.4 on page A1.27. Investigations associated with the financial systems processes required input from the corporate financial staff. The initial finding was not to change the current financial system but to rather delay further investigation until the enterprise-wide system was upgraded. The process was therefore streamlined but the transfer to a more efficient system was delayed. A third process, cataloguing, was tackled during the second phase of this research and is reported on in section 5.4.3.2 on page 5.43 and in section 3.4 on page A1.27 of Attachment 1. In re-designing the process, a deliberate attempt was made to include the learning loops depicted in Figure 2.2 on page 2.17. However, to what extent learning was taking place was not measured. This aspect will need to be addressed in the future.

From the activities listed above, it can be seen that both efficiency and effectiveness aspects for researchers as well as IMPS staff were initiated. Although the process was slow, the fact that the supporting structural capital was growing gave both staff and researchers the assurance that the service was on track. This in turn led to a perceived improvement in staff morale and customer confidence. The perceptions were not formally tested but were based on informal discussions and interactions with staff as well as customers. The fact that compliments from customers started trickling through more often than complaints was also taken as an indication that client confidence in the service was growing. The actual activities implemented to improve the relationship with clients are discussed in more detail below.

5.4.1.3 Customer capital

Because the IMPS section was attempting to project a new image it was understood right from the beginning that every possible opportunity to interact and obtain feedback from customers would have to be utilized. The most important focus point during phase one was to establish exactly who should be regarded as customers and who as stakeholders. It was also necessary to establish what interaction was taking place between IMPS staff and customers. In terms of marketing strategy and selling, it was decided to focus on the internal or CSIR customers during the first phase. This did not mean that existing external clients were neglected. There was just no concerted effort to approach new external clients.

Within the internal client grouping, the CSIRIS Director and front line managers were identified as the most important of the IMPS stakeholders. Regular contact and communication were already possible through management team meetings. The issue was therefore to attempt to consciously separate the roles of colleagues and stakeholders. This remained a challenge throughout the initial research period. It was therefore decided to, during the second phase, use an additional feedback mechanism to ensure that all three of the learning loops as identified in Figure 2.2 on page 2.17 were addressed. A further stakeholder, namely the labour union, also was identified. Although this stakeholder had no direct impact on, for example, the set budget, it soon became very clear that the relationship also needed attention. The communication channel was therefore put in place and with the assistance of the Director the relationship grew from confrontational to one of mutual understanding. Obviously senior CSIR and strategic unit managers were also regarded as stakeholders. In this regard it is necessary to mention that front line managers were required, as part of their tasks, to establish service levels agreements (SLAs) with each of the strategic units.

Strategic unit heads appointed SLA managers who were responsible for negotiating the agreement between CSIRIS and the strategic unit. SLA managers were therefore seen as key stakeholders for the CSIRIS front line. In line with the knowledge economy value cluster constellation (as displayed through Figure 4.1 on page 4.19), the IMPS service was specifically structured to service researchers directly. With the assistance of the front line managers, a deliberate attempt was made to make contact and market IMPS services to the SLA managers. SLA managers and front line staff often expressed feedback and needs from 'their' groups of researchers. In addition, it was decided to keep track of customer satisfaction as and when it was expressed and whoever verbalized the feedback. This necessitated the establishment of a single recording mechanism as well as for a contact person for clients. A motivation for the creation of a client liaison position was prepared and, shortly after approval, a client liaison officer was appointed. The client liaison officer was made responsible for analysing the feedback and, besides following-up on complaints, to also regularly report on feedback received.

Besides the feedback in terms of the service received from IMPS staff, researchers also regularly provided feedback on the trial products that were made available. This feedback was either fed back to the suppliers or, where appropriate, utilized to improve the IMPS service. For example, it was established that research staff would rather test trial products towards the middle of a financial year. This is due to the fact that new projects are established at the beginning of the financial year, which causes its own challenges. Similarly, at the end of the financial year, project deadline pressures inhibit proper testing. It was therefore decided to run trials during August and September. This situation needed to be communicated to SLA managers as well as to suppliers so that they understood the dynamics. The front line managers assisted with the communication to strategic units as they were seen to be the appropriate people to do so.

In a further attempt to assist front line managers in their communication with the SLA managers, a number of supporting documents were created. One example of these documents is a guideline to use when evaluating journals for cancellation. Another is a series of presentation slides that could be packaged to suit the needs of specific circumstances. These presentations proved to be a very useful marketing tool and time saver when staff members from other institutions visited CSIRIS.

As an additional step, after the appointment of a client liaison officer, a client contact and referral database was established. The purpose was twofold. The first was to ensure that all enquiries were attended to within an acceptable period of time. The second was to establish frequently asked questions in order to make provision for standard, easy to retrieve answers. An advantage that soon became apparent was that the database could also contribute to the accomplishment of the 'connecting minds' aspect of the CSIRIS mission. It was possible to tell which experts within the organization were willing to and actually did follow-up on the requests forwarded to them. It was also possible to identify 'best practice' in terms of the way in which strategic units dealt with external client contact and learn from that experience.

A drive towards acquiring an increase in the number of external clients was seen to be the focus of CSIRIS as a whole during the second phase of this research project. In preparation for that a market survey, which was carried out just prior to the formal establishment of CSIRIS, was analysed for its applicability. It was found that the survey supplied useful information regarding the type of service IMPS could offer to external clients as well as to the extent to which the CSIR's brand, in terms of information services provision, was established.

From the actions taken during this phase of the project, it is clear that much of what was done served to either establish systems to be utilized during the second phase or to lay the foundations upon which customer capital could be built.

As was discussed in section 3.4 on page 3.17 and in section 4.5.5 on page 4.29 and with specific reference to the work of Kaplan and Norton (2001) and Figure 4.5 on page 4.31, it is not possible to build the components of intellectual capital without also building financial capital. The next section will address the actions taken to develop financial capital.

5.4.1.4 Financial capital

The budget had, to a large extent, been set prior to the initiation of IMPS. The reliable management of the set budget formed part of the normal managerial duties. The challenge was to re-direct funds to more worthy causes without losing sight of non-discretionary expenses. As was mentioned in section 5.3 on page 5.15, prior to initiating any of the 'building intellectual capital' activities it was necessary to negotiate a budget that could tolerate investment in intellectual capital activities over and above normal running costs. This was done with the assistance of the CSIRIS Director who, being also the knowledge management champion within the CSIR, understood the need for the identified activities.

