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TELECOMMUNICATION RESOURCE MANAGEMENT FOR COMPETITIVE ADVANTAGE

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ABSTRACT

Historically telecommunications has been considered a side component of office services(voice) or information services(data). This perception is no longer valid as telecommunications plays an increasingly pivotal and strategic role in the delivery of information/data/voice services among global operations. A business strategy for **information technology** must recognise this critical contribution and seek to integrate the largely fragmented technologies of data communications, voice communications, information systems and data management.

Telecommunications has emerged as a critical function with significant impact on the strategic planning process of a modern corporation. Some of the factors which have given rise to its importance include:

- deregulation of the global telecommunications industry;
- convergence of telecommunications and computing;
- rapid growth in the telecommunications market;
- use of information services and telecommunications to gain business competitive advantages.

Strategic telecommunications planning has become a necessity in responding effectively to this dynamic and complex business environment.

However research appears to indicate that planning managers mainly focus on factors related to cost of services and/or technology platform. These perceptions often result in telecommunications planning being relegated to departments such as Finance & Administration. This sort of delegation exercises the least common denominator in a firm's budget. Telecommunications is considered a business overhead.

Conversely, the firm that views telecommunications planning as a technical exercise slots the function into the narrow confines of technical operations. These narrow confines limit the role of telecommunications planning leaving it out of touch with the firm's business goals. Telecommunications should be viewed as a corporate resource whose significance is greatly enhanced when coupled with information management, allowing the firm to achieve great strides over its competitors.

This paper attempts to examine:

1. the role of telecommunications planning in the corporate strategy;
2. its organisational relationship to information services(I.S.) within the context of an integrated information technology platform;
3. the contribution that telecommunications strategy has made to the internationalisation effort of two global Australian companies;
 - a major bank with global operations in Asia, Europe and North America.
 - a major resources exploration and processing company with offices in over 50 countries.

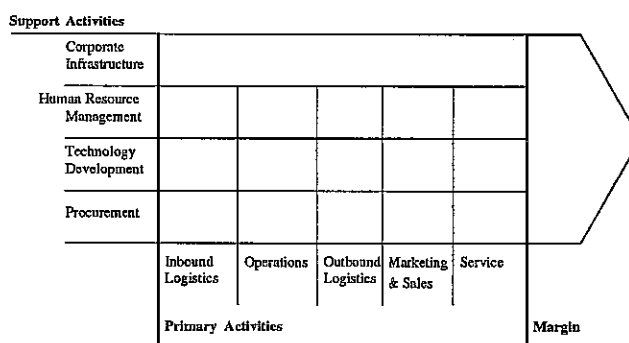
1.0 INFORMATION TECHNOLOGY FOR COMPETITIVE ADVANTAGE

Information Technology(I.T.) is having a profound impact on the way companies do business. The "value chain" concept exposed by Porter[Porter, 1985], highlights the role of information technology in securing competitive advantage. The concept divides a company's business into technologically and economically distinct activities. A firm is profitable if the value it creates exceeds the cost of performing its activities. This value is measured by the amount that buyers are willing to pay for the firm's goods and services. Every value activity has a physical and information processing component. Each activity creates, uses and updates information of some kind. Telecommunications technology can profoundly affect each one of these activities, often by simply improving efficiencies and sometimes by fundamentally altering the activity [Clemons & McFarlan, 1986]. I.T. is greatly enhancing the firm's ability to exploit linkages between value activities. The integration of intra and inter-firm activities enables company wide exploitation of core competencies.

The level of profitability may be dependant on two factors:

1. The competitive advantage the firm has over its rivals. A firm must either **perform its activities at a lower cost** or **differentiate its offerings** to extract a higher premium. [Porter, 1985]
2. The **industry leverage** developed by the firm, focusing on the development of its core competencies. Examples of core competencies include: McDonald's integration of its functional capabilities to create a consistent global product and message; and NEC's integration of computer and communications (C&C). Industry leverage enables the firm to increase entry barriers, maintain higher market shares and initiate alliances for greater bargaining power.[Grant, 1989]

The Value Chain



1.1 Enhancing Differentiation

Product differentiation significantly impacts the external value chain to the customer such as Production Innovation, Marketing & Sales and Service. Integrated Information Technology telecommunications and information services has a special feature of creating a high barrier to imitation because of the long lead time and technical difficulties associated with the design and implementation. Telecommunications is a valuable differentiator in businesses where convenience is dependant on access and information.

The key features of differentiation using information technology include the:

- **Advantage of Occupancy.** The placement of a computer workstation linked to a supplier's information network provides the customer with the convenience of placing orders and receiving time-critical information. Re-training is a very high cost which few users are prepared to accept. Therefore the first good enough service will establish a strong lead over its rivals.
- **Augmented Information Services.** Customer profile and buying trends are valuable marketing tools. American Hospital Supplies (AHS) recognised this by augmenting its Automated System for Analytical Purchasing (ASAP) electronic order/entry system by providing hospitals with management information on inventories, usage of products, costs and more. Retail distribution warehouses are able to sell information services for store layout, promotional planning and stock management to retail operations dependant on high turnover of stock such as supermarkets and large departmental stores.
- **Timely customer service.** Information Technology can be used to enhance customer service which has become an increasingly powerful business differentiator as product life cycles shorten and cost considerations in mature industries turn products into commodities. A production machinery manufacturer differentiates its after sales service by installing an expert maintenance system in its headquarters computer. When a machine fault occurs, a dial out capability alerts the manufacturer's computer which then performs the diagnosis and issues instructions to rectify the failure. Spare parts are dispatched and the field service unit is alerted, if necessary. This has reduced service call-outs and raises customer satisfaction through rapid service response.

