



South African Rail Commuter Corporation

“The Role of IT&S (Information Technology and Systems) in the Transport Arena”

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SOUTH AFRICAN RAIL COMMUTER CORPORATION

1. Executive Summary

The topic is not an easy one. **Information Technology and Systems** (or *Management Information Systems*) have come of age in the transport industry, regardless of the mode.

It is impossible to entertain any discussion about the role of IT&S without divorcing oneself from the company we are in, re-visit the position of IT&S in the Transport Industry and then define what this element, **IT&S** (or **MIS**), really is. Throughout the presentation two “**mind-sets**” are prevalent:

- IT&S is a strategic business enabling process rather than a technology or a system
- The organisation is regarded as an *open system* whereby the **Project Management** mindset represents the culture of *team learning and shared decision making*.

The objective of this presentation is on the one hand to introduce the *non-computer professional* to the IT&S discipline within the organisation and on the other hand to demonstrate the strategic importance of the Information discipline within the company. It follows the route of modern *strategic management* via the *needs* and *wants* of the client, and then defines exactly what Information Technology and Systems comprise from a business perspective. This is necessary to create a common understanding of the positioning of IT&S in the organisation and to show the influence of IT&S on the organisation culture. **Total Quality Management (TQM)** is briefly visited to illustrate the paradigm shift towards the client *wants* and the desire to satisfy these wants.

IT&S is the most important business enabler in modern business and the statement can be made that those organisations who still regard IT&S as only one of the back-office support functions, will not survive the first decade of the new century, regardless whether the **Information Infrastructure is Year 2000 compliant** or not.

- This presentation starts with the national transport directive and re-positions the client in terms of MSA agenda.
- **Information Technology and Systems (IT&S)** are then defined in perspective with its role in the organisational structure. From here the Value Chain (Porter) is used to illustrate how IT&S (as a division) has evolved to its current strategic role in the organisation.
- With the macro and micro-environment defined above, the presentation focuses on the internal Information Technology and Systems perceptions and demonstrates how the IT&S portfolio evolved over the past three decades. This is necessary to understand the technology dilemma of Information Systems and how its role is changing within the paradigm of the typical transport company.
- The volatile nature of Information Technology can only be stabilised within a given organisational culture. The IT&S Industry has its own growth patterns that

are unique and, when left alone, can develop its own culture which may not be susceptible to the dominant organisational culture. *Master Information Systems Planning* is core to the management of IT&S Cultures. This section concludes with probing statements about outsourcing.

- In the conclusion the presentation attempts to introduce the mindset of the strategic project management to the area of IT&S decision making.

The presentation utilises graphic animation and models to illustrate concepts. Throughout the mind-set of *Project Management* is prevalent. Interactive graphics are also used to create an atmosphere of “learning” while enjoying the show.

The author can be contacted in person for further comments or information.

2. Introduction

“Transport” does not have to be defined. The history of public transport most probably dates back to the invention of the wheel or to the floating of wood on water. It can be argued that Noah built his ark as the first means of multi-customer “transporting” which included people, animals and goods. It is noteworthy that even Noah had his **Information System(s) 100% aligned** with his business purpose: if it weren’t for the “winged” information service of his birds, he would have never found a “docking station”. (He should also be recognised for floating the first transport company!)

This is 1999. We are in South Africa. “Transport” includes Rail Transport, Road Transport, Transport by Air and Transport on Water, i.e. Trains, Buses and Taxis, Aeroplanes and Ships. We may all argue that these modes of public transport are one of the government’s functions. Indeed the South African National Department of Transport took the initiative to facilitate stimulating discussion around a unified “transport action plan” for a 20 year horizon.

The initiative by the National Department of Transport, called “**Moving SA**” not only introduces a totally new dimension to TRANSPORT, it signals a paradigm shift away from just providing a **product**, called “Transport”, to actually providing a **customer-centred service** to the customer. Suddenly terminology such as “customer-focus” “sustainability”, “service for the people”, etc. entered the arena of **Public Transport**.

While the Transport Industry globally and specifically in SA is transforming into a dynamic entity according to the “distribution” of its customers, all the processes supporting it cannot be left behind. **Information Technology and Systems (IT&S)** is the most important *Business Enabling* and *Supporting* entity in this process.

Most of the topics at this conference have demonstrated that business in general has already become global and that the post-industrial era had already been left behind (with or without the millennium bug!). Therefore, suffice to state: we are in the INFORMATIONAL era where **INFORMATION** has become the dominant organisational resource for any organisation in every market and industry.

The MOVING SA Action Plan is indeed so ambitious and has so many opportunities embedded in the 20 year horizon that it would be difficult not to take its Transport Vision as the goal to illustrate the role of Information Systems and Technology (IT&S) in Transport.

3. TRANSPORT in SA: Challenges and Threats. **TOPIC 1**

3.1 MOVING SA Agenda: Not achievable without Information Technology.

SLIDES 3 – 4

Up front the key objectives the MOVING SA (MSA) Action Agenda are stated as *Self Sufficiency* (as far as possible) while meeting *Customers' Needs*. (**MEET CUSTOMER NEEDS & LOWER OVERALL COSTS**) – Mac Maharaj (May 1999), previous minister of Transport, RSA.

The primary objective of MSA is to ensure that the emerging product from the MSA Action agenda “*belongs to all those who participated in its development*” (Maharaj, 1999). Within this **grand strategy** five guidelines are set:

- *Focused*: Long Term strategy
- *Data Driven*: Not opinion (High integrity)
- *Consultative*: Ensure broad range of opinions.
- *Transparent*: Open to scrutiny from all members of public.
- *Capacity Building*: Build Human Capacity. (Sustainability, constantly improving).

In short, MOVING SA suggests a totally different approach to “**The Customer**” and simultaneously introduces **participative strategic management** into the MSA Agenda.

MSA PLATFORM

Without stating the obvious, MSA assumes that the long term (20 year) Strategic Objectives will only be achieved if the entire transport industry (every stakeholder and transport role player) accepts the common challenge of national transport in **partnership** with one another, without sacrificing the unique identity of the individual companies. The mere mention of this strategy assumes the strategic role of Information Technology and Systems in TRANSPORT, from National to Local Transport authority level.

3.2 The SUPPLIER – CUSTOMER Relationship in Transport

SLIDES 5 – 7

The sceptic would immediately ask “**Is there really another transport CUSTOMER to the ones we know?**” How do we *distinguish between “informed” customers and current customers who are “weak and poorly organised”?*

Traditionally TRANSPORT operated from a **Product** mind-set whereby the end product is (for example) a specific mode of transport. It was *assumed* that the commuter would be living near the access points (bus terminals, train stations, etc.) and that the means of public transport provided by the powers to be had to be adequate and had to satisfy the commuters’ needs.

It is no coincidence that one would find the IT&S function somewhere “embedded” in the **Operations** or **Production** division of the traditional transport organisation. IT was (and still is) used as the main component to *produce* the product and service of the company. However, Maharaj (1999)

stated that vast sections of the population were excluded from basic services by the “old order”. The *transport customer* is the “people” in their own environment. Therefore the role of the IT&S function that was part of the above “old order” must also change according to the new paradigm.

The government is committed to a fundamental change of approach in the transport arena, which is reflected in the various strategies put forward in MSA. The core of the public transport system will be a network of high volume, high frequency corridors in which public transport will be a priority. It deals with urban, freight, rural and special-needs transport issues and looks into the implications for different modes such as rail, roads and ports (Maharaj, 1999).