The set budget provided another challenge in terms of the targets for external income. It was also clear that it would be difficult to reach the targets while the focus was on the internal market. It was therefore negotiated that a budget with realistic income targets would be set within three months of establishing IMPS. Subsequently, the income budget was reduced to reflect stability (the same as the previous financial year) rather than growth and fortunately this goal was reached during phase one. The running budget was reduced to make provision for the loss in income, and this was achieved through stringent saving and cost reduction measures.

The direct involvement of the CSIRIS Director in the process of re-negotiating budget, as well as the communication with front line managers at and outside management team meetings, ensured that stakeholders were aware of and supported changes within the IMPS environment.

5.4.2 Lessons learnt from phase one

A wide variety of lessons were learnt during the first phase of the project. Many of these were at a personal and often unconscious level. The following lessons were documented and reviewed at the onset of the second phase of the process. As most of the activities during phase one were focused on human capital development, most of the lessons learnt also refer to that aspect.

5.4.2.1 Human capital

The lessons listed below are in no particular priority order:

- Human capital development requires leadership rather than supervision when putting in place initiatives to develop individuals. The adaptation from supervision and even management to leadership requires patience and much practice. Staff members stretch accountability and managers find it difficult to let go of responsibilities and empower staff members. In the end, however, it is worth the effort.
- Initial or fledgling attempts from staff to be innovative and to test their responsibilities and build confidence are at times difficult to recognise and therefore easy to destroy. A leader needs to be aware and attentive to recognise and encourage such attempts. There is a fine balance between abdicating responsibility (and allowing staff members to overstep boundaries) and supporting personal development and innovation attempts.
- Without benchmarked standards, it is only possible to access skills properly once the manager or leader really knows the staff members and is able to evaluate their contribution independently. It is also only then that hidden talents and undisclosed skills become available for effective application within the team's responsibility context. In contrast it is also then that a member of staff's success in coping with his workload can be evaluated. Such processes take considerable time and must follow growth cycles to live through. It is therefore essential that skills are surfaced and benchmarked as early as is possible so that the cycle times can be reduced. Although staff members were asked to list their skills at the onset of phase one, the benchmarking was not done. It was therefore seen as a priority item for phase two.
- Building a team is, during the best of times, a difficult process and sufficient time is required. It is useful to identify and implement deliberate actions that can support and fast-track the process. In this regard, it is advisable to make use of experts outside of the immediate environment. Careful selection and

evaluation of the contribution possibilities does however need to be done prior to contracting such experts. Many so-called team builders actually encourage competition, which is not suitable when aiming to enforce sharing and mutual learning.

- Typical change management problems occur, especially during the initial stages of implementation. It was seen as important to identify and manage these as such and not to pull individual incidents out of context. So for example

    - What is said is interpreted as what is meant, to the letter. It was seen as important not to stop communicating as a result of 'less-than-desired' incidents. The answer was found in identifying miscommunication when it occured and in rectifying the matter immediately. More communication rather than less seemed to be more appropriate. It was also useful to make use of an 'open door policy' and 'management by walking about' when changes were implemented.
    - Absenteeism is a known symptom of change in the workplace. It is a major challenge when there are fewer as well as 'new' staff members in a team. This causes conflict and finger pointing within the team. In individual cases it was necessary to formally address the occurrence. From then on it was found best to step back and allow team members to resolve the problem themselves – which they did.
    - In a new situation, new staff members need considerable attention. Managers needed to set aside sufficient time for mentoring and providing assurances. This placed much pressure on managers, as they too needed to cope with the implementation of change.
    - Change is more difficult for some people than for others. There is no value in trying to put all in the same mould. Although difficult to do, it is useful to identify those staff members that are not able to adapt at all and to provide them with guidance regarding alternative options available.
    - Comfort zones are comfortable – for all. When testing new processes, constant monitoring of whether an old process is more comfortable or truly better is required. The only way to do so successfully is for staff members to participate in improving the process and to really listen to the feedback they provide at review meetings.
- Staff members should be given as much assistance as is possible to adapt to new circumstances and requirements. It is therefore essential that skills gaps and training needs are identified and addressed as early as is possible.

As a final remark, it is necessary to mention that, although it may be difficult to measure, the visible growth in individuals should be regarded as the most gratifying of the rewards associated with the implementation of human capital activities. To witness the metamorphosis from an 'own-job-only' focused individual with hidden talents to a confident employee willing to share, participate and lead for the good of the wider group is a unique privilege.

5.4.2.2 Structural Capital

A knowledge era information service needs reliable and dependable infrastructure. Building that infrastructure brings about additional responsibilities that are at times difficult to justify. It remained a challenge to focus on the end goal rather than on financial and time implications.

Stakeholder support is crucial when building structural capital. It is therefore essential that communication channels are efficient as well as effective. In terms of support and commitment, staff members should also be seen as stakeholders.

It is difficult to implement the first improvement to the structural capital. As a result it is best to identify the one item that will have most impact on the widest audience. In the case of CSIRIS that item was the introduction of electronic journal services. In the case of IMPS it was the fact that all staff were required to use the available infrastructure to create and share information.

Developing structural capital is time consuming while it is happening. It is therefore essential that leaders stay focused on the end goal and ensure that the process is kept active. Rewarding the right behaviour publicly is an important component of the process.

5.4.2.3 Customer capital

The very first lesson learnt, as part of customer capital development, is not unique to the knowledge age and it most probably will not be eliminated by the next evolutionary era either. Changed services do not run smoothly immediately and even when clients are in the communication loop they, when under pressure, do not wish to make allowances for delayed service provision. It therefore needs to be ensured that:

- staff members establish and set a realistic delivery date when accepting a task;
- a reliable feedback procedure is followed; and that
- the preventive action 'learning loop' (as displayed in Figure 2.2 on page 2.17) is functioning effectively.

A second lesson is that, given the opportunity and an appropriate mechanism, customers very quickly see the benefit and importance of continuous feedback. The mistake should however not be made of thinking that all customers are willing to provide input. Neither should it be thought that feedback is only given when questionnaires are completed or when feedback interviews are conducted. Some of the most valuable feedback provided by customers came when the purpose of the interaction was something very different: training research staff to effectively use supplier products serves as but one example of an excellent opportunity to gain feedback.

