# THE INTERNET - A BUSINESS TOOL FOR ORGANISATIONS IN THE NINETIES

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# ABSTRAK


**TITEL: THE INTERNET - A BUSINESS TOOL FOR ORGANISATIONS IN THE NINETIES**

**Hierdie studie is onderneem om te bepaal watter rol die Internet kan speel as 'n besigheidshulpmiddel vir organisasies in die negentigs**

**Die snelle vooruitgang in inligtingstegnologie oor die laaste aantal jare, sowel as die toenemende vlakke en snelheid van verandering in die besigheidsomgewing, het die volgende aspekte beklemtoon:**

- **Deur inligtingstegnologie te gebruik as 'n manier om verandering in die besigheidsomgewing te hanteer, kan ondernemings verandering beter hanteer asook 'n kompeterende voordeel verkry.**
- **'n Inligtingstegnologie strategie moet die oorhoofse strategie van die organisasie ondersteun, vir die inligting stelsels om as ondersteuning te dien vir die bereiking van die organisasie se doelwitte.**
- **Deur Internet tegnologie in te sluit in die inligtingstegnologie strategie, sal 'n organisasie in staat wees om van die verskeidenheid Internet hulpmiddele gebruik te maak in die bereiking van die organisasie se doelwitte.**

**Organisasies wat die Internet gebruik as 'n strategiese hulpbron ter ondersteuning en verbetering van hul aktiwiteite, sal 'n kompeterende voorsprong verkry oor organisasies wat kies om nie gebruik te maak van die Internet en die verskeidenheid hulpmiddele wat dit bied nie.**

**Die uitdagings van die negentigs sluit in globale mededinging, strategiese alliansies, toenemende tegnologiese vooruitgang, besigheidsproses herontwerp en tyd kompressie bestuur. Die Internet met sy verskeidenheid hulpmiddele sal die suksesvolle organisasie in staat stel om hierdie uitdagings die hoof te bied en om hulle te omskep in geleenthede vir verdere groei.**

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# CHAPTER 1

# 1. *INTRODUCTION, OBJECTIVE AND MOTIVATION OF THE STUDY*

## 1.1. INTRODUCTION

***"All sorts of individuals and companies are betting their futures on building the elements that will make the information highway a reality. At Microsoft, we're working hard to figure out how to evolve from where we are today to the point where we can unleash the full potential of the new advances in technology. These are exciting times, not only for the companies involved but for everyone who will realize the benefits of this revolution"*** **(Gates, W.H. 1995:19).**



**The rapid progress in the field of information technology over the last couple of years, has been one of the biggest challenges facing many organisations all over the world. According to Scott Morton (1991:5), those organisations opting not to make use of information technology in facing the challenges of the 90's, will become increasingly uncompetitive in the global marketplace.**

**Those organisations on the leading edge of information technology will gain a competitive advantage over their competitors. These competitive advantages are normally not long lived, due to the fact that the technology employed changes at an ever increasing pace and also because of the continuous changes in the business environment. It has therefore become the organisation which can fastest adapt to changes in the business environment by taking advantage of developments in information technology, which is able to obtain a sustainable competitive advantage over it's competitors (Scott Morton. 1991:15).**

The growth in computing power and telecommunications technology has led to the formation of what is today commonly called the Internet. The Internet is in essence a world-wide network of computers connected to each other via telecommunication media. It has been in use for about the last 30 years, by large governmental agencies who could at that stage afford the required hardware to enable this type of connectivity. Only recently has the processing power of computers become capable of connecting to these big servers. Access was still only limited to a few knowledgeable individuals and the Internet only really took off when graphical user interfaces, such as Microsoft Windows and Solaris Openwindows, became the preferred operating systems for many computers all over the world.

Microsoft Windows and Solaris Openwindows are user-friendly software packages and have the advantage of presenting information in an easy to understand graphical format. This has led to the Internet becoming graphically visible to millions, and organisations were quick to notice that millions of potential customers could be reached via the Internet, and at a much greater cost-advantage than by using conventional advertising methods.

In addition, the Internet offers communication and information gathering services vastly superior to any existing technology. Businesses can gain a substantial benefit over their competitors by adapting this new technology to enhance their existing business operations.

The Internet has the potential to change the way organisations do business. This has led to the word "Internet" becoming a buzz word in recent months and to many differing opinions as to the future of the Internet. There seems to be consensus amongst most, that the Internet is still in the relatively early stages of its development. The projected growth pattern, and its impact on information technology as we know it today, is the big uncertainty amongst individuals and businesses alike.

This thesis attempts to provide a clearer understanding of what the Internet is all about and how it will impact organisations.

## 1.2. PROBLEM DEFINITION

The problem facing many organisations wishing to make use of the Internet to enhance their overall competitiveness, is a lack of exactly what the Internet is and means. Coupled to that is the uncertainty as to the future of the Internet and whether or not it is just a passing fad (Goldsborough. 1994: 259).

There are both advantages and disadvantages by having an Internet presence, and organisations must be aware of both if they plan to gain maximum benefit from the Internet.



## 1.3. OBJECTIVES OF THE STUDY

The main aim of this study is to provide an insight on how businesses can use the Internet to enhance their existing business operations.

Towards this aim, there are the following secondary aims.

- Explaining what the Internet can and cannot do, and the tools required.
- Identifying the current risks involved with the Internet and their impact on business.
- Providing a possible strategy to follow when planning on using the Internet for business.

The output of this study should provide clear guidelines to any South African organisation on why they should utilise, or alternatively, avoid the Internet.

## 1.4. METHODOLOGY

The study takes the form of a literature study. Textbooks, reports, articles and publications relevant to the Internet and its use as a business tool are researched, evaluated and critically examined.

The literature study culminates into recommendations for developing an information technology strategy in organisations which plan to use the Internet as a business tool.

## 1.5. FRAMEWORK OF THE STUDY

Chapter two takes a theoretical approach to indicate the role of information technology within an organisation and how it should form part of the overall organisational strategy.

In chapter three the discussion revolves around what the Internet is and what it offers to organisations. The different tools and utilities available on the Internet are explained and discussed.

The fourth chapter investigates the risks involved to the organisation wishing to use the Internet.

Chapter five makes recommendations on how an organisation can tailor an information technology strategy to include the Internet. The theoretical concepts of chapters two, three and four are combined to allow an organisation to use the Internet as part of its information technology strategy.

# CHAPTER 2

# 2. *THE ROLE OF INFORMATION TECHNOLOGY IN BUSINESS*

## 2.1. INTRODUCTION

**The world is continuously in a state of change. As technology advances, the rate of change becomes increasingly faster. The rapid growth in the field of information technology over the last couple of decades, has influenced every aspect of life. This is particularly true in the business environment.**

**Information Technology (IT) has reduced eliminated distance and time. Business is now much closer to its market as well as to its suppliers - hence the accent is moving towards global competition as opposed to local competition. As more and more businesses become responsive to the reduced reaction time and adapts to the continuous changes in the business environment, their reliance on IT becomes more apparent. The world is moving towards IT as a means of coping with change. Those organisations relying on past successes and not utilising IT for managing change, will become increasingly uncompetitive in the future (Scott Morton. 1991: 5).**

## 2.2. IT INFRASTRUCTURE AS A STRATEGIC RESOURCE

**According to a study conducted by the MIT Sloan School of Management into the role of IT and organisational transformation (Scott Morton. 1991:151), there are three categories in which an IT infrastructure can be placed. These categories are:**

### 2.2.1. Independent.

The development of the IT infrastructure takes place independently and falls outside of the organisation's strategic scope. The IT infrastructure does not play a role in shaping or implementing the organisational strategy. The IT resources are considered as an administrative expense to the organisation (Scott Morton. 1991: 151).

### 2.2.2. Reactive.

This type indicates that the organisation has already noticed the importance of IT in the organisation. The IT infrastructure gets developed due to a particular strategy which the organisation is forced to pursue as a result of market forces. The IT resources are viewed as a business expense organisation (Scott Morton. 1991: 151).



### 2.2.3. Interdependent.

Organisations having this type of view have realised the bi-directional influence of the IT infrastructure and organisational strategy on one another. The IT infrastructure can be used as a tool for shaping a particular strategy and a particular strategy can also shape the development of the IT infrastructure. The IT resources are considered as a business investment organisation (Scott Morton. 1991: 152).

Whilst there are many organisations which have independent or reactive outlooks on their IT infrastructure, many successful organisations are moving towards having an interdependent outlook (Scott Morton. 1991:152). The trend amongst successful organisations, is towards aligning their IT and organisational strategies. By doing this,

organisations are able to use the advances in IT as a tool for managing the changing business environment and thus remaining competitive.

## 2.3. FOCUSING IT STRATEGICALLY

For an organisation to align its IT strategy with its organisational strategy, it is imperative for the IT strategy to be developed in the same manner as the organisational strategy is developed. Various strategic management approaches have been developed over the years, and no one approach is the best for all contingencies.

In her M.Com thesis on the integration between the IS/IT strategy and the business strategy, Janse van Vuuren suggests that a combination of these traditional approaches be used (Janse van Vuuren. 1995:40). By using a combination of approaches, and trying to identify the IS/IT opportunities, the organisation will obtain the following:



- All activities/departments of the organisation will be included when identifying possible IS/IT opportunities.
- Areas external to the organisation, such as customers, competitors and suppliers will also be addressed by the final IT strategy.
- The organisational vision and objectives will form an integral part of the IT strategy, thereby assisting in the alignment with the organisational strategy.

