The use of Internet-based communication in support of long-term customer relationships in a period of corporate change

A thesis by

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This research study is dedicated to my husband and best friend, Chris van Eeden

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"By the grace of God go I."

DECLARATION

I declare that:

The use of Internet-based communication in support of long-term customer relationships in a period of corporate change

is my own work, that all sources used or quoted have been indicated and acknowledged by means of complete references, and that this thesis was not previously submitted by me for a degree at any other university.

T. S. van Eeden

02/08/02

Date

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by
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Degree:	**Doctor Philosophiae in Information Science**
Department:	**Department of Information Science** **School of Information Technology**
Promoter:	**Prof Dr JC Cronjé**

Synopsis

The research addressed the factors contributing to the success or failure of an Internet-based communication web site in assisting business-to-business companies to create, establish and/or enhance sustainable customer relationships.

To achieve the outcome, a web site was designed, developed, delivered and evaluated to assist a business-to-business company to create, establish and enhance a sustainable corporate image as perceived by their primary clients.

The design, development and evaluation of the web site consisted of the following sub-processes:

- A review of relevant literature: firstly to reflect upon communication through the wired world, and secondly to determine how the information revolution influences the way people think, work an live.

- A survey of the literature dealing specifically with new strategic marketing perspectives, in order to identify the demands placed on a company's business strategy by the new strategic marketing perspectives, and to determine what these strategies are.

- A survey of the literature dealing with information design and the web usability of Internet-based programmes with a view to designing and developing a web site for a business-to-business company which complied with various design specifications that influence the effectiveness and accessibility thereof.

- Finally, designing and evaluating the web site to identify potential usability problems. The

three evaluation methods used were paper prototyping, machine prototyping and usability testing. The rationale being to identify major usability problems and to obtain measure from intended users and a usability expert on the effectiveness, efficiency and user-interface satisfaction of the web site.

The web site was used as basis for compiling a survey questionnaire to test the degree to which respondents strongly agreed or disagreed with statements on the following features of the web site:

- Communication
- Relationship building
- Customer service
- Design
- Usability

The questionnaire also covered aspects on computer and Internet usage experience, access and literacy of the respondents. The survey questionnaire was sent to the target population of primary clients of the participating company, the group of intended end users.

The empirical results obtained indicated that employing good information architecture that is based on customers' needs, as well as the iterative development of a web site could assist a business-to-business company to create, establish and enhance a sustainable corporate image as perceived by their primary clients.

Key terms: Internet-based communication, relationship building, customer service information design, web usability

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Die gebruik van Internetgebaseerde kommunikasie ter ondersteuning van langtermynkliëntverhoudings in 'n tydperk van korporatiewe verandering

deur

TS van Eeden

Graad: **Doctor Philosophiae in Inligtingkunde**
Departement: **Departement Inligtingswetenskap**
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Promotor: **Prof Dr JC Cronjé**

Samevatting

Die doel van die studie was om vas te stel watter faktore 'n bydrae lewer tot die sukses of mislukking van 'n Internetgebaseerde kommunikasiewebwerf in 'n sakemiliue. Die moontlike bydrae wat so 'n webwerf tot die verhouding tussen 'n besigheid en sy kliënte kan lewer is ondersoek.

'n Webwerfontwerp wat aan die hand van webgebasseerde ontwerpbeginsels ontwikkel is, is deurgaans geëvalueer en onderwerp aan bruikbaarheidstoetsing. Hierdeur is die effektiwiteit, doeltreffendheid en aanvaarbaarheid van die webwerf getoets.

'n Gestruktureerde evalueringsvraelys is deur die kliënte van die deelnemende maatskappy voltooi. Data-analise is op die response wat met die onderstaande aspekte verband hou gedoen:

- Kommunikasie
- Kliënt verhouding
- Kliënte diens
- Ontwerp
- Bruikbaarheid
- Interne gebruik
- Internettoegang
- Internetgeletterdheid

Die empiriese analise van die response het aangetoon dat goeie inligting argitektuur wat op kliënt behoeftes gebaseer is, asook deurlopende evaluering van 'n webwerf in die ontwikkelingsfase, 'n maatskappy kan help om 'n koöperatiewe beeld te bou, te verbeter en by sy kliënte te vestig.

Sleutelwoorde: Internetgebaseerde kommunikasie, kliëntverhouding, kliëntediens, inligtingontwerp, webwerfontwerp

Terminology

Agents: Individuals representing the supplier and dealership at end-user level. They are responsible for physically selling the products.

Authorizing system: A software product designed for users without programming skills to be used for developing and testing multimedia applications.

Business-to-business (B2B): The portion of the Internet market that affects transactions between business operations and their partners in marketing, sales, development, manufacturing and support. This is the largest portion of the Internet marketplace, and the fastest-growing sector.

Business-to-customer (B2C): Defined as the communications and transactions between a business and a consumer via the Internet.

Business networks: Relationships between suppliers, buyers and intermediaries, usually organised by industry group, or the contacts of an individual organisation.

Business-to-business (B2B) transactions: Business transactions conducted over public or private networks, including public and private transactions using the Internet as a delivery vehicle. These transactions include financial transfers, on-line exchanges, auctions, product and service delivery, supply-chain activities and integrated business networks.

CD-ROM: Compact disc read-only memory. A disc storage device standardised for data with 680 megabyte capacity enabling it to store 250 000 pages of text and used extensively for storing multimedia titles.

Channels of distribution: A distribution channel is a method of providing a product or service to the target user of the system. This could be an on-line mall, a portal, an own brand site or a distribution

supply chain.

Community: An electronic forum where individuals or groups gather to find relevant and pertinent information. They are often segmented by interest or geography.

Constructivist theory: Jerome Bruner's theory is that learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so. Cognitive structure (i.e., schema, mental models) provides meaning and organization to experiences and allows the individual to 'go beyond the information given'.

Crop protection: The control of weeds, pests and crop diseases to increase the yields and quality of the harvest.

Customer Relationship Management (CRM): The strategy, processes and technology designed to support the effective optimization of the customer relationship. Most systems support these activities involving customers before the sale, during the sales process, in rendering customer service and over the length of the relationship.

Distribution channel: The process of conveying goods and services through different stages from the producer to the market.

Dealership: Grouping of agents together in one legal entity in which the relevant agents and management team have shareholdings. The dealership is responsible for selling, distributing, and servicing the products at end user level.

Focus-group design and paper prototyping: Both these techniques are means to involve users in the design process from a very early stage, and provide usability practitioners with the ability to measure application usability even before a prototype has been developed.

Hawthorne effect: A social desirability tendency. Most persons will try to give answers that make themselves appear well-adjusted, unprejudiced, rational, open-minded and democratic.

Heuristic evaluation: A variation of usability inspection where usability specialists judge whether each element of a user-interface complies with established usability principles.

Hypermedia: The provision of a structure of linked elements through which the user can navigate interactive multimedia.

Interactive multimedia: The ability of the viewer to control the elements of a multimedia project when delivered.

Iterative usability testing: Usability testing is a powerful tool for quantitatively measuring the usability of software applications. In order to maximise its effectiveness, usability testing should be applied in different forms from very early in the design process and should be applied iteratively throughout the remainder of the entire development process.

Interview: Gathering information about users by talking directly to them. An interview can typically gather more information than a questionnaire and go into a deeper level of detail. Interviews are good for getting subjective reactions, opinions, and insights into how people reason about issues. Interviews may be conducted in person or over the telephone.

Pull strategy: The dissemination of product-oriented and services information for potential and existing secondary clientele (end users).

Push strategy: The ongoing communication of the principles, objectives, products and services of a company to their dealerships and their agents.

Primary customers: The members of the dealerships and agents.

Multimedia: An interwoven combination of text, graphic art, sound, animation and video elements.

Secondary clientele: The end users, namely individual farmers and the corporate food production industry.

Survey: A technique for gathering information from a large number of users. A survey can be conducted through a large number of telephone interview, a direct-mail questionnaire, or an online questionnaire.

User-centric design (UCD) framework: This framework provides organisations with a process which, if followed carefully, can help cost-effectively to enhance the usability of any software application in development. The framework advocates the early understanding and definition of all variables that can affect the end user's ability to effectively operate a proposed user interface. The UCD framework usually consists of three phases, namely analysis, design and construction.

Usability: Usability addresses the relationship between tools and their users. In order for a tool to be effective, it must allow intended users to accomplish their tasks in the best possible way. The same principle applies to computers, web sites, and other software. In order for these systems to work, their users must be able to employ them effectively.

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Chapter 1

Introduction and research questions

The thesis reports on research conducted with a view to arrive at an understanding of the factors that contribute to the success or failure of Internet-based communication web sites in assisting business-to-business companies to create, establish and/or enhance sustainable customer relationships.

To achieve the outcome, an Internet-based communication web site was designed, developed, delivered and evaluated to assist a [1]business-to-business company to create, establish and enhance a sustainable corporate image as perceived by its primary clients. Furthermore this thesis gives a reflective look at how user-centered design methods were chosen and the effect they had on achieving a user-centred design for a Internet-based communication web site. The South African Crop Protection Company aimed at communicating continually the principles, objectives, products and services of the company to its customers (dealerships and agents) via the web. Finally, the study shows the value of the involvement of customers in the process of design and evaluation of the web site which aimed at assisting them in adding value to the operations of food producers which result in optimized crop yields and income.

1.1 Background

In the discussion document of the National Department of Agriculture (see http://nda.agric.za), 'Agricultural Policy in South Africa' — the changes in the South African Agricultural Industry are discussed. Formerly controlled markets have now been deregulated. Many small, medium and large-scale enterprises have entered both the domestic and the export markets. These markets create opportunities that offer good prospects for further job creation and marketing services for farmers and, in particular, encourage emerging farmers to increase their produce. The challenge is to ensure that agricultural contributions to the national economy increase and that poverty and food insecurity are eliminated. As urbanisation is a worldwide phenomenon, the number of people engaged in farming is

[1] South African crop protection company

diminishing and the area of arable land is shrinking. Developing countries are faced with food shortages which inevitably lead to the major problem of infant malnutrition and starvation. For this reason, crop protection companies are striving to provide more effective methods and means for protecting crops and harvests, with the aim to positively impact on food security.

Sustainable agriculture uses practices and systems that maintain and enhance

- sufficient and affordable supplies of high-quality food and fibre;
- the economical viability of world agriculture;
- the natural resources of agriculture and the environment; and
- the ability of the world's population to continually provide for its own well-being.

Products, services and technologies are among the most important tools used by industry to achieve sustainability in agricultural production. This study will investigate the ways in which an Internet-based communication web site can assist a business-to-business company to build a company image and to continually communicate its principles, objectives, products and services to its clientele in times of organisational change.

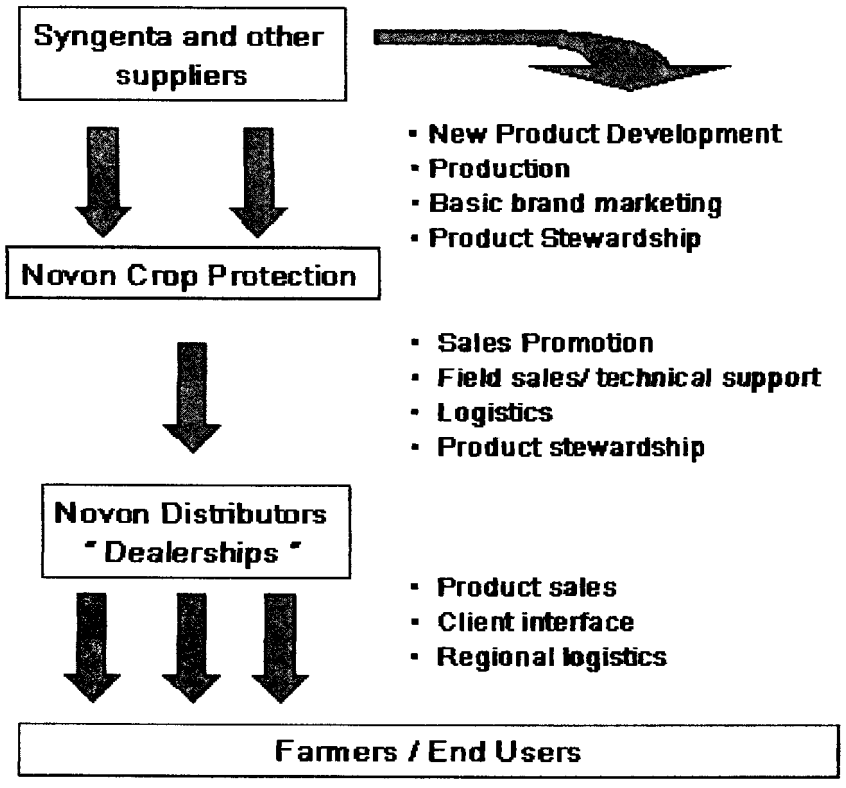
1.1.1 Corporate change at Novon

During 1999, Novartis South Africa took the decision to de-merge its crop protection sales and distribution network to become a locally based company — Novon Crop Protection (Pty) Ltd. This company will act as the holding company for the strategic alliance between product supplier and distributor chains. Novon will distribute mainly the product range of [2]Novartis, now Syngenta Crop Protection, as developed and registered in South Africa. The core objective of the formation of Novon Crop Protection is the creation of a strategic alliance that balances channel access with product access. In this way access to distribution for Syngenta Crop Protection to the dealership can be ensured over the long term. The alliance is in the form of a group of companies representing all the distribution channel functions, which

[2] The International companies Novartis and Zeneca merged during 2000. The new company name is Syngenta.

is co-owned by all the channel members involved. The clients of Novon Crop Protection Company can therefore be identified at two levels. The primary client is the dealership and its agents (partners), while the secondary client consists of the end-users using the Novon Crop Protection product range. The flow of the channel functions are depicted below:

Figure 1.1 Flow of functions in the distribution channel



Since the management of Novon Crop Protection Company recognised the potential of the World Wide Web (WWW) as a business-to-business marketing tool, a decision was taken to create an Internet-based communication web site with the aim to create, establish and/or enhance sustainable customer relationships, particularly at the time of corporate change. According to Bell and Tang (1998)(Online) companies can benefit from the Internet. However, there is no guarantee of success if crucial factors such as customer expectations and user- interaction are not addressed. Steyn (2000) reports on the non-

usability of various South African sites that do not comply with usability factors.

The results of this study should contribute to the understanding of the factors that contribute to the success or failure of an Internet-based communication web site in assisting business-to-business companies to create, establish and/or enhance sustainable customer relationships, particularly at a time of change, where old company sentiments need to be replaced and new directions need to be followed without compromising standards or alienating existing customers.

1.2 Research questions

There is a need to determine the factors contributing to the success or failure of Internet-based communication web sites.

The research problem can be formulated as the following question which represents the main question that will be addressed by this research:

What are the factors that contribute to the success or failure of an Internet-based communication web site implemented to create a corporate image as perceived by business-to-business clients?

Since the word 'factors' covers a very wide concept, it was deemed necessary to restrict the context to communication, marketing, customer service, information design and web usability. In order to develop a research strategy to deal with and answer the above question, a number of subquestions have been identified. They appear in the following table, which contains both the topic of issue and specific subquestions.

Table 1.1 Subquestions

Topic of issue	Question
Communication	• How can an Internet-based communication web site assist a company to continually communicate the principles, objectives, products and services to their dealerships and their agents (primary clientele)? • How can product-orientated and services information be disseminated to potential and existing clientele? • How can the use of the WWW assist in establishing and/or enhancing business-to-business networks at a time of corporate change without compromising standards or alienating existing customers?
Marketing	• How would an Internet-based communication web site assist in the establishment of a trust relationship between the company and its primary clientele?
Customer service	• How would an Internet-based communication web site assist in the forging of loyalties between the company and the primary clientele?
Information design	• What design factors would best facilitate the communication of the company's services, principles, objectives and products to their primary clientele?
Web usability	• To what extent can a Web-delivered web site provide information that elicits sufficient clientele motivation, acceptance and usage? • How can the Internet-based communication web site be made sustainable? • How can the Internet-based communication web site remain competitive?

To promote the logical answers to these subquestions, the following broad procedures were followed:

- A literature study was conducted of Internet literature to place the research in the context of the nature, substance and importance of global issues related to the Internet and the WWW; and to illuminate the key issues of communication, marketing, customer service, information design and web usability.
- The literature dealing specifically with marketing on the web was surveyed to explore the demands placed on the business environment by the WWW, and to determine what the new business concepts entail.
- Literature dealing with information design and web usability was surveyed to aid in the design

and development of a company-clientele accessible communication web site and CD-ROM for the Novon Crop Protection Company, which could be used as the basis for compiling a survey questionnaire to test the degree to which the business-to-business clients, both dealerships and agents, of the company agree or disagree with the usability thereof.

- The research consisted of interviews, formal and informal discussions with subjects of the focus group, and the usability testing group, which were of a qualitative nature. Quantitative measures in the form of a questionnaire were also taken. Fill-in (quantitative measure) and open-ended (qualitative measure) questions were used. Electronic observations monitored different aspects of the use of the web site.
- The results obtained were used to identify factors that could contribute to the success or failure of a business-to-business communication web site. The results obtained could then be used to adapt the business-to-business web site where necessary in order to bring it in line with the views of the majority of respondents and those of a Human-Computer Interface specialist. Once that was completed, the outcome would constitute an understanding of the factors contributing to the design of a successful web site for long-term business-to-business customer relationships, which is the academic outcome of this study.

1.3 Outcome of research

The purpose of this research is to arrive at an understanding of the factors that contribute to the success or failure of an Internet-based communication web site in assisting a business-to-business company to create and establish sustainable customer relationships in a period of corporate change. This research should contribute to business-to-business companies' knowledge of the use of an Internet-based communication web site in support of long-term customer relationships and customer service in cyberspace.

1.4 Delimitations of the study

The study would

- assess a focus group as defined by the participating company;
- comply with the ethic rules set by the company in question;
- not breach the confidentiality clause of the company in question; and
- use the information provided by the company in question for the design of a web page and CD-ROM.
- reflect on customer relationships formed within a one year period.

The study would not

- reflect on long-term customer relationships due to the relatively short time frame set to complete it.

1.5 Structure of the study

This thesis consists of five chapters which are organised as follows:

Chapter Two of the thesis consists of a review of relevant literature. The literature to be reviewed for this study will cover the following topics:

- **Communication** — the use of the WWW in establishing consumer networks and for the dissemination of product-oriented and services information
- **Marketing** — the use of an Internet-based communication web site in establishing a trust relationship between the company and its primary clientele
- **Consumer service** — the use of an Internet-based communication web site in establishing a trust relationship and forging loyalties between a company and its clientele
- **Information design** — design factors that best communicate a message to the clientele
- **Web usability** — the use of a web-delivered programme and CD-ROM in providing information that will elicit sufficient clientele motivation, acceptance and usage

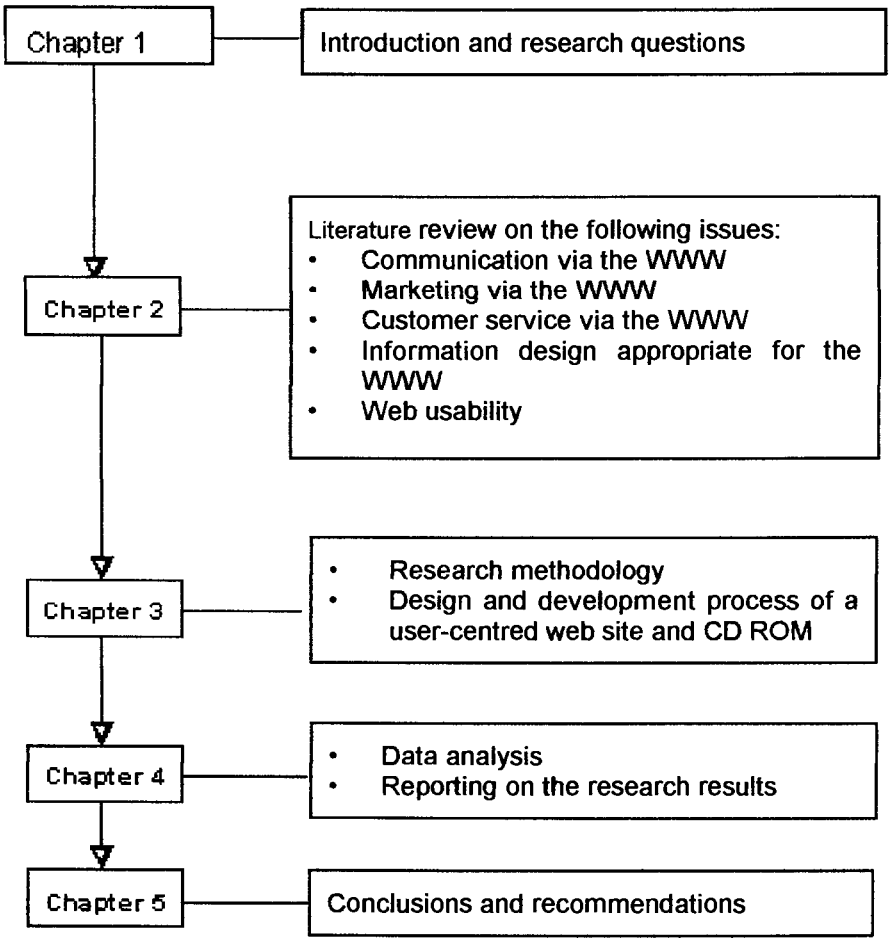
In **Chapter Three** the empirical methodology of the study is described in order to explain the research plan, data presentation and interpretation.