1.2 Lowest Cost Producer's Competitive Advantage

Information services has enabled firms to achieve great efficiencies from the traditional labour intensive clerical functions of accounting, procurement, inventory management and administration. Telecommunications enables the interconnection of disparate systems removing the constraints of geography and time. This facilitates operational cost savings taking advantage of:

- **Electronic Data Interchange(EDI) for trade document processing.**
Stevedoring terminals at the Port of Melbourne have implemented a pilot electronic container booking service which will incorporate the transfer of trade documents for custom clearance, delivery orders and export advises. When fully commissioned, the system will generate massive productivity gains by reducing queuing time and improving security at the container terminals. Trade documents in quadruplicates will be converted to a single EDIFACT message transferred between open interconnected networks.
- **Just-In-Time inventory & production management;**
Most companies carry large stocks of inventory because of "information float", the time gap between a market related event occurring and the information being available to the central coordination units. Telecommunications cuts the "float" drastically allowing firms to reduce their inventory by 50-70 percent on average. Some manufacturers maintain no more than a few hours of floor stock. The benefits of JIT inventory management are passed on to higher product quality management.

- **Labour cost differentials and skills by exporting operations to other locations.**

Telecommunications via private networks have facilitated the transfer of work to locations which can provide the high skills at the right price. Optical character reader(OCR) technology together with telecommunications makes it possible to capture data from documents with standard formats while transferring their processing to another location. Users of OCR and imaging technologies include American Express, Citibank, TIME Inc. and CIGNA Insurance[Roché, 1991]. Over the years, developing countries such as India and the Philippines have emerged as a source of low cost highly skilled computer programmers. This advantage has been exploited by information intensive companies seeking to develop software applications but limited by the rising cost and limited supply of programmers. DEC, Anderson Consulting and several large financial organisations have maintained their design expertise in the home countries but contracted out the programming to India and the Philippines.

1.3 Capitalising On Organisational Capabilities

The capabilities of a firm are enhanced by the combined efforts of teams of resources working synergistically together. These resources broadly categorised as financial, human, technological, reputation and organisational resources [Grant, 1991]. For most firms, the most important capabilities are likely to arise from the integration of individual functional capabilities.

McDonald's possesses outstanding functional capabilities in product development, market research, human resource management, financial control and operations management. However, critical to McDonald's success is the integration of these functional capabilities to create McDonald's remarkable consistency of products and services in 10,500 restaurants in 50 countries with a new location opening every 17 hours. In 1986, together with Illinois Bell, McDonald's piloted ISDN with data, voice and video capabilities at the Corporate headquarters in Oak Brook, Illinois. Together with its international network, global and regional offices receive the advantages of accurate and timely executive information for planning, marketing data for research, sales/inventory information, electronic mail, and the benefits of a virtual private network. Full implementation was completed by 1992.

Areas of Telecommunication Involvement

adapted from Michael E. Porter's "Competitive Advantage", (New York Free Press, 1985), pp: 39-43

Inbound Logistics	Materials receiving, storing and distribution to manufacturing premises
Operations	Transforming inputs into finished products
Outbound Logistics	Storing & distributing products
Marketing & Sales	Promotion and sales force automation
Service	After-sales service to maintain or enhance product value
Corporate Infrastructure	Support of entire value chain including general management, planning, finance, accounting, legal services, government affairs and quality management
Human Resources Management	Recruiting, hiring, training and development by making the skills matrix available for personnel development decisions.
Technology Development	Improving product and manufacturing process
Procurement	Function of purchasing input

2.0 TELECOMMUNICATIONS: A TOOL FOR COMPETITIVE ADVANTAGE

All the information technology applications presented in section 1, draw heavily on telecommunications as one of the key drivers of modern business. It is the **conduit** through which information between business processes flows. It is the **enabler** for competitive advantages through using information technology solutions. Telecommunications significantly impacts the boundaries within which a firm operates:

- Shrinking geographical boundaries of time and distance
- Opening "mature" markets and "closed" industries
- Establishing new alliances and linkages where these were previously impossible
- Overcoming barriers to higher business volume and revenues

2.1 Generate Operational Efficiencies

The use of telecommunications and information technology to substantially reduce the cost of production is a major strategic advantage. Squeezing costs out of a business operation is more difficult for competitors to duplicate. The fundamental aspect of this process is:

- finding substitutes for labour or wholesale export of labour to lower cost locations;
- automating the sales to production value chains to facilitate JIT production and distribution;
- Executive Information Systems linked to global databases facilitating the distribution of key critical information for planning, monitoring and control functions.
- Electronic Mail, Voice Mail, Voice & Video Conferencing which facilitate the exchange of information through out the organisation to a much wider audience while reducing the time and effort loss in travel

2.2 Facilitate Decentralisation In Centralised Firms

Telecommunications eliminates the dichotomy between centralisation and decentralisation.

Many firms have realised that adding new data traffic to an existing network has a very small marginal cost. Once a network in place, firms quickly exploit the benefits of decentralisation by adding new electronic delivery services such as electronic mail, on-line access to corporate databases, etc.