The “new” Transport System is based on a “solid” platform, built on a strategically integrated system of four continuously upgraded pillars:

- ❑ Demanding and sophisticated customers
- ❑ Basic and advanced input factors such as HR, knowledge, energy sources, capital and infrastructure.
- ❑ Appropriate industry structures characterised by value-based competition and (only where necessary) regulated monopolies
- ❑ Effective, innovative and enabling institutional and regulatory structures supported by sustainable funding arrangements.

Transportation and the Service Providers for Transport are changing. Market differentiation is taking place. The Transport value chain within modes will change with the introduction of autonomous operators, concessionaires and/or regulators. The MSA framework puts forward an uncompromising vision of transport services that are in tune with the needs of the nation and the real needs of customers, while at the same time striving to be as close to financial self-sufficiency as possible. While the overall aligning factor is the ultimate customer: the “people”, the key enabler to successful implementation of the visionary strategy, is available and appropriate **INFORMATION SYSTEMS and TECHNOLOGY.**

3.3 Relationship Marketing in Transport and role of IT&S.

Relationship Marketing stems from the late 50’s when the *marketing concept* was formulated to describe the process whereby determining the ***needs and wants*** of the target markets and delivering the ***desired satisfaction more effectively and efficiently as the competition*** are regarded as the key to achieve organisational objectives (Kotler, 1995). There is a common understanding in the Information Industry that the further away you are from direct customer contact, the more reliant you are on the information about the customer to achieve organisational objectives. Many companies/organisations do not really grasp or embrace the marketing concept until driven to it by circumstances. Aspects such as *fierce competition* in the public transport sector where market segments have high entry barriers, are unheard of.

Kotler (1996) states that a company that has to convert to a *market-oriented* company experiences three hurdles:

□ “Organised Resistance”

Company departments in the traditional public sector are normally subdivided into several, equally important business functions in a check-and-balance relationship. Enthusiastic marketers will not be allowed to put *marketing* in the centre. (Old Paradigm – Figure 1)

□ “Slow Learning”

In spite of resistance many companies manage to introduce marketing into the organisation. A marketing department is established, key managers attend marketing seminars and outside talent is hired. Budgetary constraints and inflexible policies hamper marketing growth.

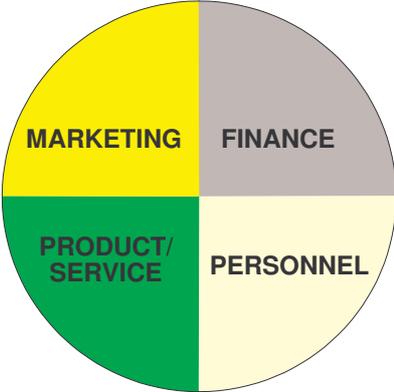
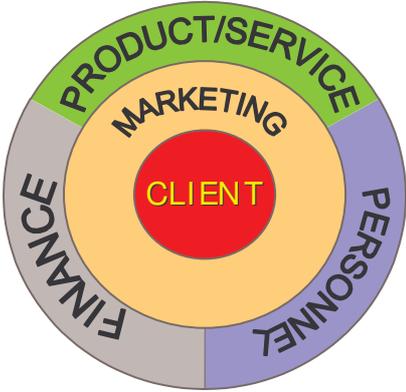
□ “Fast Forgetting”

Management tends to forget marketing principles in the wake of marketing success. This normally happens when companies **forget their target market and how to satisfy them.**

The Moving SA Agenda will most definitely introduce competition into the public transport sector. If the company’s assets have little value without the existence of customers, the key task for the company becomes one of retaining and attract new customers. The role of marketing becomes clear: customers will have to be attracted through competitively superior offers and retained through satisfaction. (This aspect is well covered by other presentations around Train Operations and Corridor Management.)

Without comprehensive Marketing Information Systems(s) the MSA agenda will not be achieved.

Figure 2 shows the “new” paradigm where customer satisfaction “drives” the performance of the entire organisation.

Figure 1	Figure 2
<p>OLD MARKETING PARADIGM</p>	<p>NEW MARKETING PARADIGM</p>
	
<p><u>PARADIGM:</u></p> <ul style="list-style-type: none"> □ Efficiency of Production □ “We run a Rail Road” □ “Marketing Intelligence” 	<p><u>PARADIGM:</u></p> <ul style="list-style-type: none"> □ Effectiveness of People/Processes □ “We are a people and goods mover” □ “Business Intelligence”

In recent years, some have questioned whether the marketing concept is an appropriate philosophy in an age of environmental deterioration, resources shortages, explosive population growth, world hunger and poverty, and neglected social services. The issue is whether companies who do an excellent job in satisfying individual customer “wants” necessarily acts in the best long-run interests of customers and society?

Where the marketing concept side-steps the potential conflict between *customer wants*, *customer interests* and *long-run social welfare* the societal marketing concept holds that the organisation’s task is to determine the needs, wants, and interests of target markets and to deliver the desired satisfaction more effectively and efficiently than competitors in a way that preserves and enhances the customer’s and the society’s well-being.

The strategic role of IT&S has already emanated from previous topics. *Societal Marketing*, as implied by the MSA Agenda, already assumes that IT&S will be one of the prominent components of the new business platform.

3.4 The TRANSPORT Challenge, facilitated by appropriate IT&S.

Moving SA Agenda states that the final product “belongs to all who participated in its development”. This implies a common client in *the macro-environment*. Yet to ensure Transport Services of a high standard to everyone, the normal “forces” of competition in the free market system must be encouraged and allowed to develop to maturity in the interest of the target customers.