In **Chapter Four** the results of the study are reported and discussed.

Finally, in **Chapter Five**, conclusions are drawn and recommendations for further research are made.

To aid the reader's understanding of the flow of this document, a graphic description appears below.

Figure 1.2 Graphic representation of the document



Chapter 2

Literature in context

Introduction

A relatively new field of study, researched by a wide range of academic researchers, is the Internet. The output from this research effort has become available largely through the process of accessing information via the World Wide Web (WWW) and the wide range of diverse journal and conference paper sources it has published. However, a considerable amount of research has been undertaken by the Information Communication Technology (ICT) Industry, business and management which provides a demonstrably applied commentary on ICT issues. It is therefore imperative to include the views of both authorities (Academic researchers and ICT Industry, business and management) on the chosen issues covered in this chapter.

The main purpose of this chapter is to place the research in the context of the nature, substance and importance of global issues related to the Internet and the WWW through the thoughts and visions of political leaders, leading representatives from the marketplace and different industries, as well as great visionaries and social commentators. This chapter explores the background and basis of communication on the Internet. It further deals with and illuminates the key issues of customer service, marketing, usability, and implications for choices and their alternatives, by reference to, and discussion of the findings of recent research studies. This provides the readers with the opportunity not only to familiarise themselves with the generic nature of Internet issues, but also to relate these issues to the context of the thesis i.e. the use of Internet-based communication by Novon Crop Protection Company in support of long-term customer relationships in a period of corporate change.

2.1 Communication through the wired world

> *We will strive to listen in new ways - to the voices of quiet anguish, to voices that speak without words, the voices of the heart, to the injured voices, and the anxious voices, and the voices that have despaired of being heard.*
> **Richard M. Nixon, inaugural address, 1969**

Reflection upon research conducted on communication via the WWW is the focus of what follows. This section is divided into four main areas based upon recurrent issues, visions and views dealt with in the relevant literature. Table 2.1 summarizes the contents of the different sections.

Table 2.1 Summary of the content of the different sections of 2.1

2.1.1. The Internet Changes Everything Age (ICE)	Thought-provoking visions by the "digerati" of some of the most important market movers, leading commentators, policy makers and government strategists who directly influence work, business and life in the ICE Age.
2.1.2 The Global information infrastructure (GII)	Key elements which form the GII and provide the underlying foundation for the Information Society are viewed. Those who control the GII are crucial, powerful gatekeepers in the network economy.
2.1.3 Putting people first in the ICE Age	People and what the impact of the wired world will be on their lives form the basis of the focus in this section.
2.1.4 The future of the Internet and the Internet of the future	This section deals with the limitations of the Internet that impede the use of the Internet and with the privacy and security industry.

2.1.1 The Internet changes everything (ICE) Age

It is appropriate to suggest that a global conversation has begun, depicted as an information revolution which is happening at a fast pace and cannot be controlled by the individual. As the opening sentence suggests, it is argued that significant scope exists for the development of the information age in terms of the way we think, work and live. The following section will therefore reflect upon the visions of key players, leading commentators, market movers, policy makers and government strategists who directly influence work, business and life in the ICE Age.

A summary of the visions of key players of the Information Age (Gore, 1999:7-17; Bangemann, 1999:18-21; Toffler, 1999: 22-30) is presented under the following points:

- The Information Revolution is still in its infancy
- Connecting our children to the future
- IT pursues the re-inventing of governments
- Power in the world today is no longer bisected but trisected
- Deep coalitions will follow
- Info-power in the firm

Reflections on these thought provoking visions on the ICE Age are what follows.

2.1.1.1 The Information Revolution is still in its infancy

Gore (1999: 7-17) draws attention to the following developments, achievements and challenges that remain to be resolved:

- Information and communications technologies will have a dramatic impact on the way people work, learn, live, and interact with each other.
- The global revolution is altering the structure of all societies at every level. Today's information/biological revolution is creating a new civilization that is highly technological, but may have more in common with certain pre-industrial social forms than with industrial life.

Closed societies will disappear and the world will unify.

- Technology will continue to improve.
- Competition between new and existing telecommunications companies will eventually drive the deployment of broadband networks capable of handling voice, video and data, putting an end to the World Wide Wait. '*We should not view information technology (IT) as an end in itself, but as a tool that we can use to create economic opportunities, improve our quality of life, and advance our most basic values*' (Gore,1999).
- The cost of transmitting and processing information will continue to plummet.
- The applications of IT will be limited only by peoples' imagination, creativity, and ability to innovate. It could create a digital divide between those who have access to Information Age tools and those who do not, not only within developed countries, but between developed and developing countries.
- Privacy could be eroded as it becomes easier to collect, store and link personally identifiable information.
- The potential downside of IT on privacy should be addressed. People should have the right to choose whether their personal information should be disclosed; the right to know how, when, and how much of that information is being used; and the right to verify it before it is made available to others.
- There should be a move ahead from a focus on technology to a focus on people, content and quality.
- New forms of international collaboration between public and private sectors, and also calls for an International Charter for a political understanding to fulfil the Global Information Society agenda, should be pursued.
- In a Round Table discussion on key obstacles to global communication and new electronic services in Brussels, a common understanding was reached in the private sector that on a global scale it was necessary to lift obstacles resulting from divergent rules and policies in the following areas:

  taxation, tariffs, intellectual property, encryption, authentication, data protection and liability. Industrialists agreed to launch a Global Business Dialogue with governments and international organizations in order to develop consensus on solutions to these seven priority

issues, and on future issues to be identified over time. *'The Commission is committed to guaranteeing that this new process of policy-making is successful in order to ensure that the continuing fast technological developments have a positive impact on the economy, job creation, and the social and cultural values of our society' (Bangemann,1999:21).*

2.1.1.2 Connecting our children to the future

Information technology, used creatively, has the potential to revolutionize the way teachers teach and students learn. Investment in computing and communications equipment now accounts for almost half of the total investment in business equipment, and money spent on business-to-business electronic commerce in the US alone is expected to exceed $300 billion by 2002 (Gore,1999:12).

- Consumers are using the Internet to buy books, groceries, cars, airplane tickets and financial services.
- On-line catalogues and electronic markets often provide customers with greater choice, more information, and a greater ability to compare the products and prices of multiple firms.
- Companies are using IT to increase productivity, forge closer relationships with suppliers, customize products and services to the needs of individual consumers, provide just-in-time training, and leverage the shared knowledge and expertise of their employees.
- By the year 2010, the number of people who are able to support themselves and their families because they are able to reach world markets through the Internet will triple. It will also help give consumers access to a whole new world of goods and services.

2.1.1.3 Power in the world today is no longer bisected but trisected

According to Toffler (1999: 22-30), a member of the International Institute for Strategic Studies and a Fellow of the American Association for the Advancement of Science, power in the world prior to the knowledge-based economy was bisected with the agrarian countries at the bottom and the industrial countries at the top. The knowledge-based economy has changed this tendency with the agrarian countries still on the bottom rung of the power ladder, mass-manufacturing industrial economies halfway up the power ladder and a third wave information-based economies temporarily on top of the power ladder. A major preoccupation of Toffler (1999, 22-30) in this area is an attempt to identify the

key factors that are influencing information-based economies.

- IT can be used to create virtual organizations that reduce duplication and pull together information and services into a user-friendly 'one-stop shop' (Gore, 1999:13).
- Digitalization and networks may well be destabilizing forces in the ICE Age.
- Nation states are losing their ability to maintain airtight boundaries.
- Money flows across borders electronically. For this reason, the relative power of governments is reduced, while that of markets has increased.
- Ideas and different cultures penetrate almost any part of the globe.
- The debate about the free flow of information will soon be settled by engineers and not politicians who wish to control the flow of information by so-called 'permission to receive' laws. Thus, the traditional power of sovereign nation states diminishing. The result is a much higher level of interdependency.
- There is a definite move forward to a post-industrial global age that is similar to the pre-industrial age.
- Giant corporations have global interests to advance or defend.
- Some global corporations are stateless.
- Nations are represented in Inter-Governmental Organizations (IGOs).
- There are now 25 000 Non-Governmental Organizations and they are all Internet-linked and busy forming coalitions and setting up complicated political relationships.
- 'Global gladiators' (drug networks and criminal groups) are all linking up with more advanced communication and surveillance technology than the police and intelligence agencies.

  'In short, a significant degree of power is draining out of nations and states, and is accruing to different non-national and non-state players. These players are very different from one another, but they can, and do, work together' (Toffler,1999:24).

2.1.1.4 Deep coalitions will follow

According to Toffler (1999: 25-26), the future holds within it the development of 'Deep Coalitions'. These 'Deep Coalitions' will consist not only of nations and states, but will be multilayered, multi-leveled coalitions in which there may be three nations allied with two giant corporations, and even an

organisation such as Greenpeace. Once alliances are formed and interdependency with other countries' economies is established, political involvement could follow. *'To succeed in this world, companies and countries alike need to understand power better - and the ways that information revolution is changing it'* (Toffler,1999:26).

2.1.1.5 Info-power in the firm

Finally, Toffler (1999: 26-30) predicts that power is not merely shifting at the global level, but in societies and in businesses as well. The wiring of the world holds a threat for many entrenched power-holders. He foresees that power will increasingly hinge on knowledge - and most powerful of all will be software about software, knowledge about knowledge. A logical deduction to make is that the relationship of information to decision-making in large corporations can be the source of many of today's changes in power relations in the firm. The shift towards employee empowerment has occurred because management can understand the actual, newly complex and fast-changing realities that the employees need to cope with at the periphery or out in the field. Management therefore has to rely on knowledge down below to a far greater extent than ever before. Furthermore, firms cannot compete in today's environment unless their employees are skilled and capable of both innovation and intelligent decision making. The information revolution is driving these changes, and shifting some (not all) power downwards. *'The Information Age offers much to mankind, and I would like to think that we will rise to the challenges it presents. Our future generations will take mankind to new levels of consciousness and achievement, particularly if they can always be mindful that information is not knowledge - and knowledge is not wisdom'* (Clarke,1999:36).

On 12 October 1998 Al Gore (cited in Leer, 1999:14) posed five great challenges to the International Communications Union that have not been met.

Table 2.2 Digital Declaration of Interdependence (Leer,1999:14)

1.	We must improve access to technology so that everyone on the planet is within walking distance of voice and data telecommunications services within the next decade.
2.	We must overcome our language barriers and develop technology with real-time digital translation so that anyone on the planet can talk to anyone else.
3.	We must create a Global Knowledge Network of people who are working to meet our most important challenges in education, healthcare, agricultural resources, sustainable development, and public safety.
4.	We must use communication technology to ensure the free flow of ideas and support democracy and free speech.
5.	We must use communication technology to expand economic opportunity to all families and communities around the globe. Everyone in every part of the world should have the opportunity to succeed if they are willing to work for it. Some estimate that global electronic commerce will grow to more than $300 billion per year in just a few years.

This section has offered a number of reflections upon the visions of leading thinkers on the outcome of the Information Revolution. Gore and Bangemann (1999) have moved **from a focus on technology to a focus on people, content and quality**. They communicate their expectations of the wired society and the suggested challenges that await nations, governments and individuals alike. Toffler (1999) shows concern about the Information Revolution owing to **the scale and impact thereof on all levels of the society,** while Clarke (1999) communicates **a positive perspective on the challenges** and offers that await us all.

2.1.2 The Global information structure (GII)

Key elements which form the GII and provide the underlying foundation for the Information Society are examined in this section. Those who control the GII are crucial, powerful 'gatekeepers' in the network economy.

Given the scale, diversity and speed of change in the web industry, it is not surprising that many different stakeholders are involved in the GII operations. According to Gilhooly (1999:42), a founder Commissioner of the Global Information Infrastructure Commission, the trauma of adjustment is being felt more keenly within the communications industry itself than anywhere else. He predicts that the incumbent telecommunications operators will no longer command exclusive channels to customers. Rather, they will be shared among network operators, content providers, systems integrators and multiple market entrants (Gilhooly, 1999:43).

> *'The central paradox of the convergence era is that, while the telecommunications operators are the investors, owners and gatekeepers of the vast, global fibre optic network that has grown up over the past decade, the content and computing conglomerates are basing their expansion plans on the assumption that bandwidth will be free and access open. This stark clash in cultures is indicative of a huge power play among industrial interests, the outcome of which will set the pace and character of the communications revolution. Already, multimedia applications are emerging that can only profitably be handled by tomorrow's pricing and delivery mechanisms. However, until the relics of the old telecommunications order are swept away - relics of pricing, ownership, regulation and technology - the goal of a truly Global Information Infrastructure (GII) will remain elusive'*(Gilhooly, 1999:43).

Gilhooly warns that the telecommunication industry needs to change its business strategy if it wants to endure. Low-cost access to high-capacity communications wherever and whenever demand arises will be essential in order to meet the needs of the multimedia marketplace (Gilhooly, 1999:46). Therefore, the liberalization of the global telecommunication industry, with special reference to the South African situation, is a necessity if we are to effectively handle the explosion of new broadband capable networks.

Access is, and will continue to be, the key bottleneck in telecommunications, even at a time when the local access market is sustaining its financial value, as the long-distance and international market is threatened by the erosion of historical cross-subsidies (Gilhooly, 1999:46). Problems such as these are well known in South Africa as we continue to experience delays and congestion in data traffic as a result of low-speed bandwidth, which is discouraging South African users from using the Internet as a mainstream medium to engage in online transactions. A key problem facing South Africa, unlike most countries, is the five-year monopoly that was granted to the only South African telecommunications company, Telkom, to provide basic services, under the Telecommunications Act of 1996 (Michalson, 1999) (Online). Although there are technologies that have been developed for

high-speed, broadband data communications, such as, Integrated Services Digital Network (ISDN), Digital Subscriber Line (DSL), satellite and T1 and T3 lines, which are available in South Africa, their prohibitive cost for South Africans means that they are not commonly used (Michalson, 1999 (Online) & Dale, 1999 (Online)).

Regulation of the media and communication industry is another key element of the GII that requires attention. Olswang (1999:54) indicates that the European nations have allowed state control and regulatory intervention while the USA steered away toward minimal government intervention with self-regulation by the industry. He believes that Europe is now struggling to come to terms with the Digital Age by clinging on to regulatory structures that no longer work. This issue is picked up by Scardino (1999:411), who stresses that governing bodies should err on the side of less rather than more regulation to allow competition rather than bureaucratic prescription to shape the market. Cochrane (1999:80) is another visionary who believes that Information Technology (IT) is allowing the creation of a global Information Economy that will lead to an Information Society. Nations that try to impose regulations and put a framework for society in place first, before learning how to use the GII for wealth creation, are endangering entire economies.

This section has offered insight into the views of visionaries on the GII and the dynamics of the global Information Economy that, according to their thinking, will lead to an Information Society. Gilhooly(1999:47) predicts that the **telecommunication industry will no longer command exclusive channels to customers**, but will share them among network operators, content providers, systems integrators and multiple market entrants. This is necessitated by the **explosion of new broadband capable networks.** Gilhooly (1999) shows concern for the problem of **channel access which continues to be the key bottleneck in telecommunications** due to the erosion of historical cross-subsidies.

Regulation of the media and communication industry is another key element of the GII addressed by Olswang, Scardino and Cochrane (1999). They agree on the **regulation** issue **affecting the GII industry** and warn governing bodies not to prescribe to the market but to allow competition in the global information economy. We are reminded of the momentous responsibility of those who control the GII in the network economy.

2.1.3 Putting people first in the ICE (Internet Changes Everything) Age

> *"....in my opinion, seeking information from the Internet is rather like a parched man endeavouring to quench his thirst by putting his head into Niagara Falls."*
>
> **Arthur C Clarke**

As the opening quote suggests, it will be argued that being digital in the wired world significantly impacts on the lives of individuals and the global society as a whole. This section attempts to explore the impact of the wired world on the lives of people and society through reflection upon related research and visionary contributions in the literature. An effort is made to address such questions as: 'What is the effect of being digital?' and 'What is the scope for narrowing the digital divide?' With regard to information overload, Leer writes as follows: ' . . . of having too much choice and not enough time, of being bombarded by the media offerings and an avalanche of consumer electronic applications. Will the common cold be replaced by Wired Indigestion? Or will the readers of the Wired World get the right stuff digested to live happily ever after he or she got connected?' (1999:383). In surveying various responses to the proposed impact of the Wired World on our lives, Leer's (1999:383-385) summary of the contributions of Negroponte, Handy and Fjortoft can be tabulated as follows:

Table 2.3 Summary on responses to the impact of the Wired World

Category	Negroponte	Handy	Fjortorft	Implications
* Global equals local * Shared interests become local	* The world will morph into a planet full of loosely connected physical and digital communities. * The Digital Age brings a new form of localism. * The concept of neighbourhood will change in the Digital World as physical location will be less important. * The neighbourhoods of the Wired World are groups that evolve from shared interests like those found on mailing lists, in news groups, or in aliases organised by like-minded people.	* Handy agrees with Negroponte; that there are many features of the Wired World that will liberate and enrich people's lives. * In the knowledge age individual differences will be important both inside and outside organisations. * Like Martin (1999:324), he too believes, to quote him, '. . . that successful organisations will be built around talented individuals and that institutions will be less important as people will spend more of their lives outside formal organisations.'	* Fjortoft addresses the following difficult questions: • Will the Wired World be a better world for people to live in? • Will it make a difference to the distribution of wealth and prosperity? • Will it help us solve the biggest crises of humanity, poverty, unemployment, pollution and warring between regions?	* In a global world there is no room for organisational boundaries.
* Need for communication standards	* The lack of cultural diversity and the dominance of the English language on the Internet should not pose a problem. * English as a second language, with or without computers, has become an international protocol and in the same way, English will continue to be the air traffic control language of the Net for the next ten years or so. * English could however at some point be superseded by Chinese and other languages could flourish too.	* Handy warns that a society founded on individualism could fall apart without the glue of fraternity, the awareness that there are others who are as important as oneself. Fraternity, he suggests, could be just the kind of new religion or fashion we need to save ourselves.	Fjortoft's conclusion is that the choice is ours. We have an unprecedented opportunity to harness technological advancements for the purpose of making substantial progress towards a truly global economy and a real global society. However, it will not happen without strong leadership and joint efforts from both governments and businesses at both the national and international levels.	* Global diversity needs sets of norms and values to prevent chaos.
* Choice versus reality	* International bodies must recognize that a higher level of communications standard is needed to make sure that all languages are equally accommodated and self-descriptive. * People enjoy and benefit from being connected to the on-line world. * Children learn and gain social skills through the Internet, they don't lose them. * Adults on the Net enjoy even greater opportunity, as more people discover they can work from almost anywhere. * The 'virtual corporation' is an opportunity for tiny companies (with employees spread across the world) to work together in a global market and set up base wherever they chose.	* An abundance of choice affects people and society, and all this choice may lead to the erosion of any one dominant set of values. * People may choose to opt out of leadership roles in business and society, because talented people may find a life on the edges of organisations more fulfilling. This could have a serious impact on organisations, which would be left with the second best. * Not everybody has this abundance of choice or any choice at all. Choice is for the privileged. * Choice will seem a hollow mockery when someone is old and cold and poor.	* The principles of equal access to education and knowledge in a Global Information Society beg the question of who will foot the bill. * Fjortoft makes it very clear that the risk of a further widening of the existing gap between the haves and have-nots is prominent. It is a terrifying scenario that the great benefits of the Wired World would only be available to those who can afford it, unless we come up with new models for economic development.	* New economic models are crucial in delivering the benefit of the Wired World globally.