Just as is the case with building structural capital and closely related to the second lesson referred to here, is the fact that building relationships is a time consuming activity. Ample time provision for the activity should therefore be made so that it becomes a priority and not an 'add on' item on the agenda of daily activities. Relationship building also requires a good memory. It is essential to put in place mechanisms to regularly have contact with clients (without causing a nuisance) and to create a memory jogger system as a tool to use in preparation for the intervention (which obviously should not overstep privacy boundaries).

Lastly, it is important to recognise customers as customers and stakeholders as stakeholders. In an environment such as the one under discussion, it was for example easy to underestimate the stakeholder role of the labour union. Similarly, the front line staff were acknowledged as colleagues but not really recognised as customers at the start of the second development phase.

5.4.2.1 Financial capital

Access is needed to sufficient finances to buy in external expertise. Expertise does not come cheaply. On the other hand it is impressive how creative individuals become when they are motivated to see their plans come into being but are confronted with the fact that funds are limited.

5.4.3 Phase two initiatives

Phase two of the project started on schedule in January 2002. The most important feedback received while reviewing phase one was that the pace needed to slow down so that there would be less disruption of the day-to-day tasks. Fortunately, the project was largely at a maintenance stage. Much of the process re-engineering had already taken place and at the time just needed to be continued or 'tweaked'. Only two or three large initiatives were still outstanding. The result was that the pace naturally slowed down. This feedback was, however, taken to heart and it was decided to introduce activities at a more comfortable pace for staff members. The introduction of the personal monitor, which is described in detail as part of structural capital below, is one of the activities, that was done at a pace slower than what was planned.

Reporting on the activities associated with phase two is approached similarly to phase one, starting with developments in terms of human capital.

5.4.3.1 Human capital

During phase two, as was the case during the first phase, attention was given to personal growth and teamwork across boundaries. During this phase, though, it was decided to concentrate on those areas where assistance from outside the IMPS group was necessary. As a result it was negotiated with other CSIR service units to assist in the mentoring and skills development of particularly talented (but perhaps without formal qualifications) individuals. Again the development was targeted to remain within the boundaries of the skills required for the accomplishment of the mission of the CSIRIS IMPS programme area. The project leader for information procurement also negotiated the 'short term' exchange of staff between the ILLs departments of the CSIRIS and the University of Pretoria's Academic Information Service with the intention to learn from each other.

As a second example, it is worth mentioning that the project leader of the information procurement project decided to enrol for a further university qualification, as did the professional member of staff within the information management project. Lastly, a concerted effort was made to expose a variety of staff members to external courses and professional society activities – when these were in line with their developmental plans. This was done in conjunction with the activities of a training task team.

As a result of the progress review that took place in December 2001, four task teams were established. The task team members cut across the formal project areas. Their activities focused on three of the capitals: human, customer and financial capital. (Due to the efficient development of enterprise wide systems, it was seen as less important to, at that stage, establish a task team that could address infrastructure and largely duplicate efforts taking place within other sections of the organization. One member of staff was delegated to continue to monitor and contribute to organizational activities). Each of the task teams were required to build structural capital in terms of developing mini business plans and budgets for their own activities. Staff members were asked to participate in task team activities on a voluntary basis.

Although the comparison is relatively flimsy, it was decided to manage the task teams as CoPs (see section 3.4.1.1 on page 3.21). No team leaders were appointed. When the teams were established it was explained that each team was responsible for planning activities relating to the task, budgeting for the task activities, and executing the plan. They were made aware of the fact that they needed input from all IMPS staff members and that task team plans would have to be approved at a staff meeting once sufficient budget was provided for by the finance task team. The task teams that were established were the following:

- **Rewards and recognition** – to bring about true transparency and objectivity in the reward and recognition system. Task team members were expected to establish the full extent of the rewards system within the CSIR to ensure that an IMPS system did not contradict the wider requirements.
- **Training** – to address issues relating to the skills that ensure that real value is provided for customers. This task team was also responsible for compiling a list of conferences that could add value and improve the competency of the group. It was their responsibility to ensure that all staff members were given access to information about developmental opportunities. It did however, remain the responsibility of individuals to make use of relevant opportunities.
- **Marketing** – to address issues relating to customer capital. Because of the nature of the marketing required, it did not remain feasible to restrict the task team's activities to marketing IMPS services only.

- **Finance** – to address issues relating to financial capital but to also make staff much more aware of the accountability aspect of running a healthy business. Staff members who joined this task team were provided with training in order for them to have a basic understanding of the CSIR's financial systems as well as the budgeting process.

It is possible to, at this stage, report that, just as is the case with communities of practice, the group members determined the success of the task team. Because of the importance of these task teams, it was perhaps not the appropriate opportunity to experiment with communities of practice.

The skills development of individual staff members fell outside the ambit of the training task team. This remained the responsibility of the IMPS management team. Both the tangible and intangible value chains were taken into consideration when identifying skills that were necessary and that needed to be developed within the group. As a start, the skills identified in Table 4.2 on page 4.24 were evaluated and correlated with the skills identified by Lombard, et al., (1999, pp 6-8) of the CSIR, Marshall, et al., (1996) and Van Deventer, Mbundu and De Bruyn (1999, pp 5-6).

Following this exercise, an audit was done on the available skills to establish the areas in which it was necessary to focus training activities. The result of the audit is reflected in section 1 on page A1.8 of Attachment 1. A complete list of the identified skills is provided as Appendix A on page A1.44 of Attachment 1. The list in Appendix A was not seen as very useful and Appendix B was provided as a first attempt to link the identified skills to the IMPS value chains (refer to Figure 4.2 on page 4.23). In analysing Appendix B, there was a perception that not all of the required skills had been identified. With the assistance of the IM and the IP managers, 24 additional skills were identified. The skills were then classed as core or non-core skills. An indication, as to which capital it would most likely build, as well as the contribution to the tangible or intangible value chains, was indicated. This led to the development of Table 5.3 where the skills required for Financial and Human Resource management are included as M&BD skills.