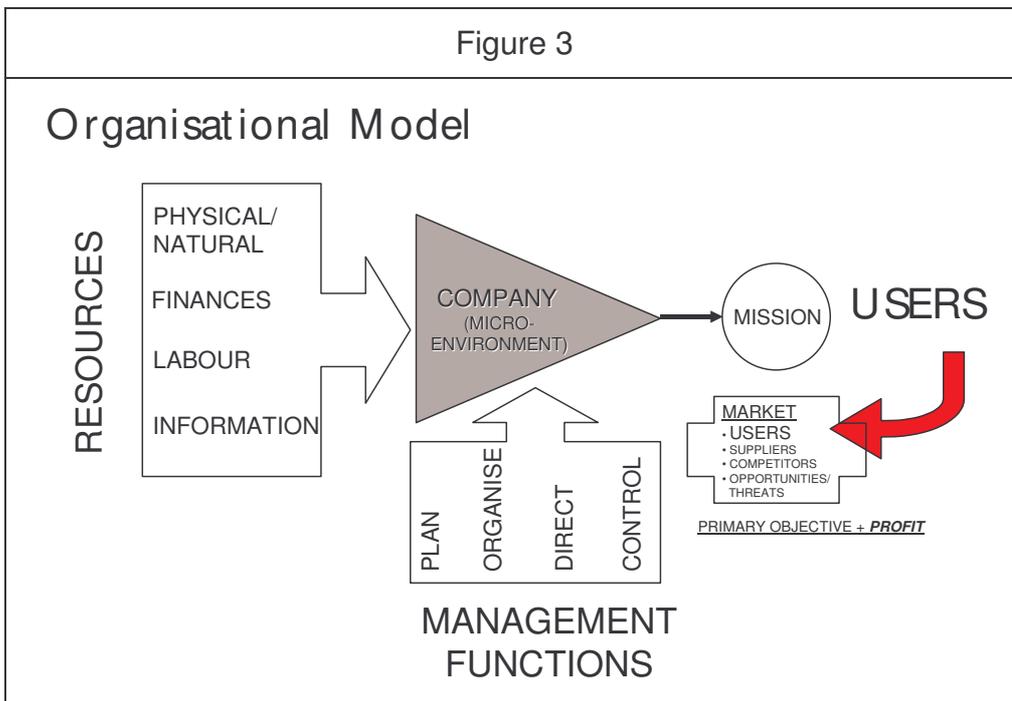
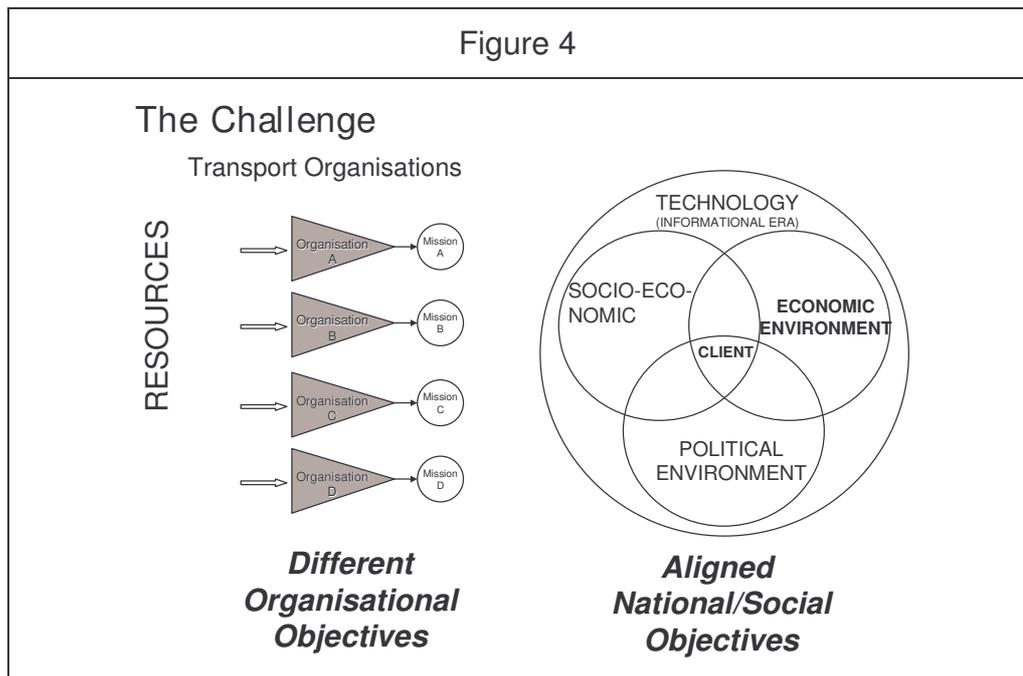


Figure 3 represents the normal managerial processes and resources in any company. The end-product/service is produced to satisfy the needs of the target customers in a certain market. Companies compete with one another to attract the most customers, etc. Yet MSA suggests **ONE** customer: THE PEOPLE in its own environment.

Figure 4 shows the immense challenge of the transport industry to align individual transport companies to serve the customer within the macro-

environment without necessarily changing the organisational content of the individual companies.



4. Information Technology and Systems (IT&S) **TOPIC 2**

4.1 What is “Information Technology and Systems”?

SLIDES 9 – 10

In short IT&S refer to the portfolio of “Management Information Systems”, or **MIS**. There is a clear distinction between the application of **Information Technology**” and IT&S. Normally Information Technology only refers to the “computer technology” or the miniaturised electronic circuitry that make up the computer systems.

The presentation demonstrates the varying perceptions of MIS (or IT&S) within the organisation and sets a common platform for further discussion about IT&S.

Trends in the Information Industry often only show the positioning of comprehensive Application Systems (e.g. SAP, BAAN, JD EDWARDS, etc.) instead of differentiating between the real business strengths of the products. From the company’s perspective it is essential that the business of the relevant company is satisfied. Therefore this section in the presentation should not leave any doubt about the various types of IT&S (or MIS), the various roles in the typical organisation and how it links with the networks and communication systems.

In conclusion to this section, the relative importance of the various IT&S in terms of strategic role within the organisation and in terms of the targeted “*decision-making information*” is demonstrated.

4.2 Where does IT&S fit into the Transport Industry?

SLIDES 11– 12

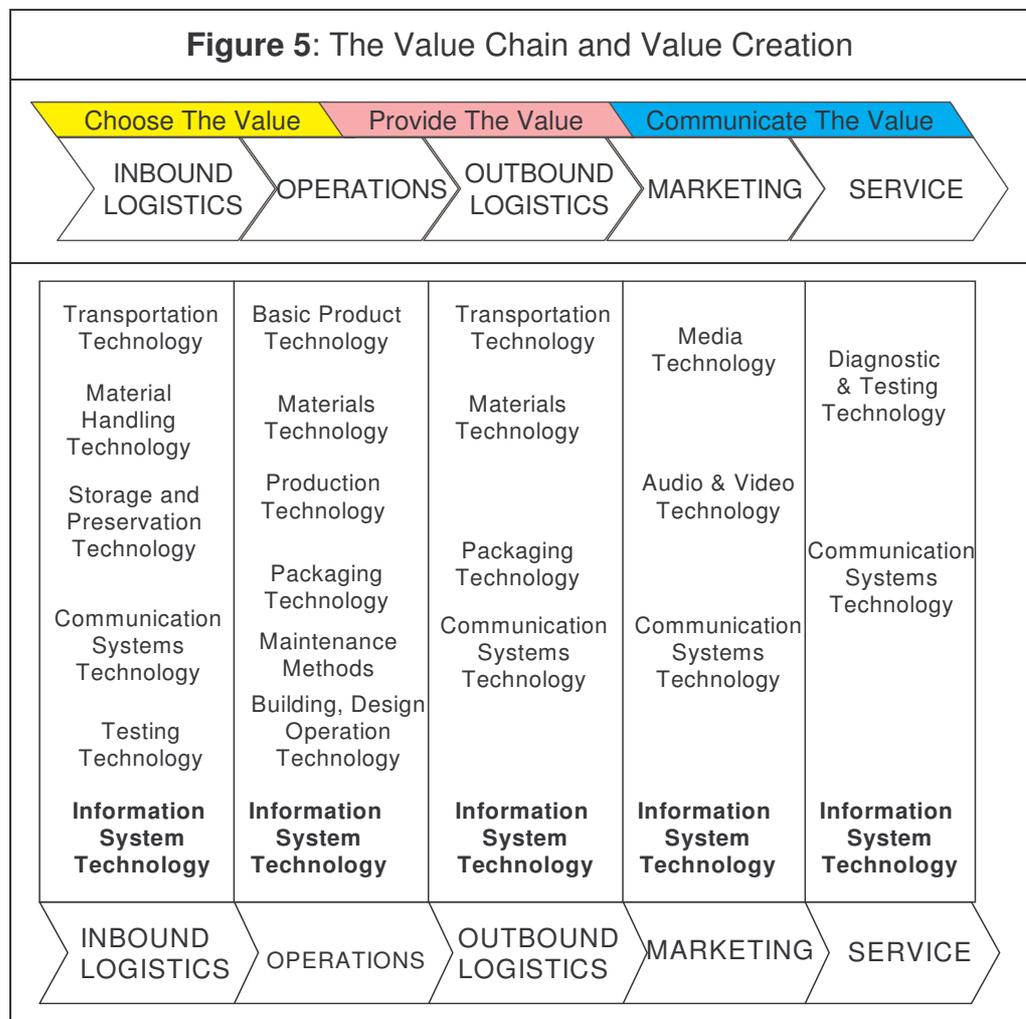
Michael Porter (1985) proposed a *generic value chain* as a tool to identify ways to create (more) customer value. This generic value chain was updated by Lanning and Michaels (Kotler, 1995) to super-impose the *value creation*

and delivery sequence (as required by the MSA Agenda) on top of the primary activities. (Figure 5 below demonstrates these concepts).