Leer concludes that 'It is encouraging that there seems to be unanimous agreement that the Information Society of the Wired World must be inclusive and provide an equal opportunity for all. There is equal agreement that people should be at the centre of the Wired World' (Leer, 1999:385).

Given the importance of narrowing the digital divide, a number of researchers have focussed on this issue:

As the report by McConnell International in collaboration with World Information Technology Services Alliance (WITSA) (TAD, September 2000, Update 3)(Online) indicates, few of the 42 economies assessed by them have the infrastructure necessary to be full participants in creating and disseminating information.

- Twenty-five of these critical economies, representing nearly 3,6 billion people, require substantial improvement in their connectivity.
- The remaining 17, conditions are marginally better.
- Eleven of these are demonstrating improvement.

(TAD, September 2000, Update 3)(Online)

The fundamental lack of connectivity in countries such as those in South Asia and Africa is an enormous draw back for short-term progress. The report states that the African continent, with nearly 15 percent of the world's population, possesses just two percent of the world's total number of telephones and less than 0,1 percent of all Internet users. There is, however, some progress. Five years ago, only five African nations even had Internet access; by the year 2000 all 54 were connected. Africa has witnessed complementary growth in Internet host numbers, at nearly double the rest of the world's 18 percent rate. Ghana provides an example of how connectivity issues in Africa are being addressed. Much can also be learned from South Africa's province of Gauteng, which has approved plans to begin construction on an 'Innovation Hub'-- an incubator and training centre for rising high-tech enterprises. Modelled after similar undertakings in Asia, the project will include the creation of a 'tech corridor' leading from Pretoria to Johannesburg (TAD, September 2000, Update 3)(Online). On World Telecommunications Day (18 May 2000) the Communications Minister of South Africa, Dr Ivy Matsepe-Casaburri, made a further promising announcement regarding the

establishment of Internet centres, to be known as 'Dot ZA' centres, in informal settlements throughout the country with the purpose of bringing Internet, to the poor and in addition, the presentation of computer literacy programmes (TAD, June 2000, Update 1) (Online).

Similar initiatives have been undertaken by the M.S. Swaminathan Research Foundation (MSSRF) in Chennai, India, provides information to local rural people according to their needs and demands through the use of both analog wireless technologies and two dial-up Internet connections connected to two telephones (TAD, May 2000, Update 5)(Online).

Another initiative that needs mentioning is the undertaking by a team of engineers in India who plan to use India's extensive railway network as a conduit for communications cables in their quest for cheap and fast Internet connections. Cybercafé kiosks established at stations along the line form part of their plans to accelerate Internet access to the community at low cost (TAD, June 2000, Update 4)(Online).

This vision extends to other areas in India as well. Uttar Pradesh and Bihar - two of India's poorest and most populous states, had eight towns fitted out with video e-mail booths to bring the Internet within reach of the poorest of the poor (TAD, October 1999, Update 1)(Online).

The new information and communication technologies (ICTs), centred mostly on the Internet, provide potential to redress imbalances throughout South Asia and Africa (TAD, May 2000, Update 5)(Online). The sentiment expressed here is that not even the poorest countries should be left out of the ICE Age (TAD, August 2000, Update 2 & TAD, August 2000, Update 4)(Online). However, according to the McConnell International report (TAD, September 2000, Update 3)(Online) mobile access to the network might help to narrow the digital divide, but will not bridge it.

An increased demand for connection will create huge opportunities and challenges for network service and content providers. But to fulfill this quest the world faces a great need for more qualified people.

Shortages are greatest in four areas:

- Managers competent of completing complex technology projects
- Policy analysts who understand government regulation's tendency to dampen business particularly in a changing technology environment
- Local content creators aware of the network's potential
- Software, hardware, and communications engineers

With reference to the world-wide population, the McConnell International Report (2000) rates intellectual capital as the greatest strength of the countries rated (TAD, September 2000, Update 3) (Online). Although some of the countries may be coming to the networked world rather late, they are positioned to leap from agricultural or industrial economies to knowledge economies, provided their establishments and people are perceptive and open to change. The more successful countries, often with private-sector assistance and leadership, will invest to a great extent in raising general public awareness and in promoting technological education. Such investments create increased interest and skills, and produce long-term economic growth (TAD, September 2000, Update 3) (Online). A report by the European IT Observatory (EITO) further stresses that the ineffective use of Internet and related technologies contributes heavily contributing to the digital divide and will most likely continue to do so in the future (Mitchell, 2000 (Online); Wetmore, 1997).

A key consideration in any discussion on the digital divide must be the ability of the wired population to access and cope with Internet technology. Ironically, income, education, age and gender are reported to cause the largest gap in the Digital Divide (Nua Internet Surveys, 2000)(Online). This is supported by the latest results of the Pan-European Internet Monitor from Pro Active International (Nua Internet Surveys, June 6th, 2000).

- Men were much more likely to have used the Internet recently. About 36 percent of all European Internet users are women (Nua Internet Surveys, June 2000)(Online).
- The 25-34-year-old age group is the most active online, while the over 55s are the least active (Nua Internet Surveys, June 2000).
- According to the latest quarterly research from the Australian Bureau of Statistics (ABS), older

people, women, the unemployed and those in low-income groups are considerably less likely to have Internet access in Australia. While Internet access is becoming more widespread - 6 million people surfed in 1999 - the digital divide persists (Nua Internet Surveys, June 19th, 2000)(Online).

- A report from Jupiter finds that the digital divide reflects differences in household income and age, rather than differences in ethnic origin (Nua Internet Surveys, June 19th, 2000(Online); Nua Internet Surveys, June 6th , 2000)(Online)).
- Minorities, low-income persons, the less educated and children of single-parent households, particularly when they reside in rural areas or central cities, are among the groups that lack access to information resources (TAD, October 1999, Update 1 (Online); Nua Internet Surveys, June 19th, 2000 (Online)).

The cost of Internet access relative to per capita income is another critical factor, along with inefficient transportation systems, inadequate treatment of information security, and low human capital levels (TAD, September 2000, Update 3).

Although the Internet has a strong potential to improve people's lives, it can also be a source of division in society, with the information haves having an unfair advantage over the information have-nots. Businesses and governments should see to it that this scenario is thwarted to avoid costly social consequences. In the emergent networked world, the main goal should be universal access, to ensure that everyone has a chance to gain entry into the Internet and use services they need at prices they can afford (Wetmore, 1997:1). Business can also make a contribution by participating in pilot and demonstration programme that explore new and better ways for all citizens to gain access to emerging technologies and services. It was estimated that by the year 2000, 60 per cent of jobs would require a working knowledge of information technologies. As creators and vendors of these products, businesses need to be certain that customers receive the education and training necessary for the 21st century (Wetmore, 1997:1)(Refer to results on page 186 & 188).

This section started out from the premise that the wired world significantly impacts on the lives of

individuals and the global society as a whole. An attempted was made to explore the impact of the wired world on the lives of people and society through reflection upon related research and visionary contributions in therelevant literature. Based on the literature studied, numerous suggestions were made for narrowing the digital divide. It has been suggested that we have an **unprecedented opportunity to harness technology advancements** for the purpose of making substantial progress towards a **truly global economy and a real global society.** However, **this will not happen without strong leadership and joint efforts** from both **governments** and **businesses** at both the national and international levels.

2.1.4 The future of the Internet and the Internet of the future

This section deals with the privacy and security industry. The starting point is a discussion of the prediction on the future of the Internet by one of the great visionaries of our time. What follows is an investigation into the privacy and security industry of the Internet.

The limits on our vision

It is the belief of Borenstein (1999:199) that the following scenarios are easy to predict:

- The Internet of the future will be **easier to use and overwhelmingly faster** and more powerful than it is today. This rung true in the presence where 286 computers with only 50Mb RAM have been replaced by Pentium IV Notebooks that boast 6.4 Gb of hard disk space and anywhere between 256 to 2000 Mb RAM.
- Many **older communications media** – including telephone and broadcast, audio and video – will gradually be **integrated under the Internet umbrella** (Borenstein, 1999:200). One year after this prediction news headlines could already be viewed on WAP phones.
- Most **computer software** will continue to be made **easier for non-experts to use** (Borenstein, 1999:200). This became evident with the launch of Microsoft Windows 2000 (see www.microsoft.com/windows2000). The operating system came with features that made it more reliable and manageable, and made doing business on the Internet less daunting.
- A **profusion of technical alternatives** and sociopolitical mechanisms will create **multiple**

tiers of Internet services – some faster, some cheaper, some more or less robust and reliable, and some asymmetrical in their capabilities (such as cable modems that can download data much faster than they upload it). **This, in turn, will further stratify society**, not just between those who do and do not have Internet access, but between those whose access is more or less enriched and of higher or lower functionality (Borenstein, 1999:200). A recent banking study (2001) done in South Africa (see www.webcheck.co.za/library_whobanking.html) addressed this issue and showed that the profile of an Internet banker did differ from that of the average SA Web user.

- **The tendency of information to flow freely** – which seems to be a direct consequence of digital technology – is **unlikely to be reversed** by the wishes and desires of those in authority. Accordingly, governments and other institutions that attempt to staunch this flow will continue to experience extreme difficulties, which will ultimately be understood to be sheer futility (Borenstein, 1999:200).
- The **free flow of information** will also **permanently undermine current notions of copyright and intellectual property,** though with what consequences is somewhat harder to predict (Borenstein, 1999:200).

As with all technologies, the Internet can be used for good or ill. Money, however, is the lens that is currently focussing the most attention on the Internet. It seems likely that the exponential growth in commercial uses of the Internet will cause the Internet to do more harm than good in the short term. In the longer term, non-commercial innovations will slowly produce social benefits that should help to mitigate, and perhaps even outweigh, the negative effects (Borenstein, 1999:201).

The privacy and security industry

The powerful commercial focus of today's Internet makes it almost certain that the abuses and harmful effects will come first, with the more salutary effects coming as belated reactions to these abuses (Borenstein, 1999:201). The ever more commercial Internet will lend itself to a host of abuses that will only be corrected after they are well understood, which means after they have caused significant visible harm (Borenstein, 1999:201; Gattiker *et al.*, 1996:6). Stories of killer viruses, stolen credit-card

numbers, and hackers who have shown a persistent ability to attack both customers and Internet businesses alike, fill the Internet media (Berghel, 2000:17; Business Week, 2000:174).

Security is another good example. The fundamental insecurity of Internet-based communication will not be going away any time soon, and the more people come to understand that fact, the more worried they will feel about their privacy (Borenstein, 1999:202). As with the privacy industry, the security industry might eventually be brought under control by means of a combination of government regulation and non-profit activism, but this is likely only after the public has become aware of a pattern of serious abuses (Borenstein, 1999:202). This view is reflected by the action taken by the Better Business Bureau, the Federal Trade Commission (FTC), and the Organization for Economic Coordination and Development (OECD), who have all published sample online privacy policies (Wazeka,2000: 64). According to the Online Privacy Alliance (OPA), a coalition of major Internet companies and trade associations, the top 100 Internet companies now all have privacy policies posed now on their web sites (Wazeka,2000: 64). A similar privacy protection directive is imposed by the European Union with their Data Protection Directive to U.S. companies which imposes strict limits on the collection and use of personal data in the 15 EU countries (Business Week, 2000:174). Internet companies should realise that unless they can guarantee privacy, governments will step in. In contrast to privacy protection, Berghel (2000:17) reports on government anti-privacy initiatives such as the Clipper chip and the recent judicial decisions in the Pillsbury Case, determining that employees have no right to expect privacy from e-mail that passes through an employer's network. Given the importance of the impact this could have on personal privacy, researchers and developers alike have created utilities and tools to protect Internet privacy (Berghel, 2000:17; TAD, September 2000, Update 1(Online)).

These include

- Web anonymizers (see www.anonymizer.com);
- remailers (see www.zerknowledge.com);
- encrypted pseudonym services (see www.zeroknowledge.com);
- encrypted authentication environments (see www.zks.org);

- online monitors that report back to the client when information about them is accessed or stored (see www.privacyinc.com); and
- a variety of combinations thereof (see www.int.c2.net) (Berghel, 2000:17).

Countering such technology are

- Snoopware (see www.hitekinfo.com/)
- Stealthware (see www.winwhatwhere.com)
- ID counterfeiters (see www.fakeid.net and www.photoid.com) (Berghel, 2000:17).

In the light of the above, Attaran (1999:22) cautions Internet users to be wary of possible invasions of their privacy and to take precautionary measures such as the following:

- Avoid divulging personal information on the Internet.
- Evaluate the online privacy policies of companies.
- Be aware with whom you are communicating on the Internet.
- Protect personal passwords.
- Avoid fraudulent scams.
- Stay abreast of new developments (Attaran, 1999:22).

Given the scale of the privacy and security debate, and the serious effect on Web providers and consumers alike, developers and researchers will continue to develop and improve utilities and tools to redress this topic of growing concern.

2.2 Marketing via the Web

This section emphasizes the importance of a new strategic marketing perspective that must permeate organizations and change them into new entities centred on customers and customer service. Further more, the section aims to explore the impact of the wired world on the business environment through reflection upon related research conducted by the Information Communication Technology (ICT) Industry, business and management which provides a demonstrably applied commentary on the

emergence of a new global economy and related marketing issues. A short historical perspective on marketing will be followed by a discussion of relationship and one-to-one marketing concepts, best practices and creative implementation of ICT that will help make web marketing a success.

Table 2.4 summarizes the contents of the different sections.

Table 2.4 Summary of the content of the different sections

2.2.1 The history of marketing	Through the history of marketing, a new language that is open, natural, and direct are spoken on the Web. The Internet invites participation and greatly facilitates the sharing of relevant knowledge. Web customers are informed and therefore empowered customers with their own sets of demands.
2.2.2 One-To-One Web marketing	One-to-one marketing concepts and technologies provide the underlying foundation for this section. Marketers are cautioned to protect users' privacy, give users control over their own personal information, and practise self-regulation in order to prevent government intervention.
2.2.3 Relationship Marketing	The essence of relationship marketing is discussed in this section. Attention is given to relationship marketing objectives, components, elements and principles. A distinction is established between consumer-to-business marketing and business-to-business marketing.
2.2.4 The inevitability of the Web as a Business Vehicle: Requirements to adopt to the new rules of doing business	The starting point is the mention of the important aspects of the Web as a business vehicle to be persuaded by the Novon Crop Protection Company. Web business 'sins' and guidelines for success are discussed.
2.2.5 Customer service in cyberspace	The net result of the Web Effect forms the basis of this section. Attention is given to the empowered customer who has gained an unprecedented position of control on the Internet.

2.2.1 The history of Internet marketing

> *"Merchants have no country. The mere spot they stand on does not constitute so strong an attachment as that from which they draw their gains."*
>
> **Thomas Jefferson**

In the many years before the Industrial Age, ancient markets were full of the sound of conversation. Marketing was done by the local merchants who knew everything about their customers, by memory or by recording information on accounts. This interaction between customer and merchant was known as one-to-one marketing (Allen, Kania & Yaeckel, 1998:3; Locke, 2000:9).

The turn of the nineteenth century was the dawn of mass production, mass marketing and mass media. There was little recognition of market segments (Allen, Kania & Yaeckel, 1998:3; Locke, 2000:10).

With the emergence of the Information Age, databases became a useful tool for marketing and computing became more cost-efficient, as was predicted by Moore's Law which states that every 18 months or so the speed of microprocessors doubles and the cost decreases proportionally (Barksdale, 1999:98; TAD, August 2000, Update 2 (Online)). Moore's Law has been proven by the incredible advances in technology and, indirectly, by the new economy (TAD, August 2000, Update 2) (Online). After a period of 30 years, Metcalfe's Law (named after Bob Metcalfe, inventor of Ethernet and founder of 3Com) came into being, stating that the value of a network grows exponentially. Every endpoint that is added can then be connected to all the other endpoints. This implies that the network that doesn't reach everywhere is of little value, which is one of the features of the Net Economy (Barksdale, 1999:98; TAD, August 2000, Update 2 (Online)).

> ***With exponential-plus growth, today's impossible and inconceivable will be tomorrow's products, and in no time at all. Don't blink!*** **(TAD, August 2000, Update 2) (Online)**

In the 1970s, the practice of using demographics in marketing came in use. In the 1980s, the use of lifestyle data, psycho-graphics, became the next big trend in marketing, and in 1991, well-known marketing expert Regis McKenna introduced marketing managers

to the concept of relationship marketing, which was followed by another marketing revolution, the one-to-one marketing mantra (Allen, Kania & Yaeckel, 1998:3; Locke, 2000:7). This implied that services similar to those provided by the local merchant could be provided by using databases and interactive software and systems such as web site personalization and one-to-one Web conferencing (Allen, Kania & Yaeckel, 1998:3).

In 1991, Tim Berners-Lee created a graphic way to share data among scientists, which had become a useful communications vehicle by 1993. In 1993 NCSA Mosaic, the first graphics-based Web browser (and precursor to the Netscape's Navigator and Microsoft's Internet Explorer browsers) was introduced. It is interesting to note that the Web had relatively insignificant penetration among the mass population in 1993. Morgan Stanley's technology research report, *Advertising Report* (1997, Harper Business), showed how long it would take for the Internet to reach 50 million users relative to other communication media (Allen, Kania & Yaeckel, 1998:4; Leen, 2000:16).

- **Radio**: 38 years
- **TV**: 13 years
- **Cable**: 10 years
- **Internet**: 5 years

The Internet's adoption growth is impressive. By 1995 new Web sites were appearing on the Internet. According to a Network Wizards statistical count, in July 1995 there were more than 6.6 million hosts on the Internet with 120,000 domains, growing from more than 1.7 million hosts and 26,000 domains in July 1993. Web marketing at this time consisted of publishing product and service information, creating and placing banner ads, and alerting news groups of company events and product happenings (Allen, Kania & Yaeckel, 1998:4).

Since 1995 Web marketing has become serious business. By 1998 the Web totalled over 1 million domains. The Web's community became big enough for advertisers and marketers to make it a mainstay in their marketing plans and budgets. In 1999, 196 million people spent over $ 120 billion online (Dutta & Srivastana, 2001: 2).

An interesting phenomenon that Web marketing professionals now have to consider is the concept of *consensual marketing*. This means that the online community has the leverage to determine from whom they will receive marketing messages and from whom they will buy online (Allen, Kania & Yaeckel, 1998:4; Leen, 2000:56). Consensual marketing will be practised by all good Web marketers if they want to build loyal and ongoing relationships with their users, prospects, customers, business partners, and other constituents. The adoption of consensual marketing methods is crucial to practising and taking advantage of the one-to-one marketing the Web allows (Allen, Kania & Yaeckel, 1998:4; Leen, 2000:21).

As a result of the exploration of Web marketing, various web marketing ideas and methods have seen the light. For the purpose of this section, the focus will fall on one-to-one marketing ideas, relationship marketing ideas, customer service and the new rules that regulate business on the Web as discussed by research and marketing experts.

2.2.2 One-to-one Web marketing

Allen, Kania and Yaeckel (1998:5) review the difference between one-to-one marketing and other types of marketing as follows:

- **Mass marketing:** One-to-all or one-to-many communications without specialization of message or medium.
- **Target marketing:** One-to-many or one-to-few communications with specialization of message and medium for each identified segment of the whole market.
- **One-to-one marketing:** One-to-few or one-to-one communications with individualized message and medium for each highly targeted market or individual customer (Allen, Kania & Yaeckel, 1998:6).

There are many publications in which web marketing principles and strategies are reported by industry practitioners a well as academics in the field. Peppers and Rogers are among those who have written on the subject of one-to-one marketing. Allen, Kania and Yaeckel (1998) have extracted pertinent

concepts from their books which are also picked up by Kim (2000); Power, Weber and Boswell (2001); Levine, Locke, Searls and Weinberger (2000) in their publications. The following is a synopsis of important one-to-one marketing concepts.

Table 2.5 One-to-one marketing concepts that can be applied when using the Web (Allen, Kania & Yaeckel, 1998:7-9; Kim, 2000:75-98; Power, Weber & Boswell, 2001:188-201; Levine, Locke, Searls, & Weinberger, 2000:1-39,75-114).