Table 5.3: Skills required to ensure IMPS sustainability

Cap - Contributes to the building of this capital (CC=customer; FC=financial; HC=human and SC=structural capital)
A - Available
NR - Available but not required
IM - Information Management
IP - Information Procurement
M&BD - Marketing and business development
T - Contributes to the **tangible** value chain
I - Contributes to the **intangible** value chain
C - Core skill

Skill	Cap	A	NR	IM	IP	M&BD	T	I	C
Ability to make connections – connecting minds and information	CC					Y		Y	
Client relationship management	CC	Y			Y	Y		Y	Y
Communication and people skills	CC	Y		Y	Y	Y		Y	Y
Identification and tracking of experts	CC	Y			Y	Y		Y	
Interpretation – to tie knowledge of the market with needs of the customers.	CC					Y		Y	Y
Interviewing	CC					Y		Y	
Marketing	CC	Y			Y	Y		Y	Y
Needs identification	CC	Y			Y	Y		Y	Y
Networking	CC	Y		Y	Y	Y		Y	Y
Pro-active identification of potential customers.	CC				Y	Y		Y	Y
Service development	CC	Y		Y	Y	Y		Y	Y
Accounting	FC	Y			Y	Y		Y	
Bargaining	FC					Y		Y	Y
Budget control	FC	Y			Y	Y	Y		Y
Buying	FC				Y		Y		
Evaluation of supply chain	FC	Y			Y	Y		Y	Y
Financial administration	FC	Y			Y	Y	Y		Y
Interpretation of currency fluctuation	FC	Y			Y			Y	Y
Interpretation – reading of legal documentation	FC					Y	Y		Y
Knowledge of pricing models	FC					Y	Y		Y
Knowledge of supplier efficiency	FC	Y			Y			Y	Y
Negotiation and bargaining - suppliers	FC	Y			Y	Y	Y		Y
Ability to use available technology effectively	HC			Y	Y	Y	Y		Y
Ariel	HC	Y			Y		Y		Y
Assertiveness	HC	Y		Y	Y	Y		Y	
Building organizational culture	HC	Y				Y		Y	Y
Coping with change	HC	Y		Y	Y	Y		Y	Y
CSIR DocDel	HC	Y			Y		Y		Y
CSIR project management system	HC	Y				Y	Y		Y
CSIR project management system administration	HC	Y	Y				Y		
Culture consciousness	HC	Y				Y		Y	Y
Database design	HC	Y		Y		Y		Y	
Decision making	HC	Y		Y	Y	Y		Y	Y
ERUDITE	HC	Y	Y					Y	
Facilitation (for communities of practice and cross functional teams)	HC	Y				Y		Y	
Human resource management	HC	Y				Y		Y	

Skill	Cap	A	NR	IM	IP	M&BD	T	I	C
ICT manipulation	HC	Y				Y		Y	Y
III Millennium	HC	Y		Y	Y		Y		Y
Inmagic	HC	Y	Y					Y	
Innopac	HC	Y		Y			Y		Y
Interpretation of legal and technical documents	HC	Y				Y		Y	Y
Leadership	HC	Y		Y	Y	Y	Y		Y
Management	HC	Y		Y	Y	Y	Y		Y
Mentoring	HC	Y		Y	Y	Y		Y	Y
MS Access	HC	Y	Y					Y	
MS Excel	HC	Y		Y	Y	Y	Y		Y
MS Power Point	HC	Y				Y		Y	Y
MS Word	HC	Y		Y	Y	Y	Y		Y
Negotiation and persuasion	HC	Y			Y	Y		Y	Y
NT	HC	Y	Y					Y	
Overview (balcony vision)	HC	Y				Y		Y	Y
PC technical fault identification and repair	HC	Y	Y					Y	
Persuasion	HC	Y			Y	Y	Y		
Presentations	HC	Y				Y		Y	
Prism	HC	Y			Y		Y		
Request	HC	Y			Y		Y		Y
Sabinet Online	HC	Y		Y	Y		Y		Y
Strategy and vision formulation	HC	Y		Y	Y	Y		Y	Y
Team playing	HC	Y		Y	Y	Y		Y	Y
Telephone etiquette	HC	Y		Y	Y	Y	Y		Y
Time management	HC	Y		Y	Y	Y		Y	Y
To be pro-active	HC	Y		Y	Y	Y		Y	Y
Training - teach users to exploit the full capacity of available products	HC					Y		Y	Y
Understanding of management trends	HC	Y				Y		Y	Y
Understanding of organization's politics	HC	Y		Y	Y	Y		Y	Y
Understanding of technical trends	HC	Y				Y		Y	Y
Web design software	HC	Y				Y	Y		Y
Web page design	HC	Y				Y	Y		Y
Web publishing	HC	Y				Y	Y		Y
Word Perfect	HC	Y	Y					Y	
Writing - manuals, documents, procedures, etc	HC	Y		Y	Y	Y	Y		Y
'Market scanning' and analysis – to identify sources proactively and identify market trends	SC				Y	Y		Y	Y
Ability to analyse	SC					Y		Y	Y
Ability to distinguish between attempting to rectify errors internally and when to call for assistance	SC	Y		Y	Y	Y		Y	Y
Ability to identify errors	SC			Y				Y	Y
Ability to use labelling equipment	SC			Y			Y		Y
Analytical skills - for needs identification and analysis.	SC	Y			Y	Y		Y	Y
Book acquisitions	SC	Y			Y		Y		Y
Building customized portals and extranets	SC	Y				Y	Y		Y
Capturing lessons learnt	SC	Y				Y	Y		Y
Cataloguing	SC	Y		Y			Y		Y