In the broader sense, a firm’s technology encompasses a *set* of technologies that are used in the different aspects of its activities. A firm’s technology has thus often been decomposed into its constituting technologies.

It is important to realise that key elements of a firm’s technologies often exist in *embedded* form. (This form often protects trade secrets based on know-how.) Key parts of the technologies may exist only in *tacit* form rather than be expressed or codified in manuals, routines and procedures, recipes, rules of thumb, or other explicit articulations. “Craftsmanship” and “experience” (two core technologies in the transport industry) usually have a large tacit component.

At any given time, a firm (or other productive unit) has a stock of technologies which are to a greater/lesser extent embodied in its products/services and production/delivery systems. There is also a rate of change in this stock of technologies which is driven by internal and external technological development efforts.



Technological change is one of the most important forces affecting the firm’s competitive position, and research suggests that firms find it difficult to respond to such changes. An audit of the technological capabilities should therefore address the issue of how well the firm understands the dynamics of the life cycle of the various technologies that it employs. (Burgelman, 1996, p7). **Information Technology** (as part of the “set” of technologies) has

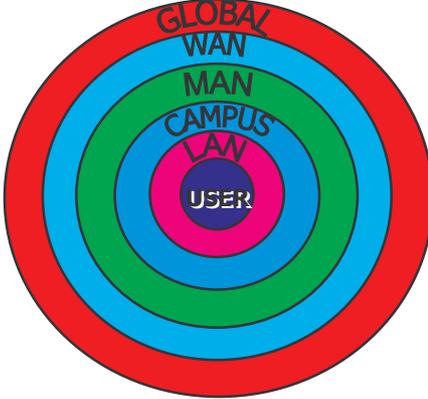
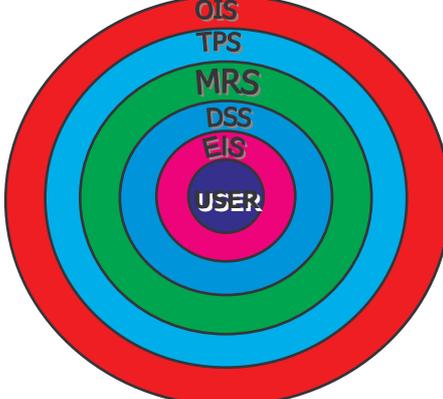
become the most common denominator in all spheres of the Value Chain. The strategic importance of **Information Technology** also emerges from figure 8.

5. IT&S: PROVISION AND SUPPORT TOPIC 3

5.1 From the User perspective.

SLIDES 13 – 20

Slides 16 and 17 show the identical paradigm for Network Connectivity within a specific organisation. Considering the **User** as the focal point it follows automatically that the **CONNECTIVITY** via a local area network (LAN) is all that is needed to connect the neighbouring workstations together. The further away from the user, the more complex the *connections* become. Figure 7 shows exactly the same configuration with the exception that the user is now the CEO. His/her computer is connected to others, but to provide Decision Support. If any one of the *connections* go down, the business at large is directly impacted. Therefore the CEO calls the “Help Desk” and they immediately send out a business expert, **who in turn** may decide to call in a technician if required. (Refer to the “portfolio of computer systems” earlier.) The paradigm shifted from “**CONNECTIVITY**” to “**AVAILABILITY**”. (This picture is also consistent with the Value Chain scenario presented earlier.)

Figure 6	Figure 7																								
<p align="center">Connectivity (the Operational Problem)</p> 	<p align="center">Availability, (the EXECUTIVE problem)</p> 																								
<table border="1"> <thead> <tr> <th colspan="2" data-bbox="443 1659 880 1709">Information Technology</th> </tr> </thead> <tbody> <tr> <td data-bbox="459 1713 603 1749">LAN</td> <td data-bbox="619 1713 865 1749">Local Area Network</td> </tr> <tr> <td data-bbox="459 1753 603 1789">CAMPUS</td> <td data-bbox="619 1753 865 1789">LAN's sharing Data</td> </tr> <tr> <td data-bbox="459 1794 539 1830">MAN</td> <td data-bbox="619 1794 865 1865">LAN's Serving a Metropolitan area</td> </tr> <tr> <td data-bbox="459 1870 539 1906">WAN</td> <td data-bbox="619 1870 865 1906">Wide Area Network</td> </tr> <tr> <td data-bbox="459 1910 593 1946">GLOBAL</td> <td data-bbox="619 1910 865 1982">INTERNET/ International</td> </tr> </tbody> </table>	Information Technology		LAN	Local Area Network	CAMPUS	LAN's sharing Data	MAN	LAN's Serving a Metropolitan area	WAN	Wide Area Network	GLOBAL	INTERNET/ International	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="938 1659 1391 1709">Multi-Skilled IT&S</th> </tr> </thead> <tbody> <tr> <td data-bbox="954 1713 1008 1749">EIS</td> <td data-bbox="1114 1713 1385 1749">Executive Information</td> </tr> <tr> <td data-bbox="954 1753 1018 1789">DSS</td> <td data-bbox="1114 1753 1343 1798">Decision Support</td> </tr> <tr> <td data-bbox="954 1803 1024 1839">MRS</td> <td data-bbox="1114 1803 1327 1848">Man. Reporting</td> </tr> <tr> <td data-bbox="954 1843 1018 1879">TPS</td> <td data-bbox="1114 1843 1273 1915">Transaction Processing</td> </tr> <tr> <td data-bbox="954 1919 1018 1955">OIS</td> <td data-bbox="1114 1919 1343 1955">Office Information</td> </tr> </tbody> </table>	Multi-Skilled IT&S		EIS	Executive Information	DSS	Decision Support	MRS	Man. Reporting	TPS	Transaction Processing	OIS	Office Information
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5.2 IT&S Function in the Company

Figure 8 above shows how the IT&S function has evolved from a large company unit to a *project management* or *team working mindset*. At the same time the “clients” of the IT&S department are no longer from the “Computer Division” only, they are “line of business unit”, “project teams”, etc. Many companies of the new millennium want to be classed as “**world class**” companies. The key focus to achieve success in this regard is to support the primary objective of “Enhanced Competitive Position”, as indicated below.