Share of the customer	Peppers and Rogers presented the idea of switching the marketer's mind set from share of the *market* to share of the *customer* – also known as increasing the share of each customer on a one-to-one basis. **Benefits:** • Increased profitability since it is cheaper to increase sales to existing customers than to acquire new customers. • During the process of increasing the share of each customer, loyal relationships with customers are established. • In order to maximize the share of each customer, it is imperative to know what the customer thinks, which can only be done with one-to-one communication mechanisms.
Customer retention versus acquisition	It costs five times more to acquire a new customer than it costs to retain a customer.
Law of repeat purchases	The more successful a business is in getting each customer to buy from them, the higher the long-term profits. The more units are sold to a particular customer, the higher each unit's margin will be over time.
Customer dialogue	Using two-way interactive communications vehicles and feedback mechanisms enables the marketer to learn more about each customer. It should be made easy for customers to communicate with the organization. It is essential to act on what the customer says in order to build trusting and loyal relationships, which will translate into more sales and better profit margins. This is further highlighted by Power, Weber and Boswell (2001: 238).
The new competitive rules	Customer-driven competition is synonymous with one-to-one marketing. Information technology can raise the competitive playing field because it • can track customers, • enables interactive dialogue, and • allows mass customization where products and services can be created to the specifications of an individual customer.
The learning relationship	The way to build the strongest link between marketer and customers is to establish a learning relationship. The following steps should be applied to establish this relationship: • Find out what the customer needs through interaction and feedback. • Meet these needs by customizing the product or service and specifications. • Continue interaction and feedback to learn more about the customer's individual needs. • Keep the customers satisfied so that they are not lost to the competition.

Convenience and incentive	• Make it convenient for customers to give information about themselves. • In addition to important personal communications between customers and company representatives in sales, marketing, and support, the Web and other interactive media can make it convenient for customers to share their thoughts with the business. • Providing an incentive to customers aids entering into a learning relationship with the organization.
Important rules for the one-to-one-marketing road	Approach customers for their personal information in the following way: • Don't ask for all of the information at once. A learning relationship should be conducted in the long term, especially since markets and customers rapidly change. • Give the customer a choice in what information he or she wants to provide. This establishes a relationship based on trust, which will widen the communications channel between the two parties. • Create an equitable value exchange between the information collected and the service provided in return. • Establish a *Privacy Bill of Rights*.

It is clear from the information portrayed in Table 2.7 that equitable web marketing technologies are needed to achieve the desired web marketing outcomes. An attempt is made by Allen, Kania and Yaeckel (1998:11), and by other researchers, to outline the Web marketing technologies and their applications, but given the surge of new technological developments it is perhaps inevitable that gaps should exist between the ever-changing web environment and the extent of the information provided in the following Table.

Table 2.6 Web marketing technologies and how to apply each of them (Allen, Kania & Yaeckel, 1998:11; Sindell, 2000:147, 246; Power, Weber & Boswell, 2001: 221-225).

One-to-One-Web Technology	Uses
Web site interactivity	Enables users to learn more about your organization, products, or services by allowing them to interact with your web site or functions on your web site. Conducts personalized dialogue with each user. Provides entertaining and useful web experience that promotes remembrance and loyalty among users.
E-mail	Maintains ongoing organization and marketing communications via e-mail announcements and newsletters Reaches people without requiring a visit to a web site Targets e-mail advertising on other organizations' e-mail announcements and newsletters
Web site personalization	Learns more about each user or target markets Presents personalized recommendations, especially if you serve a wide variety of target markets or provide a wide range of products or services

One-to-One-Web Technology	Uses
Web site personalization	Automates many processes such as recommendation, cross-selling, and count management Targets advertising to individuals based on their user profiles; presents a unique web experience to each customer Conducts membership and loyalty programmes; some can be premium services that customers pay for
Push	Maintains ongoing organization and marketing communications Reaches people without requiring a visit to your web site Creates a different channel to each market for both Internet and Intranet applications Targets advertising to individuals based on their user profiles; presents unique information or marketing messages to each customer
Community	Creates online discussion forums among users and with organization representatives (management, sales, customer services, etc.) Increases site traffic and site visit longevity Promotes site and brand loyalty
Web presentation and conferencing	Conducts seminars, sales meetings, and training via the web Decreases the cost of many face-to-face meetings
Advertising	Increases awareness and response from the Internet audience Conducts targeted and one-to-one advertising to optimize advertising budget Conducts responses and transactions-oriented web advertisements
Web site tracking/ traffic analysis	Assesses the performance of the web site or specific sections of the site Learns more about the web visitors and customers Integrates user profile and other databases with tracking data (what users are viewing/clicking on) on your web site
Database integration	Makes other back-end, historical, or live data available to the web site such as product/service information, customer information, purchase transactions, shipping, and account management. Performs database marketing on the web site or on the Internet Performs data mining to segment customers (by profitability, site usage, etc.) and forms predictive models about future site or transaction activity

The Web and one-to-one marketing technologies are only vehicles for building one-to-one relationships with the online customers (Allen, Kania & Yaeckel, 1998:10). A web site should interact with customers in a very human way. However, there are some interactions that should never be left

to the Web to handle, such as complex customer support issues. This is where human interaction will succeed (Allen, Kania & Yaeckel, 1998:10).

One example of technology being used to build relationships with online users is Like Minds (see www.likeminds.com) , who created the Movie Critic Web site (see www.moviecritic.com). The site makes recommendations about movies based on an individual user preference profile and the preferences of other like-minded users of the site. They gather user preference information in order to learn more about their viewers. The Movie Critic service is driven by technology but requires human interaction in order to provide value to its users (Allen, Kania & Yaeckel, 1998:10).

One-to-one Web marketing has a future, but the *expense, technology* and *privacy* obstacles need to be addressed before both business and customers can truly benefit from one-to-one relationships. One-to-one marketing is an investment over the long term, but in order for both the user and the marketer to benefit, the marketer will have to protect users' privacy, give users control over their own personal information, and practise self-regulation in order to prevent government intervention (Allen, Kania & Yaeckel, 1998:14).

2.2.3 Relationship marketing

> ***All for one, one for all, that is our device.***
> **Alexander Dumas, The Three Musketeers**

Gordon (1998:9) defines relationship marketing as 'the ongoing process of identifying and creating new value with individual customers and then sharing the benefits from this over a lifetime of association'. Therefore relationship marketing involves the understanding, focussing and management of ongoing collaboration between suppliers and selected customers for mutual value creation and sharing through interdependence and organizational alignment. The starting point is the acknowledgement of the relationship marketing objectives as stated in Table 2.7.

Table 2.7 Relationship marketing objectives (Gordon, 1998:9).

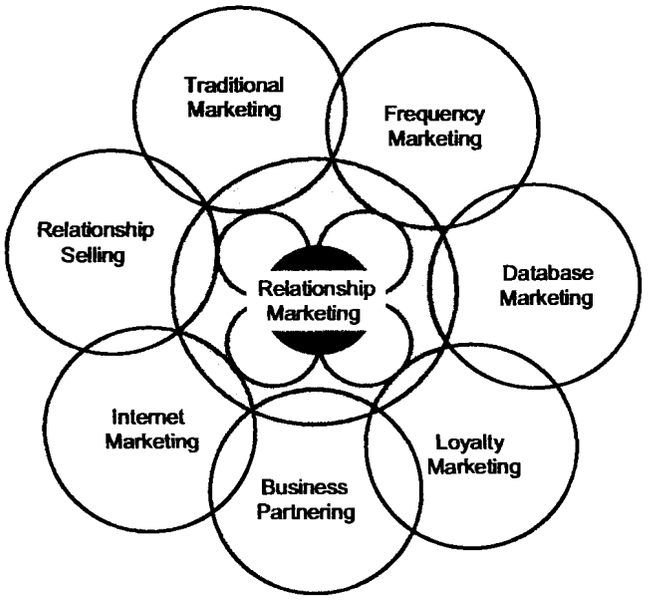
Value for customers	Seeks to create new value for customers and then share the value thus created between The producer and The consumer.
Key role of the individual	Recognizes the key role of individual customers, not only as purchasers, but in defining the value they want.
Integrate business processes	Requires that a company, as a consequence of its business strategy and customer focus, designs and align its business processes, communications, technology and people in support of the value that the individual customer wants.
Cooporate	This is a continuously cooperative effort between buyer and seller. Therefore, operating in real time.
Recognize life time value	Recognize the value of customers over their purchasing lifetimes, rather than as individual customers or organizations that must be resold on each purchasing occasion. In recognizing lifetime value, relationship marketing seeks to bond progressively more tightly with customers.
Chain of relationships	Seek to build a chain of relationships within the organization and its main stakeholders, including suppliers, distribution channel intermediates and stakeholders.

The relationship marketing objectives (the one-to-one marketing mantra) were introduced to marketing managers by Regis McKenna, a well-known marketing expert, and echoed and preached by experts in this field such as Don Peppers and Martha Rogers (Allen, Kania & Yaeckel, 1998:7;Hammond, 1999:1). The idea of stocking a group of products and then seeking customers for those products has become outdated. Instead, the move towards developing deep relationships with customers and then seeking ways to provide them with more products and services tailored just for them has become the focus point (Hammond, 1999:1). Marketers now have a tool that allows them to know their customer more intimately than before. Jim McCann, the founder and president of 1-800-Flowers (see www.1800flowers.com), also expressed the same sentiment, namely that computers are just tools that allow companies to provide interactivity, and they cannot motivate customers or nurture the bond that results in repeat business by themselves. In his words: 'Despite your name, 1-800-Flowers, we're in the 'social expression' business, like the people who sell greeting cards and chocolates. Flowers are symbolic, timeless, not high tech. And yet we conduct 10 percent of our business online. We're using this new channel to reach a growing market segment that is embracing new technology and is motivated by convenience. But we've never lost sight of customer satisfaction, which we handle the

old-fashioned way: one-to-one' (Allen, Kania & Yaeckel, 1998:10). Marketers no longer have to make uninformed decisions about their customers because of the two-way interaction and communication capabilities that the Web allows (Allen, Kania & Yaeckel, 1998:11).

The logics of relationship marketing should be studied by companies who wish to enter the technology field of Web-related marketing (Cunningham, 2001:1). Relationship marketing recognises that the 4 Ps of marketing - product, promotion, price and placement/distribution - change fundamentally in a world in which technology can mass customize all the aspects of the 4 Ps of marketing in various variations at nearly the same to mass-marketing costs (Gordon, 1998:21). Figure 2.1 illustrates the various areas of relationship marketing and shows how marketing techniques fit into the larger context of relationship marketing.

Figure 2.1 Selected relationship marketing elements (Gordon, 1998: 21)



Internet marketing, as one of the components of relationship marketing, as portrayed by marketing experts, will be discussed as one of the research issues pursued by the NOVON Crop Protection Company's management under section 2.2.4 page 46.

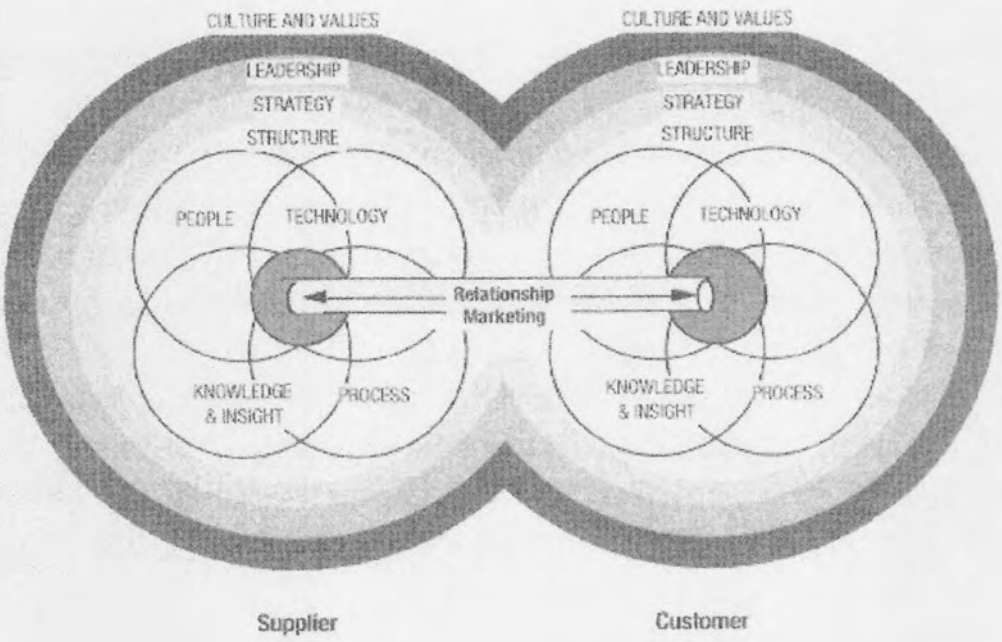
Relationship marketing comprises of eight main components. These eight components are depicted in Table 2.8.

Table 2.8 The eight components of Relationship Marketing (Gordon, 1998:22)

Component	Outcome
Culture and Values	The customer's culture and values must be conducive to the formation of an enduring relationship.
Leadership	The leaders within a company and leaders among customers must be prepared to focus on the value that can be unlocked through Relationship marketing and the mutual interests of individual customers and suppliers.
Strategy	Strategy needs to be customer-centric, with relationship objectives and strategies geared to individual customers.
Structure	The structure of a company should facilitate its strategy. Thus it will have managers responsible for each category of relationship, such as that of current customers, new customers, employees, suppliers, and investors.
People	People are The key to any relationship. Train, develop and grow people into owners of a process which seeks to build customer bonding and purchase 'favourability' rather than purchase satisfaction. Customer information is pushed to the front-line where customers and the company interact. Increasingly, the front line people are becoming consultants, working with customers to add value to their company.
Technology	Deploy technology to provide a better customer memory. Give customers the communications options they want to help them repeat the purchase experience.
Knowledge and Insight	Invest in customer knowledge and insight.
Process	Focus processes around existing customers, giving each the value they want and communicating as everyone wishes to be engaged by the company.

The goal of relationship marketing is to align all these aspects of a company with its chosen customers and stakeholders. This view of relationship marketing is illustrated in Figure 2.2.

Figure 2.2 Relationship marketing (Gordon, 1998:22)



Each of the components presented in Figure 2.2 represents a challenge for the Relationship Marketer.

Regis McKenna (1991) wrote a book, *Relationship marketing* (1991), about the changes marketers need to make to become more customer-centred in their marketing efforts. In order to leverage relationship marketing, marketers needed to move from monologue to dialogue with customers.

Table 2.9 depicts a condensed version of some of the important principles from Regis McKenna's book as reported by Allen, Kania and Yaeckel (1998:6).

Table 2.9 Relationship marketing - principles and actions (Allen, Kania & Yaeckel, 1998:6)

Principle	Action
Owning the market	Define which (market segment) is yours and dominate it. Develop products and services to serve that market specifically. Define the standards in that market. Deepen relationships with customers.
Knowledge-based marketing	Integrate the customer into the product and service design process to guarantee that the product is tailored to the customer's needs, desires, and strategies. Generate niche thinking – use the company's knowledge of channels and markets to identify market segments that you can own. Develop an infrastructure of suppliers, vendors, partners, and users that help sustain and support your edge in the market segment.
Experience-based marketing	Spend time with customers. Monitor competitors. Develop feedback analyses that turn information about markets and competition into product intelligence.
Adaptive marketing	Sensitivity – communications and feedback channels Flexibility – organizational structure and operation style that takes advantage of the new opportunities feedback brings about Resiliency – learn from mistakes

By its very nature, the term 'Relationship marketing' is widely used in the media and within companies to imply a special relationship formed with customers. However, relationship marketing differs markedly according to the profile of the customer. Accordingly, an effort is made to address the differences between business-to-consumer interaction and business-to-business interaction. This is a topic discussed with authority by Cunningham (2001:1-36) and, with respect to quality, researched in great depth by Gordon(1998:113-133). The difference between the types of customers is illustrated in Tables 2.10.1 - 2.10.4. The first column provides the "Categories" under which the different types of customers will be discussed. After each table a short discussion follows on how these categories reflect on the interaction of the client, i.e. Novon Crop Protection, with its clients.

Table 2.10.1 Consumer versus Business-to-Business Market places (Cunningham, 2001:1-36; Gordon, 1998:113-133)

Category	Business-to-Consumer (B2C)	Business-to-Business (B2B)
Description	Consumer markets comprise individual buyers each of whom must be won and kept, but the firm may survive and prosper even if it does not succeed in winning every customer it would like.	End-user demand is concentrated among fewer customers. The customer assumes particular importance to the supplier. The supplier depends heavily on the business of each of its customers. The defection of a single major customer could damage the company beyond repair.
Goods and Services	Centres mostly on consumer products and services, the products and services most affected by price and convenience as purchase factors. Consumers make decisions about what they want to buy using the Web as a sophisticated research tool, but many are still buying from traditional stores.	Different buyers within a company who buy products for different reasons, in varying amounts and frequency. The relationship expectations of each of the product categories would also be expected to vary according to factors such as the strategic importance of the product, the substitutability of the vendors and the level of expenditures that are made.
Market Structure	Consumers are numerous, and the business of one specific customer will not make or break the supplier. Technology can help vendors understand their customers in consumer markets, but the technology will need more sophistication and modelling than in business-to-business markets to have the same yield.	Business-to-business markets tend to have more concentrated end-user demand than do consumer markets. The business of specific industrial or commercial accounts can be more important to a supplier dependent on such demand. Business-to-business markets can also be more concentrated geographically than consumer markets. Concentration of end-user demand offers more opportunity to identify and research business-to-business customers in depth. Companies cannot invest as much time and money to understand each consumer in a fragmented market as they do for more concentrated industrial, commercial, institutional or government market places.
Distri-bution Channels	It has not been common for consumers to buy directly from their suppliers — until now. With the advent of the Internet, and electronic commerce more generally, technology has the potential to remove levels in the distribution channel and offer consumers the chance to buy directly from their suppliers.	Business-to-business marketplaces typically have had shorter distribution channels than consumer markets. Distribution channel intermediaries will not go away any time soon, but their growth may be more limited if they are not finding ways to use technology to bond with customers and use the vendors' solutions to help them do so.

From the above it is evident that interactivity between [3]Novon Crop Protection Company and its clients

[3] Novon Crop Protection Company = Novon

takes place on a business-to-business basis. This is deduced from the following:

- End-user demand is concentrated among Novon dealers.
- Novon depends heavily on the business of each of its dealers . The defection of a single dealer would leave a void in a large distribution area in the country, in which the dealer did business.
- Novon dealers buy crop protection products suitable for demarcated geographical areas according to specific producer demand. They have more concentrated end-user demand than do consumer markets.
- Novon has a short distribution channel as is graphically illustrated in Figure 1.1., page 3. Novon aims to enhance their customer relationships with its dealers through the use of an Internet-based communication web site.

Table 2.10.2 Consumer versus business-to-business market places (Cunningham, 2001:1-36; Gordon, 1998:113-133)

Category	Business-to-Consumer (B2C)	Business-to-Business (B2B)
Decision-Making Criteria	Decision-making criteria for consumers may vary according to many factors, including issues associated with the product category as a whole, the consumers' values and the consumers' perceptions that a given brand may be readily substituted for another.	More generally, business-to-business purchase criteria may be categorized as follows: ✦Help the company conceive and adopt products, services and processes that will add value to internal and external customers of the company, lowering costs, improving quality and otherwise helping the company to improve its customer performance and competitive position. ✦Produce products of consistently high quality and be in a position to demonstrate assurance of that quality, such as statistical process control and adoption of and conformance with, ISO 9000 standards. ✦Ensure that produces conform with the customer's expectations and specifications. ✦Provide the products when, how and in the volume required, appropriately tagged, stacked, and packaged. ✦Consistent with the product specifications and ancillary requirements for service and support, for example, ensure that the initial, lifetime and value-in-use prices are the lowest among competing vendors. ✦Support the products with services, helping to improve the value of the products in use, such as by providing training, vendor installation and maintenance, diagnosis guided by technology and customer support. ✦Be easy to do business with. Keep customers happy. ✦Demonstrate professionalism, caring, responsiveness and attention, helping the company to manage difficult or unexpected situations.

With reference to the decision-making criteria, Novon strives to employ its products, expertise and

services to the advantage of the principle of sustainable agriculture. This characteristic adds value to its business partners, lowering costs, improving quality and otherwise helping Novon to improve its customer performance and competitive position. With the creation of quality solutions, the product is only one of the steps in the value chain that is proceeded by a quality diagnostic and recommendation service supplied by well-trained experts in the field of crop care.