Major trading companies such as Texaco have by-passed the banks for foreign exchange and treasury management services by linking directly into the international dealing networks. A 20% reduction in cash inventories has been often quoted by large corporations.

Hewlett Packard and GE(USA) have successfully changed the relation between its field sales teams and branch offices. The sales personnel are armed with up-to-the-minute inventory records, client & product information and price alterations through a portable computer linked through a global packet switched network to central databases. Some companies have started using cellular modems and pen-based Personal Computer(PC) to speed up order entry.

Distributed Business Operations are key initiatives for shipping lines whose agents are distributed among distant ports. The ability to respond rapidly to changes in customs and transportation regulations is critical to modern container lines operations. This response also requires the ability to handle trade documents electronically to reduce manually handling large volume of paperwork.

Wan Hai Steamship Company implemented an EDI system using an information technology architecture based on HP-3000 and PC LANs in the East Asian trade zones. The errors from multiple manual data entries in the processing shipping documents fell by over 40%, errors in invoice processing fell by 30%, errors in taxation documents by 10% and errors in financial statements fell by 5%. Sales spent less time correcting errors and more on providing a superior service and getting more business. The financial benefits over a 7-year period were estimated to exceed NT\$165 million. What was more important was the ability to handle larger volume of trade without necessarily increasing processing costs. In addition, management is receiving accurate and timely planning information which was otherwise not available. Telecommunications facilitated the **avoidance of costs** as well as **improving operational effectiveness**. [Roche, 1991. p. 300-313]

2.3 Provide Superior Customer Service

If a company already has a strong communications capability, it will discover many ways to exploit this network through inter-company linkages. The recent trends involve connecting suppliers and customers, using EDI to eliminate delays and multiple data entry errors, EFT/POS and credit cards for capturing customer buying profiles.

A major Australian minerals processing company has implemented an integrated information gateway to its customers. The mail gateways have X400 mail and X500 directory services to permit global intercommunity access. The trading gateway is standardised to accept EDIFACT and ANSI Electronic Data Interchange(EDI) documents. This ensures that the company is able to provide **rapid response** together with controlled access by customers to corporate information.

2.4 Maintain Strategic Alliances

Links between related companies even competitors into electronic networks will push the frontiers of economic efficiency facilitating faster trade and lowering costs.

GE Information Services (GEISCO) is a Value Added Network provider. Its network is its strategy. The company believes that its business is to provide enhanced communications to major global corporations. Its business is captured by the keywords: **Electronic Commerce, Information Management and Systems Integration**. GEISCO's ability to anticipate the communications needs of major corporations has placed it in an enviable position to form strategic alliances with companies such as:

- Apple Computer for global communications and information integration
- Coles Myer, Australia's largest retailer, for EDI and X400 communications
- Major financial institutions for global risk management

GEISCO markets information and communication services to sectors such as Trade & Transportation, Health Care, Information Industries, Publishing, Retailing & Distribution, Financial Services, Pharmaceutical, Insurance Services and Petrochemicals.

2.5 Create Market Innovation

Health Communications Network(HCN) is an Australian innovation which will capitalise on the use of the national public switch telephone network(PSTN) to deliver patient data to doctors and hospitals. It's objective is to overcome the difficulties of sharing and obtaining patient data whilst retaining the benefits of medical confidentiality.

Automated Teller Machines(ATM) are another concept which although innovative, were really another means of delivering the same service of deposit and withdrawals but with added convenience and simplicity. ATM's only provided competitive advantage for a limited time, until rivals recognised their community acceptance and imitated the concept. The innovator had about 3-5 years lead time.

3.0 THE SENIOR MANAGEMENT AGENDA : VISION; POLICY; ARCHITECTURE

Opportunities for actualising the competitive advantages have often met with the organisational obstacles of:

- delegation to a technical elite;
- inappropriate business justification;

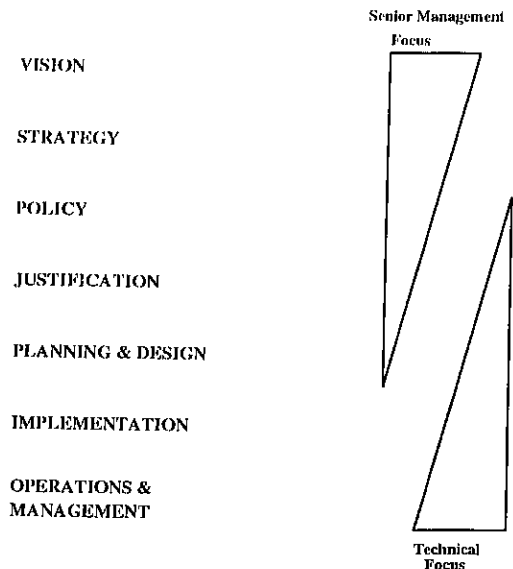
resulting in a naive acceptance of the promises of innovation. This precedes the naive insistence of control in the aftermath of failure. Senior business managers have long relied on technical staff to make decisions for Information Technology strategy and implementation policies because they were uncomfortable with technology and did not comprehend its significance to corporate business strategy.[Keen, 1988].

The problem of delegation has been found to be the most significant problem when trying to integrate the objectives of business and technology-driven implementation.[Keen, 1988; King & Premkumar, 1989].