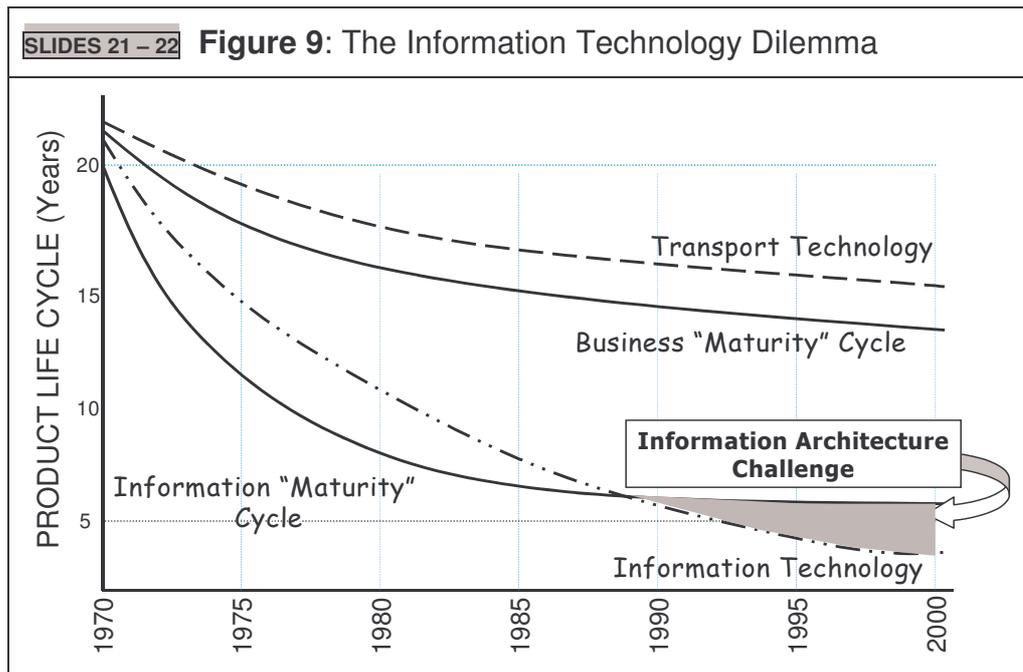
The most noteworthy aspect of the matrix below is the shift in dominant skills. The Support Technician has been replaced with a “multi-skilled” “knowledge worker”.

Figure 8: The Information Technology and Systems Department			
	Mid 70's to 80's	Mid 80's to 90's	Mid 90's to 2000+
Source	Large Company Units	MIS Units & End Users	Coordinated IT/End-User Efforts
Primary “Clients”	Single D/P MIS or IT Department	Individual Managers	Line-of-Business Unit
Primary Objective	Efficiency	Effectiveness	Enhanced competitive position
Justification	Support of Operations	Management Support	Market share (Added Value) & Profitability
Dominant Skills	<ul style="list-style-type: none"> • Operations • Software 	<ul style="list-style-type: none"> • Analysts • S/W Engineers • Facilities 	<ul style="list-style-type: none"> • Bus. Analysts • DBA/DBM • Proj. Management

One holistic view of the above evolutionary pattern should leave no doubt about the paradigm shift in IT&S from **Operational** to **Strategic** and the associated shift from **dedicated** resource skills to **multi-disciplinary**, business-related **project management skills**.

As discussed later the above picture gives clear guidelines to the business leaders where to focus (or **not to focus**) when outsourcing is considered.

5.3 The Dilemma of Information Systems and Technology in Transport



Computers have become smaller to almost invisible levels, yet the power has increased tremendously. **Information Technology (not Systems!)** has become almost a commodity item since the marketing of the first popular "PC" (Personal Computer). In less than 15 years of availability of these technologies, the *product life cycle* dropped to less than three years. While other technologies stabilised somewhat over the last decade, IT in general has become smaller and smaller to the point of almost non-visibility. However **IT&S projects** apply multiple sets of technologies and also follows a complex pattern of **benchmarking, testing and change management** which often (if not always) result in **project implementation** cycles of a minimum of 2 – 3 years for a medium size IT&S project.

Figure 9 also shows that the choice of information architecture to satisfy the business, has become more strategic since 1990 because the "*IT investment maturity cycle*" is more than the turn-around time of the technology. Significant changes in how to apply Information Technology throughout the organisation have to be made. Also some companies previously *outsourced* this decision to *service providers*. Therefore the statement can be made, based on many case studies, that the *choice of information technology* rather than *information architecture* was root to the cause of most expensive information system failures in large corporate environments. (This is a study on its own.)

Companies who regularly conduct proper Master Information Systems Planning (MSP) realise that the Architecture challenge for the future lies in **business-related, strategic** decisions rather than obtaining the most recent technology for the sake of "being advanced". (Also see later the choice about **OUTSOURCING**.)

6. IT&S and ORGANISATIONAL CULTURE **TOPIC 4**

6.1 Organisational Style and Culture

SLIDES 24 - 33

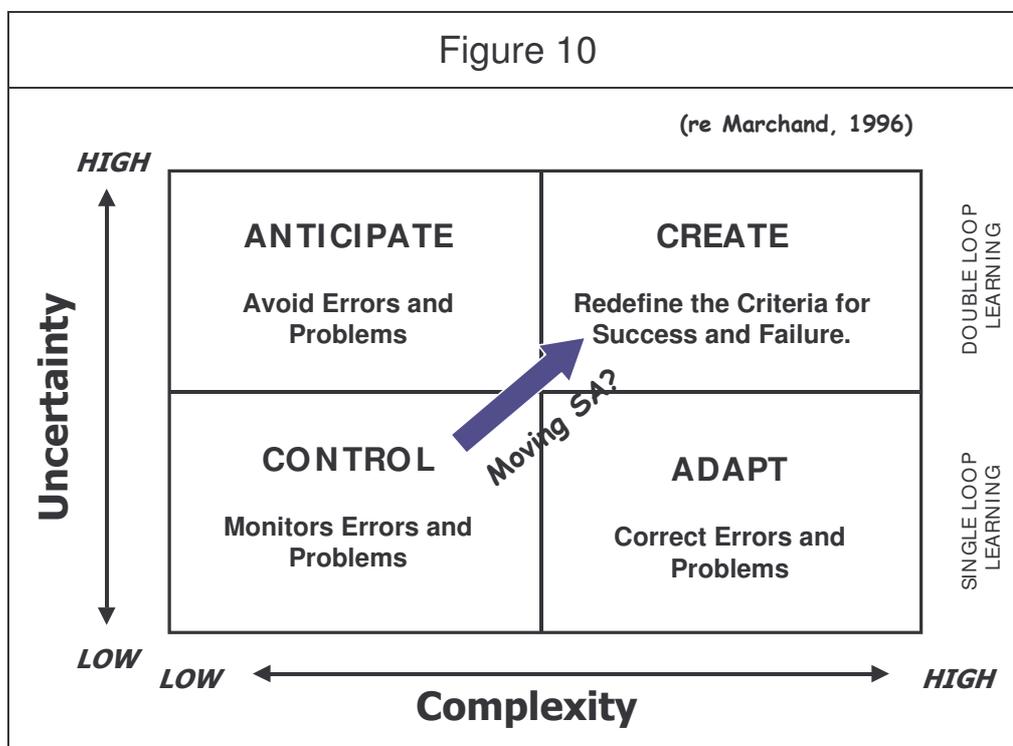
We have already established the strategic role of IT&S (MIS) in the company. Organisational culture is created by top management, more specifically: the CEO. Zwass (1995) distinguishes between four schools of thought that had direct implications in the formation of organisation culture. (Slide 24). identified Various so-called “schools of thought”. (These “schools of thought” are briefly listed in one slide.)