Table 2.10.3 Consumer versus business-to-business market places (Cunningham, 2001:1-36; Gordon, 1998:113-133)

Category	Business-to-Consumer (B2C)	Business-to-Business (B2B)
Decision-Making Process	There are four main views that govern how a consumer would make the purchase decision. ✦The consumer could be seen to operate according to a Stimulus-Response model, the theory of instrumental conditioning followed by the behaviourists. ✦Cognitive researchers believe that consumers go through problem solving when they make their purchase decision, comparing brand attributes in the context of their needs and selection criteria, which leads to favourable attitudes, which in turn drives purchase behaviour. ✦The social-psychological theorists believe that making appeals to the group affects individual purchase behaviour, and so they look to role models to become opinion leaders for the broader group. ✦Involvement theory suggests that, for product categories that are relatively unimportant to the buyer, consumers can be influenced by using low involvement media, such as TV, with limited information transfer and high levels of repetition.	Businesses' decision making comprises many different decision makers for most product categories, each playing different roles in a process that can be quite complex and may differ substantially from firm to firm.
Buyer-seller relationship	Consumers can be more fickle and in some markets may be prone to switching behaviour not evident to many businesses. In many instances, consumers form their decisions without direct intervention from the supplier.	In B2B marketplaces, close personal relationships are commonly formed, more so than for consumer marketplaces. In B2B markets, customers expect to be recognized for their importance and for their suppliers to take steps to bond with them and their organizations. Interpersonal bonding, comprising a matching of people and process, enabled by the knowledge suppliers have of their customers and the technology to put this knowledge to work, are important components of this bonding.
Reciprocity	It is not common for consumers to extend their business relationships to become customers of one another.	In B2B markets, it is common for firms to extend their business relationships to become customers of one another.

A major preoccupation of Novon in the categories mentioned in Table 2.10.3 is their attempt to form close personal relationships with their clients. In the B2B market, Novon's clients expect to be recognized for their importance.

Table 2.10.4 Consumer versus business-to-business market places (Cunningham, 2001:1-36; Gordon, 1998:113-133).

Category	Business-to-Consumer (BC2)	Business-to-Business (B2B)
Mutual value creation	The consumer may prefer little in the way of mutual value creation with the supplier.	In B2B markets, suppliers and customers have the potential to work together to create new products, processes, value chains or even entire businesses and new enterprises, and then to share the new business value. This may mean opening themselves up in ways that were previously almost heretical, such as by providing suppliers with access to their customers or by sharing proprietary knowledge.
One-way relationships	For some products, most notably those for which the product category is of limited interest to the purchaser, such as can occur in high-frequency repeat purchase/low-involvement decisions in consumer markets, the buyer may prefer little in the way of dialogue, mutual value creation or other engagement with the vendor. This situation could apply equally to consumables and low-involvement capital goods for industrial or other business-to-business applications.	Most companies, though, even for routine repurchases, have a higher interest in the relationship than would be the case for comparable categories of consumer products.
Brand equity	The value of the brand to the consumer over and above the core functionality needed for market place participation may be termed the brand equity. This additional value is the goodwill consumers are willing to pay to obtain a specific brand over another product or service, the same in all respects expect for the brand name.	In both consumer and business-to-business markets, the brand itself has considerable power to influence the purchase decision. If customers are engaged by the brand alone, this represents the main vehicle by which the company forms a relationship with its customers.

The profile of Novon Crop Protection Company's crop protection dealers represents the B2B interaction, while on another level their interaction with South African food producers is represented by a B2C relationship. From the above it is clear that Novon has to create, establish and/or enhance sustainable

customer relationships, without compromising standards or alienating existing customers. To facilitate a deeper understanding of the role that Internet has as a business-to-business medium, and as one of the research issues pursued by the Novon Crop Protection Company's management, a discussion of this aspect will follow under 2.2.4.

2.2.4 The inevitability of the Web as a business vehicle: Requirements to adopt to the new rules of doing business

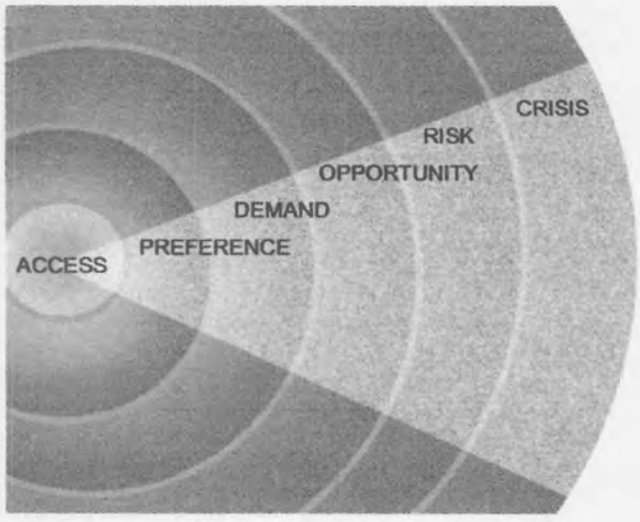
Following the previous section which provided an overview of relationship marketing aspects, this section reviews relevant literature covering important aspects of the Web as a business vehicle to be pursued by the Novon Crop Protection Company.

According to Edward Lorenz's chaos theory principle, known as the Butterfly Effect (cited in Windham, 1999:3), the Web's growing impact on business is something that is referred to as the Web Effect. The Butterfly Effect has become a popular metaphor for describing the chaos theory, the notion that the flapping of a butterfly's wings in China can send ripples of effect throughout larger and more complex systems, causing a hurricane in another part of the world (Windham, 1999:3). Following this analogy, the Web is a true 'phenomenon' that is impacting businesses world-wide. The 'complex system' being impacted by the Web is our global economy. The Web affects businesses in ways that cannot be entirely predicted, and that will continue to impact organizations in this unsettling way for many years to come (Windham, 1999:4; Johnston, 1999:228).

This ripples in the Web Effect are illustrated in Figure 2.3. The Web Effect begins with access. In the relatively short time frame since the Web has been in existence, it has been observed that people with access to the Web – who perform work and personal activities there – quickly develop a preference for

the Web as a vehicle for many business and leisure tasks (Windham:1999:4; Leen:2000,22-23).

Figure 2.3 The ripples in the Web Effect (*cited in* Windham, 1999:3)



> *'When written in Chinese, the word "crisis" is composed of two characters. One represents danger, and the other represents opportunity'.*
>
> **John F. Kennedy**

This in turn leads to a dependence on the Internet for finding information, purchasing products, seeking services and communicating – it has become an indispensable tool for getting things done (Windham, 1999:6). Dependence on the Internet initiates a demand for online services (Windham, 1999:6).This Web Effect is forcing companies to develop a Web strategy. Web access and preference are now critical fibres in the fabric of economies. Customers demand that businesses meet their needs, tastes, dislikes, likes and desires via the Web (Windham, 1999:6; Leen, 2000: 21;Borenstein,1999:211). Within this context companies have to explore ways to avert crises and the possibility of being left behind in the networked economy. Although the Web could pose a real risk in areas such as control and legal issues, companies that look at the Web as an opportunity to improve customer service,

streamline accounting and financial practices, and better meet the information and purchasing needs of its customers and partners, will be in a much better position to survive in the networked economy (Windham,1999:7; Levine , 2000:68-73). Realizing that an opportunity exists is only a small, first step. There are many companies that recognize a window of opportunity but will not be aggressive enough to make the changes necessary to maximize the opportunity. Even after the opportunity is recognized, success or failure will depend on how truly committed a company is to addressing the demands of Web-savvy customers (Windham, 1999:7; Levine, 2000:68-73). Silence is fatal in the network economy; by not responding rapidly enough to accommodate the changing needs of customers, businesses pave the way for customer dissatisfaction (Windham, 1999:7; Levine, 2000:72-73).

Why aren't companies moving faster to offer Web sites that enable commerce, customer service, marketing assistance, or distribution support? The research done by Windham (1999:14) shows that real operational issues stand in the way of progress. This sentiment is echoed by Power, Weber and Boswell (2001:5-8) and Michalson (1999) (Online), who emphasise that the rules or principles of business have not changed as dramatically as has the way of conducting business. To be competitive, companies need to understand the new rules and overcome the barriers to change (Windham, 1999:14).

The six Web rules as derived from thousands of hours of Cognitiative's Pulse of the Customer research (cited in Windham, 1999:14):

- *Know what your market requires. Research has shown that empowered customers on the Web have common demands for what is called a Whole Experience.*
- *Resolve conflict with existing business strategies.*
- *Establish and sustain brand loyalty is the focus of manufacturers and suppliers.*
- *Appoint empowered executive leadership and create organizational structures that work in a web-involved company.*
- *Invest in the necessary technology to make the effort successful.*
- *Internationalize your web strategy and execution.*

According to Windham (1999:18), today's businesses must meet the dead-ahead challenges presented

by the Web straight on because after the Web dilemma is resolved there will be only two basic kinds of organizations left - those who embraced the Web with determination, and those who wish they had.

To meet the dead-ahead challenges businesses will have to learn to apply the latest tools and technologies to their businesses as it could aid in staying abreast of developments. Waiting for technologies to settle down, could be detrimental. The Web rewards innovators and risk-takers. The only effective way to learn what the Web can do for your business is to experience it (Ware, *et al.*, 1998:73-88). However, a whole Web initiative could be nullified if the following Web business sins are committed.

Table 2.11 Web business sins (Ware *et al.*, 1998:73-88; Windham, 1999:14; Power, Weber and Boswell, 2001:5-8; Michalson, 1999 (Online))

Web business sins	Discussion	Implications
Failing to link Web initiatives to the existing business strategy and focus	Many companies have followed the crowd and, in knee-jerk fashion, simply built a Web site because it seemed like the cool thing to do, rather than because it made strategic or economic sense. **The typical predicted results:** • Little or no Web traffic; weak or nonexistent sales • Heavy investment expense with no hope of a positive return • A cynical, unhappy senior management team The failure to align a Web initiative with existing strategic direction and focus usually occurs when the Web team has not thought through basic marketing concepts like, "Who are our customers and why do they buy from us?" If your typical or most important customers are not Web savvy or are unlikely to use the Web at all, then the best Web design and the heaviest advertising in the world won't help.	• The Web is evolving and will evolve for the foreseeable future. • The technologies that form the foundation of the Internet and the Web are still being developed and improved, and at a frenetic pace. • The only way to survive in this environment is to "stay tuned." Pay attention, read the news, attend conferences, and learn from both your competitors and business partners.

Web business sins	Discussion	Implications
Assuming customers will come because the site is there	Customers should be given a reason to seek out a Web site: by making it a "cool" place with interesting and unusual graphics or information, by offering prizes, special prices, or otherwise valuable information, or in other ways making it a compelling place to visit. Most managers believe for very understandable reasons - that their company's products and services are the best there are, and that customers naturally want to buy them. But the world does not beat a path to your door, unless there's something behind the door that it wants and needs. Even if there is, the world has to learn about that door through advertising, public relations, word of mouth, etc. Many businesses have got so caught up with the Web craze that they let the technology overwhelm their existing knowledge about their current and prospective customers, as well as why customers buy their products and services. If your current customers are highly computer literate, and your web site does not provide them with the information or the interactions they want, it will almost certainly fail. Don't expect your web site to succeed just because it exists.	• Know what your market requires. • Invest in customer knowledge and insight. • By getting to know our customers better - keeping track of their likes, dislikes, special needs and previous behaviour more business could be generated from an existing customer base and loyalty of those customers deepened. Technology provides the tools to deal with customers individually and track their preferences • Give the customers reasons to visit the web site, offer them something of value, and do it in compelling ways.
Failing to provide adequate resources to manage the Web site	One of the most compelling aspects of the Web is its low cost. Relative to other means of conducting business or advertising, it is remarkably inexpensive. Among the most important characteristics of a Web-based business is its ability to radically lower the cost of reaching and serving customers; increase global reach with virtually no incremental cost; support multiple steps in the transaction life cycle; reach millions of customers with individualized information at virtually zero incremental cost.	• Many companies are seduced and misled by their incomplete understanding of what it takes to design, launch, and maintain an adequate Web site. • The major costs are incurred in maintaining the site, upgrading the technology platforms, and updating the contents -- just like earlier IT architectures.

Web business sins	Discussion	Implications
Failing to learn from experience	The worst thing you can do is to fool yourself into thinking that a web site can go up and stay up without continued maintenance and enhancement. The need for resources to maintain the accuracy and currency of the information on the site is only part of the reality of learning from experience. Expect to update the core structure and design of the site on an ongoing basis for a least the first several years - as you learn from your successes and failures, as you get feedback from customers, employees, and business partners, and as the technology itself evolves. Every interaction is a chance to learn how you are perceived, what your public wants and expects from you, and what kind of interactive capability is right for your business. Be sure to pay attention. The bottom line: Plan on regular major overhauls of the web platform and its design every two to three months for at least the first year, and then every six months after that.	• Webifying a business means big change, which is never easy. • Carefully think through how to introduce new technologies, who to involve in planning and implementation, and what messages to send out to the organization and its customers. • Building and executing a Web-based strategy is all about learning from experience. The only feasible approach is to recognize at the outset that no matter how carefully you think things through before you start, you will discover new ideas and new approaches along the way.
Defining the web site as an IT responsibility	It should be clear that the Web is a business venture that just happens to rest on new information technologies. The leadership and accountability for launching a new business venture-even one dominated by technology-must reside in a business unit, not in the IT organization. It is certainly natural and understandable that the early initiatives for exploring and employing Web technologies come from the IT organization. After all, that is where both the awareness of new technologies and the ability to make them work should reside. But the IT organization is at best a support unit for the rest of the business.	• The role of IT is to inform the organization of what is available on the technology frontier and to help the company think through the opportunities and challenges of every new technology. • Once the organization commits to using web technologies, it's imperative that a business executive take responsibility for the success of the effort. For example, the marketing web sites at Levi Strauss are managed by the marketing department, with support from a web master. There is no doubt that the web site is a marketing tool.

It is clear from Table 2.11 that committing web business sins could cost a company dearly. It is therefore proposed that cognisance be taken from the following guidelines when planning a Web strategy for the purpose of this research.

Table 2.12 Guidelines for success (Ware *et al.*, 1998:73-88; Power, 2001:189-201; Powers,1999: 158-159).

Implement a Web strategy that supports and reinforces the core business strategy	The business strategy of a business reflects the: • organization's core competencies, • knowledge of products and services, • existing customer relationships, and • marketplace image and credibility. Ignoring those powerful resources when launching a web site is not only silly, but it can also lead to outright disaster. Take advantage of the Web's unique characteristics and capabilities to deepen relationships with customers, suppliers, and partners. The Web is about relationships. It helps the business reach new customers globally. But more importantly it lets you customize your information, products, and services to each individual customer - whether an organization or an individual. The Web also lets business reach out to customers, engage in interactive dialogue with them, build communities of interest for them, and learn from them. Failure to take advantage of these capabilities amounts to ignoring the Web's core strengths.
Know the customers, and design a Web strategy with them in mind	Understand your business ecosystem, and fit your Web strategy to it. Thus, the extended network of customers, suppliers, venture partners, and others who have some interest in the business. They form the network of relationships and transactions that is central to the business's existence. The Web can be used to reduce costs, shorten cycle times, focus efforts, and enhance the entire ecosystem.
Do not delay - just do it	Waiting until the concepts are proven or the technologies settle down, will be too late. The Web rewards innovators and risk-takers. The only effective way to learn what the Web can do for a business is to experience it.

2.2.5 Customer service in cyberspace

> *'If you have an unhappy customer on the Internet, he doesn't tell his six friends, he tells his 6000 friends.'*
>
> **Bezos, 1996 cited in Sterne, 1996:xxi**

Changing customer needs, demands and expectations

The net result of the Web Effect forms the basis of this section. Attention is given to the empowered customer who has gained an unprecedented position of control on the Internet. The importance of a new strategic marketing perspective that must permeate organizations and change them into new entities centred on customers and customer service is emphasized.

The Web Effect is a driver of change and its impacts are a major source of interest to researchers and industry alike. It will be recognised in Table 2.13 that draws on the key demands of the empowered customer (Windham, 1999: 6-7, 22-24) which identifies key areas that business should strive to address on the Web. This is combined with the information drawn from various researchers which adds suggested responses to the customer control issues.

> *'We believe in the power of the informed customer.'*
>
> **Ned Hoyt, Cofounder and CEO, iOwn.com**

Table 2.13 Changing customer needs, demands, expectations and delivery on the promises (Sterne, 1996: 3-21, 89-91, 186-212, 224-226; Peppers & Rogers, 1997: 70-72 ; Leigh, 1997:44; Mishina, 1998:8-9; Hoffman, Novak & Peralta, 1999:80-85; Windham, 1999: 6-7, 22-24; Leen, 2000:14-31; Cunningham, 2001: 51 - 54)

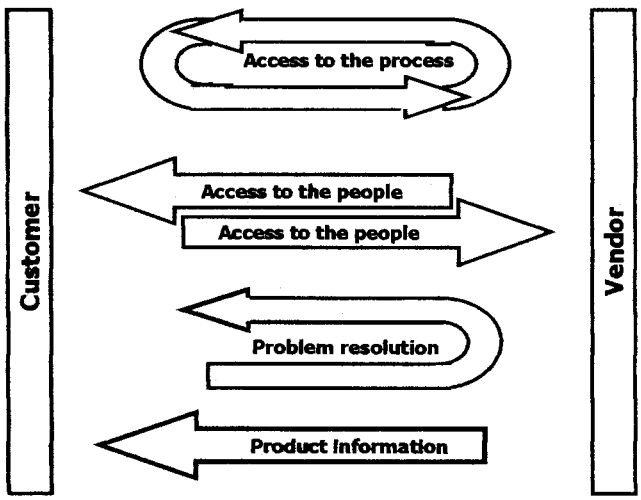
The needs of the empowered customer	Discussion	Implication
A new medium means new messages	Cyberspace customers are much more likely to complain about products, services, people and philosophy. Normally nice people will be willing to spill their guts on the screen.	Rejoice and embrace this criticism. The silent customer who feels no affinity with a company is a lost customer. The one who complains is a vital source of information. Customers' impressions are reliable. The message is to find every new way to communicate.
The Internet empowers customers	The Internet is an empowerment tool, providing customers with myriad of options they never had before – different brands to choose from, searchable databases, unique personalization features, numerous shipping options, built to order merchandise, instant access/downloads of electronic content, and items up for auction. Customers are smarter and more demanding than ever, and the Web is a tool that enables them to conduct sophisticated and extensive comparison shopping. As a result, control of the transaction has shifted from the seller to the buyer, from the vendor to the customer.	David Perry, founder and CEO of Chemdex Corporation, a company that aggregates the process of buying and selling life science products via the Web, comments, 'If we can operate a business that solves problems for our customers, then we will be successful. Our goal is to figure out what their problems are, get them to communicate those to us, go solve them, and communicate back that we've solved them. If we can do that, then we've built both a relationship and successful business' (cited in Windham, 1999:7).
Demands of the empowered customer Successful Web strategies are based on four basic principles – the "demands of the empowered customer."	**'Give me what I need when I need it.'** Wherever they are in a cycle of consuming – learning, shopping, buying, using – customers want companies to anticipate and offer what they need in one cohesive experience.	Companies that integrate marketing, sales, fulfilment, and customer service departments' activities into one integrated Web system have a distinct advantage, because the site – in absence of human contact – essentially 'pulls' people through the logical sequence of consuming, which is called the Consumption Cycle.

The needs of the empowered customer	Discussion	Implication
	'Don't waste my time.' Contrary to some popular opinions, most of today's Web users don't 'surf.' They are time deprived and usually come to the site with a specific purpose in mind. This is true of both business and individual consumers. Business-to-business Web sites must enable users to perform their jobs better. Business customers want Web sites to empower them to do the things they need to do. **'Give me meaningful content, not fluff.'** Customers want engaging content – not propaganda.	One of the top benefits to using the Internet in business is that it can increase productivity. Productive Web sites have a depth of content (addressing all visitors' needs) and a breadth of content. There are destinations where users can go to get practical content – such as pricing, product specifications, quick and easy access to technical support, and comparative analysis. A customer's idea of Web productivity is a site that provides quick and easy access to technical support, tracking of orders, product updates, chat rooms, frequently asked questions (FAQs), and the like. To get marketing messages across in an effective way, companies need to integrate them throughout the site's content so that the users receive and interact with the messages on their own terms. The content must hold their attention, empower them, and cause them to want to come back. This is engagement – and it's not an easy technique to master.
	'Don't exploit me.' People are increasingly suspicious of how information will be used for marketing because some companies are misusing and abusing information gathered from online commerce by sending unsolicited junk mail, known as spam, and by selling the information to third parties. Companies who misuse information are running the risk of losing many customers who strongly resent this type of exploitation.	People are willing to register, if they must, to get access to job/task - critical data. But they draw the line when sites ask for personal information – such as income, age, education, and home address – that is irrelevant to the task at hand. For a successful registration, trust must be earned and user rights must be respected. Educating customers about what and when something is secure is the key to overcoming concerns about security.