Skill	Cap	A	NR	IM	IP	M&BD	T	I	C
Collection building - virtual and physical	SC	Y		Y			Y		Y
Collection maintenance	SC	Y		Y			Y		Y
Compilation of policies and guidelines	SC	Y		Y	Y	Y		Y	Y
Converting paper to electronic	SC	Y				Y	Y		
Creativity	SC	Y				Y		Y	Y
Critical evaluation.	SC	Y				Y		Y	Y
Data capturing	SC	Y		Y			Y		Y
Database creation, maintenance and manipulation	SC	Y		Y			Y		
Database development	SC	Y	Y				Y		
Database maintenance	SC	Y		Y			Y		Y
Database searching	SC	Y		Y	Y	Y	Y		
Deliveries	SC	Y		Y			Y		
Development of subject specific databases	SC	Y		Y				Y	
Dialog searching	SC	Y			Y			Y	
Document supply	SC	Y			Y		Y		Y
Driving	SC	Y		Y			Y		
Efficient administration	SC					Y		Y	Y
Filing	SC	Y				Y	Y		Y
Secretarial	SC					Y	Y		Y
Identification and rectification of errors in copied records	SC	Y		Y				Y	
ILL	SC	Y			Y		Y		Y
Indexing	SC	Y		Y			Y		Y
Information collection	SC	Y		Y				Y	
Information management	SC	Y		Y			Y		Y
Information Packaging	SC					Y		Y	Y
Internet searching	SC	Y			Y	Y	Y		Y
Investigation - faults and sources	SC	Y		Y				Y	Y
Issue desk	SC	Y		Y			Y		Y
Journal administration	SC	Y		Y	Y		Y		Y
Judgement – recognise it when you see it	SC				Y	Y		Y	Y
Knowledge management	SC	Y		Y	Y	Y		Y	Y
Knowledge of international cataloguing standards	SC	Y		Y			Y		Y
Knowledge of the CSIR subject areas to include those as subject terms where appropriate	SC	Y		Y				Y	Y
L&IS system maintenance	SC	Y		Y			Y		Y
Maintaining information products	SC	Y		Y		Y	Y		Y
Network administration	SC	Y	Y					Y	
Networking – especially when tracing ‘difficult’ documents.	SC				Y	Y	Y		Y
Novell network administration	SC	Y	Y					Y	
Packaging of information retrieval from databases and internet	SC	Y				Y		Y	
Policy and procedure formulation	SC			Y	Y	Y	Y		Y
Pro-active identification of future projects	SC	Y		Y	Y	Y		Y	Y
Product development	SC	Y				Y		Y	Y
Record keeping	SC	Y		Y			Y		Y
Report collection maintenance	SC	Y		Y			Y		Y
Scanning (text/images)	SC	Y				Y	Y		Y
Secretarial duties	SC	Y				Y	Y		Y
Selecting L&IS systems	SC	Y		Y		Y	Y		

Skill	Cap	A	NR	IM	IP	M&BD	T	I	C
Shelf reading	SC	Y		Y			Y		Y
Sifting, sorting, maintaining information collections – virtual and physical.	SC			Y			Y		Y
Stock purchases	SC	Y			Y		Y		Y
Subject area knowledge (CSIR specialization areas)	SC	Y		Y				Y	
Support of hardware items	SC	Y	Y					Y	
Systems administration	SC	Y		Y				Y	
Technical know-how relating to the L&IS system.	SC			Y				Y	Y
To identify errors	SC	Y		Y				Y	Y
To make connections – connecting minds and information	SC	Y				Y		Y	Y
Training	SC	Y				Y	Y		Y
Transferring information from the physical (paper) to the virtual (electronic) domain	SC					Y	Y		Y
Trend identification	SC	Y		Y	Y	Y		Y	Y
Understanding of information trends	SC	Y		Y	Y	Y	Y		Y
Verifying records	SC	Y		Y	Y		Y		Y
Web development and maintenance	SC	Y				Y	Y		Y
Web site administration	SC	Y				Y	Y		Y
Writing and implementation of marketing plan	SC					Y	Y		Y
Writing	SC			Y	Y	Y	Y		Y

This exercise did not take cognisance of skills levels and the list still contains some duplication. It is necessary to also determine if these skills requirements are at the 'beginner, experienced or mentor' level. As a first step, these skills 'levels' need to be benchmarked within IMPS but the intention is that the skills levels will be calibrated with staff members at other institutions. The calibration did not form part of this research. It would be ideal if that could be done as part of further research. It may also be useful to put skills into competency groupings rather than to just list them.

The most important initiative during this phase should be seen as the skills audit that was completed and then gave rise to considerable, subsequent development work. The audit should in future serve as the base from which human capital development within IMPS can be measured. The IMPS personal monitoring tool, which is discussed in the next section, also used the skills audit data as 'base entry level' information. Most of the second-phase structural capital development energy was utilized to develop the personal monitor.

5.4.3.2 Structural capital

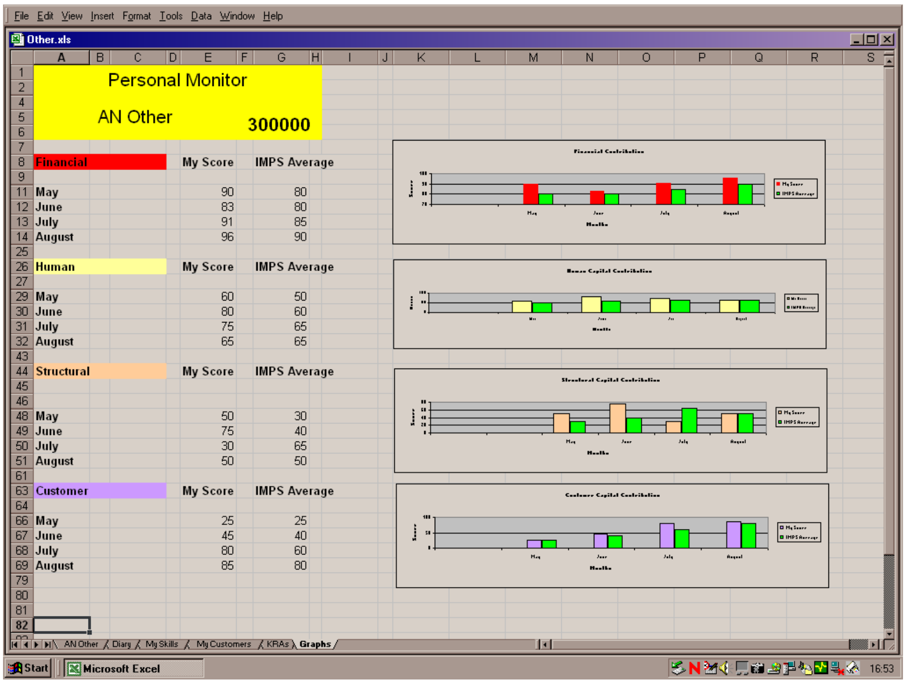
A personal monitor was developed in an effort to provide a tool that could be utilized to measure personal contribution and growth. A secondary goal was to serve as a transparent and fair evaluation system that would reward desired behaviour. The reasoning behind the monitor is that it is not possible to measure the growth in intellectual capital at organizational level, if growth cannot be measured at individual contribution level. Because it is so easy to again measure only financial capital related items, an attempt was made to identify what should be measured to establish personal value over the spectrum of capitals. Table 4.7 on page 4.43 reflects the questions that were formulated to make staff members aware of the fact that knowledge era work is about more than just doing a job. From the questions listed in Table 4.7, a comprehensive monitor was created making use of a Microsoft Excel workbook that was personalized for each staff member. After a first attempt to launch the monitor, it was realized that it was far too complex and cumbersome for the value that would be gained from its implementation. Implementation was stopped and, with the assistance of individual staff members and the two project managers, the monitor was considerably condensed and simplified. Table 5.4 below reflects the portion of Table 4.7 that refers specifically to the 'adapted' personal monitor.