Therefore one cannot fully analyse the role of IT&S in any company without assessing the organisation culture and whether the IT&S division contributes to this or not.

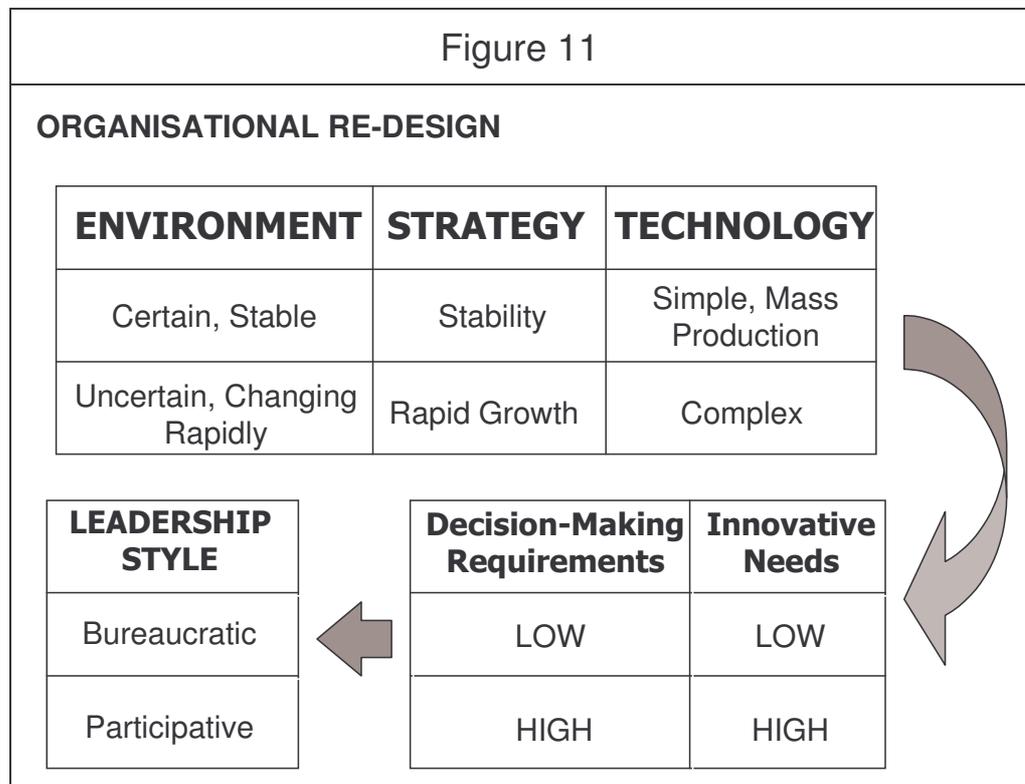
Business Culture cannot be managed as a deliverable. It is the result of three elements, i.e. Leadership, “Way of Life” and Strategic Purpose. IT&S (as a entity) is prominent in all of these.

One cannot ignore the perceived business culture that emerges from the Moving SA Agenda. **Transformation** of the transport industry implies a change of business culture. It is expected that IT&S must be the key driver to facilitate a smooth, uneventful transition because of the importance of **INFORMATION**.

Marchant (1996) suggests a simple matrix whereby the “Uncertainty” of the forces in the industry is plotted against the “Complexity” of the target markets.



The cradle for successful transformation change is the organisational culture, maintained by visionary leadership. Change in industrial and domestic markets will automatically trigger a strategic change in the **Supporting Information System and Technology Culture** and Leadership style, as demonstrated by figure 11.



6.2 Master Information Systems Planning (MSP) as subset of the MASTER PLANS

SLIDES 33 - 40

The Master Information Systems Plan of any organisation or business entity is the *Information Technology and Systems' Picture* of the MASTER SYSTEMS PLAN. The Master Systems plan is defined as the process of “How to build and maintain viable businesses in the face of rapidly changing market place and environment” (Burgelman 1995).

Every organisation’s Business Plan can be described as a portfolio of master plans, e.g. Human Resources Plan, Master Finance Plan, etc. The commonality of IT&S throughout the organisation lead to the formulation of Master Information Systems Plan to resemble the Master Systems Plan in informational terms, hence **MSP**.

Figure 12 shows the MSP process in organisational context and figure 13 shows the results of successful Master Systems Planning throughout the transformation process.

The presentation also demonstrates the popular 5 methodologies that are applied in typical MSP processes. These are:

- ❑ **Derivation from Business Plan:** Popular for Marketing companies
- ❑ **Value Chain Method:** For Manufacturing and Production Companies
- ❑ **Strategy Set Transformation:** Popular for small, profit centred companies.
- ❑ **Business Systems Planning:** The most comprehensive, “default” model.
- ❑ **Critical Success Factors:** For the “Learning Organisation” type.

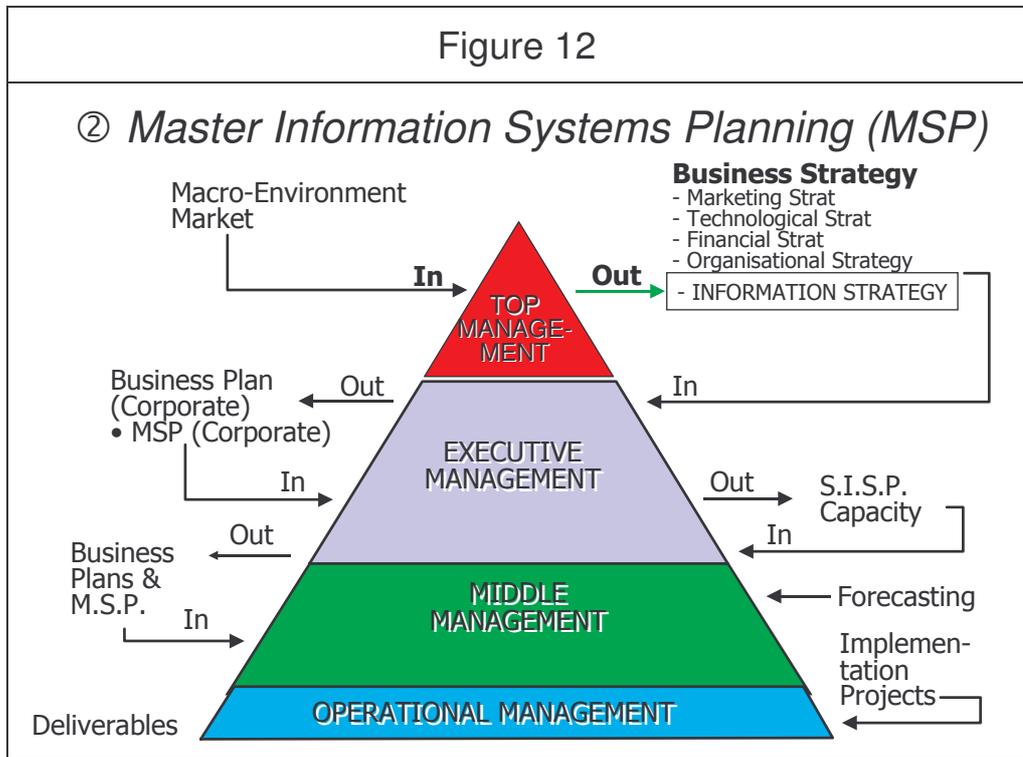


Figure 13

② *Master Information Systems Planning (MSP)*

PARADIGM SHIFT enabled by IT&S

ITEM	OLD	NEW
Strategic Planning	Marketing Technology Organisational	Client-focus Cost Effectiveness Sustainable Development Community Involvement
Capacity Planning	Information Storage	Information Flow
Business Plan	Functional Fragmented	Holistic Integrated
Business Architecture	Non Existent	Synchronising of all architectures
Information Architecture	Computer Architecture (Mainframe-based)	Network Architecture Data Architecture Application Portfolio
Enterprise Network Issues	Connections	Connectivity Availability Reliability
Key Network Issue	Communication	Competitive advantage Sustainable growth