The needs of the empowered customer	Discussion	Implication
Customer expectations Satisfying customer expectations may prove the greatest challenge of managing a successful business enterprise, whether B2B, B2C or e-business.	**Access to product and service information** In the long run customers are going to want access to everything.	Research by Black Box employees (see http://www.blackbox.com) showed that customers were far more interested in product information and support than in online ordering. They expressed a need to get access to detailed product specifications or assistance. So even if a web site is a static electronic version of merchandise, product information and service descriptions, the customers and potential customers will benefit from what they didn't enjoy before: access to the business' information. Succeeding depends on managers realigning their thinking specifically for the Web environment.
	Access to problem resolution Now that I know everything you want to tell me about your products, I need to know some of those things you don't want to tell me.	Let the customer be the customer service rep and do the database inquiry. Provide the customer with FAQs, discussion area, a Knowledge Base on product choices and an online help service. Train the customers to fend for themselves. Once trained, people are delighted to fend for themselves. Before they're trained, they are very unhappy while learning. Ensure they have access to online help, online tutorials, and online demonstrations.

The progression of giving the custom roduct information, problem resolution information, people, and processes leads to customer integration as portrayed in the following Figure.

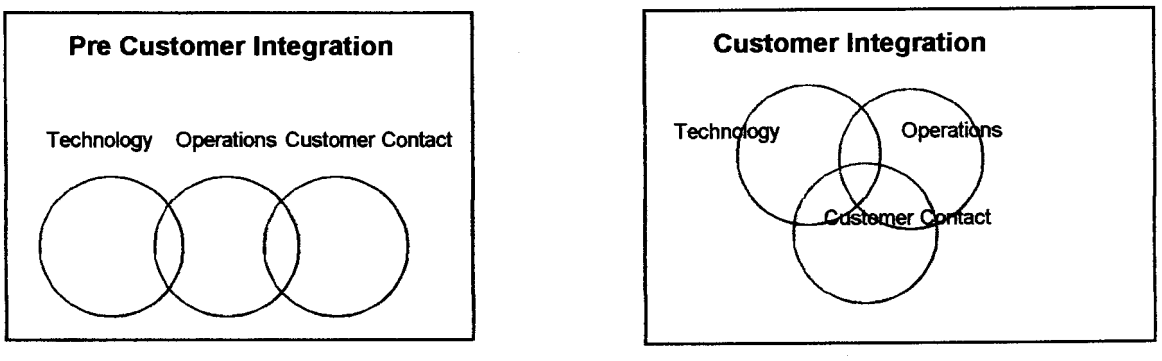
Figure 2.4 Each level of Customer integration raises access expectations to the next level (Sterne, 1996: 212)



Customer Integration engenders more interaction between customer and business which in turn engenders higher customer expectations, until customers expect to have total access to information in the business. Customer integration could be used as a strategic advantage for conducting customer service on the Web (Sterne, 1996: 208 - 209; Windham, 1999:32). The success of the relationship between the customer and business depends on cooperation on three fronts - technology, operations and customer contact. Although information systems departments have worked with operations for years and operations have been engaged with customer service, cooperation between the three fronts was lacking. However, technology has now made cooperation possible, enabling the marketplace to deliver customer service successfully on the Web. Figure 2.5 illustrates the transgression from pre-

customer integration to customer integration.

Figure 2.5 Pre-customer integration versus customer integration (Sterne,1996:295)



Customer service in an era of one-to-one marketing means bringing the focus down from the institution to the individual, from the profession to the professional, from the corporation to the customer. This shift from the monolithic to the many comes after a move from the mainframe to the microcomputer (Sterne, 1996: 209 - 211). As the customer comes closer and the business gets flatter, the value chain becomes shorter. This in turn highlights the importance of maintaining the relationship between the two entities. According to Sterne (1999: 294), this can only be achieved if the three fronts of business are brought together to work as a team, which will contribute to the ideal of business facilitation versus the old roles of sales and service.

This section has offered a number of reflections upon marketing research on the web. It has been suggested that **the importance of a new strategic marketing perspective centred on customers and customer service should not be underestimated**. **Relationship** and **one-to-one marketing concepts, best practices** and **creative implementation of ICT**, that will help make **web marketing a success** has been probed. From the discussion it could be concluded that B2B companies, such as Novon, should focus on what is necessary to enhance and maintain relationships, and on what is possible in the electronic customer service environment of the business.

2.3 Information design

According to Davis and Merrit (1998: 33), interactive information design consists of the interface components - and the technologies behind them -- which are the canvas, paints, and picture frames that are used to meet the communication challenge. Various aspects play an important role in interface design (Holzschlag, 1998: 77; Davis & Merrit, 1998: 33). These aspects need to be considered as they influence the effectiveness and accessibility of a web site. The five aspects of interface design are metaphor, clarity, consistency, orientation and navigation.

In the table that follows each of the five aspects is discussed. The 'Specification' column provides guidelines as specified in the literature, while the 'Implications' column indicates how these guidelines are to be implemented in the context of the client, i.e. Novon Crop Protection Company.

Table 2.14 Features of interface design (Davis & Merrit, 1998: 34 - 39, 47; Holzschlag, 1998: 77 - 85; Hall, 1997: 190 - 192; Nielsen, 2000:164 - 221; Vaughan, 1998: 40 - 41, 476 - 487

Interface design feature	Specification	Implications
Metaphor	This term is used to indicate the symbolic representation of the structure that is built or represented. Metaphors can be very specific, or they can be abstract. Metaphors can provide a unifying framework for the design and can facilitate learning by allowing users to draw upon the knowledge they already have about the reference system.	Use part of Novon company logo - symbolic representation of the communication link between the company and the primary clientele.
Clarity	Communicate with clarity - every element on a page should have a reason for being there. Use words in addition to images. Within the first second it should be clear to the user that the web site is useful and well-crafted. An unattractive splash page or a home page that does not load fast or properly will unsettle many a web visitor. It takes a web visitor another 10 seconds to decide wether the web site is easy to use. The next minute is used to evaluate the content. If found interesting, the visitor is usually hooked on the site.	Attention should be given to the following aspects: Restrict download speed of web pages Use recognisable company logo features with short, meaningful explanations where applicable. Relevant and interesting content should be incorporated. Provide short introduction line on splash page. Provide orientation information such as target browser information and optimal screen resolutions. Clarify the possibility of a language option choice.
Consistency	Keep a visual, conceptual, and mechanical consistency. Consistent design is gained by *using the site metaphor throughout the site, *keeping graphical elements compatible, *maintaining a consistent colour palette, and *arranging navigation options uniformly.	**Use the chosen site metaphor throughout the site.** Use part of the company logo repeatedly throughout the site. **Keep the graphic elements compatible.** Aim to keep the graphical elements compatible by using subject-related imagery for decoration and representation. Include image maps with mouse over attributes. **Maintain a consistent colour palette.** Make use of the company logo colours, which are the end-spectrum colours blue and red. Although these colours are less visible than middle-spectrum colours, it conveys the company brand logo colours. The meaning of the lettering colour blue, which would be used mostly, is truth, clarity, dignity and power. This coincides nicely with the goals of the company.

Interface design feature	Specification	Implications
		The colours should be used consistently and conservatively. Lettering blue - code #006699, which has a reduced intensity, thus being more pleasing to the eye than computer colour palettes, will be used.
Consistency continues	*Font styles should be consistent in terms of face, colour, and size.	**Arrange navigation options uniformly.** Place text-based navigation options along the bottom of each page. Use graphic navigation above the text-based options. Try to keep the navigation elements the same throughout the site. **Use consistent font styles in terms of face, colour, and size throughout the site.** Decide on a San Serif typefaces that is round, smooth, and easy to read. Font selection - Arial, Verdena - ; HTML basefont size of 3, with a range from -1 to +2. Include lower and higher case lettering.
Orientation	Orientation works in concert with the other aspects of interface design in creating a cohesive product. This cohesion is of the utmost importance because as a site grows the potential for confusion rises exponentially. Designers recommend an interface that has several standard menu options present on every screen. The user should never be more than one mouse click away from the main index page. Include a table of contents or site map. No matter how complex or seemingly simple the site, a map, directory, or navigate-by-menu section is an essential resource that provides an overview of the entire site and allows the visitor to move around comfortably and feel in control. Provide embedded descriptions of each link on the site. List brief explanations for each external link to aid as a quick resource. Map the structure of the web site early in the designing phase.	Prioritize the information so that specific topics are layered beneath general categories. Restrict the main options to not more than ten per page. Site structure: Non-linear - unbound, no predetermined route. Navigation media: • Textual to provide perpetual clues about the location within the content • Iconic - design with metaphor link symbol • Graphic - pictorial representation of what information is available, e.g. product information • Implicit - e.g. useful and fun information, the Novon story, Novon and you Include a site map as well as a library item - Novon organogram - links to title pages. This could help with the management of growing data during the design phase. Storyboard the interactivity of the proposed site to illustrate how it will be accessed and how the user will proceed to the payoff point. Challenge the design and look for gaps in the story before presenting it to the management for comments.

Interface design feature	Specification	Implications
Orientation continues	Decide on the organizational structure or combination of structures to be used: *Linear - users navigate sequentially, from one frame or snippet of information to another. *Hierarchical - users navigate along the branches of a tree structure that is shaped by the natural logic of the content. *Non-linear - users navigate freely through the content of the web site, unbound by predetermined routes. *Composite - Users may navigate freely (non linearly), but are occasionally constrained to linear presentations of movies or critical information and/or data that are most logically organized in a hierarchy.	
Navigation	Navigation interfaces need to help users answer the three fundamental questions of navigation: • Where am I? • Where have I been? • Where can I go? Poor navigation aids can make viewers feel lost and unconnected to the content.	The user's current location needs to be shown at two different levels: • Relative to the Web as a whole • Relative to the site's structure Identify the site on all the web pages. Avoid using navigation interfaces that are drastically different from the ones used by the majority of other sites. Include the company logo on every page. The logo placement should be consistent. The main headlines for each page should state the name or main content in a glance. Generate a meaningful name for each page in the HTML header definition. This will assist users to locate individual pages that they have book marked. Address the "Where have I been" question by using the back button provided by web browsers or use descriptive links. This will help users to learn the structure of the site, and prevent them from going to the same page many times. The question of "Where can I go" should be addressed by visible navigation options and other link options on each page. The following hypertext links will be considered: Embedded links (underlined text). Structural links that systematically point to other levels of the site structure as well as to siblings in the hierarchy. Associated links ('see also' hints about other pages that may be of interest).

From the above it is evident that the interface components of information architecture is indeed a huge advance for designing the navigation space of programs and should form part of every design project. To sum up, good information architecture that is based on customers' needs, applied skilfully by designers, will finally make the Web easy to navigate. Once web sites become easier to navigate, users will reject sites that make them spend most of their time on irrelevant pages (Nielsen, 2000: 260).

To facilitate a deeper understanding of the importance of consulting with the client on the developing structure, navigation, style, and technical components, aspects of web usability and web design principles are discussed in the following section.

> ***'Consumers can't see code, but they react immediately to the way a site looks and feels.'***
>
> **John Carey, President and founder of Sutio Interactive**

2.4 Web usability

According to Benjamin (2000:1) and Nielsen (2000: 380), product functionality used to be a very important issue for developers and consumers alike but this has been replaced by consumers' demands for user-friendly software products that are capable of effectively supporting their real-life tasks and goals. User interfaces now have to be easy to operate. The trend is for stakeholders to become a greater part of the process of design and evaluation than traditional instructional design models had originally intended. Norman (1988:188) stated that user-centered design is a philosophy based on the needs and interests of the user, with an emphasis on making products usable and understandable. These sentiments are also shared by many web developers that are fast realising that the usability of their software products is critical to their continued success in the marketplace (Salvo, 2001:273; Ellis & Kurniawan, 2000:263; Walsh,1999:53). The usability of a user interface is often the deciding factor between failure and success. It will be recognised in the following table that identifies key issues regarding web usability and how web developers should strive to achieve it. This is

combined with the information drawn from various researchers which adds suggested responses to the usability issues.

Table 2.15 Web design principles and guidelines to enhance web usability

(Pike, 2000: 88 ;Nielsen, 2000: 380 - 383; Muff, 2000: 39; Brock, 1999:17; Strow, 1997:31B)

Principle	Rationale
Be non-linear	Don't force users to live through a stream of time that they can't control.
Customize service	Computers can do different things for different people.
Be asynchronous	A customized link to check the status of an order allows a customer to resume a 'conversation' many hours later without spending any time on re-establishing context.
Support anonymity	If people don't have to reveal who they are, they might be more willing to do certain things.
Link liberally	Links are the foundation of the Web and can make anything into an extension of your own service.
Support search and multiple views	Different people have different preferences, and there is no need to be limited to a single way of doing things on the Web.
Be small and cheap	Because of the efficiency of computers, it is possible to deal in much smaller units than before.
Be free	It costs very little to offer free samples over the Web, so a book publisher could offer a free chapter and a consultant could offer free advice on some frequently asked questions.
Ignore geography	Support users who access your site from home, the office, the car, while away on business trips or vacations, and from anywhere in the world.
Be consistent	A powerful usability principle. When pages always behave the same way, visitors don't have to think about what to do next. Instead, they can focus on content. This is particularly important for the small business where the goal is to tell visitors why you are valuably different. Don't make them guess what to do next. Clarify what you have to offer — and how to get there.
Provide contact information	Place contact information in a visible location. A lack of contact information is enough to frustrate any visitor and send them elsewhere. Addresses, phone numbers, faxes and e-mail addresses should be displayed at the bottom of many or all pages of the site. Design a 'contact us' button or area where clients can ask questions. Keep the visitor loyal by providing attractive content and real deals. Client loyalty will keep business growing. People talk about great products and courteous service. Appealing content, creative site design, easy navigation and cool graphics will never replace a trusting relationship between a business and a client. Nonetheless, a Web site can prove to be a powerful way to promote a long-term business relationship.
Apply Web psychology	Psychologists have researched selective attention, which is directly applicable to Web design. Selective attention is when an individual has a goal and attends to only those things that advance the fulfilment of that goal, ignoring everything else along the way. On the Web, this means visitors tend to ignore anything that looks like a Web advertisement. By avoiding numerous banners, multiple animations and small pop-up windows not solicited by the user, your site won't look like a billboard.

Principle	Rationale
Simplicity	Most users would rather have simplicity. People are extremely goal-driven on the Web. They have something specific they want to do, and they don't tolerate anything standing between them and their goal.
Design smart	Because Web users are in a hurry, design your site so visitors know what you're talking about, understand your message and your advantage. Include banners and headings, write pointedly and without pretense, include clarifying graphics and highlight important areas.
Design fast	Watch your download times. Visitors don't care why site response times are slow; they simply react — by leaving.
Follow the leader	Acknowledge the "Law of Experience." People spend time on other sites and form expectations. Analyse the big competition in terms of information layout and navigation. Let big business do the educating. Tailor their efforts to your needs.
Identity	Register a domain name that reflects the company and that is easy to remember.
Display listings/portfolio	Information should be complete and include information such as demographics.
Provide authoritative market commentary	Establish credibility by posting accurate, up-to-date market information.
Make professionals accessible	The Net should deepen personal business relationships. Each member of staff is a hook for a new client. So make it easy for visitors to find out who they are.
Make the site easy to view and to navigate	Text should be readable. Restrict the width of the pages, or at least of the text, so that a reader's eye doesn't have to wander all the way across the screen. Your competition is just a click away. If the Web site is not easy to use or takes too long to load, customers and potential customers will quickly click away from the site and go to competitors.
At a minimum a Web site should be an online brochure	Be specific, if you say you do everything, nobody will believe you.
Physical address	Trust begins with the understanding that you are a real firm in a real place.Tell the world where you are physically located.
Give it value	Provide real value for those visiting your site. Your customers don't care about your nifty graphics or cool pictures. Articles and helpful information can work. Think about commonly asked questions from customers and answer them in the form of free articles on the Web site.
Update often	Keep material fresh and updated. Renew it regularly.
Keep it simple	Don't make people download software such as plug-ins, to view the web site. Appeal to the lowest common denominator of technology, while employing the best and latest in rock-solid security.
Share information	Give customers a chance to share common experiences with each other. Negative postings about a company is a great opportunity for the company to correct a negative and turn it into a positive.
Professionalism	The site should be professional and tastefully done.
Use graphics	Limit the use of graphics, but use them. People are visually oriented.

Achieving product usability is not an easy task, and many developers fail in their efforts to improve the user-friendliness of their software applications because they do not recognise the importance of accounting for user requirements from early within the software development (Bevan, 2000 (Online);Usability First™, 2001 (Online). Ware *et al.* (1998:73-88) identify a number of prerequisites for effective organizational involvement, of which the following two are important for this study:

- Don't do anything without approval from the client.
- Match the Web technologies and design to the business strategy and customer requirements.

According to Benjamin (2001: 2), a web site can only exhibit a high degree of usability if the needs of the client are considered from early within the development life cycle thereof. Usability being the quality of a system that makes it easy to learn, easy to use, easy to remember, error tolerant and subjectively pleasing, must be tested throughout the design and development phases (Usability First™, 2001) (Online). This is achieved by employing iterative development, which progressively refines the design through evaluation from the early stages of design. The evaluation steps enable the designers and developers to incorporate user and client feedback until the system reaches an acceptable level of usability (Benjamin (2000: 2; Bevan, 2000: 7). Three of the preferred evaluation methods for ensuring usability are:

- Paper prototyping
- Machine prototyping
- Usability testing

The first method is paper prototyping. Bevan (2000:23) states that the purpose of the method is to clarify requirements and enable draft interaction designs and screen designs to be very rapidly simulated and tested. Bevan (2000:23) identifies four benefits of paper prototyping, namely:

- potential usability problems can be detected at a very early stage in the design process before any code has been written;
- communication between designers and users is promoted;
- paper prototypes are quick to build, thus enabling rapid design iterations; and
- only minimal resources and materials are required.

The second method of evaluation is machine prototyping. The purpose of machine prototyping is to obtain rapid feedback on the usability of prototypes. According to Bevan (2000: 31), potential usability problems can be detected at an early stage before development is complete. This method requires only three to five users that have to think aloud and explain their interpretation of the contents of each screen and their reasons for making choices.

The third method of evaluation is usability testing. The purpose of usability testing is to identify usability problems and obtain measures of usability. Bevan (2000: 28) identifies the following two major benefits of usability testing:

- Major usability problems are identified, including problems related to the specific skills and expectations of the users.
- Measures can be obtained for the users' effectiveness, efficiency and satisfaction.

Bevan (2000: 28) states that planning for usability testing is a major task that should entail the following:

- Select the most important tasks and user groups to be tested.

- Select users who are representative of each user group. Three to five users are sufficient to identify problems, but eight or more users of each type are required for reliable measures.
- Produce a task scenario and input data. Write instructions for the users on what to achieve but not how to achieve it.
- Plan sessions allowing time to give instructions, running the test, answering a questionnaire, and a post-test interview.
- Two administrators are normally required: one to interact with the user, and one to note problems and to speak to any observers.
- One room should be used for testing.
- If usability measures are required, prompt the users to explain their interpretation of the contents of each screen and their reason for making choices.

From the above it is evident that the application of evaluation methods helps to ensure end-user satisfaction. Usability First™, 2001 (Online), states the benefits of planning usability into a project as follows:

- Increased end-user satisfaction
- Increased end-user productivity, success, and completion
- Reduced long-term development costs (costs incurred from fixing poorly designed products)
- Reduced training and support costs
- Return business to improve competitiveness

It seems fitting to conclude this section with the words from Davis and Merrit (1998:53), *'We all benefit from having our work critiqued, but better to have it done in the soft light of concept introspection than in the harsh glare of product failure.'*

2.5 Summary

The main purpose of this chapter was to sensitise the reader to the nature, substance and importance of global issues related to the Internet and the WWW through the thoughts and visions of world authorities. The chapter explored the background and basis of communication on the Internet, and it dealt with and illuminated the key issues relating to customer service and relationship marketing. This provides the reader with the opportunity to gain insight into the generic nature of the Internet, and to relate these issues to the context of the thesis, i.e. The use of Internet-based communication in support of long-term customer relationships in a period of corporate change.

This chapter has given a review of literature relevant to the research questions and has served the purpose of contextualising the research. The chapter was concluded with a section on **information design and web usability** to deepen the understanding of the **importance thereof in web design** and the **necessity of employing the related principles and methods**. Table 2.16 gives a summary of the communication issues addressed in this chapter while Table 2.17 summarizes the content on the Internet marketing content with reference to the relevance of the research questions and possible implications based upon recurrent issues, visions and views in the literature.