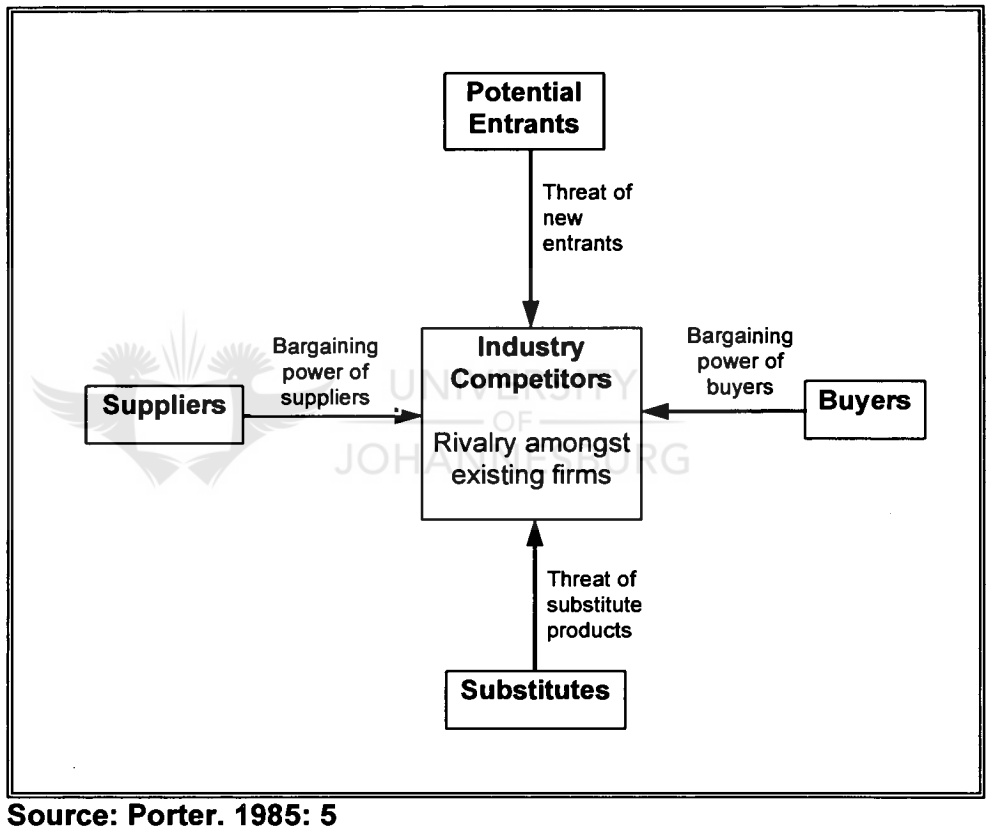
Janse van Vuuren (1995:41) proposes the combination of the following four strategic management techniques to obtain a strategic focus for the IT strategy:

- the five forces model
- critical success factors
- value chain
- value system

## 2.3.1. Five Forces Model

**The way an organisation copes with, or plans to cope with, its competition forms the basis of any strategy formulation. The five forces model attempts to disseminate the industry environment, thereby giving the organisation a better understanding of the environment it operates in and the forces at play within the specific industry (Pearce & Robinson. 1991:88).**

**Figure 2.1 Competitive forces in the industry**




**Source: Porter. 1985: 5**

**The level of competition in an industry depends on five basic forces, which are diagrammed in figure 2.1. These five forces are:**

- **Threat of new entrants into the market.**
- **Powerful suppliers.**
- **Powerful buyers.**

- Threat of substitute products into the market.
- Jockeying for position amongst existing competitors.

### 2.3.1.1.Threat of new Entrants.

When new competitors enter a market, the existing market share for existing competitors are threatened. It is in the strategic interest of the existing competitor to try and reduce the risk of new entrants into a market. This is normally achieved by increased resistance and competition from the existing competitors, or by creating barriers to entry for any potential new competitors. There are six major sources of having an entry barrier in an industry (Pearce & Robinson. 1991: 89):

- Economies of Scale.



If an industry requires economies of scale for its competitors to become profitable, it acts as a natural barrier for any potential entrants into the industry. The new entrant will be required to invest heavily in capital to attain the economies of scale required or alternatively would be forced to operate at a cost disadvantage.

- Product Differentiation.

Branding a product or service successfully will enable a product to be differentiated from competed products. New entrants will have to find ways of eroding the existing customer loyalty of a well branded product. This will require substantial expenditure from the new entrant in terms of higher advertising and lower margins due to price cutting.

- **Capital Requirements.**

  **If a huge capital expenditure is required to enter an industry, the number of potential entrants is reduced due to the fact that fewer entrants have the required amount of capital to invest in new ventures.**

- **Cost Disadvantages Independent of Size.**

  **Some organisations might have a cost advantage which is not available to a new entrant. Factors such as, experience curve, patents, governmental subsidies or superior location, might act as a barrier preventing a new entrant from entering an industry.**

- **Access to Distribution Channels.**

  **A new entrant must have a distribution channel if it wishes to sell its product. The existing distribution channels might not be readily available to a new entrant, thus creating an entry barrier into an industry.**

- **Government Policy.**

  **By governmental intervention into an industry, a barrier to entry can also be created. Regulatory factors such as licensing and environmental controls by governments, are classic examples of how government policy can prevent new entrants from entering an industry.**

### 2.3.1.2.Powerful Suppliers.

The role of suppliers in an industry is often a force to be considered very carefully. If the suppliers become too powerful they can exert an influence by raising prices or lowering quality on goods supplied. In this way a supplier can affect the profitability of an entire industry. A supplier group can be considered to be powerful when (Pearce & Robinson. 1991: 92):

- It is more concentrated than the industry it sells to and is dominated by a few companies.
- Its product is unique, differentiated or has a switching cost.
- It has no competition with another product in the industry.
- It poses a threat to integrate forward into the industry's business.
- The industry is not an important customer.



### 2.3.1.3.Powerful Buyers.

Powerful buyers can erode profitability by demanding lower prices or higher quality. A buyer group is powerful when (Pearce & Robinson. 1991: 93):

- It buys in large volumes or is concentrated.
- The products it purchases are standard or not differentiated.
- The product it purchases, forms a component of a bigger product and is a significant fraction of the cost for the bigger product.
- It earns low profits, increasing the incentive to lower costs.

- The industry's product is not important to the quality of the buyer's product or service.
- The industry's product does not save the buyer money.
- The buyers pose a threat if integrating backwards to make the industry's product.

### 2.3.1.4.Substitute Products.

Substitute products are products which have the potential to become a replacement for existing products. A substitute product does not compete for a slice of market share in an industry, but erodes the total market size in an industry (Pearce & Robinson. 1991: 94).

The threats posed by substitute products are bigger when they are:



- Technologically more advanced than the existing product.
- Offer a price/performance advantage over the existing product.
- Are produced by an industry earning high profit.
- Are seen by customers as the preferred product to purchase.

### 2.3.1.5.Jockeying for Position.

Inside the industry the existing competitors continuously compete for market share by using tactics like cost-cutting, advertising and product improvements. The rivalry between competitors in an industry is related to the following (Pearce & Robinson. 1991: 95):

- There are numerous competitors and they are similar in size and strength.
- Industry growth is slow.
- The product or service lacks differentiation or switching costs, thereby allowing customers to shop around for the best deal.
- Fixed costs are high or the products are perishable.
- Capacity is increased in large increments, thereby upsetting the supply-demand balance of the industry.
- Exit barriers are high.
- Rivals are diverse in strategies, resulting in competitors trying to outmanoeuvre one another on a continuous basis.

### 2.3.2. Critical Success Factors

Firdman (1991: 35) states that there are three key factors that characterise our world today:



- Global environment.
- Change.
- Information glut.

These three factors affect businesses on a continuous basis and in order to compete successfully in today's world, an organisation must be able to:

- Operate in the global environment.
- Adapt to imminent change.
- Select information relevant to a current business problem and make decisions rapidly.

These three abilities imply that the organisation must be integrated, flexible and able to manage information in an effective and efficient manner (Firdman. 1991: 36).

### 2.3.2.1.Integration

There are three different types of organisational integration which can be considered. The different types of integration may require different information systems for implementation. As part of the strategic planning process, the organisation should determine what type of integration is critical to achieve its strategic objectives and then implement it accordingly. The three types of organisational integration are (Firdman. 1991: 36):

- Functional integration between two or more functional areas within the organisation.
- Geographical integration amongst dispersed components of the organisation.
- Interorganisational integration between the organisation itself and the global organisational infrastructure.



### 2.3.2.2.Flexibility

Firdman (1991: 36) suggests that the flexibility required from any predictable change in the business environment, can be addressed by IT. However, in its strategic planning process, the organisation must clearly identify the changes that it deems most important, the ways of affecting and/or predicting these changes, and the degree of flexibility necessary to react to the changes.

The flexibility required can be classified as the following:

- Flexibility necessary to react to a change that the organisation can predict, affect and control.
- Flexibility necessary to react to a change that the organisation can predict and take into account, but cannot control or affect.

#### 2.3.2.3.Information management

Effective and efficient information management affects both integration and flexibility. Firdman (1991: 37) contends that properly planned, executed, and organised information management is the most significant tool for building integration and flexibility into the organisational information system.