Table 5.4: Monitoring personal value – what contributions to measure

Personal contribution to both the tangible and intangible value chains	Contribution to IMPS/Value added
What skills do I need to do my job? What additional skills do I need to learn? At what skill level am I functioning?	What did I teach to whom?
What am I doing to identify new and better ways to do my work?	What am I contributing to our overall innovation process?
What do I do to ensure good quality work? How often do I need to re-do work?	
What feedback am I getting with regards to the service I am providing?	What do I contribute to the improvement of our service to customers?
	What did I contribute to finding new ways to improve our relationship with our clients?
Are my timesheets completed?	

The second version of the monitor was launched in May 2002. Staff members were only provided with a two-page form to complete (see Attachment 2). The form was in a Word document format that contained the measuring criteria and a 'scoring table'. The form could be printed and completed by hand. They were, however, required to edit the financial capital portion of the form to indicate the bulk of their daily task as one item only with a maximum score of 50 out of a possible 400. Although a few members of staff were trained to assist in the process, that specific item caused real problems for most, as they could not agree with the concept of the 'job' they were doing being only such a small portion of the full contribution. The monitors were checked to establish the nature of problems and these were addressed at an individual level. All staff members agreed to use the system for a period of six months after which the system would be reviewed and adapted to make provision for further concerns. The paper-based monitors were captured by hand at the end of June 2002. Only then were the results transferred to the adapted Excel workbooks from which it was possible to automate calculations. Because the data was seen as untested and therefore unreliable, results were not reflected as part of this research. Figure 5.4 below does, however, reflect the graphs section within the monitor. From the graphic it is possible to see that an individual is able to benchmark his/her own progress against that of the rest of the section.

Fig 5.4: The IMPS personal monitor



The figure shows that the monitor workbook makes provision for several worksheets. The first of these is for the capturing of scoring data; and the second sheet is a diary where any back-up information is captured. Worksheets three, four and five allows for the individual to, with the guidance of his immediate manager, list his skills (including the skills level), his customers and the key result areas (KRAs) or objectives for a specific review period. KRAs form part of the CSIR's formal evaluation system. The last worksheet provides the graphs that are drawn from the information captured on the first worksheet. The benchmarking figures come from a separate workbook that is generated from the personal workbooks. As indicated in section 2.4 on page A1.20 of Attachment 1, staff members have reserved judgement on the use of the personal monitor. From observing reactions and listening to complaints, it is the perception that most are finding it challenging to make provision for the monitoring of more than just 'financial capital contribution'. Because all appear to be positive about the intention behind the monitor, it has been identified as one of the priority actions, for the next development phase (not covered in this report), to ensure that the tool is formed and shaped until it becomes acceptable to all.

On the graphs (Figure 5.4), the green bar always indicates the IMPS average. The monitor was designed so that each of the intellectual capital categories carries equal weight: a score out of approximately 100. It is necessary to, at a later stage, evaluate if it is not perhaps necessary to build in a weighting system that is more appropriate to a person's specific role within IMPS. The agreement with staff was that the methodology would be reviewed at the end of a six-month implementation period. It is also at that stage that a decision will be made whether the system will be introduced to the rest of CSIRIS.

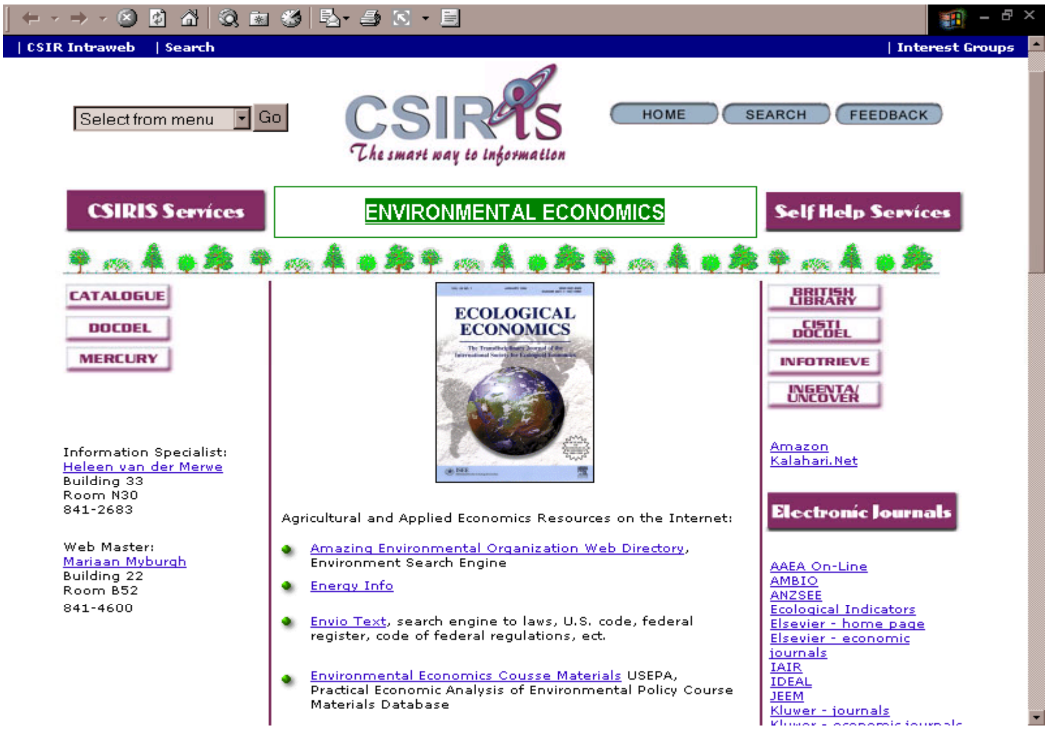
Currently the usage of the monitor is cumbersome. The intention is not to work in such a way for a prolonged period. Should the monitor prove to be valuable, the process should be migrated to the enterprise-wide workflow system. At present the CSIR's workflow system does not make provision for scorecard evaluation of individuals but, according to the supplier of the software (Peoplesoft, 2002), the balanced scorecard is part of their enterprise performance management product line. This functionality should be investigated during the next development phase.