Table 2.16 Summary of the content of the communication section of Chapter 2

Content of communication issues	Literature exploration	Research sub-questions
The Internet Changes Everything Age (ICE) Thought provoking visions by the "digerati" of some of the most important market movers, leading commentators, policy makers and government strategists who directly influence work, business and life in the ICE Age.	According to Gore (1999: 7-17) and Bangemann (1999:18-21), the Information Revolution has moved from a focus on technology to a focus on people, content and quality. Toffler (1999: 22-30) shows concern about the Information Revolution owing to the scale and impact thereof on all levels of the society, while Clarke (1999: 31-38) communicates a positive perspective on the challenges and offers that await everyone.	How can an Internet-based web site assist a company to continually communicate the principles, objectives, products and services to their dealerships and their agents (primary clientele)?
The Global information infrastructure (GII) Key elements which form the GII and provide the underlying foundation for the Information Society are viewed. Those who control the GII are crucial, powerful gatekeepers in the network economy.	In surveying various responses to the proposed impact of the Wired World on our lives, Leer (1999:383-385) summarises the contributions of Negroponte, Handy and Fjortoft as follows: The telecommunication industry will no longer command exclusive channels to customers, but will sharethem among network operators, content providers, systems integrators and multiple market entrants (Gilhooly,1999:47). This is necessitated by the explosion of new broadband capable networks. However, channel access continues to be the key bottleneck in telecommunications due to the erosion of historical cross-subsidies. Regulation of the media and communication industry is another key element of the GII addressed by Olswang, Scardino and Cochrane (1999).The regulation issue affecting the GII industry and governing bodies should not prescribe to the market but allow competition in the global information economy. We are reminded of the momentous responsibility placed on those who control the GII in the network economy.	How can product-orientated and services information be disseminated to potential and existing clientele?
Putting people first in the ICE Age People and what the impact of the wired world will be on their lives form the basis of the focus in this section.	This section started from the premise that the wired world significantly impacts on the lives of individuals and the global society as a whole. Relevant literature contains numerous suggestions regarding the narrowing of the digital divide. It has been suggested here that we have an unprecedented opportunity to harness technological advancements for the purpose of making substantial progress towards a truly global economy and a real global society. However, this will not happen without strong leadership and joint efforts from both governments and businesses at both the national and international levels.	How can the use of Web site assist in establishing and/or enhancing business-to-business networks, at a time of corporate change without compromising standards or alienating existing customers?

Content of communication issues	Literature exploration	Research sub-questions
The future of the Internet and the Internet of the future The limits on our vision and the privacy and security industry are dealt with in the section.	An insight into the privacy and security industry of the Internet follows. The limits on our vision It is the belief of Borenstein (1999:199-200) that the following scenarios are easy to predict: The Internet of the future will be easier to use and overwhelmingly faster and more powerful than it is today. Many older communication media – including telephone and broadcast audio and video – will gradually be integrated under the Internet umbrella. Most computer software will continue to be made easier for non-experts to use. The cost of connecting machines to the Internet will become very low, so that nearly every new electrical device will have on Internet connection if the marketers can come up with even a remotely plausible reason to do so. A profusion of technical alternatives and socio-political mechanisms will create multiple tiers of Internet services – some faster, some cheaper, some more or less robust and reliable, and some asymmetrical in their capabilities (such as cable modems that can download data far faster than they upload it). This, in turn, will further stratify society, not just between those who do and do not have Internet access, but between those whose access is more or less enriched and of higher or lower functionality.	
	The tendency of information to flow freely – which seems to be a direct consequence of digital technology – is unlikely to be reversed by the wishes and desires of those in authority. Accordingly, governments and other institutions that attempt to staunch this flow will continue to experience extreme difficulties, which will ultimately be understood to be sheer futility. The free flow of information will also permanently undermine current notions of copyright and intellectual property, though with what consequences is somewhat harder to predict. As with all technologies, the Internet can be used for good or ill. Money, however, it has been claimed, is the root of all evil, and money is the lens that is currently focussing the most attention on the Internet. It seems likely that the exponential growth in commercial uses of the Internet will cause the Internet to do more harm than good in the short term. In the longer term, non-commercial innovations will slowly produce social benefits that help to mitigate, and perhaps even outweigh, the negative effects (Borenstein, 1999:201). The privacy and security industry It is predicted that the abuses and harmful effects to the Internet will come first, with the more salutary effects coming as belated reactions to these abuses (Borenstein, 1999:201). The ever more commercial Internet will lend itself to a host of abuses that will only be corrected after they are well understood, which means after they have caused significant visible harm (Borenstein, 1999:201; Gattiker *et al.*, 1996:6). Given the scale of the privacy and security debate, and the serious effect on Web providers and consumers alike, developers and researchers will continue to develop and improve utilities and tools to redress this topic of growing concern.	

Table 2.17 Summary of the content of the marketing section of Chapter 2

Content of marketing issues	Literature exploration	Research sub-questions
The history of marketing Through the history of marketing, a new language that is open, natural, direct and often funny evolved and is now spoken on the Web.		How would an Internet-based communication web site assist in the establishment of a trust relationship between the company, and the primary clientele?
One-to-one Web marketing One-to-one marketing concepts and technologies provide the underlying foundation for this section. Marketers are cautioned to protect users' privacy, give users control over their own personal information, and practise self-regulation in order to prevent government intervention.	One-to-one Web marketing has a future, but the *expense, technology* and *privacy* obstacles need to be addressed before both business and customers can truly benefit from one-to-one relationships. One-to-one marketing is an investment over the long term, but in order for both the user and the marketer to benefit, the marketer will have to protect users' privacy, give users control over their own personal information, and practise self-regulation in order to prevent government intervention (Allen, Kania & Yaeckel, 1998:14).The only effective way to learn what the Web can do for your business is to experience it (Ware *et al.*, 1998:73-88).	
Relationship marketing The essence of relationship marketing is discussed in this section. Attention is given to relationship marketing objectives, components, elements and principles. A distinction is established between consumer-to-business marketing and business-to-business marketing.	This section provided an overview of relationship marketing aspects. Relationship marketing objectives, elements, and main components and their value integration in a customer relationship were discussed. An effort was made to address the differences between business-to-consumer interaction and business-to-business interaction.	
The inevitability of the Web as a business vehicle: Requirements to adopt to the new rules of doing business The starting point is the mentioning of the important aspects of the Web as a business vehicle to be persuaded by the Novon Crop Protection Company. Web business sins and guidelines for success are discussed.	This section reviewed relevant literature covering important aspects of the Web as a business vehicle to be pursued by the Novon Crop Protection Company.The importance of addressing the demands of the Web-savvy customers, which inevitably leads to either success or failure, was highlighted.To meet the dead-ahead challenges businesses will have to learn to apply the latest tools and technologies to their businesses as it could aid in staying abreast of developments. Waiting for technologies to settle down could be detrimental. The Web rewards innovators and risk-takers. However, a whole Web initiative could be nullified if Web business sins are committed. Guidelines to aid companies when planning a Web strategy were presented.	

In the table that follows the content of customer service issues addressed in Chapter 2 is summarized with reference to the relevance to the research.

Table 2.18 Summary of the content of the customer service section of Chapter 2

Content of customer service issues	Literature exploration	Research sub-questions
Customer service in cyberspace	The net result of the Web Effect forms the basis of this section. Attention is given to the empowered customer who has gained an unprecedented position of control on the Internet. The importance of a new strategic marketing perspective that must permeate organizations and change them into new entities centred on customers and customer service was emphasized. From the discussion it could be concluded that business should focus on what is necessary and what is possible in the electronic customer service environment of a new global economy.	How would an Internet-based communication web site assist in the forging of loyalties between the company and its primary clientele?

The literature exploration on information design is summarized in the following table with reference to the relevance of the research subquestion on information design.

Table 2.19 Summary of the content of the information design section of Chapter 2

Content of information design issues	Literature exploration	Research sub-questions
Introduction to interactive information design and its components	The five aspects of interface design, namely metaphor, clarity, consistency, orientation and navigation, were discussed. The aspects that play an important role in interface design were highlighted because of their influence on the effectiveness and accessibility of a web site.	What design factors would best facilitate the communication of the company's services, principles, objectives and products to their primary clientele?

Finally, Table 2.20 summarizes the information on web usability issues as addressed in the literature study.

Table 2.20 Summary of the content of the web usability section of Chapter 2

Content of web usability issues	Literature exploration	Research sub-questions
Introduction to usability How to achieve a high level of usability	Information and resources for key issues related to usability in web site design formed the basis of this section. The key principle for maximizing usability is to employ iterative design, which progressively refines the design through evaluation from the early stages.	To what extent can a Web-delivered program provide information that elicits sufficient clientele motivation, acceptance and usage? How can the Internet-based communication web site be made sustainable? How can the Internet-based communication web site remain competitive?

The aim of Chapter 2 was to place the current study into perspective by reference to relevant literature.

The next chapter will be aimed at presenting and describing the research project.

Chapter 3

Research project description

Introduction

This chapter reports on the gathering of relevant web-based communication information in the chosen field of study, the methods and materials used in the design and development of a company-clientele accessible Web site and CD-ROM for the participating crop protection company. After a formulation of both the practical and the research problems the chapter will systematically describe the development and evaluation process, following the Hodgkinson's Daisy Instructional Design method (Figure 3.3, p. 80). This chapter will present and discuss the use of a clearly defined usability design framework in order to maximise the effectiveness, satisfaction and efficiency of an Internet-based communication web site and will argue that if a user-centric design framework is applied correctly, 'design for usability' will be the desired end result.

3.1 Research problem

3.1.1 Purpose of research

The purpose of this research was to arrive at an understanding of the factors contributing to the success or failure of an Internet-based communication web site in assisting business-to-business companies to create, establish and/or enhance sustainable customer relationships. Furthermore the research project was undertaken to assist a crop protection company to create and establish a sustainable corporate image as perceived by its primary clientele. This, in turn, would assist its clientele to add value to their business-to-customer relationship. A needs analysis was conducted to ascertain whether an Internet-based communication web site would meet the needs of the client. Table

3.1 illustrates the design specifications at the macro level with the questions posed to the management of the crop protection company.

Table 3.1 Design specifications at macro level - Phase One: Strategy

Analysis	Questions	Source of information
Concept • Audience • Purpose • Content	Who is going to use the web site? Why is an Internet-based communication web site needed? What is the purpose of the web site? What is it they need to know, or do or feel? Where is the web site going to be used?	Managing Director of Crop protection company
Practical considerations • Performance schedule • Resources • Provisional budget	What is the desired performance? What time constraints exist? What data is available? Who will aid in the provision of the data? What is the limit of the budget?	Managing Director of Crop protection company
Technical factors • Equipment • Distribution	What resources are available?	Managing Director of Crop protection company Financial Director IT department

The needs assessment involved input from both the researcher and the crop protection company. In order to satisfy the needs of the crop protection company, the following research outcomes had to be addressed.

3.1.2 Outcome of research project

This is a development study which has two sets of outcomes, commercial and academic. The first academic outcome is to arrive at an understanding of the factors contributing to the success or failure of Internet-based communication web sites in assisting business-to-business companies to create, establish and/or enhance sustainable customer relationships. The second academic outcome is to investigate design models and principles to design for usability.

Given the purpose of the above outcomes, the other academic outcomes are to:

- Implement an Internet-based communication web site that can be used as an example of designing for usability.
- Establish whether the Internet-based communication web site met the requirements for designing for sustainable customer relationships, information design and web usability.

The seven commercial outcomes of the research project are to:

- design, develop and produce an Internet-based communication web site that would aim to assist a crop protection company in creating and establishing sustainable customer relationships,
- help the crop protection company decide whether the Internet-based communication web site would be suitable for use by its particular users and would suit its tasks and working environment,
- expose a focus group of the primary clients to the Internet-based communication web site to determine the usability of the product,
- report on any usability defects of the Internet-based communication web site and to give an overall report on the usability of the product as determined by an usability expert,
- evaluate the response of primary clients to the information design, usability, communication and customer service principles, encompassed in the Internet-based communication web site,
- establish the Internet experience and skills of the primary clients, in order to motivate the crop protection company to budget for appropriate skills training and the acquisition of new and/or relevant technology and
- empower spouses and children with relevant information, advice, entertainment, guidance and

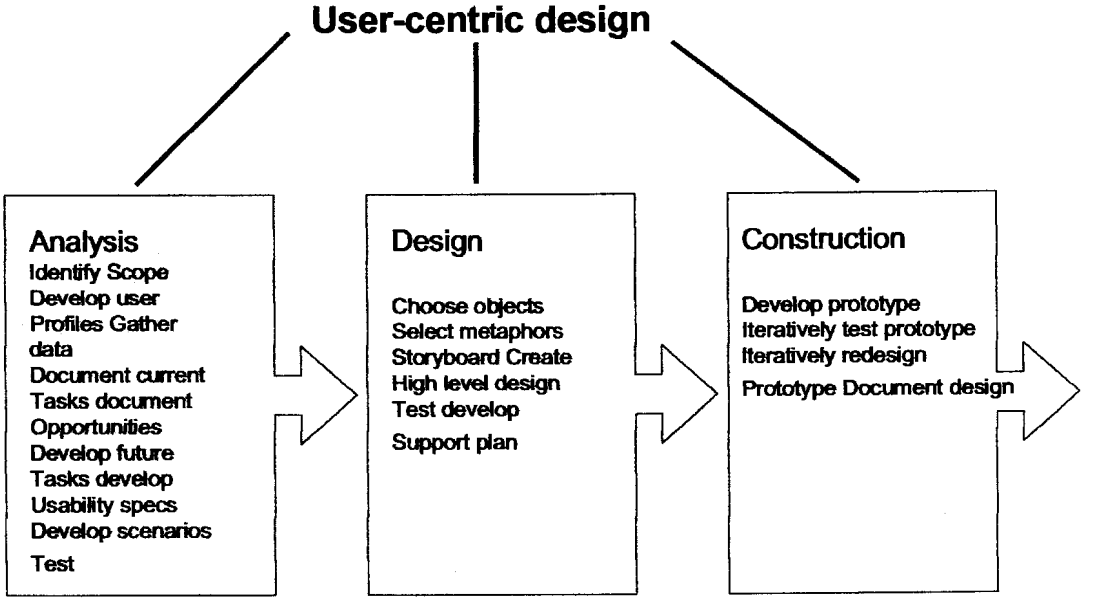
resources to advance communication between the different parties and to strengthen the customer relationship.

The thesis reports primarily on the academic outcome, but with reference to the commercial outcome.

3.1.3 Internet- based communication web site - Phase Two: Design

In this section the design phase of the web site will be discussed. Based on the needs assessment, the research outcomes and the design specifications at a macro level, the developer decided to pursue both a User-centric Design Framework (UCD) (Benjamin,2000: 3) and the Hodgkinson's Daisy Instructional Design method (Adendorff, 1999: 2) in the design and development of the web site, as illustrated in Figures 3.1 and 3.3 respectively.

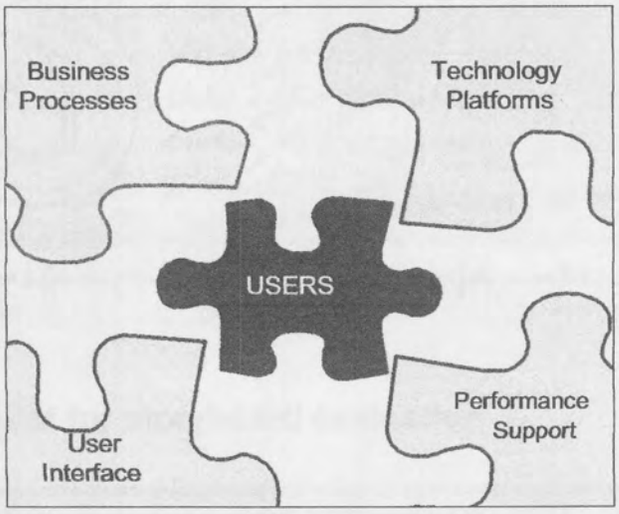
Figure 3.1 User-centric Design Framework (Benjamin, 2000: 3)



Adapted from 'GUI' Design Essentials, S Weinschecnk, P. Jamar & S. Yeo, 1997

According to Benjamin (2000: 2) the advantage of the UCD framework lies in its recognition of the user as an inseparable part of the application design puzzle as portrayed in Figure 3.2. If their needs are not considered from early within the development life cycle of the web site, it would be impossible to design an application that would ultimately exhibit a high degree of usability.

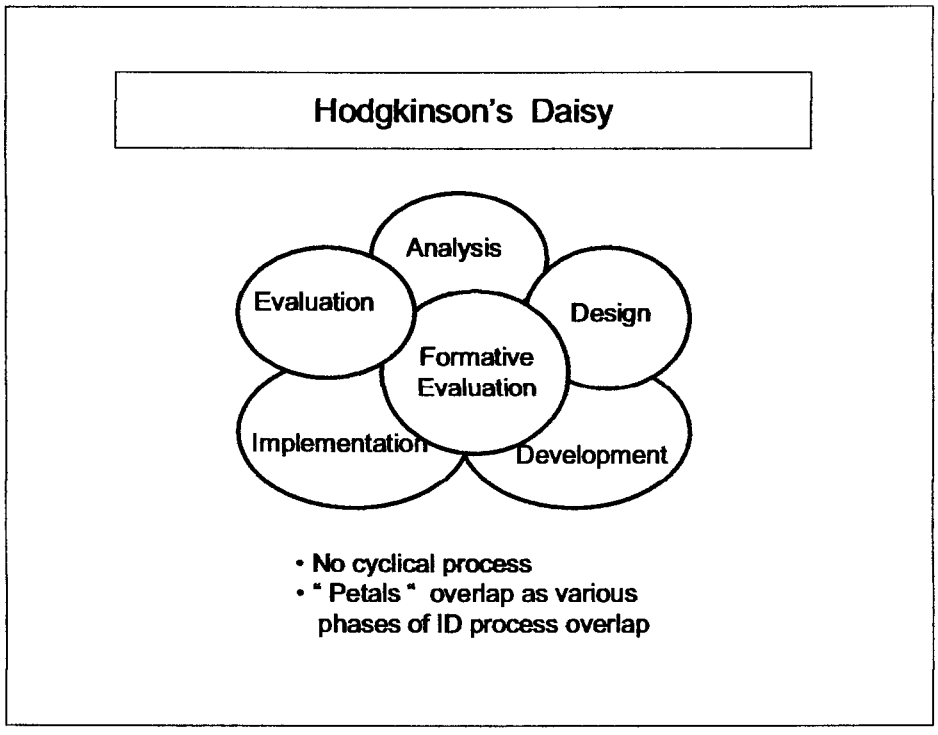
Figure 3.2 Application design puzzle (Benjamin, 2000: 3)



Users are an integral and central piece in the application development puzzle.

The Hodgkinson's daisy instructional design method (Figure 3.3) reflects the continues basis of evaluation through each stage of development that provides feedback to both designers and users on the design process.

Figure 3.3 Hodgkinson's Daisy Instructional Design method (Adendorff, 1999:2)



Gery, Alessi, Trollip and Fardouly, as quoted by Adendorff (1999: 4), state that the design phase is critical to the effectiveness of the web site. To arrive at a usable end product and in order to meet the assessment criteria and outcomes determined by the developer and company managing director in a combined effort, a site map was created. This site map indicates the levels and sublevels, site structure, splash page, home page, about pages and content pages of the proposed site. Specific attention was given to how the levels related to one another. A non-linear structure layout approach was applied that would encourage the user to consider the information based on its context. This would allow the user to interact within a non-linear environment that allows for tangential and choice-driven information retrieval. Attention was given to internal linking, as well as external linking possibilities. This site map, created in Microsoft PowerPoint 97® , appears as Appendix A.

To clarify design specifications, an Instructional Design Blueprint at microlevel, based on design considerations reported by Reeves (1994: 6 - 16), was developed and presented to the Managing Director of the company for signed approval. This process ensured that the development would meet the specifications agreed to and to clarify the elements that would be used in the web site. The design specifications are indicated in Table 3.2.