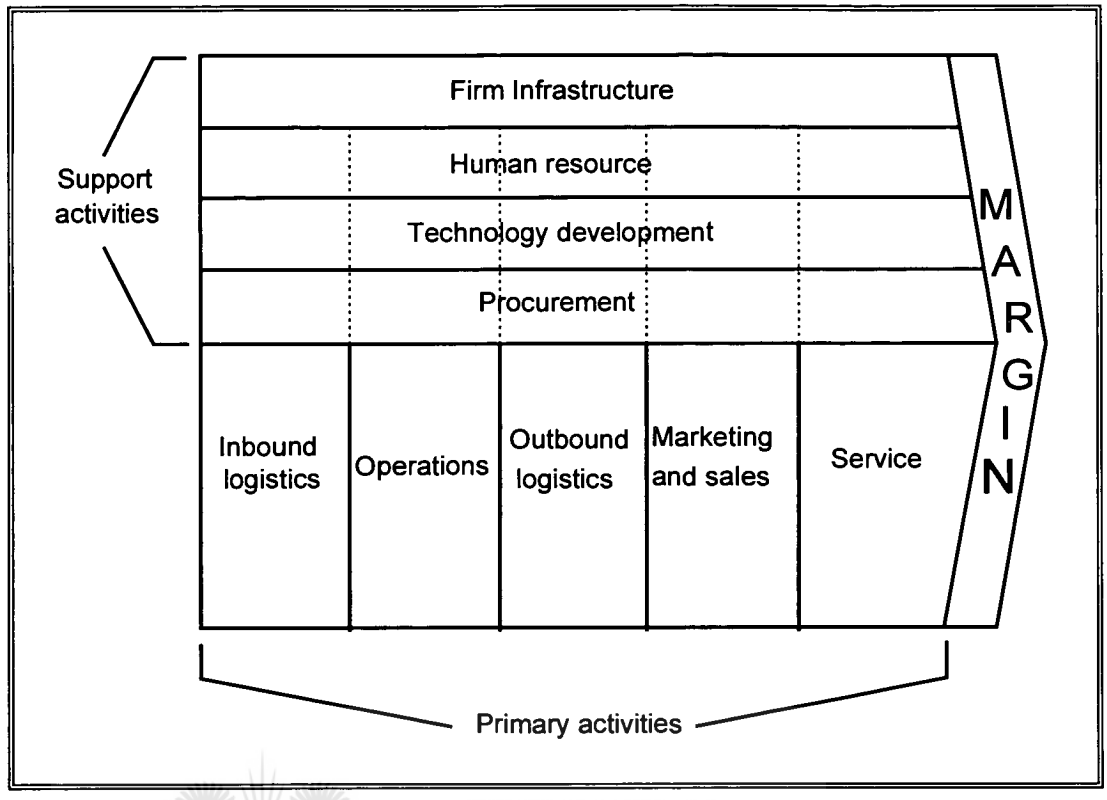


### 2.3.3. Value Chain

The competitive advantage of an organisation does not only depend on the industry it operates in and its position in that industry. It is also influenced by factors internal to the organisation. The different ways organisations go about in addressing similar activities, will therefore have a direct impact on the competitiveness of the organisations. The value chain is a basic tool for analysing the sources of competitive advantage inside an organisation (Porter. 1985: 36).

The value chain desegregates an organisation's activities into strategically important activities, called value activities. These value activities are physically and technologically distinct activities that an organisation performs. A typical value chain is illustrated in figure 2.2.

**Figure 2.2 A Typical value chain**






**Source: Porter, 1985: 37**

**The value activities in the value chain are divided into two types; primary activities and support activities. The primary activities are those which add value to the product and provide an indication of the product flow through the organisation. The support activities are those functions in the organisation which offer support to the primary activities.**

**By analysing the value chain of the company, management will be able to see whether either the physical or information processing component of IS/IT can transform the value chain to the organisation's advantage. From an IS/IT perspective, the value chain is a valuable way of identifying where better information and systems are needed, especially to show where integration through systems could provide potential advantage over competitors. The main benefit of value chain analysis is that**

it identifies the main information needs and information flows that reflect what the organisation actually does, as opposed to how it is organised to do it (Janse van Vuuren. 1995: 45).

### 2.3.4. Value System

The value system is an extension of the value chain approach. Whereas the value chain focused on the internal activities of an organisation, the value system takes a broader view and incorporates the value chains of the organisation, the competitors, the suppliers and the customers. The value system is a representation of the flow of goods and services from the source of raw material through to the end user or customer.

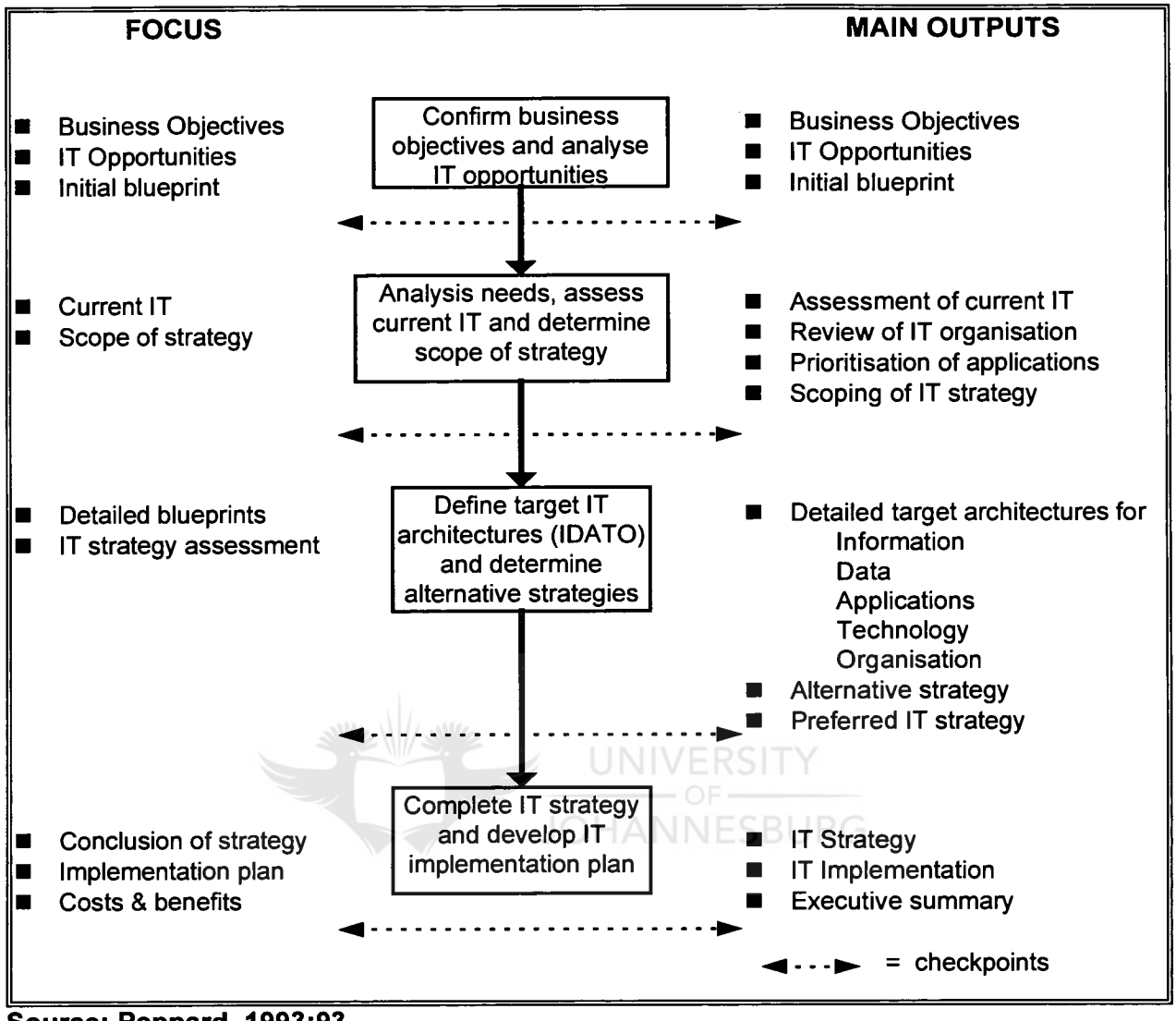
By analysing the value system, an organisation attempts to identify potential areas where it might be possible to exchange information with others in the value system. By identifying such interorganisational linkages and pursuing them, strategic alliances can be formed in an industry, providing organisations with another avenue for gaining a competitive advantage in an industry (Janse van Vuuren. 1995: 46).

## 2.4. PLANNING PROCESS OF AN IT STRATEGY

Peppard (1993:90) proposes a four staged approach to planning an IT strategy:

- Phase 1 - Confirm business objectives and identify IT opportunities.
- Phase 2 - Analyse current needs, issues and produce strategy scope.
- Phase 3 - Produce architectures or blueprints for the five main IT strategy components - Information, Data, Applications, Technology and Organisation (IDATO).
- Phase 4 - Complete the strategy and consolidate the outputs.

**Figure 2.3 The IT strategy planning process.**




**Source: Peppard, 1993:93**

### 2.4.1. Confirm business objectives and identify IT opportunities.

**During the initial phase the focus is on identifying the business objectives and finding IT opportunities for the achievement of these objectives.**

**A top-down approach is taken to determine the strengths, weaknesses, threats and opportunities and how IT can impact on these as well as how these impact on existing IT. The techniques**

discussed previously for focusing IT strategically should be applied for this process.

The aim of phase one is to establish an initial information architecture, which will usually include a statement of high level information requirements, functions and their breakdown, information flows between functions, and information systems area (Peppard. 1993: 92).

A checkpoint is built into the process after phase one. This is to ensure that all the objectives of phase one have been achieved before progressing onto phase two.

### 2.4.2. Analysing current IT and defining strategy scope.

The objectives of the second phase are to review how the existing organisation is served by IT, to assess the IT environment itself and to focus on strategy by undertaking target applications.



An initial assessment of the organisation itself with regard to IT is undertaken, including the impact of IS/IT on organisation boundaries, functions and responsibilities. Also, any existing plans for reshaping the organisation in the light of new products, services or support activities should be covered in terms of the potential IS/IT impact.

Most importantly during phase two, a view is taken on the scope of the IS/IT strategy exercise. There is a trend towards much more focused IS/IT strategies, with prioritisation of the areas for attention based on the relative contribution that an application system will make towards strategic goals and the critical success factors, the likelihood of real IT opportunities, a preliminary view of costs and benefits and the urgency of the needs. Often the focus is differentiated between long term and short term goals.

The prioritisation sets the strategy boundaries and the likely implementation sequence required for the various components of the information systems architecture (Peppard. 1993: 94).

### 2.4.3. Developing target IS/IT architectures (IDATO) and alternatives.

The aim of phase three is to develop the detailed architectural components of the IT strategy including the information, data and applications required, together with a technical architecture and an IT organisational structure. In addition, alternative migration approaches to achieve the target architectures are considered and evaluated, and a preferred strategy is chosen.

Phase three puts in place five blueprints of an IS/IT strategy of information, data, applications, technology and the IT organisation (IDATO).



The IS component - the information, data and application blueprints - are normally produced together, organised by each major grouping of applications that will clearly link objectives, goals, critical success factors, user requirements and data needed to support the user requirements, together with broad implementation options and assessments of costs and benefits.

The IT component - the technology blueprint - will span the major applications areas and will usually cover hardware, operating and systems software, communications, data storage and management, development environments and toolkits, together with the overall integration requirements and an assessment of costs.