Other changes and improvements to structural capital were less intensive than the implementation of the personal monitor. For example:

- During the first phase of implementation, it was established that investigations associated with the financial systems processes required input from the corporate financial staff. It was then decided to delay changes to the internal financial system and to do further investigation once the enterprise-wide system was upgraded. During phase two, procedures around petty cash, the payment of invoices and a number of other minor procedures were streamlined. As part of the CSIRIS-wide streamlining of project registration, the IMPS timesheet and financial reporting was also addressed and simplified.

- CSIRIS took on the responsibility to facilitate communities of practice within the CSIR. It was therefore seen as important to also develop those skills within the IMPS environment. Not all IMPS staff members were required to participate but it was especially the web developer and the managers that were tasked with the skills development challenge. Virtual communities were of special interest. Initially the virtual community structure was to be based on portal technology but, due to technical constraints as well as a lack in appropriate skills, the web interfaces, for the communities, were developed as static pages. The planning and thinking was done in conjunction with appropriate front line staff members and the community facilitator. Planning was also done in such a way that it allowed for migration to a more appropriate technology when that became available. Figure 5.5 is an example of one such a virtual community interface.

Fig 5.5: Interface for a virtual community



The interface makes provision for links to the CSIRIS services and also to 'self help' commercially available document delivery services. Direct links to specific e-journals and the most suitable search engines applicable to the subject area are included. The content of the centre panel is determined solely by the community and is changed as often as is necessary.

As a result of feedback received from customers, it was decided to redesign the layout of the CSIRIS Intranet interface (Figure 5.3 on page 5.24). The enhanced version made provision for subject categorization as well as for 'an article of interest' section that could be updated with a brief overview and a link to an article that is of general interest to CSIR staff. In Figure 5.6 on the next page, for example, the link was to an article on performance based pricing, which linked to an article on the *Harvard Business Review* site.

Fig 5.6: Enhanced Intranet Interface

The new interface also made provision for a link to the documented results of an Information Services Forum, which was established by CSIRIS management to facilitate formal feedback from the CSIRIS customers. From the 'hit rate' results analysis, which is run monthly, it was established that more than just the CSIRIS staff were reading the CSIRIS staff newsletter and as a result it was also given more prominence on the new interface.

Another activity that had direct impact on the growth of structural capital is a cataloguing benchmark exercise that was done in conjunction with the preferred partner, UP AIS. A task team was appointed to specifically look at the process being followed at 10 of the institutions identified as leaders in the industry. The conclusions, reached after the completion of the investigation are reported in section 3.4 on page A1.27 of Attachment 1. The report (Van Deventer, et al., 2000) was presented to the management of CSIRIS and UP AIS as well as to colleagues from the participating institutions.

In summary, the most important activities during this phase, that specifically relate to the development of structural capital, are the development of a 'personal growth and contribution' monitor and a cataloguing benchmark study that was completed in collaboration with a reliable partner. The next section addresses activities associated with customer capital.

5.4.3.3 Customer capital

Phase two corresponded with the CSIRIS-wide drive to increase activity in the external market. In relation to Ansoff's marketing strategy model (discussed in section 3.4.3 (c) on page 3.50) and keeping in mind the products and services that IMPS could offer, it was decided to follow a product development strategy and to market only existing products to new markets/customers. The secondary role that IMPS needed to play was in terms of developing and producing supporting documentation such as templates for proposals and marketing brochures. Co-ordination of the activity was delegated to the client liaison officer who had to ensure that contributing individuals, from both the front line and IMPS, kept to set deadlines.

The liaison officer was also responsible for keeping track of the marketing plan and its associated activities. Both the CSIRIS managers and the marketing task team participated in identifying the appropriate activities, but the liaison officer put in place a system that ensured that weekly, monthly and quarterly activities were executed. Some of these activities were specifically planned to include partners (for example book suppliers to host a book fair), some were purely informative, and others, the monthly activities, were targeted at information literacy. Again the liaison officer's role was to ensure that planned activities took place. She also ensured that a review of activities could take place prior to setting the programme for the next period. Every opportunity was utilized to gain feedback from clients that were affected by individual activities. This feedback was documented and made available via the document management system. A synopsis of the results was also published in the weekly newsletter to staff.

The establishment of an Information Services Forum (for the CSIRIS group) was seen as another opportunity to gain formal feedback from the most important clients and stakeholders. An Executive Vice-President, who is also the most important CSIRIS stakeholder, chairs the forum. Active participation in this forum ensured that IMPS had an opportunity to market its services and identify needs that were perhaps not being addressed. Two such items were:

- a need to develop alternative funding models to pay for services that are of a generic nature; and
- the need for a guideline document that research staff members could utilize to identify what information resource is most suitable for a variety of information retrieval needs.

From the above it can be seen that the second phase of customer capital development focused heavily on collecting and interpreting feedback from customers. The feedback was utilized to continuously address and improve activities that were taking place as part of the day-to-day operations.

5.4.3.4 Financial Capital

Besides the normal budgeting and financial control activities, the development of new funding models still provided a challenge at the end of the research period. It was therefore decided to facilitate a workshop and invite the two project managers, the CSIRIS Director, and the front line managers to participate. The purpose was to gain input as to what models to propose to the Information Services Forum.

As was mentioned at the beginning of the section on phase two activities (see page 5.32), the pace slowed down during the second phase and the focus was on maintaining and stabilizing activities that were initiated during the first phase. Even though it could therefore be seen as a maintenance phase, there were a number of lessons that came from the phase two activities.