A further cause of frustration is the inability of managers to provide the appropriate business justification for information services and telecommunication projects. The most touted justifications are based on: Cost-displacement; Full allocation of costs and Short-term planning objectives. This is in stark contrast to an investment with long-lead times for design and implementation, or an infra-structure that is intended to create opportunities that improve revenues.

It is imperative that senior business management initiate the process by which key business criteria form the basis for a Business Vision for Telecommunications. This has to be followed by a clear policy statement setting the boundaries for risk, architecture, planning horizon, and pace of change management. The strategy must be carried down to design and operations management details. At this point, the process can be delegated to the domain of the telecommunications specialist for implementation. Newstead presents a framework for developing the focus from vision to an implementation plan in which he indicates the degree of focus by senior management and technologists[Newstead:1992].

Senior Management Focus in Telecommunication Development



3.1 Build the Business Vision for Telecommunications

Vision :

- "The ability to perceive the invisible through keen foresight" [Webster's Dictionary]
- "A photograph of the future. Concrete yet easily understood" [Keen, 1988]
- "A coherent and powerful statement of what the business can and should be in X years hence" [Wilson, 1992].

Telecommunications is a subject often encountering uncertainty and ambiguity. The technology is evolving so rapidly that standards, protocols, and hardware are in a constant state of flux. It is hard for people to envisage the implications of electronic delivery mechanisms such as; video conferencing, VSAT receivers, mobile/cellular telephony, electronic document interchange(EDI), etc. Deregulation is introducing significant uncertainties for firms traditionally used to a single PTT supplier. The uncertainties are **business, technical, cultural and social**. It is difficult to envisage something that does not yet exist, where there is no tradition of integrating telecommunications into the business for competitive advantage.

Peter Keen [Keen, 1988] lays out three goals for the process of building a shared vision:

1. Shift the focus and terms of debate for telecommunications from technology to business, and from cost to benefit.
2. Provide a forum for sharing views and building momentum towards consensus. Bring business people directly into what has been a technical debate.
3. Disseminate the vision and message widely throughout the organisation

This building of the vision must be sponsored by the highest levels within the organisation. The lack of senior management support has been identified as the most critical factor leading to the failure of major shifts in the business paradigm.[Keen, 1988; King & Premkumar, 1989]. This sponsorship will most likely be provided through a top-level steering committee reporting to the Board of Directors. Its functions will be to interpret the business vision and through the use of business and technology line managers, set the agenda and policies for the implementation of an information technology architecture.

Both Australian corporations involved in this study produced a vision and future directions paper after considering blue print set out below. The details of the strategy varied according to their business environment.

Blue print for establishing a Business Strategy for Telecommunications

Telecommunications Audit	Review of current architecture implementation Physical, traffic, organisation, policies & procedures
Internal Business Environment	Review business strategy and priorities by division and individual business units targeting areas of where telecommunications can contribute to internal efficiencies and overcome weaknesses
External Business Environment	Identify potential threats and industry shifts within the next 3-5 years
Application Opportunities	Identify ways by which I.T. could capitalise on internal strengths and market opportunities while defending against external intrusion
Telecommunication industry trends	Identify industry trends in telecommunications and the required actions necessary to ensure continuing compatibility, maintainability and reliability of the network
Organisational Change Management	Recognise the cultural distances between technological innovation and genuine achievement.

The following have been identified by Newstead as key elements of a telecommunications strategy :

Application Opportunities

- Competitive Essentials
- Business Unit Priorities
- Product/market segments
- Strategic Business Plan

Technical Elements

- Network Topology and Configuration
- Network Solutions
- Broad Plant Capacities
- Network Standards
- Type of Services to be provided

Human Resources Elements

- Business benefits expressed in terms of user's specifications
- Organisation for planning, implementing and operating the telecommunications infrastructure
- Degree of user involvement; business performance monitoring of the services, feedback & reviews
- Accountability by users for business justification and by technologist for network performance
- Employee relations and continuing education & training

Financial Elements

- Financial requirements (fixed and variable investment)
- Financial analysis including
- Cost/benefits developed jointly by business users and technical staff
- Pricing allocations for continuing operations;
- Transaction based or cost recovery based.

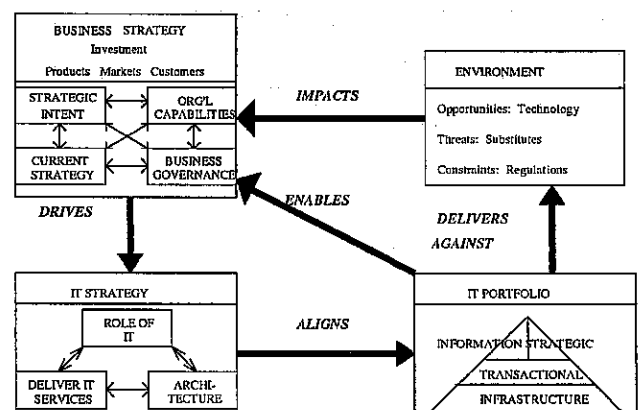
3.2 Establish the Bridge from Vision to Action: POLICY

The Policy Bridge spans the chasm between business vision for a telecommunications strategy and the implementation of the architecture. In building the policy statement, it is critical to recognise that **"Business criteria should drive technical planning"**. Technical decisions are not absolutes but involve trade-offs with economic variables. Policy is an explicit set of mandates and directives. It defines bounds on planning and design, clarifies responsibilities and confirms authority. Policy is a set of choices within self-imposed constraints. Keen [Keen:1988] lists some major policy issues:

- The degree and pace of change management is willing to accept
- Vendor Policy
- Architecture Policy
- Range of Services to be accommodated
- Planning horizon including funding and cost recovery
- The acceptable level of Risk (technical and financial)
- Security
- Service Availability

Most constraints imposed on the organisation are not directly controllable: government regulation and availability of technology. Other factors are controllable in the long-run but are an imposition against current and short-term activities. These include: organisational capabilities and industry practices.