**The IT organisation blueprint will focus on the IT function and its overall development as an organisation unit to achieve the required delivery capability to support the IS/IT strategy. During phase three, staffing and skills gaps will be identified, together with an initial view on staffing levels, and on how the IT function might be resourced (Peppard. 1993: 95).**

### 2.4.4. Developing an IT strategy implementation plan.

**The objective of phase four is to develop an implementation plan for the selected IS/IT strategy and to conclude the IS/IT strategy planning exercise.**

**The outputs from the previous three phases are to be concluded into the implementation plan. Transition or migration approaches for each main grouping of architectures will be determined and the implementation plan should cover the various projects to be undertaken, their sequence, resourcing needs, costs, benefits, timescales, criticality and strategic impact. A business case should be made for the IS/IT strategy with a solid analysis of business potential, likely return on investment, benefits - both tangible and intangible - and all known costs and assumptions should be clearly stated (Peppard. 1993: 96).**

**Lastly, the outputs are brought together to create three main end products:**

- ***IT strategy*** **- including aims; objectives; critical success factors; information system architecture and priorities; target IDATO blueprints; migration or transition approaches to achieve the applications, recommended technical architecture and IT organisation structure;**

- *IT strategy implementation plan* - including implementation plan and timetable; resource requirements; cost and benefit projections; business case and assumptions;
- *Executive summary* - covering the main findings, conclusions and recommendations.

## 2.5. THE COMPETITIVE ADVANTAGE OF AN IT STRATEGY

By developing an IT strategy and implementing it in a structured way, it is possible for an organisation to gain a competitive advantage over its competitors.

According to Janse van Vuuren (1995:57), IS/IT can provide a competitive advantage by changing the nature of competition in the following ways:

- Changing the industry structure; and
- creation of new industries and businesses.



### 2.5.1. Changing industry structure

By using IS/IT in the pursuit of competitive advantage, enterprises attempt to externally disturb the competitive forces that shape an industry. An industry's profitability is not determined by what the product looks like or whether it embodies high or low technology - it is determined by the structure of the industries and the forces at play in the industries (Janse van Vuuren. 1995:57).

The effect of IT within an industry was analysed by using Porter's five forces model (see section 2.3.1). The five forces are:

- New entrants

- Suppliers
- Buyers
- Substitutes
- Rivalry amongst existing competitors

The collective strength of these five forces determines the ability of firms in an industry to earn, on average, rates of return on investment in excess of the cost of capital. They thus determine industry profitability because they influence the prices, costs and required investment (Porter. 1985: 4). By using IS/IT in the pursuit of competitive advantage, firms attempt to disturb these forces (Janse van Vuuren. 1995:58).

### 2.5.2. Creating new business

IS/IT can affect competition by creating new business, often from within a company's existing operations.

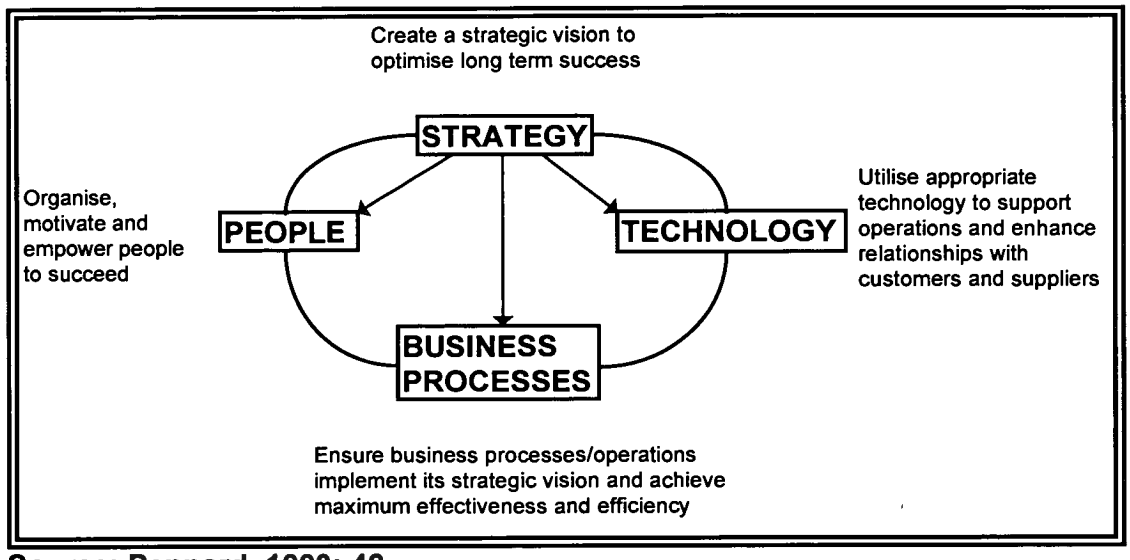
In response to globalisation and rapid technological change, outsourcing has become a popular strategy for many organisations. This strategy entails organisations focusing only on the things which it does particularly well: the so-called core competencies. Everything else is outsourced to specialist organisations. Given the rapid change and increasing complexity of IT, many organisations contract specialist IT organisations to manage their IT investments. There is a rapid trend towards outsourcing network and data centre management due to the costs and risks of maintaining these systems (Peppard. 1993: 58).

## 2.6. CHALLENGES OF THE 90'S.

Before we can fully understand the role IS/IT will play in organisations, we need to understand the business environment that they face in the nineties. The focus is not just on how developments in technology will

affect companies but also on how the other components of a business - its strategy, its people and its operations - are changing(Peppard. 1993: 28).

**Figure 2.4 Business integration model**




**Source: Peppard, 1993: 42**

The importance of the business integration model is the interdependencies of strategy, people, technology and operations. Used improperly, technology such as the Internet, can waste a lot of money and divert management attention and even increase overall costs. Treated in isolation it is unlikely to significantly improve performance but properly applied through a strategically aligned IT strategy, it can enable dramatic improvements in business performance (Peppard. 1993: 46).

### 2.6.1. Trends in strategy

#### 2.6.1.1.Global marketplace.

For some organisations the response is reactive as they face international competition in their home country for the first time. As we move into the nineties a global company will not be defined as one that does business

internationally but one that provides a consistent level of high quality products and services in every market in which it operates (Peppard. 1993: 28).

#### 2.6.1.2.Strategic alliances.

The trend towards strategic alliances, which started in the eighties, is unlikely to stop during the nineties as organisations realise that the resources required to compete on a global scale frequently exceeds those available to any one organisation (Peppard. 1993: 29).

#### 2.6.1.3.Outsourcing.

The concept of outsourcing is built around identifying the core activities that an organisation can perform competitively and subcontracting out other parts of the business process that it has no competitive advantage in. The trend is towards outsourcing the IT function and is sometimes also referred to as facilities management (Peppard. 1993: 29).

### 2.6.2. The people dimension

#### 2.6.2.1.Importance of people.

Recent management thinking has realised the importance of people when introducing new technology. The goal is towards a competitive workforce with three characteristics (Peppard. 1993: 30):

- Knowledgeable
- Productive
- Motivated

#### 2.6.2.2.New skills.

The skills required by the modern workforce as information technology and new ways of doing business, create demands for particular kinds of skilled professionals (Peppard. 1993: 30).

#### 2.6.2.3.Ability to change.

As organisations become more adept at managing technological change, it will increasingly be those that actively manage the people dimension that will gain the competitive edge (Peppard. 1993: 31).



#### 2.6.2.4.Organisational impacts.

One of the key impacts of IS/IT is the effect it is having on the way organisations are structured. The role of middle management is under pressure as IS/IT facilitates the vertical flow of information through the organisation as executive information systems give senior management better access to information (Peppard. 1993: 31).

### 2.6.3. Impact of technology

#### 2.6.3.1.Revolutionising industries.

The successful exploitation of new technologies has been a source of tremendous opportunity for many companies and a significant threat to those who have not adapted.

The challenge for management is recognising the limits of its current technology, developing a technological direction and managing the associated technological change (Peppard. 1993: 32).

#### 2.6.3.2. How is technology affecting competition.

As well as creating new industries and revolutionising existing industries, technology has the potential to significantly improve an organisation's competitive position within an industry (Peppard. 1993: 33).



### 2.6.4. Operations/business processes

#### 2.6.4.1. Business process re-engineering (BPR).

BPR questions the validity of existing ways of organising work and is concerned with redesigning the organisation around fundamental business processes (Peppard. 1993: 33).

#### 2.6.4.2. Time compression management.

One of the key sources of competitive advantage in the nineties, will be time compression or the ability to deliver

faster than competitors. Time compression can be achieved by means of faster delivery or shorter product cycles (Peppard. 1993: 34).

## 2.7. WINNING STRATEGIES.

Peppard (1993: 36) contends that for an organisation to remain competitive during the nineties, the above challenges need to be addressed. For the successful organisation to address these challenges, the organisation will have to be flexible, quicker to market, focused on customer values, cope with rapid change, innovative and in partnership with customers, suppliers and competitors.

### 2.7.1. Flexible.

The old rigid structures and hierarchies of the past are no longer adequate and are giving way to more flexible organisational structures. These flexible structures enable the organisation to respond to change much quicker than was previously possible (Peppard. 1993: 38).

### 2.7.2. Quicker to market.

Increasingly organisations are realising that, as product life cycles are becoming compressed, speed to market is a key source of competitive advantage (Peppard. 1993: 38).

### 2.7.3. Focused on customer values.

Technology is now providing the means to realistically segment markets and target customers according to their needs. The

emphasis is moving from transaction processing to customer service oriented systems (Peppard. 1993: 38).

### 2.7.4. Able to handle rapid change.

The nineties will be characterised by change and will require organisations to adapt to new market structures and reinvent the way they have traditionally done business (Peppard. 1993: 39).

### 2.7.5. Innovative.

Successful organisations will be characterised by innovation across the full spectrum of their business activities. This is not limited to new product development but includes developing new marketing strategies, opening new channels of distribution, segmenting customers in new ways, streamlining logistics, developing new organisational structures to complement their existing strengths. Innovation needs to permeate all functions and all aspects of the organisation (Peppard. 1993: 39).