5.4.4 Lessons learnt from phase two

During the second phase of implementation, the working environment had become much more stable and as a result the lessons from this phase were to a certain extent more lasting than those from the first phase. The lessons are again grouped as emerging from the four capitals.

5.4.4.1 Human capital

Not all teams are able to manage themselves with the same amount of success within an unstructured environment. The situation needs to be monitored and, when necessary, deliberate action has to be taken to ensure that teams learn from each other. If this is not done it is very difficult to keep some task teams functioning effectively.

It is very easy to allow the results of a skills audit to overshadow the development that is taking place. It is therefore recommended that the requirements for a skills level be established prior to an audit. Knowing what the requirements are minimizes the 'surprise factor' for staff members as it makes it easier for individuals to judge their own expertise. Care is also needed to not allow something like a skills audit to turn into competition amongst individuals.

5.4.4.2 Structural capital

Benchmarking is valuable for a variety of reasons. However, ample time provision is needed and it must be ensured that all interviewers approach the exercise from the same angle. Visiting the benchmarking partners one by one allows for additional information to be collected but it would perhaps have been useful to meet with all the participants as a group, either at the onset of the project or as a last review prior to releasing the final report.

5.4.4.3 Customer capital

There are definite advantages to allowing a stakeholder to drive a formal feedback activity such as is the case in the CSIRIS Information Services Forum. Both customers and service providers see the stakeholder as an honest broker and the feedback provided is therefore of value for all.

At the same time though, it is easy to allow positive feedback to overshadow what may appear to be minor indications of problems. When everyone else seems positive, it is a difficult task to ensure that one stays 'honest' to a complaining customer. In this regard the monitor, even though it makes provision for gaining additional 'points' when a problem is resolved, did not in the initial stages have the desired effect. Having identified the problem, additional measures needed to be taken to ensure that these complaints were addressed with the appropriate diligence. It does appear to be an area that needs additional attention.

5.4.4.4 Financial capital

Stakeholder attitude was definitely influenced by positive interactions with CSIRIS customers. It was a mistake not to build more strongly on the same model for IMPS stakeholders. This was rectified late in the research project.

In closing, it is perhaps necessary to mention that maintaining and growing a system holds a different challenge to establishing it. If the implementation of intellectual capital management is to reach its full potential, it is necessary to ensure that all leaders buy into and are able to see the advantages of intellectual capital management early in the process. This means that the responsibility of driving the different stages of implementation could be shared.

It became very clear towards the end of the second phase that it was necessary to do a formal evaluation of progress.

5.4 Evaluating progress

Evaluation of progress occurred continuously, but very informally, during and after the 'phase one' activities were implemented. It was decided to do a formal evaluation at the end of the second phase. It was seen as of little value, within the context of this research, to merely count and reflect items such as years of service in the company or the amount spent on formal training. Neither were items associated with per capita income of real value or relevance. However, items such as customer satisfaction and lessons learnt were relevant. Table 5.4 on the next page, which also builds on Table 4.6 on page 4.37 and Table 5.2 on page 5.16, was created to reflect only those tools that were utilized to gain the results reflected in the *IMPS Intellectual Capital Report* (Attachment 1).

Table 5.4: Measuring growth – indicators and tools utilized

Measurement category	Indicators of growth	Measuring tools
Staff development and satisfaction (Human capital)	Motivated workforce Active participation at staff meetings Participation in networks Active participation in strategy sessions	Staff satisfaction polling through focus group discussions and interviews Analysis of 'gripes and whines' sessions and staff meeting participation.
	Personal development	Skills audit Review of personal scorecards Analysis of staff newsletter content
	Supportive environment to stimulate knowledge transfer	Analysis of staff newsletter content
	Appropriate skills under development Appropriate KRAs for performance evaluation Innovation projects	Evaluation of the human resource development plan Audit of training sessions, Conference attendance and formal training
	Participation in CoPs, task teams and consortia activities	Review of task team activities
Infrastructure development and utilization (Structural capital)	Reliable sources from which to extract statistics regarding: • staff complement; • training needs; • skills levels; and • customer product use.	Structural capital audit and analysis of available statistics
	Improvement in processes including benchmarking	Audit of process re-engineering
	Proof that the identification and development of suitable systems tools and templates is happening Proof that the identification and capturing of best practices, corporate memory and lessons learnt is occurring Proof that service levels, pricing models and other material that will guide the relationship between the organization and the customer has been established	Audit of repositories and systems
	Growth in CSIR structural capital	Review of new products and services
Customer commitment and satisfaction (Customer capital)	Commitment towards IMPS amongst customers	Delphi technique feedback
	Independence of customers	Analysis of new product usage statistics

Stakeholder satisfaction (Financial capital)	Keeping stakeholders up to date with regard to developments of strategic importance	Personal semi-structured interviews
	Proof that the group is achieving its mission	Measurement against the mission of the group
	Proof that the group is acquiring the infrastructure to enable the implementation of e-business strategies.	Analysis of activities
	Proof of responsible supply chain selection • Benchmarked preferred supplier list • Analysis of products • Analysis of usage statistics (from suppliers)	Analysis of available supply chains

The results of the analysis and review process are reported in detail in Attachment 1.

5.5 Summary

Chapter 5 provides a detailed overview of the activities implemented at the CSIRIS IMPS section where an experiment was conducted to see if intellectual capital management was an appropriate management philosophy to follow. The activities were structured over a period of 18 months and were implemented in two phases. Kaplan and Norton's adapted scorecard framework (which was discussed in section 4.5.5 on page 4.30) was utilized to set objectives for each of the two phases.

A situation analysis was done at the start of the experiment. The adapted version of Sveiby's Affärsvärlden model (Figure 3.2 on page 3.17) was utilized to identify specific actions and initiatives to be taken as a consequence of the situation analysis findings. It is clear that most of the activities focused on human capital development as that seemed to be the obvious place that needed most developmental work. However, an overview of all activities was given in Table 5.2 on page 5.16.

The last section within this chapter identified the indicators that need to be evaluated for growth as well as the tools that will be utilized to establish how much growth had taken place. The result of the evaluation is reported in the following chapter.