Business Strategy Driving Information Technology



4.0 TOWARDS AN INTEGRATED INFORMATION TECHNOLOGY

Competitive advantages are no longer achieved by simply automating the manual processes of accounting and administration. The next generation of "springboard initiatives" involve considerable risk;

- **market concept risk** where success will be judged by customer acceptance and continued use;
- **technology risk** incurred with unproven or new technology in the context of intended use, users, volumes, and performance requirements
- **economic risk** when the outcomes of the business concept, technology and implementation is other than what was optimistically forecast in terms of revenue or support.
- **organisational risk** refers to the possibility that a technically functional innovation fails to secure buy-in, threatening key aspects of the firm's culture, management processes or require skills not possessed by the firm

The pace with which telecommunications and information management innovations are changing means that the risks cannot be overcome by simply more emphasis on a technology-based solution. There needs to be a business solution which incorporates the integration of communications, computing, and data management. Integrated technologies require integrated thinking within an integrated organisation. This remains the challenge of senior information systems and telecommunication managers.

Some of the more significant concerns encountered by senior business and technology managers attempting to integrate the two disjointed areas of the enterprise include:

- aligning business objectives and justification with information technology solutions
- developing an information architecture
- improving IT strategic planning
- understanding of the role and contribution of information technology in achieving the strategic objectives of the enterprise

4.1 Align Business And Technology Goals

The critical factor towards the integration of I.S. and telecommunications to achieve the organisational business strategy is the commencement of a dialogue between the technologists and senior business managers. The key to alignment is **relationships** not just strategy. [Keen, 1991].

In building these relationships, senior managers have to be committed to three areas:

1. Education,

Education is not synonymous with training. Education is continuing and pervasive. It usually precedes a shift in management paradigm and the implementation of a major technological change. It is necessary so that people have the vocabulary, the understanding of the business message and the insight to be meaningfully involved and committed. Education is key to developing senior management awareness towards the competitive advantages available by integrating information technology with business goals.

2. Systematic cross-fertilisation of skills,

This process is critical if an organisation is to build the dialogue, and relationship between the business and technical drivers of its future direction. Telecommunications specialists are usually lacking in the areas of business management expertise with considerable less exposure to lateral development in marketing, finance,

industrial relations, and business operations. Similarly, marketing, finance and administration staff are ill-informed about the strategic benefits afforded by integrated information technology. What level of details should managers require? Non-technologist should aim for the basic understanding that will allow them to appreciate and read a telecommunications plan as a technical manager should have of financial cost analysis, debits, depreciations, etc. They need a "functional" appreciation of the capabilities and limitations of telecommunications and computing technologies.

3. Institutionalise the process of innovation.

Innovation entails risk. The companies that have proven the success of information technology as a differentiator:

- have a clear vision of the role of information technology in the implementation of their business strategy. Eg. Citibank in the development of its global network architecture.
- were not trapped by technology and did not rely on technology in itself to give them an edge. Eg. GEISCO in developing business alliances over multiple industries and business focus.
- maintained close links to customers and use information technology to understand the customers buying profile and trends Eg. American Hospital Supplies(AHS)

I.T. successes are rarely strategic in the traditional grand, innovative and dramatic sense. They are mostly undramatic concepts that relate to the core business drivers of the firms such as ATMs, Order/eniry terminals with on-line access by the customer, EDI, computer aided manufacturing incorporating JIT inventory control, airlines customer reservation systems, integrated corporate financial workstations. These are the fundamental elements of transactions, customer interactions, ordering, production, and delivery that define customer service. Each "innovation" was an evolution of core business drivers. They became revolutionary when customers voted with their dollars to an industry leader delivering a superior service or product. Failures were those innovations which did not gain a critical mass of acceptance nor did they relate to the structures of ordinary life or ways of doing business.

4.2 Re-Engineer The Organisation

It is critical that the business criteria and priorities drive the building of the vision and the development of the telecommunication strategy. This must first and foremost be reflected in the commitment of top management and the sponsorship of the Chief Executive Officer or Managing Director. Following on this commitment, the strategy planning team should be drawn from senior line managers who may have also participated in the building of the organisation's overall business strategy. Internal technical experts should be used to provide consultancy on industry trends in their areas of speciality. The justification for the use of innovative telecommunications must be based on clear and achievable business goals with consideration that the investment should be viewed as a the long term asset rather than simply as a current cost recoverable. Whilst telecommunications and information services may result in significant cost substitution, their long term contribution is to be an enabler to higher business processing capabilities and avoidance of costs. [Keen 1991]

The organisation structure which best facilitates the dialogue and relationship between business and technical leaders will be most able to exploit the benefits of information technology. The business team rather than a functionally defined hierarchy is seen as the real unit of organisation. Change and uncertainty as the norm has shifted the emphasis from division of work by labour to division by knowledge. Team work is relational. The quality of performance depends on the quality of interactions,

communication, and coordination between team members. Management control is replaced by coordination of the work of others. Decision making occurs in the team rather than in a hierarchy. Most firms who have a team emphasis or subscribe to cross-functional personnel networks, have a world-wide telecommunication infrastructure to facilitate regular personal communications.