### 2.7.6. In partnership with customers, suppliers and competitors.

Increasingly, organisations are forging closer links with customers and suppliers. Globalisation is pushing many organisations into partnerships with customers, suppliers and competitors in the form of joint ventures and alliances, in order to complement their own strengths and weaknesses (Peppard. 1993: 39).

# CHAPTER 3

# 3. *THE INTERNET - WHAT IT IS AND WHAT IT OFFERS*

## 3.1. INTRODUCTION

**The Internet grew from humble beginnings about twenty-seven years ago. It started out in 1969 as an experiment by the Unites States Department of Defence (Bateman. 1995: 490). They wanted to ensure the integrity of their computer system in the case of a war breaking out and destroying one or more of their mainframe computer sites. Later, this internetworking experiment grew into other governmental departments, such as universities. Eventually the Internet became widely used as computing power increased and graphical user interfaces made it easier for computer users to work with computers (Goldstuck. 1995: 13-16).**

**Today the Internet makes full use of new computing technology and is constantly pushing the technology frontier forward. The World-wide Web (WWW) gives a graphical representation of information on the Internet and it has become by far the fastest growing tool on the Internet. Due to this huge growth in popularity, new applications are being developed at this very moment to take advantage of the latest developments in computing power. The WWW is becoming much more than a fancy graphical interface, and is now beginning to make use of multimedia for added attractiveness as well as incorporating some other more established Internet functions, such as File Transfer protocol (FTP), TELNET and Database searches, into its own functionality.**

## 3.2. WHAT IS THE INTERNET?

Probably the most basic definition of what the Internet is, is that the Internet is a global network made up of smaller individual networks, each linked together through telecommunications media (Waddington, S. 1995:73).

This explanation might seem very simplistic at first, but in essence it is exactly what the Internet is - nothing more and nothing less. Every computer network has its own system administrator. The system administrator is responsible for the well-being of his or her specific network. By linking the different networks together via a wide area network (WAN) or via the telephone system, one creates a super-network made up of the smaller networks. This is the Internet as we know it today.

The Internet is not owned, financed or censored by anyone. The smaller networks attached to the Internet are owned, financed or even censored by its owners or system administrators, but they have no say about anything else happening on the Internet (Brody. 1995: 26).

Within the Internet there is a certain order based on standards and an understanding of how to get millions of different computers to communicate with one another. All communications between computers on the Internet take place by using a communication protocol which has become the standard for communication on the Internet. This protocol is called Transmission Control Protocol/Internetworking Protocol (TCP/IP) (Waddington, 1995:75). All computers wishing to communicate on the Internet, must do so by communicating via the TCP/IP protocol. This enables computers with different architecture to communicate with one another.

## 3.3. COMMUNICATING ON THE INTERNET.

### 3.3.1. Electronic Mail (Email)

Increasingly, Email is becoming the dominant form of business communication and customer interaction as its advantages become evident to business people. Besides reducing postal and telephone charges it helps to improve communication and productivity by breaking down distance and time barriers and by speeding up the decision-making process through the provision of a forum for replies or clarifications (Lawrence. 1995: 34).

In terms of improving customer interaction, there are two ways Email can be used for the improvement. Firstly, an automated mailhandling service can be used to deliver information about the company and its products to customers on demand. Secondly, a mailing-list server can be set up to let people subscribe and a company can then post them information on anything it wants to announce. At the same time it allows the organisation to receive customer feedback and to respond accordingly (Seng, 1996:47).

### 3.3.2. Internet Relay Chat (IRC)

IRC is a tool used for real-time communications with other people on the Internet. It provides a mode of communication which is quicker than standard Email (ANON(b). 1995: 52).

An IRC session is initiated by a user on an IRC server. He/she can then join a chat channel. The chat channel is a channel through which those users inside the channel can type messages to each other in real time. What a user types gets displayed on the

screens of all the other users in the channel. In this way a real-time chat session takes place.

Due to time differences across the world, users often use Email to make appointments with other users to set a specific date and time for having an IRC session. IRC is also used for reporting first-hand on fast breaking news events.

### 3.3.3. Voice Chat

Voice chat is quite a recent development on the Internet and many still see it as more of a gimmick than a proper Internet tool. It is essentially a live telephone conversation with someone else on the Internet. (Fox. 1996: 38)

Instead of transferring text across the Internet, as with IRC, a digitised voice signal is transferred. To use this facility, both users must have a soundcard in their computers with a microphone and speakers. The soundcard encodes the voice into a digital signal for transmission and decodes the received signal into audible sound when receiving.

The advantage of voice chat is that two users, which are continents apart, can enjoy a telephonic conversation at the cost of a local phone call for each. (Given that their computer hardware can handle voice chat.)

### 3.3.4. Video Conferencing

Video conferencing is in the same phase of development as voice chat and is also at this stage considered to be more of a gimmick than a useful Internet tool. In addition to transmitting and receiving sound, a digital video image is also transmitted and received.

Over and above the computer hardware required for voice chat, users wanting a video conference must have hardware capable of encoding and decoding a video signal. This is done with a video card and a video camera.

The big problem currently facing this technology, is the fact that the Internet is somewhat slow to provide a decent video conference of high standard. As bandwidth and computing power increase, this obstacle is almost certain to disappear, providing us with video conferencing as a proper and useably Internet tool (Waddington. 1996: 38).

## 3.4. TRANSFERRING DATA ON THE INTERNET.

### 3.4.1. TELNET



The Telnet protocol is used to connect a terminal to a remote host computer via the Internet. The terminal then allows the computer to be used just as if the system was connected directly (Willis. 1995: 48).

Setting up a Telnet connection with a host computer is possible on the Internet once one knows the computer's name. To prevent anybody who knows the name from getting direct access to the system, a password is requested after one has entered one's user name. In most cases, Telnet users obtain only limited access to a system, certain sensitive sections being screened. This is called anonymous Telnet.

By using Telnet, any user is able to access public information from the host computer without interfering with the operation of the host computer.

### 3.4.2. File Transfer Protocol (FTP)

FTP sessions are available to exchange data between two computers. The FTP tool allows computer users to download files and store these on their own hard disks. The files may be any type of data, such as programs, text, drawings, photographs, etc. The efficiency of the data exchange is increased by the use of data compression systems (Dahmer. 1995: 67).

The FTP function also offers an anonymous mode, which restricts the type of files to be downloaded to shareware and public domain only.

### 3.4.3. Mail Attachments



Mail attachments are a way of sending someone a file by using Email. Most Email systems have a facility for handling attachments.

By sending someone a normal Email message and attaching a file to the message, the recipient will receive the Email message and the attached file at the same time. This facility is extremely useful for getting feedback on documents.

## 3.5. FINDING DATA ON THE INTERNET.

### 3.5.1. Archie

Archie is an archiving system which gets updated frequently. By using this system, an index may be created which contains the

names of the many thousands of servers on the Internet (Smith & Gibbs. 1994: 102).

Archie offers three options to the user (Smith & Gibbs. 1994: 107):

- Establish a Telnet connection with the server running Archie;
- Run Archie from the local server if it is available;
- Contact Archie via Email.

Archie has two important limitations (Smith & Gibbs. 1994: 105).

- Because it works via anonymous FTP, the archive is restricted to files which can be requested anonymously.
- All files are indexed by name. Because there are no descriptors, the names are sometimes very cryptic.



### 3.5.2. Gopher

The Gopher system is a much more user-friendly Internet tool than Archie. This program makes information sources more easily accessible via a menu structure. Gopher reduces uploading and downloading of files to a single keystroke, while it is also suitable for running FTP or Telnet sessions. The only condition for the Gopher user is that the computer which is logged on has the required supporting software (Smith & Gibbs. 1994: 136).

### 3.5.3. Veronica

Veronica is actually an acronym and stands for: Very Easy Rodent Oriented Netwide Index to Computerised Archives (Smith & Gibbs. 1994: 148).

Veronica goes one step further than Gopher. Veronica enables one to use key words to search in Gopher title indexes. By using Veronica, the user will get a list of Gopher sites where the required files are kept (Smith & Gibbs. 1994: 148).

### 3.5.4. Wide Area Information Servers. (WAIS)

WAIS attempts to harness the vast resources of the Internet by making it easy to search and retrieve information from remote databases (Smith & Gibbs. 1994: 123).

Like Gopher, WAIS systems use the client/server model to make navigating around data resources easy. Unlike Gopher, WAIS does the searching itself. A WAIS client communicates to a WAIS server and requests it to perform a search for data containing a specific word or words. WAIS searches are conducted into the contents of files on the databases and not just on the file titles as by Gopher and Veronica (Rubin. 1994: 30).



### 3.5.5. WHOIS

The WHOIS directory provides names, Email and postal mail addresses, and often phone numbers of people listed in it.

It is a valuable tool for finding the correct details about a person or organisation of which only the name is known (Smith & Gibbs. 1994: 53).

### 3.5.6. Finger

Finger is a handy little program that lets one find out more about people on the Internet. It can also be used to tell others about yourself. (Smith & Gibbs. 1994: 51)

Internet users create a text file containing their information and place it in their home directory on their Internet servers. The file is called ".plan" and is accessed whenever someone issues the finger command followed by your Email address.

### 3.5.7. World Wide Web (WWW)

The WWW is the fastest growing and most used Internet tool due to the ease of use created by its graphical user interface (Seng. 1996: 48).

There are a growing number of WWW search tools available and most Internet service providers have access to a few of them on their homepages.



The search engines on the WWW vary and some search only the WWW, while others search both the WWW and the rest of the Internet.

Some search tools offer limited functionality until one registers with them. Thereafter one pays for information, but the information is then of a much better quality and more detailed (Aley. 1995: 27).

## 3.6. PROVIDING DATA ON THE INTERNET.

### 3.6.1. World Wide Web (WWW) Homepages

The WWW is the fastest growing Internet tool due to its ability to handle hypertext links, graphics fonts, sound and video (Seng. 1996: 48). It allows an Internet user to view graphic files and video clips or listen to an audio track, as well as retrieve information.