7. IT&S Project Management **TOPIC 5**

7.1 Strategic Project Management

SLIDES 41 - 47

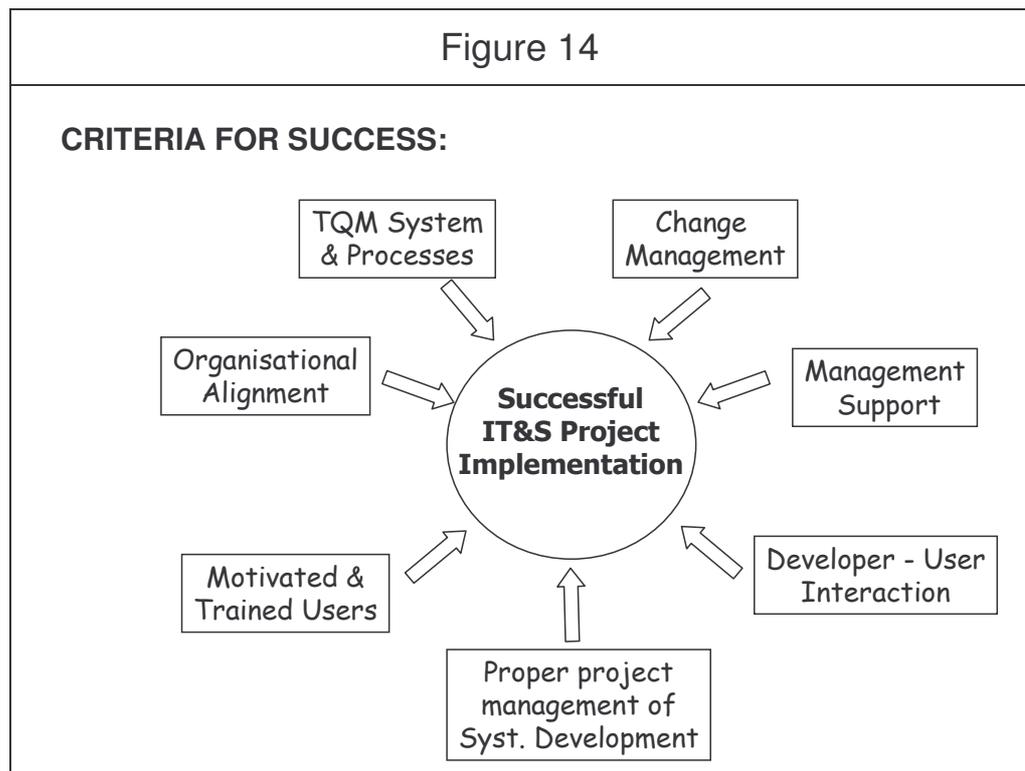
After positioning the MSP with the Business Planning process the key to successful planning stems from *professional Project Management*. Without detailed discussion it should be noted that IT Project Management also experienced a total transformation from the *development mind-set* of the mid 80's to *Strategic Project Management* for the new millennium.

Suffice to state that the process of Transformation, as highlighted by the MOVING SA Agenda, is a *Strategic Project Management Process*.

The presentation highlights the 5 generic phases of Project Management, viz:

- ❑ Conceptual Phase
- ❑ Feasibility/Broad Planning Phase
- ❑ Planning and Mandate Phase
- ❑ Execution Phase
- ❑ Commissioning and Conversion Phase.

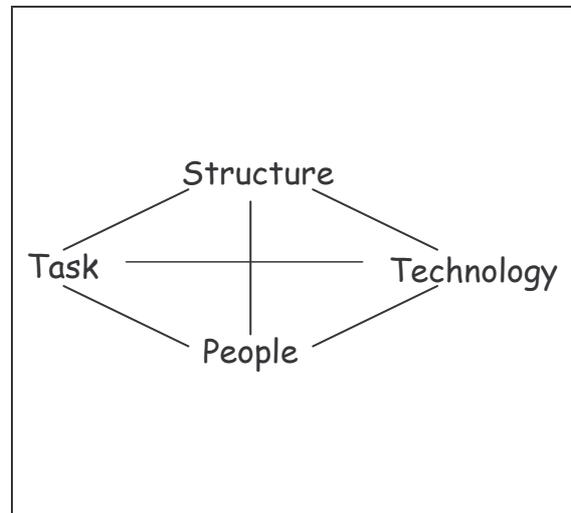
7.2 Criteria for Successful Project Management Implementation



Factors in Successful IT&S Project Implementations are shown in figure 14:

- ❑ **Organisational alignment.**

Introduction of a major information system requires a mutual adjustment of for principle components: *people* who will work with the system, *the task* that must be accomplished by the use of the system (user requirements), the *organisational structures* surrounding the use of the system and the *system (IT)* itself



□ **Management Support**

Project Sponsors are crucial for successful project management. It is the task of management to make available the necessary resources, skills, etc. The *project change management* at this stage must be established to ensure appropriate resources being available for any eventuality.

□ **Change Management**

Systems analysts are also “change agents” in the sense that the introduction of new systems imply change control and hence *change management*.

□ **Sufficient Interaction between Users and Developers**

Users’ involvement is not only necessary to ensure smooth transitions, it also creates the participatory decision making which in turn creates mutual commitment for effective (successful) implementation.

□ **Motivated and Trained Users**

Lack of User training causes (without exception) resistance to acceptance of a system. This *user resistance* may be *people oriented*, *System-oriented* or *Interaction-oriented*.

□ **Proper Management of a System Development Project**

Costs overruns, schedule slippage, user interference outside the steering committee, lax project management practices, etc. are notorious for causing project management disasters. Project management methodology should be utilised to its maximum potential.

□ **System Quality**

It was implied that Strategic Project Management goes hand-in-hand with the principles and application of Total Quality Management (TQM).

8. LET's GET PRACTICAL: **TOPIC 6**

8.1 Threats to the Business introduced by IT&S.

Year 2000 Bug

- The information industry is responsible for the “Year 2000 bug”. This “bug” is simply the result of using only the last two digits of 1999 (year calendar) as a “filing index”. The source of this methodology could be traced back to the 60's when computer technology was in its infancy years. Obviously after 1999 this number would reset to “00” (not “2000”) and any computer instruction that refers to this method of indexing would fail. (Globally more than \$6b has been “invested” to rectify this “design mistake”, without any expectancy of “return on this investment”).
- The solution to this problem rests with the IT&S Projects Office.
- Successful Y2K project management at the SARCC (**South African Rail Commuter Corporation**) for example, lead to an open statement that it is not possible for any train accident to occur on or after 1 January 2000 as the result of a “Year 2000 problem”.
- The national Year 2000 Decision Support Centre can be approached for progress on the national Y2K (“Year 2 thousand”) project.