This team approach is represented in both Australian corporations which have recognised that they are players in their respective information intensive industries; banking & finance and resources processing. This networking is illustrated in their telecommunication strategy and implementation network.

4.3 Manage The Economics Of An Integrated I.T.

Information Technology costs in infrastructure and software development has been growing by an average of 15% between 1960-1990. [Keen, 1991: pp. 141]. Often IT expenditures are among the highest component of business cost after employee costs, real estate and interest. There are three issues in managing the economics of information capital: managing costs, managing benefits and managing risk exposure.

Managing Costs: Keen suggests that to begin managing costs a firm needs to establish an IT Asset Balance sheet. This is a management report capitalising all IT equipment, software and data resources. Firms are generally aware of the central hardware costs which is depreciated on the financial balance sheet but often overlooks the hidden value of software (often customised to the firm's business requirements), data (eg: customer profiles, market research, product knowledge, etc) and distributed equipment (small unit items, PCs, telecommunications). A typical international bank identified total IT assets of \$ 2.24 billion subdivided as follows:

- Hardware: 16.40 %
 - Centrally managed computer 5.35 %
 - Distributed computers 3.75 %
 - Network Equipment 4.68 %
 - Distributed telecommunications 2.63 %
- Facilities: 8.60 %
- Software 21.80 %
 - Application Development 18.75 %
 - Other including PC software 3.05 %
- Data 53.2%
 - Salaries, processing, storage incurred in creating online data which is the basis of all products and services

Business users do not appreciate the scale or value of Information Technology structures. They appreciate even less the value of a telecommunications network. Therefore most business unit managers view the large investments as an expense rather than an asset, thus justifying their call to cut the costs of I.T. This perception is compounded when charges are allocated to business units on the basis of full cost recovery. What is required here is a change in attitude, for management take an asset view of I.T. This means funding the corporate infrastructure separately from business applications.

Telecommunications, shared database management resources, security and network management facilities are part of this infrastructure and must be funded as a long term capital investment justified by corporate policy requirements. For firms in information intensive industries (airlines, financial services, retailing, etc), this involves paying a premium for support of infrastructures that will ensure continued flexibility and quality of service, to avoid the firm being pushed into a position of competitive disadvantage.

Managing IT Benefits: I.T. benefits can sometimes be convincingly determined at the application level, the use of a private network link between Australia and Fiji at 19.2 Kb carrying voice and data can be justified on cost displacement and

service quality. An electronic mail system can be evaluated in quantitative terms by tracking the costs of communication. An innovative financial or trading product may be measured by increase customer satisfaction, or market share even if no exact figure can be calculated. More often, business justifications are not as obvious, and managers focus mainly on the costs rather than the benefits.

Keen [Keen, 1991: pp. 162-163], suggests that business managers should be aware of the following facts:

1. I.T. spending does not create benefits in itself.
2. It is the management process that determines the benefits not technology.
3. Many value added benefits do not show up in the traditional accounting and revenue based measures.
4. I.T. platform is the infrastructure for long range competitive advantages rather than short term gains.

I.T. rarely reduces cost. **Its main value is most often in changing the cost structure of the firm** so that it can process increased volumes without increasing personnel. I.T. substitutes fixed-cost capital for variable-cost labour. I.T. should be viewed as an **enabler of the firm's business**, making practical services and products that would be prohibitively expensive or impossible.

Airlines, banks, credit card and newspaper publishing companies could not operate without their I.T. base since the costs would be astronomical and inevitable delays would render their services totally unacceptable. Business managers should manage the benefits of I.T. rather than focus on the costs to the detriment of foregoing competitive advantages. A frequent attempt to justify the benefits of I.T. against traditional revenue based measurements fails. A firm supplying portable PC's with modems to salespersons should reject measurements such as selling costs per unit volume adopting instead number of contact hours per customer. Since the technology has opened up greater opportunities for sales contact. [Keen, 1987: pp 90-94]. The new measures should be based on the **ratio of the variable costs that technology is expected to substitute.**

Managing I.T. Risks Exposure: Technology risks become business risk when a large proportion of a firm's cash flow is dependant on a reliable I.T. infrastructure. Financial institutions are so dependant on their telecommunications network and information services, that less than 99.9 % uptime is unacceptable. Two areas of risk are **security** and **network management.**

Security risk concerns the vulnerability to threat of criminal theft, fraud, accidents of information leakage and unauthorised access. The concept of on-line customer service and product delivery is to make access as convenient and easy as possible. Controls are necessary to restrict unauthorised access and yet allow approved users to carry out their functions.

Network management involves maintaining the telecommunications network at a very high level of reliability and availability. Reliability involves the accurate transfer of data between computer hardware and applications and the maintenance of the network infrastructure.