Any business can take advantage of the explosive marketing opportunities of the WWW by establishing a web presence - from a simple advertisement to a full service virtual storefront. In fact, many organisations are converting from Gopher in particular to this new infrastructure for conducting virtual commerce (Seng. 1996: 48).

## 3.7. THE GROWTH OF INTERNET BUSINESS



### 3.7.1. Business intelligence.

With its world-wide scope and volume, the Internet is probably the single most valuable tool to an organisation for gaining timely and significant insights into overall market trends and competitive pressures.

Strategic insights can be gleaned from the large and expanding number of corporate FTP, Gopher and WWW sites as well as the various technical, business, vendor- and product-specific discussions in newsgroups.

The Internet can be expected to provide the most candid critique of a company in terms of discussion in newsgroups about product quality, customer support and other risk and critical success factors (Seng. 1996: 48).

### 3.7.2. Marketing, sales and promotion.

The interactive nature of the Internet makes it an excellent tool for gathering information and feedback about product market opportunities and potential new product ideas.

Monitoring of the various discussion groups and corporate/product discussion groups can provide significant sales leads (Seng. 1996: 48).

Through the use of a corporate WWW server site, an organisation can most effectively promote its products by disseminating timely organisational happenings, product announcements, recent strategic alliances and others of potential interest to existing and prospective customers. Continuous up-to-the minute electronic publishing of virtually any type of marketing collateral materials, sales literature, owner's manuals, technical documents or time-sensitive information, can all be easily made available via the Internet.



Email can be used to allow customers to submit specific product questions and to request specific sales quotes. Real-time feedback can be obtained as visitors fill out forms. This allows for instant up-to-date statistical reporting which can help shape marketing strategy.

The Internet promotes rapid and productive communication that can reduce the sales cycle significantly. It allows for 24-hour business communications, which few businesses can offer customers (Seng. 1996: 48).

### 3.7.3. Business contacts

Newsgroups provide an excellent place to meet people with related interests. The Financial Economic Network (FEN) has become the largest electronic financial network in the world, linking people with scholarly and practical interests in business and economics.

Subtle business card exchanges are also taking place on the Internet. A contact which begins on a personal level may evolve over time into a business relationship (Seng. 1996: 48).

### 3.7.4. Research and development (R&D)

There are many significant benefits of the Internet to the R&D of an organisation due to the vast amounts of information available on almost any subject imaginable.

The Internet provides strong support for communications, co-ordination and collaboration among R&D teams. It also provides ready access to a wealth of expertise offering an abundance of on-line access to subject matter experts and knowledge sources. World-wide expertise on various aspects of an organisation's business development may be available via the numerous newsgroups on the Internet.

However, it must be borne in mind that the value of the Internet is largely a function of the quality and relevance of its information content. Not all desired topics may be discussed. On the other hand, not all discussion groups have strict quality control over its content and information may be flawed, misleading, misinterpreted, of limited value or inaccurate (Seng. 1996: 49).

### 3.7.5. Time-saving and cost-saving

Many daily operational chores such as frequent meetings, telephone conversations and report preparations could actually be speeded up with Internet use (Seng. 1996: 49).

For sales people and field representatives who need to communicate and obtain information on the fly, there is a range of networking tools such as wireless modems to assist them with their jobs. The ability to communicate using Email and distribute files in any format, quickly and conveniently to anyone connected to the Internet or a select group, allows for easy collaboration with colleagues.

The cost of entering WWW-presence business is low (Seng. 1996: 49). Electronic networks can enable entrepreneurs to start businesses without acquiring expensive physical assets. By having a business which operates via the Internet, an entrepreneur can potentially save on the following costs:



- Leasing of office space due to the business operating from home.
- Printing and postage costs because of Email.
- Acquiring of mailing lists can be done on the Internet.

One of the easiest and least costly ways to open an on-line business, is to become a tenant in one of the many "cybermalls" that are springing up faster than was imagined. Companies that operate these electronic malls will sell on-line space on their servers and will offer assistance in the design of homepages to provide all the product and ordering information customers need. The cybermall companies will manage all the technical aspects and often do some marketing and advertising. This approach has already benefited business people who had little or even no knowledge of the on-line world, but are able to take their existing service into cyberspace via a cybermall (Seng. 1996: 49).

### 3.7.6. Training on the Internet.

While the relative price of conventional education is rising, the digital revolution has been decreasing the cost of storing, manipulating and transmitting information by 50% every 18 months, with no end in sight. This technological wave is now driving major changes in the way education is produced and delivered (Eagar. 1996: 33).

Current distance education literature supports the thesis that modern digital and telecommunication technologies can deliver information and impart knowledge equal to and, if used efficiently, even better than traditional means. Research on delivery modes and their correlation to student achievement outcomes, has shown that students learn better via teletraining mode than face to face instruction (Eagar. 1996: 33).

Course design and overall quality of instruction are also usually better in electronic distance education (EDE) courses than in traditional classroom instruction. Integrated sound, motion, image and text create a rich new learning environment awash with possibility and a clear potential to increase student involvement in the learning process. The interactive capabilities of both programme and delivery systems allow for feedback, dialogue and ongoing assessment that are impossible in all but the most localised and direct applications of resident instruction.

The Internet offers limitless possibilities for education, in general, and EDE in particular. The collaborative work environments created using multimedia technology will increase student interaction, giving new possibilities to distance learning. Asynchronous communication made possible by computer conferencing, Email and voice mail allows students to control the time, place and pace of study and also to interact with other students. In the coming years, EDE will undergo revolutionary

**changes when students will gain access to large databases and dial-up and on-demand information services (Eagar. 1996: 36).**

### 3.7.7. Recruiting on the Internet.

***A case study:***

***Two years ago, when American Contract Services (ACS) in Cambridge, Massachusetts, began surfing the Net in search of employees, it was mostly out of curiosity. Who might they find in cyberspace?***

***As it turned out, they found a lot of skilled , reliable programmers, software developers, and other top-notch IS personnel. Moreover, it took less time to post jobs and get responses. It also cost less and returned more qualified leads than did the firm's primary recruitment vehicle - ads in the Boston Globe.***



***"Say you put a $1500 ad in the Globe. You might get 10 resumes, of which none or one might be qualified." says ACS president Andrew McAuliffe. "When you get responses from the Internet, you know that at the very least, the people are somewhat qualified, because they're on the net."***

***Using an executive search firm can easily cost you $10000 to $15000 to hire a skilled professional. In contrast, it costs ACS $3500 a year to run ads on the Internet-ads that "give us unlimited access, full descriptions of jobs, and no limit to how long the ad can appear," says ACS's McAuliffe. Compare that to a typical two-column Sunday ad in the Boston Globe, which runs between $1500 and $2500. Before ACS began using the Internet, its print ad budget was $35000 to $40000 a year. McAuliffe won't say how much it is today, but he claims it's dropped considerably.***

*Another advantage cited by recruiters is the ability to widen an employee search geographically. McAuliffe says using the Internet makes it easy to find the right programmer for a Boston job, even if that programmer currently lives in Des Moines. Candidates are also finding it easier to search for a job out of state or overseas, now that recruiters are on line.* (Appleton. 1995: 39)

## 3.8. THE FUTURE OF THE INTERNET.

At the rate at which technology is progressing, it is not very easy to make any long term predictions as to the future of the Internet. The only prediction which can be made with any degree of certainty, is that the Internet is here to stay and that it is going to become a more important part of the way we live and conduct business(Verity & Hof. 1994: 38-46).

There are a number of recent developments which look as if they might have a bearing on the future of the Internet over the medium term. These are:

### 3.8.1. Multimedia

Multimedia applications on the WWW are becoming more abundant as more people join the Internet and find the interactivity provided with multimedia applications a valuable part of their Internetting experience. Sound, video and animation provide a welcome relief to those whose perceptions of computers are that of a text-based screen waiting for some unintuitive command from the user. Multimedia is playing an important role in the breaking down of barriers between computer-shy users and the possibilities offered by these computers.

At present the bandwidth required to support proper multimedia is often still a problem, resulting in a very slow Internet from the user's perspective. As more people invest in the Internet and a minimum critical mass is reached, service providers and telecommunications companies will have enough incentive to increase bandwidth. As the telecommunications technology advances, systems with higher transmission speeds will become more readily available, such as the Integrated Services Digital Network (ISDN) lines, recently launched in South Africa (Dejesus. 1996: 51).

### 3.8.2. Virtual Reality

Virtual reality is a system where human movement is fed back into the software application and the software responds according to the user's response. This creates an experience for the user as if he/she is part of the application.



At the moment virtual reality has its biggest usage in computer games, but it should not be long before virtual reality gets used in other fields (Goldsborough. 1994: 66).

### 3.8.3. The Telecommuter

Telecommuting is a term used to describe an arrangement where an office worker performs all his day to day functions without being at the office. By dialling into his/her office network, from a home computer or a portable computer, a person can theoretically conduct all his work without being physically present at the office. The worker therefore does no commuting between the home and office and hence the term, telecommuter. Already some professions allow a telecommuting arrangement,

and it is estimated that seven million Americans will be telecommuting by the end of 1996 (Goldsborough. 1994: 24).

### 3.8.4. The Virtual Office

A virtual office can be created by establishing an enterprise on the Internet. A service is offered, ordered, paid for and delivered via the Internet. This results in no office space, personnel or other business functions as traditionally required, to be present. A virtual office can be operated successfully by an organisation specialising in creating homepages for clients. The organisation offers its service on the Internet, gets an order and is paid over the Internet, and delivers the homepage service over the Internet.

### 3.8.5. Java

Sun Microsystems have developed Java, a programming environment which helps users create applications across the Internet. These applications need only be created once, and can then be run across any platform which has the capability to run Java applications.

The implications of Java are profound. Applications can reside on the Internet, and can be downloaded to a client computer for use as and when required. These applications execute against client computers, irrespective of the client's operating system, as long as the operating system has a Java virtual machine built in. All the latest operating systems include Java virtual machines in their offerings, making Java a reality (ANON. 1996: 26).

Java technology opens up many new avenues in the way computers can be used. For example, with a Java application residing on the Internet and a user downloading the application, using it and discarding it afterwards, the concept of a small

client PC comes closer to reality. The power of a desktop PC can be substantially less than is presently the case, were Java technology to be used. The potential for using less powerful and cheaper PC's is made possible by Java technology and the Internet.