Computer Crime, Abuse and Bugs

- It is not a known factor that large sums of money are spent annually (globally) to curb “soft crime”, or in computer terms, the violation of information rights and licenses. With **business information** more freely available on INTERNET or even just local area networks, this asset must be protected.
- Considering the generation of so-called “viruses” of more than 10 known bugs per day, protection of business information is also no more a minor task.
- The following list describes some of the risk in the information arena:

IDENTIFIER	DESCRIPTION
Impersonation	“Stealing Password”: Gaining access to a system by identifying oneself as a legitimate user.
Trojan Horse Method	Concealing within an authorised program a routine of instructions that will cause unauthorised actions.
Logic Bomb	Unauthorised instructions staying dormant until a specific event occurs, or when a specific time comes.
Computer Virus	Segments of code, which, once introduced by an attacker to a “host” program, are able to gain control of the system and replicate itself onto other programs and storage media in that system (e.g. Stiffy Disk).
Data Diddling	Changing data before or during its input, often to change the contents of the database.

Salami Technique	Diverting small amounts from large number of accounts maintained by the system; these small amounts, like "thin slices" will not be noticed. (Controls will have to be implemented by the business unit).
Superzapping	Uses systems program that can bypass regular system controls. (Needs high skills)
Scavenging	Unauthorised access to information by searching through the residue after a job (batch) has run on a computer.
Data Leakage	A variety of methods for obtaining data stored in a system. (Could be very sophisticated)
Wiretapping	"Tapping" into the communication system and lines.

8.2 MIS Management in Crisis (A case study by Eric Freund and Frank Schlier)

In this section the findings of the authors are stated as reported by Freund. Research into the "future of IT" as is consistently published in the computer magazines, is best summarised by the findings of the above case study. (Note that the research date was 1989). It creates a *mirror* for everyone of us to actually compare the above results with the Information Culture of our own organisations:

- "The customer service approach, used almost exclusively in the past and even still by many **Information Systems (IS)** departments to support their missions, cannot fully meet the current and future organisational requirements".
- "IS development, as a function of the corporate infrastructure, needs a more encompassing mission statement – one that is based on full partnership with both users and top management"
- "Corporate executives have become increasingly dissatisfied with information-based systems that cannot meet the strategic needs of their organisations. This dissatisfaction usually focuses on three issues:
 - IS failure to fully automate and integrate systems that meet specific business functions
 - Inefficiencies of current piece-meal systems that cannot meet the overall corporate need for information
 - IS' inability to decrease an ever-increasing backlog of requests".
- Freund states in his findings that "In the past (?) corporate executive decision makers did not view IS managers as partners in the overall organisation's strategic planning process. Yet this oversight has not deterred senior executives from expecting IS to keep pace with organisational demands for information."

- “Without having been involved in setting the direction or the priorities of the company, and in some cases, not even having being told what they are, IT&S is expected to deliver the strategic systems needed by the organisation”.
- “In many organisations, the prevailing corporate attitude is that IT&S as a whole, is a support department that provides necessary services to its internal customer base – other departments. This has lead to unfortunate and, in some cases, disastrous corporate consequences.”
- “Changing corporate strategies will always pose immediate and continued challenges for IT&S managers. To meet this challenge IT&S must formulate a **mission** that is aligned with the corporation’s strategic planning effort”.
- “IT&S development must lead in the implementation of systems that optimise the organisation’s systems investment by the following:
 - Determining strategic approaches for supporting the company operations and management decision making with information-based systems. (Also INFORMATION CULTURE)
 - Participating with executive management (top management) in the development of IT&S products
 - Leading in corporate systems **project planning** and policy studies.
 - Identifying clear corporate system objectives
 - Developing corporate as well as operational systems definitions and specifications (**Project Management**)
 - Enlisting the active participation and support of all designated corporate **project team members**
 - Implementing, supporting and evaluating strategic and tactical IT&S products”. (MSP part)
- The “SYSTEMS” components to enhance corporate technical advantage are:
 - Actively participate in corporate strategic planning
 - Engage corporate management in IT&S strategic IT Planning
 - Research, develop, evaluate and incorporate new software technologies to meet planning objectives
 - Planning and designing corporate computer architecture strategies and standards.
 - Pursuing, identifying and implementing new and/or alternative vendor hardware and software systems that assist in meeting corporate planning objectives.

8.3 IT&S Outsourcing

- Bob Martin, CEO of Wall-Mart Stores, Bentonville, Arkansas stated: *“The rules of the IT&S game have shifted. Technology now requires general management leadership”*. (HBR, Sept – Oct 1995)
- In the past when the technology product life cycle was longer than the time for the technology to reach maturity within a specific business (see figure 9), outsourcing on the basis of “technology only”, was feasible.
- During a series of interviews in the Harvard Business Review (1995 – onwards) the following conclusions about OUTSOURCING can be made:
 - a) As technology becomes pervasive in the business, it has changed the way we work (Bob L. Martin, CEO, Wall-Mart Stores, Bentonville)
 - b) Technology investments (outsourcing) must **reduce the complexity** of the business. More than often OUTSOURCING of a tiny element of technology adds to the complexity of the business.
 - c) While any organisation is in some or other transformation change the outsourcing of any IT&S will not only jeopardise decision making, it could delay the transformation process which could lead to total collapse of the organisation.
 - d) **“Strategy isn’t beating the competition; it’s serving customer’s real need”**. Only **you** know how to serve your customer. – Kenichi Ohmae.
 - e) **“The smartest strategy in war avoids a battle”** Sun Tsu (500BC)
 - f) **“Simply providing aspirin for every headache isn’t strategy”**.– Kenichi Ohmae. (Outsourcing must not be entered into as an “aspirin for a headache”).
 - g) “IT&S is vital business within your business, run by people who understand the real business and the competing forces within the industry” (Gene Batchelder, senior vice-president and CFO of GPM Gas Corporation, Houston).

8.4 IT&S Outsourcing: Contracting out the “Crown Jewels”.

Figure 15

EASTMAN KODAK

“Subcontracting of support functions is nothing new; services such as the company cafeteria, security services, and building maintenance are farmed even by the largest companies. But none of these is nearly as vital as to the success of an enterprise information technology.....Obvious(ly)five to ten years from now KODAK will find it has lost the its ability to grasp possibilities inherent in information technology”

Philip H. Dorn (October, 16, 1989)

9. SUMMARY

At the end of a complex presentation one can state categorically:

- A. Whatever happens in the Transport Industry in SA, Information Systems and Technology will drive the vision.
- B. There is a tremendous challenge ahead for anyone with a passion for public Transport.
- C. The demand for Information Technology and Systems will only be satisfied from within the **Business environment** where there is a business purpose which can take the IT&S professional out of the highly volatile IT environment into the environment for maturing technological innovations.

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- ❑ Joined SA Transport Services (SATS) as member of the international “Computerised Signalling” team, who installed the first computer systems on the Coal Line Project in the late seventies.
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- ❑ Joined TRANSTEL after split of Signals and Telecom at SATS, at Area Manager, Western Transvaal. (1987)
- ❑ Joined DATAVIA as head of the Network Engineering Section (1991)
- ❑ Joined SARCC as acting Group IT&S Manager (1994)
- ❑ Completed his MBA at UP in 1996 with distinctions (amongst others) in Project Management and Strategic Technological Management as main subjects.
- ❑ Topic of his dissertation: “*Project Management as the Strategic drive of Successful Concessioning*”
- ❑ Hobbies: Outdoor life and Biblical Archaeology.