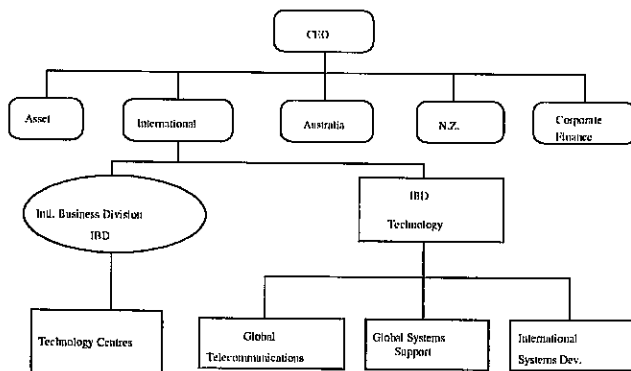
Ensuring the security and reliability of the information technology infrastructure is expensive. Viewing these as extra costs will put the firm at risk. Managing I.T. risk is just part of managing the economics of information capital.

4.4 Banking and Financial Services

The following case studies will illustrate and compare the steps taken by two Australian companies in meeting some of the concerns of: aligning business with technology and managing the I.T. organisation.

The Australian Banking Corporation Limited (ABC Ltd., a case study name), is a global bank with operations throughout the Asia-Pacific, Europe and North America. It operates its own private network with major nodes in Melbourne, Singapore, London and New York. The telecommunications network carries voice, fax and data with line speeds from 9.6 Kbs to 64 Kbs.

Since mid-1980's, senior management at ABC Ltd. had accepted that telecommunications and information services are critical resources for achieving competitive advantages in a global information intensive industry. ABC Ltd. has currently established a vision of **providing its global business operations with the benefits of decentralisation while implementing a centralised business vision for telecommunications.** A recent key initiative had been to merge disjointed technology expertise under the business management below the board level.



The above diagram illustrates the close relationship between International Business Divisions (IBD) and the IBD Technology. Common reporting lines to the Executive Director (International) ensures that business requirements are closely linked to the information delivery mechanism critical to global banking. Information Technology Support is located at major network nodes and key financial trading centres.

The telecommunications network architecture is determined by a specialist group within IBD Technology. Similarly the design and implementation of global delivery platforms are managed by International Systems Development in conjunction with Information Technology Support. The International Business Divisions present their information requirements to IBD Technology. Each request is addressed by a functional requirement analysis and documented as business specification proposal (BSP). The BSP is completed by the telecommunications or system development group in conjunction with the business unit proposer. The BSP when approved is let to tender by internally operations or external service providers. IBD Technology specialists maintain control throughout the design and implementation phases by taking the role of project manager. System performance is monitored by the business users with regular feed-back to the central technology group.

The following schematic diagram illustrates the intra-corporate relationships between the International Business Divisions, IBD Technology and service providers (ABC Ltd's Network Operations, I.T. Development, Software providers, PTTs and VANs). Decentralised business functions are met by a centrally planned international network architecture and distributed data processing.

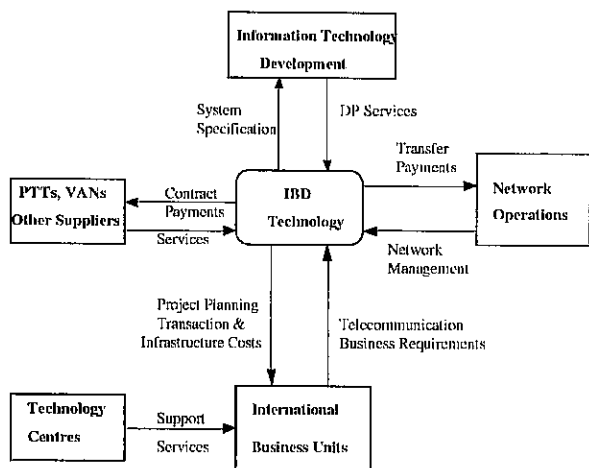
Keen has identified this organisational structure as "Centralised". The strategy is characterised by the creation of a corporate-wide set of shared utilities and common delivery base. The role of the Corporate Telecommunications (IBD Technology, global Telecommunications) group is to direct planning and operations. It acts to ensure standards are rules to be followed. In ABC Ltd., this is possible because IBD Technology is the technical owner of

all projects. The strategy is aimed at delivering corporate efficiency through shared resources. The advantages are clear links of authority between corporate business planning and telecommunications planning. The drawback is frequent opposition from local units to the central authority. The pros and cons of this structure appears to be supported by the emphasis on cost efficiency with less focus on business innovation through telecommunications. Risky innovation is not as encouraged through the abdication of authority for technology to the central planning group. Prior to the corporate difficulties faced by ABC Ltd., in the late 1980's, there was more local autonomy in telecommunications and information services. This guaranteed incompatibility and with little efficiencies gained through corporate resource sharing. This was evidenced in practice through much of the business applications with wide duplication of data. The pendulum has swung back to a centralist approach in times of recession and cost cutting.

The justification for new developments and greater use of telecommunications and I.S. is mainly focused on cost displacement or on business requirements. There does not appear to be much use of innovative telecommunications and information management as "springboard initiatives" to:

1. change industry boundaries,
2. create market innovation

Schematic diagram of "Centralisation within Decentralisation"



The author feels that ABC Ltd. should be looking at using innovations such as:

1. Financial EDI payment services to provide greater added value to the linkages between supplier and buyer corporations. Only the Commonwealth Bank actively promotes its financial EDI services.
2. Integrated Financial Workstations delivering services of cash management, financial information services, corporate financial reporting, payment services, portfolio management, financial EDI services, etc.
3. Intra and Inter-corporate electronic mail services, e-mail to fax, and video conferencing facilities to increase management effectiveness.
4. Use of "008" or "13", charge free telephone numbers for customer service response
5. Use of expert systems for loan approval or financial derivative trading systems.