Many leading hardware and software companies, such as Microsoft, Sun Microsystems, Oracle, Motorola, Intel and Netscape, have embraced Java technology and are working towards integrating this technology with their existing and future products. Devices such as microprocessors and cellular phones will soon have Java embedded into them, which will be able to be controlled via the Internet (ANON. 1996: 26).

# CHAPTER 4

# *4. RISKS INVOLVING THE INTERNET*

## 4.1. INTRODUCTION

**With most new technology, there is a degree of risk involved along with the apparent advantages offered by such new technology. The Internet is no exception and it would be irresponsible to highlight only the advantages without mentioning the risks.**

**The global trend in business is towards integrating business functions with information technology (Peppard. 1993: 5). The information systems used to achieve this is becoming a much more valuable asset for all organisations, because of its impact throughout the organisation. It is therefore imperative to consider the risks and possible disadvantages involving the Internet. This chapter provides and overview of the current risks associated with the Internet.**

## 4.2. NETWORK SECURITY

**By far the most serious concern is the lack of proper security on the Internet. The lack of security is apparent in the following areas (Lenihan. 1995: 12):**

- **Security against computer hackers obtaining unauthorised access into systems.**
- **Protection against computer viruses.**

### 4.2.1. Securing against hackers

There are three ways in which hackers can gain access into a company's computer system:

- Hackers external to the organisation and who are able, through unknown means, to log onto a company's computer system. This type of hacking is probably the least common, but potentially has the highest risk of causing damage (Lenihan. 1995: 11).

  Companies can prevent external hackers from gaining access to their computer system by setting up so-called firewalls. A firewall is a program which regulates the access into a computer system. There are a variety of firewall programs available for providing security from external hackers (Dawson. 1995: 171).

- External hackers who gain access via an employee's computer while the employee is connected to the Internet. With the right software, a hacker can gain access to the organisational network without the employee noticing anything (Lenihan. 1995: 11).

  The best method of combating this type of unauthorised access, is to ensure that employees are not connected to the company network whilst working on the Internet. In addition, employees should be encouraged to use dedicated, stand-alone computers for all Internet related work.

- Hackers internal to the company. These type of transgressions normally happen when an employee leaves his/her computer unattended for a period and has forgotten to log off the computer network (Lenihan. 1995: 11).

  Special programs are available to automatically detect when a computer connected to the network has been inactive for a

certain period of time. The computer then automatically logs off from the network, thereby preventing unauthorised users from gaining access to sensitive areas on the computer network (Lenihan. 1995: 12).

### 4.2.2. Security against viruses

Viruses can be downloaded from the Internet when an employee unintentionally downloads a virus-infected file.

The best way to secure against this risk is to prohibit employees from downloading or copying software that is available on the Internet or other on-line resources. If an employee must have software, download it onto a stand-alone computer and have it checked out by the company's computer staff. There should also be memory resident virus-checking programs on all the computers, with regular updates to the latest versions (Lenihan. 1995: 12).



## 4.3. EASE OF ESTABLISHING A WWW PRESENCE

Establishing and maintaining a presence on the Internet is not as easy as it appears to be, especially for small businesses (Brindley. 1996: 76).

Firstly, the technical know-how must be available for setting an organisation up on the Internet. The level of technical expertise required will depend on the particular needs and circumstances of the organisation. If an organisation wants to provide its own server and telecommunications connection to the Internet, there would be more technical expertise required than for an organisations wishing only to rent some server space from a local Internet service provider.

Secondly, there is the administration and maintenance associated with having an Internet presence. Email correspondence, feedback processing and information updating are just some of the tasks required on a regular basis when on the Internet.

Those organisations wishing to get onto the Internet, will have to ensure that they have the required expertise and/or manpower to address the above issues.

## 4.4. VISIBILITY ON THE INTERNET

Once an organisation has set itself up on the Internet, the problem most often experienced is that of getting its presence noticed (Seng. 1996:49).

One solution to the problem of distinguishing a company's home page from millions of others is to locate it at a popular place on the Internet. There are various sites on the Internet which lure thousands of visitors per day, and companies often purchase an area on one of these pages. In this way they can ensure that the links to their site is at least seen by thousands of potential customers every day.

Another way of getting noticed is to register a site with some of the more popular search engines available. Once registered with a search engine, the details of a site will be added to the search engine's database and the site will be listed when someone does a search for any of the keywords which occur in the site.

## 4.5. SECURING TRANSACTIONS

To take advantage of the Internet from a business sense, an organisation might not only want to inform its customers of products and company happenings, but would ideally like to effect some

transactions over the Internet. The movement towards the virtual corporation supports this concept of transacting over the Internet.

At present there is not a complete system in place for allowing transactions to take place in a 100% secure fashion, but big companies such as Mastercard, Visa, Microsoft, IBM and Netscape, have joined forces to address this issue. With their huge financial resources and extensive experience in transaction handling, a system is likely to be announced sooner, rather than later (McCarthy. 1995: 36).

Marion (1995: 38) states that in order for a transaction handling system to be 100% reliable and secure, there are 5 factors which need to be addressed. These are:

- Authentication.
- Certification.
- Confirmation.
- Nonrepudiation.
- Encryption.



### 4.5.1. Authentication

One has to make sure that one's trading partners are who they say they are whenever noncash monetary value changes hands. Electronic commerce over the Internet requires a digital version of the common two proofs used in shopping malls - an identity document and a credit card.

### 4.5.2. Certification

One has to have a guarantee from a reliable third party that authentications are valid.

### 4.5.3. Confirmation

Once the transaction is done, one needs a receipt that the seller received the order and the buyer received the goods.

### 4.5.4. Nonrepudiation

Once the trading partners have agreed to the deal, one must be able to hold them to it, just as a signature on a credit card slip shows that somebody has agreed to buy something.

### 4.5.5. Encryption

In all of the above steps, secure information is being passed over an open network, so it must be encoded. If not, one runs the risk of being the victim of some serious theft.



## 4.6. LOSS OF PRODUCTIVITY

One of the main attractions of the Internet is also often cited as being one of its potential pitfalls. The fact that the Internet contains information on almost every imaginable subject is often used in arguments towards the fact that employees will be so engrossed in surfing the Internet, that they will neglect their normal work, resulting in loss of productivity (Goldsborough. 1994: 266).

While this might be true in many instances, it should not be held up as an excuse not to get an Internet presence if such a presence offers other advantages to the organisation. With proper management, there need not be any productivity loss, but rather a productivity increase over the long term (Goldsborough. 1994: 267).

By allowing Internet access from a few dedicated machines, which are not connected to the company network, and having these machines located in a central area, employees will be forced into using the Internet on company business. As an incentive for using the Internet as productively as possible, the company may decide to allow employees to use the Internet after hours with no limitations. In this way, the employees will satisfy their curiosity regarding the Internet, and the organisation will in the long term find benefit in having employees who can use the Internet in a productive and efficient manner.

# CHAPTER 5

# 5. *THE INTERNET AS PART OF THE IT STRATEGY*

## 5.1. INTRODUCTION

**Chapter two covered the theoretical aspects relating to the need for organisations to align their IS/IT strategy with their corporate strategy if they which to remain competitive during the 1990's.**

**Chapters three and four covered the Internet and provided information on what the Internet is, what the Internet offers, what the future of the Internet holds and what risks are associated with the Internet as we know it today.**



**This chapter will conclude the study by showing how the practical aspects of chapters three and four can be incorporated into the theory of chapter two. This approach will provide organisations with a basis from which to ensure that their IS/IT strategy is not only aligned with their corporate strategy, but that their IS/IT strategy can take advantage of the potential offered by the Internet.**

## 5.2. THE INTERNET'S IMPACT ON FOCUSING IT STRATEGICALLY

**In chapter two it was shown that many successful organisations are bringing their IS/IT strategies and organisational strategies into alignment by adopting an interdependent outlook on their IT infrastructure.**

**A combination of four strategic management approaches have been proposed as a starting point in developing both the IS/IT-, and**

organisational strategies. Internet technology can have a significant impact on the way these approaches are used by an organisation and the tools available on the Internet will now be applied to each of the four strategic management approaches.

### 5.2.1. Five Forces Model

The five forces model is aimed at identifying the five major forces at work within a specific industry and provides an insight as to how these five forces influence the industry environment within which an organisation operates.

Whilst investigating each of these five forces, an organisation must consider the impacts these forces have on its operations, as well as the impact its own actions will have on influencing these forces. By looking purely at the Internet as a business tool, the following effects are generated both from and on these five forces:



#### 5.2.1.1.Threat of New Entrants

The Internet can be used effectively in both creating and overcoming the barriers of entry normally required to dissuade any potential new entrants from entering an industry.

- *Economies of Scale* - The Internet can provide a potential new entrant with a mechanism to expand its market on a global scale and thereby attain the required economies of scale required to be competitive in an industry. This is all made possible due to the near elimination of time and distance provided by the Internet.

**The economies of scale traditionally required to be profitable, might also be reduced by employing Internet technology. An organisation might find a significant reduction in overhead cost by the efficient use of the Internet. The Internet provides extremely cost effective alternatives to using, for example, the traditional postal system, conventional advertising methods and conventional information gathering techniques.**

**By using the Internet as a business tool to streamline order processes, handling transactions, communicating almost immediately and providing valuable information, new levels of customer service can be set. This in itself can act as a significant entry barrier to potential entrants who might not feel they can compete at such levels.**



- ***Capital Requirements*** **- Using the Internet in the setting up of new ventures can reduce the amount of capital required. An online order processing and transaction handling system can greatly reduce the level of infrastructure required.**

  **With the vast reach of the Internet, an organisation might also be in a better position to obtain partners for joint ventures or even to shop around for second hand equipment. This can also have a significant impact on the capital requirements for new ventures.**

- ***Cost Disadvantages Independent of Size*** **- With the global reach of the Internet, factors such as experience curves, patents, governmental subsidies or superior location can all be exploited to compete in**

certain industries. At the same token, the Internet can also be a great threat to organisations in an industry if it allows these factors to be exploited against it.

- *Access to Distribution Channels* - Using Email to communicate, the WWW to provide information and secure servers to handle transactions, an organisation can significantly alter the conventional distribution channels for a product.

- *Government Policy* - At present governmental policy across the world is lagging a bit behind the rapid advances of Internet technology. The best example is probably the free flow of pornography across the Internet to and from countries where it is banned by law. The same can be said of software programs and intellectual property. Import duties on these goods are being thrown into disarray as users just blindly send information and programs to whoever requests it.



Although governments are busy catching up, the damage might already have been done in some cases and organisations need to consider both the effect of, and lack of, government policy carefully.

### 5.2.1.2.Powerful Suppliers

If anything, the power of suppliers might be reduced by the advent of the Internet.

- Users will ultimately have a bigger choice of suppliers to choose from via the Internet.

- Competition will become more fierce as organisations from across the globe start competing in markets previously only served by local suppliers.
- Service offered via the Internet might be superior and more efficient than was traditionally the case.

On the other hand, by being able to supply foreign customers in a country with a strong exchange rate, the power of the supplier might be increased locally.

#### 5.2.1.3.Powerful Buyers

The power of the buyer will in all likelihood have the inverse effect to that of the suppliers due to the same reasons given in section 5.2.1.2.



#### 5.2.1.4.Threat of Substitute Products

The Internet definitely offers the possibility of introducing substitute products as more organisations start using the Internet to promote their products from all over the world.

The various discussion groups on USENET also provide a mechanism for introducing information on substitute products and also for influencing perceptions on existing products.

#### 5.2.1.5.Rivalry Amongst Existing Competitors

By employing the Internet to enhance its existing business operations, an organisation can gain a competitive advantage over its competitors. The extent of this competitive advantage is largely dependent on how

the Internet is integrated in the IS/IT strategy and also on how closely the IS/IT strategy is aligned to the organisational strategy.

By using the Internet to maximum advantage in each of the forces as described by the five forces model, an organisation can significantly better its position amongst its rivals in an industry.

### 5.2.2. Critical Success Factors

In chapter two it was shown that there are three key factors that characterise our world today:

- Global Environment
- Change
- Information Glut



The Internet seems designed as if to address these three issues specifically.

Firstly, the Internet allows operation in the global environment. The Internet has the effect of reducing distance in a dramatic fashion by making communication available to anyone almost anywhere in the world.

Secondly, the Internet greatly reduces the concept of time. One need only think how a transcontinental message via Email, in approximately ten seconds, compares to the time a transcontinental message took to be delivered one hundred years ago. This enables individuals and organisations to react rapidly to changes - the second of the critical success factors.

Thirdly, the Internet is a vast source of information. The time required to extract the relevant information would have made the Internet an option not feasible to most, was it not for the WWW and its associated search tools. The Internet now provides a structured way of storing, maintaining and presenting information.

### 5.2.3. Value Chain

The value chain is a valuable tool for identifying sources of competitive advantage inside an organisation. By analysing the value chain, areas within the organisation where the Internet can play a role in improving overall efficiency, can be identified.

#### 5.2.3.1.Primary Activities

These activities are defined as those which add value to the product. By making use of Internet technology in all of these activities, benefits can be obtained.

- *Inbound Logistics* - By using Internet tools such as Email and transaction handling systems, the inbound logistics for an organisation can be improved significantly. During times of short supply of raw materials, the Internet can also be used in the second sourcing of these raw materials.

- *Operations* - Internet technology can also be used within an organisation in the form of Email. Communications within the organisation will be improved. Participation in USENET newsgroups can also be encouraged as a means of keeping employees up to date on the latest advances in their specific areas of expertise.

- *Outbound logistics* - Information provided via WWW homepages on stock levels, quality achievements and expected delivery times, can be a great value added feature for customers. In addition to this, it is also a vital link between the operations and sales departments to ensure that unrealistic customer expectations in terms of delivery schedules are minimised.

- *Marketing & Sales* - Through creative use of WWW homepages, the efficiency of the sales and marketing departments can be enhanced. Customers can be kept up to date via Email of any changes to their orders and various new avenues of revenue can be obtained by marketing the organisation and its products correctly.

- *Service* - Overall service to customers can be enhanced with the use of the Internet. Provision of information, order processing, transaction handling, ongoing communication and deliveries, can all be done via the Internet.



### 5.2.3.2.Support Activities

These activities are often described as the organisational overheads. Although they are necessary for the day to day operations of the organisation, they do not add value directly to the product. Organisations must try and keep their overhead costs as low as possible to obtain the most favourable profit margins. The Internet provides opportunities to lower the overhead costs of organisations in the following areas:

- *Human Resources* - It was shown in chapter three how it is possible for an organisation to recruit via the Internet. The pool of available resources is bigger, due to the global reach of the Internet. The cost of recruiting on the Internet is also much lower, thereby reducing the overhead costs.

- *Technology Development* - Through the Internet, an organisation can stay informed on most new developments across the world. Email communication enables scientists and engineers to exchange ideas and information which would otherwise have been lost to the organisation or would have to have been gathered at great expense of both time and finances.

- *Procurement* - By using Email, order processing and transaction handling tools, the procurement process can become more efficient, thereby reducing overhead costs.



### 5.2.4. Value System

Whereas the value chain focuses on the internal processes of an organisation, the value system looks at how various value chains can be integrated to provide a more efficient process within an industry.

The Internet can be used to great advantage in this area. By communications via Email between suppliers, organisations and customers, the process flow from raw materials to end product can be better understood and any changes can be quicker reacted upon.

Information on external events impacting on an industry can also be monitored more closely via the Internet.

## 5.3. THE INTERNET AND COMPETITIVE ADVANTAGE

In chapter two it was shown that an IS/IT strategy, closely aligned to the organisational strategy, can provide a competitive advantage by changing the nature of competition in two ways:

- Changing the industry structure; and
- creation of new industries and businesses.

The way in which the Internet can change the industry structure was discussed in section 5.2, where the five forces affecting an industry were analysed in terms of the way Internet technology can affect changes within them.

The advent of the Internet has created a new industry - that of providing Internet services. With the rapid technological change associated with information technology, outsourcing has become a popular strategy for many organisations. Internet services are being offered by organisations experienced in using the Internet and its associated tools in the most efficient and creative ways. This relieves much of the burden on those organisations wishing to use the Internet as a business tool for improving their operations, by allowing them to focus on their core activities while having Internet technology available to assist them in performing their core activities more efficiently.

## 5.4. ADDRESSING THE CHALLENGES OF THE 90'S WITH THE INTERNET

One of the lessons from the eighties is that concentrating on one element such as information technology is not enough to gain

competitive advantage. For the organisation to be both efficient and effective, it must integrate strategy, people, operations and technology. By achieving this level of integration, the organisation will be in a favourable position to meet the challenges of the nineties.

### 5.4.1. The Internet and strategy

When an organisation is planning a strategic shift, the Internet can play an important role in achieving the new objectives. The Internet has the ability to reduce time and distance significantly. This factor alone will enable an organisation to adapt quicker to changes in an ever changing marketplace and could provide organisations with a considerable competitive advantage over its competitors.

The latest trends in strategy, such as globalisation, strategic alliances and outsourcing, can all be promoted and achieved more efficiently by employing Internet technology.



### 5.4.2. The Internet and people

The Internet can enable an organisation to utilise the skills of its people more effectively. They can be facilitated in a number of ways through the use of Email, video conferencing and networking on a global scale to have access to required information.

### 5.4.3. The Internet and technology

By using the Internet as part of an efficient end effective IT strategy, organisations will be in a position to have an impact on the rate of change of certain technologies.

For instance, by using the Internet to communicate more effectively, transfer data more efficiently and having access to information from across the world, an organisation could speed up the development cycle of new products significantly. By being able to introduce a product into the market quicker, an organisation is affecting the technology relevant to a particular product.

### 5.4.4. The Internet and operations/business processes

IT has underpinned the development of many changes at the operational level for organisations and the Internet is no exception. The Internet can change the way an organisation responds to requests for information, communicates both internally and externally, and stores and retrieves information about the organisation.



## 5.5. WINNING STRATEGIES AND THE INTERNET

Chapter two concluded with six characteristics which an organisation must display in order to be considered competitive during the nineties.

### 5.5.1. Flexibility

The Internet provides organisations with the tools to become more flexible. By improved internal and external communications, an organisation gains flexibility by being able to make decisions quicker.

### 5.5.2. Quicker to Market

The Internet offers organisations the opportunity to decrease development cycles for new products by improving communications, enabling discussion groups on any topic and providing access to vast amounts of knowledge around the globe. All this means that products reach the market quicker.

### 5.5.3. Focused on Customer Values

The Internet allows the ability to address specific customers with specific messages or information. The needs of customers can be better addressed in this manner than by conventional mass market oriented communications.

### 5.5.4. Able to Handle Rapid Change



The Internet's ability to provide timely information and responses to changes in the marketplace is unparalleled at present. The ability to handle rapid change via the Internet has been discussed in numerous sections earlier in this study.

### 5.5.5. Innovative

Innovation is what keeps the Internet going. By using the Internet as a business tool, an organisation will gain access to innovative concepts and methodologies employed elsewhere in the world. In addition to this, many new avenues are opened for the creation of innovative ideas within the organisation, be exposing employees to the Internet.

### 5.5.6. In Partnership with Customers, Suppliers and Competitors

**By analysing the value system for an industry, and by employing Internet tools such as Email communication between suppliers, organisations and customers, the process flow from raw materials to end product can be better understood and any changes can be quicker reacted upon.**

## 5.6. CONCLUSION -

**As the 20th century is drawing to a close, IT is becoming more important strategically and spending is unlikely to decline. IT has become too important to the survival and competitiveness of organisations for this to change. The nature of the investment in IT should reflect the business environment and challenges of the nineties. Some of these challenges will include global competition, strategic alliances, importance of a flexible and skilled workforce, the increasing rate of technological development, business process re-engineering and time compression management. The Internet with its assortment of tools will enable the successful organisation to rise to these challenges and to transform them into opportunities of growth.**

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