The above examples are not exhaustive nor are they meant to be a criticism that ABC Ltd. has not considered these applications. However, there is little evidence that ABC Ltd. has exploited current technology to gain greater competitive advantages over some of its rivals. The perception has been based on general inquiries, interviews and publicly available documents on the company's products and services.

However it is obvious that the close relationship between technologists and business leaders had encouraged cross-fertilisation of skills and generated awareness of telecommunication and I.S. capabilities by the business units. This had been evidenced by the development of an wide global network capable of providing management with timely and accurate information for risk management, planning and decentralised business control.

4.5 Resources Processing :

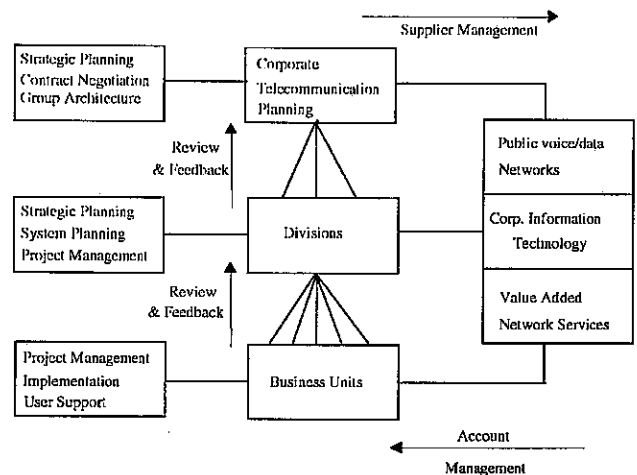
The company studied will be referred to as Central Resources Limited (CRL), not the true name of the company. CRL is a multi-divisional corporate with operations in four continents covering joint ventures, trading & sales, manufacturing, exploration, primary and secondary processing of natural resources. It is divisionalised based on the classification of resource processed.

The key element of this organisation's telecommunications business strategy is "**Customer Service-Supplier Relationship**". CRL faces a different corporate culture to ABC Ltd., each of its sub-divisions are global companies in their own right and their own corporate identity. Whilst there is considerable joint development of common infrastructure, for the total corporate good, each division is sufficiently independent to pursue its own unique telecommunications requirement planning within broad general guidelines. Keen[Keen, 1987, pp: 215] refers to this type of firm under the classification of, "Guided" or "Coordinated". The characteristic of such an organisational structure is a Corporate HQ strategy favouring local autonomy with HQ Staff playing a centralist role of setting long-term planning and investment. Guidelines are standards and recommendations often couched with strong persuasive powers. The benefits of this structure is the provision of a strong base for service integration with local authority for traffic flow. The drawbacks are frequent ambiguities with possible conflicts of authority.

CRL has a Corporate Information Services department located within the Corporate HQ which oversees the corporate wide organisational telecommunications and information services architecture. It services the Business Divisions by providing guidance and strategy planning. It manages the network by keeping to itself the authority to negotiate external services from international PTTs, equipment suppliers, and major software development contracts on behalf of the enterprise.

In turn each business division, is responsible for developing an appropriate implementation strategy within the context and guidelines laid down by the overall corporate business vision, policy in compliance to the corporate telecommunications architecture. The key to successful implementation is frequent communication through regular reviews and monitoring.

Schematic Diagram of "Customer Services - Supplier Relationship"



REFERENCES:

1. Brancheau J.C. & Watson R., "Information technology and global competition", *Information and Management* 20(1991), pp: 213 - 223.
2. Clemons E.K. & McFarlan F.W., "Telecom: Hook-up or Loose out", *Harvard Business Review*, Jul-Aug 1986, pp: 102 - 110.
3. Dickinson R.M., "Telecom management: An emerging art", *Datamation*, March 1984, pp: 121 - 130
4. Grant R.M., "The resource based theory of competitive advantage: Implications for strategy formulation" *California Management Review*, Spring 1991, pp: 114 - 135.
5. Keen P.G.W., *Competing in Time*, Ballinger Publishing Company, Cambridge, Massachusetts, 1987
6. Keen P.G.W., *Shaping the Future*, Harvard Business School Press, USA, 1991
7. King W.R. & Premkumar G., "Key issues in telecommunications planning", *Information and Management* 17(1989), pp: 255 - 265
8. Kraus A.W. & Leonard-Barton D., "Implementing new technology" *Harvard Business Review*, Nov - Dec 1985, pp: 102 - 110
9. Langowitz N.S., "Managing a major technological change", *Long Range Planning* Vol. 25, October 1992, pp: 18 - 28
10. Neo B.S., "Information technology and global competition.", *Information and Management* 20(1991) oo: 151 - 160
11. Newstead I.A., "Telecommunications: A new strategic resource", *Monash University, Seminars* (26th Nov. & 3rd Dec. 1992) Sir John Monash Centre, Melbourne, Australia.
12. Roche E.M., "Telecommunication and Business Strategy", Dryden Press, Chicago, 1991
13. Porter M.E. & Millar V.E., "How information gives you competitive advantage." *Harvard Business Review*, Jul - Aug.1985, pp: 149 - 160
14. Tokzadeh G., "Post-divestiture telecommunications", *Information and Management* 22(1992) pp: 177 - 186