Table 3.2 Design specifications

Online media	Specifications
Instructions	Orientation information Splash page - short introduction line Background imagery Direct link to useful and fun information pages for the convenience of spouses and children Language option choice - for further investigation Best viewed at 800 x 600 screen resolution with target browser Microsoft Internet Explorer 4
Menus for navigation	Non-linear - unbound, no predetermined route Textual to provide perpetual clues about the location within the content Iconic Graphic Implicit - e.g. useful and fun information, the Novon story, Novon and you Site map Library item - Novon hierarchical system - links to title pages
Screen layout	Default page size 640 - 480 Line length - approximately 10 words per line Text justify left Chunk information Brief paragraphs; limit scrolling Screen density - clean screen design - white open spaces Font selection - Arial, Verdena - Sans serif typefaces (round, smooth, easy to read); HTML basefont size of 3, with a range from -1 to +2 Lower and higher case Icons/buttons - imagery plus text Layers convert to tables Speed of display - range from less than 10 seconds to 22 seconds; maximum may not exceed 25 seconds
Metaphor	Part of company logo - symbolic representation of the communication link between the company and the primary clientele

Online media	Specifications
Colour	Company logo colours End-spectrum colours blue and red - although less visible than middlle-spectrum colours, it conveys the company brand logo colours. Meaning of most used lettering colour blue - truth, clarity, dignity, power Use colours consistently and conservatively Lettering blue - code #006699 - reduced intensity, thus more pleasing to the eye than computer colour palettes Link lettering blue - #006699 Bold Library item lettering blue - code #000080 Bold; #006666 Bold Lettering red - code #990000 bold & italic Lettering black - code #333333 Meaning of background colour white - light, purity, cleanliness, emptiness
Graphics	Decoration Representation Interpretation Image maps with mouse over attributes Role over images Graphics download speed - aim for less than 5 seconds per image Photographic image type - JPEG format (Joint Photographic Experts Group)for small file sizes Flat colour image types - GIF format (Graphic Interchange Format) for condensing images Animated text - use limited -text move towards the centre of the page

Online media	Specifications
Interactivity	Input devices - keyboard and mouse Online questionnaire (electronic feedback) Submitted to a CGI-script • Fill in • Multiple choice • Anonymous Response forms (electronic feedback) Submitted to a CGI-script Different elements in forms: • Radio buttons • Text areas • Submit/clear buttons Enquiry forms (electronic feedback) Submitted to a CGI-script • Radio buttons • Text areas • Submit/clear buttons Mail to option
Writing style	English - 2nd language level No abbreviations Afrikaans - explore possibility after prototype evaluation
Highlighting mechanisms	Link lettering blue - #006699 Bold Italic Underscore

Literature suggests that it is important to consult with the client on developing structure, navigation, style and technical components, and to obtain approval before proceeding with production (Siegel, 1997: 161; Vaughan, 1998: 462). To aid in visualizing the web page layout, and the relationship between web pages, and to provide insight in how the web site would work, a storyboard was designed and presented to the Managing Director for input and approval. Part of the storyboarding process involves challenging the design and looking for possible shortcomings in the story. Changes were made to accommodate management's suggestions. Figure 3.4 presents a sketch design of the home page as presented in the storyboard, while Table 3.3 provides a checklist used to scrutinize the storyboard design.

Figure 3.4 Home page of Novon Crop Protection Company

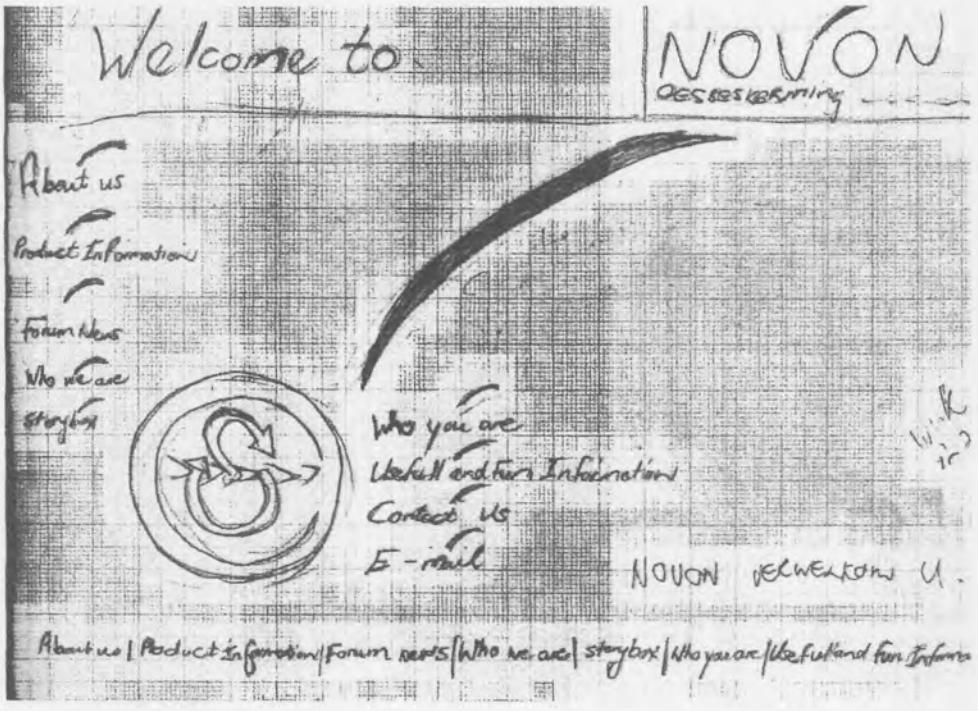


Table 3.3 Checklist for storyboard evaluation

Task/Question	Action/Adjustments	Checked
What are all the possible ways in which a user might want to access the content?	Request input from management Explorer possibilities	✓
Is the content powerful enough?	Suggestions from management	✓
Are the links appropriate for the visitors?	Plan multiple navigation options	✓
Will the links keep visitors within the site until they reach their destination?	Check for distracting links	✓
Are the interactions dynamic?	Evaluate in-house	✓

3.1.4 Internet-based communication web site - Phase Three: Production

> *You set my desire . . .*
> *I trip through your wires*
> U2

Based on the design specifications, storyboard design evaluation output and the proposed research outcomes the researcher/developer pursued the task of prototyping the web site. Table 3.4 provides an overview of the production process.

Table 3.4 Overview of the production process

Task	Action
Technology infrastructure	**Personal computer:** • Pentium 120 MHz, • 32 Meg of RAM, • 1,2 Gigabytes hard disk, • CD-ROM • 14" SVGA monitor HP Desk Jet 950C printer HP Laser Scanner Platform Windows 95 Target browser Microsoft Internet Explorer 4 Word processing :Corel Word Perfect 8, Microsoft Word Corel WordPerfect 8 Tools: Corel Presentation 8 Microsoft Office Tools : Microsoft Photo Editor IMSI Master Clip Browser Internet Explorer 4.0 Outlook Express Adobe Acrobat 4
Authoring tool	**Dreamweaver 3** - WYSIWYG round trip HTML editor - the code that Dreamweaver automatically writes can be altered by the programmer

Task	Action
Integration of assets	**Text:** • Existing sources - text and graphics stored in digital format; from brochures, newsletters, product information brochures; product labels stored in digital format; hand-written notes, e-mail, and faxes from management and personal assistant to Managing Director **Visuals:** • Existing sources - in-house photographs; company logo and dealership logos - paper-based and stored in digital format **New material:** • Photographs digitized, coded, and archived • Manipulation of graphics to create new imagery
Asset processing	Optimize visual material for both high quality and quick download. Apply Gif format for condensing flat colour images and JPEG format for compressing photographic images
Asset integrating process	Dreamweaver apply formatting tags to text Apply 'alt tags' where applicable to icons and graphics place holders Name graphics correctly to simplify search Dreamweaver site-management scheme requires that all files be kept within one main root folder on the hard drive: C:\novon_alpha_testing\novonprototype
Development of layout grid	Layout elements: • Design in layers; convert to tables for Netscape 4.5 users • Frames - use only for 'useful and fun information' pages • Forms for true interaction between company and primary clientele
Asset archiving	Back up procedure: Save files on disk
Production in progress	Preview web pages in primary browser Complete Anecdotal Record Forms and Formative Review Logs Consult with experts in the field of web design and programming at University of Pretoria Consult with study supervisor on Instructional Design issues Continually inform company Managing Director Present primary browser previews to Managing Director

3.1.5 Internet-based communication web site - Phase Four: Delivery

After the completion of the production phase, the Managing Director in collaboration with management, decided that the main delivery system for the web site would be on CD-ROM. CD-ROM (compact disc read-only memory) has emerged during the last few years as one of the most cost-effective distribution media for Internet-based projects (Vaughan, 1998: 555). According to the Managing Director, most of their primary clients had access to a CD-ROM player and would therefore be able to access the web site.

Table 3.5 Phase Four: Delivery

Task	Action
Uploading Web files to a live Web server	FTP program: CUTE FTP version 4 FTP files to Web Server, test before going live Web administrator applies server-side technology - writes CGI scripts to perform browser detection and form functions (submit button activation, links to response pages) Domain name: http://www.novoncp.co.za
Delivering on CD-ROM	Outsource production and cover design Request to have a run-time file installed Compose a quick reference guide

Due to a lack of Internet connectivity agents were issued with a CD-ROM to ensure access to the company's web site via personal computers. The relevant addresses of the agents and dealerships were obtained from the Personal Assistant of the Managing Director. The evaluation questionnaire and CD-ROM were posted under cover of a letter from the Managing Director. The agents were requested

to evaluate the company web site and complete and return the questionnaire by a specified date to the company head office. The primary aim of the cover letter was to increase the response rate and to increase the probability of an honest reaction.

To achieve these aims, the following information was provided in the letter (Letter detail in Appendix B):

- Details regarding the aim of the research
- Attention was drawn to a self-addressed, franked return envelope that was included with each questionnaire and could be used to facilitate easy posting of the completed questionnaire
- An offer to respondents that they could keep the CD-ROM and use it as an aid in their line of work

The questionnaire was posted to 111 agents on 30 July 2000 and respondents were requested to return it by the end of September 2000. As less than 10 completed questionnaires had been received by the end of September the return date was extended. The cut-off date for receipt of the questionnaire was set at 30 May 2001.

3.1.6 Target population

The target population consisted of both dealerships and agents of the crop protection company. Spouses and children were encouraged to participate on a voluntary basis. The focus group consisted of area managers and agents assigned to the task by the crop protection company. The focus group participated in usability testing of the alpha test site with the purpose of helping the crop protection company decide whether the product would be suitable for their particular users, tasks and working environment. A convenience sampling of one expert in multimedia design completed the targeted population.

Table 3.6 shows the profiles of the purposive target population who completed the user evaluation questionnaire.

Table 3.6 Profile of target population - user evaluation questionnaire

Number of primary clients	111	**100%**
Number of respondents	35	**The percentage of successfully returned questionnaires 31,5%**
Age range	24 - 57 years	**≤24-33 years 37,1% (Internet age)** **≥34 - 57 years 62,9% (Pre - Internet age)**
Language	Afrikaans English	**91,4%** **8,6%**
Gender	Male	**100%**
Marital status	Unmarried Married Divorced	**22,9%** **71,4%** **5,7%**

As indicated in Table 3.6, a total of 35 of the target population who successfully completed the evaluation questionnaires equalled 35. Behr and Mayer, quoted by Steyn (2001:10-11) state that even for quantitative studies a number as low as 30 could be adequate. This correlates with the rule of thumb given by Kahander (1994) who says :'*..time consuming surveys..:with a response above some 15 to 20% are considered successful'.*

The 35 completed questionnaires received back, ensured a favourable response rate of 31,5%.

Table 3.7 portrays the profiles of the focus group who participated in the usability testing of the web site.

Table 3.7 Profile of the focus group (convenience sampling) - usability testing

User profile			
Occupation:			
Area manager	**6**	**Agent**	**7**
Gender	**Male**	**Gender**	**Male**
Age ratio	**41-55**	**Age ratio**	**30-56**

3.1.7 Type of study

The research was of a qualitative nature and consisted of interviews and formal and informal discussions with management and subjects of the focus group. Quantitative measures took the form of a questionnaire and usability testing. Fill-in (quantitative measure) and open-ended questions (qualitative measure) were used in the questionnaire (Appendix B), giving the respondents the opportunity to elaborate on the questions raised. To ensure internal validity and reliability, the triangulation strategy was employed (Mouton & Marais, 1988:91).The design of this research is of a non-experimental nature.

3.1.7.1 Interviews, formal and informal discussions

Focus group interviews were used to determine the views of management with regards to web site usage, usability, communication, customer service principles and relationship building capacity. This focus group and the one-to-one interviews fall into the category of qualitative research, and the focus group usability testing can be classified as quantitative research. The following table provides an overview of the qualitative research methods.

Table 3.8 Brief discussion of the qualitative research, with the emphasis on one-to-one interviews

Data sources	Discussion
Focus groups - field notes	Special attention was given to the views of management prior to the design of the Internet-based communication web site.
One-to-one interviews - field notes	The researcher took notes during the course of the design, production and implementation phase of the Internet-based communication web site.
One-to-one telephone/e-mail conversations	The researcher interacted on a regular basis with the Managing Director of the crop protection company with regard to the needs analysis, financial implications, design, production, distribution and evaluation issues.
Informal discussions with experts in the specific field of study and attendance of workshops on the topic	Specific authorities in the field of web site design and usability testing were consulted, *inter alia* at workshops, to help establish a conceptual framework on web site design that would include web design peripherals, web design management, usability and user-centric design.

The analysis of the above-mentioned qualitative data assisted the researcher in discovering the important issues that the crop protection company wanted to address in the Internet-based communication web site, and to determine which web design peripherals would be crucial in the development and production of a suitable web site for the crop protection company in question. The researcher depends on the reliability of the qualitative research data by virtue of the following quality

characterisations :

- the credibility, consistency, and neutrality of the Managing Director and management of the company involved, and
- the knowledge, experience and sincerity of researchers and authorities in the chosen field of study.

These criteria coincide with the model for reliability of qualitative research of Guba as reported by Eagleton (1998:31). The qualitative information provided the researcher with insight into the field of study that also aided in the compilation of a quantitative analysis of the study by means of a structured questionnaire.

3.1.7.2 User evaluation questionnaire

A questionnaire method of data collection formed the basis for the study. Although several instruments are available, such as Chin, Diehl and Norman, 1988 (Online); Lewis, 1995 (Online);and Nielsen, 1993 (Online), it was felt that no single instrument covered all the issues adequately. As a result a unique questionnaire was designed, based on those mentioned.

The questionnaire dealt with the following four main issues:

- **Section A** was concerned mainly with information related to the demographic and personal characteristics of the target population.
- **Section B** covered aspects on computer and Internet usage experience, access and literacy.
- **Section C1** consisted of evaluation questions relating to the information design and the usability of the Internet-based communication web site prototype. The type and extent of the information needed required the respondents to access the prototype either via the Internet or on the CD-ROM that was provided.

- **Section C2** was concerned with information related to communication, relationship building and customer service principles.
- **Sections D and E** contained questions relating to the useful and fun pages and links on the web site aimed at the children and spouses of the primary clients. Completion of these section was voluntary.

The questionnaire was pre-tested in each area with five randomly selected people - one from management and four independent candidates. The questions were generally easily understood and readily answered. The researcher was of the opinion that the candidates understood the wording of the questions, that there were no unnecessary questions and that the time taken to complete the questionnaire was satisfactory. The questionnaire is attached as Appendix B.

3.1.7.3 Heuristic usability evaluation

An interface rating form developed by a Human-Computer Interface specialist was used in the formative evaluation phase of the web site in order to maximise the effectiveness of the usability methodologies and to ensure a usable product. The heuristic evaluation form, designed in accordance to a user-centric design framework (Benjamin, 2000: 3), included the following categories:

- User profiling and characterisation
- Display and interface properties
- Interactivity
- Information design
- Task analysis

The interface of the prototype web site was scrutinized by the expert and each element of the interface

was evaluated against commonly accepted heuristics principles. Feedback was provided by the following methods:

- A structured report commenting on web site content, user profile, page layout, visual presentation, structure, navigation, interaction, hyperlinks, graphics and technicalities.
- An expert review checklist where 1 represented the lowest and most negative impression on a 5 point rating scale, while 5 represented the highest and most positive impression.
- A heuristic evaluation form providing a weighted value score.

The report is attached as Appendix C, the expert review checklist as Appendix D and the heuristic evaluation form as Appendix E.

3.1.7.4 Usability testing

The researcher designed a usability test that consisted of performance task measurements and the thinking aloud protocol. The thinking aloud protocol was used in conjunction with the performance measurements. Several resources were consulted to aid in the design thereof (Davidson,1999 (Online); Hom,1996 (Online); Bevan, 2000 (Online)). The design structure and page design were evaluated by a convenience sampling of the proposed end users. Information gathered from the thinking aloud protocol did not need to be aggregated or analysed before it could be used. The usability test was pre-tested with three randomly selected people - one from management and two independent candidates. The performance tasks were generally easily understood and readily performed. The researcher was of the opinion that the candidates understood the task scenario, that the tasks would succeed in testing the usability interface design, and that the time taken to interact with the web site was satisfactory. The usability testing framework appears as Appendix F while the results of the performance tasks of the usability test are included in section 4.2.3.

3.1.7.5 Summative evaluation

During April 2001 a primary clientele survey was undertaken to determine customer satisfaction. The summative questionnaire was designed by the Managing Director of the company in collaboration with the researcher/developer. A section of the questionnaire dealt with web-based communication and computer use. The other sections were devoted to business-to-business concerns.

The survey was conducted during the company's annual conference for their primary clientele. Audience response technology - DIGIVOTE® - 2000 was used during one of the sessions for answering the questionnaire. DIGIVOTE® - 2000 is a wireless-based interactive communication and audience response/voting system that allows closed answering via handsets. The questions and answer options were displayed on-screen and the clientele responded by keying in their answers. Results by number of percentage were displayed on a video screen using high-impact graphics. This resulted in valuable discussion and feedback from the floor. Relevant information will be reported in Chapter 4, section 4.2.5, pages 167-170.

3.1.8 Data collection procedure

Qualitative and quantitative data recorded was appropriately processed according to the methods used, the type of data and the coding of the data gathered. Applicable statistical software packages provided fast, efficient, and accurate handling of data. The data will be appropriately displayed in Chapter 4 using frequencies, descriptive statistics, histograms and diagrams to verify data and to draw conclusions about experiences, opinions, and feelings about the Internet-based communication web site.

The following table shows how data was collected in an attempt to answer the subquestions in Table 1.1.

Table 3.9 Data collection procedure

Aim	Data collection	Data analysis	Outcome
Describe relevant information on research topic	Literature survey	Draw conclusions	Chapter 2
Determine needs of crop protection company	Conduct a needs analysis	Apply data in the design phase of web site	Chapter 3
Focus group interviews	Conduct interviews Record interviews	Conduct analysis	Chapters 3 & 4
User-centric design framework	Research user-centric design framework	Apply user-centric design framework during design and production phase	Chapters 3 & 4
Focus group usability testing	Compile usability test Conduct usability test	Quantitative analysis Qualitative analysis	Chapters 3 & 4
Multimedia design experts	Submit web site on CD-ROM for usability testing and report on usability interface design	Quantitative analysis Qualitative analysis	Chapters 3 & 4
User evaluation questionnaire - formative evaluation, where data is collected to modify or revise a software program. in a development stage used (Hannafin & Peck, 1988:301)	Compile evaluation questionnaire Dispatch to target population	Quantitative analysis Qualitative analysis	Chapters 3 & 4
Post-survey Summative evaluation, where the effectiveness/impact of a programme is estimated after it has been developed and used (Hannafin & Peck, 1988:302)	Electronic data collection	Quantitative analysis	Chapters 3 & 4

3.2 Methods of investigation

3.2.1 Data collection methods

A literature survey, a user-evaluation questionnaire that consisted of closed and open-ended questions (formative), needs analyses, expert report, usability testing, summative evaluation questionnaire and feedback discussions with management were utilised to collect and distribute information and interpret data.

3.2.2 Description of instruments

Different methods of data collection were employed. The following instruments were used:

- User-evaluation questionnaire - formative evaluation
- Interviews, formal and informal discussions with subjects of the focus group and management of the crop protection company
- Interface rating form for experts
- Usability testing
- User evaluation survey - summative evaluation

3.2.3 Data collection plan

A data collection matrix as illustrated in Table 3.10 indicates which instruments were used to address the various research questions.

Table 3.10 Data collection matrix

Topic of issue	Question	Literature review	Web search	E-mail/ Telephone/ Interview	Questionnaires	Usability test
Communication	How can an Internet-based communication web site assist a company to continually communicate the principles, objectives, products and services to their dealerships and their agents (primary clientele)? (Push strategy)	✓	✓	✓	✓	
	How can product-orientated and services information be disseminated to potential and existing clientele? (Pull strategy)	✓	✓	✓	✓	
	How can the use of the WWW assist in establishing and/or enhancing business-to-business networks, at a time of corporate change, without compromising standards or alienating existing customers?	✓	✓	✓	✓	
Marketing	How would an Internet-based communication web site assist in the establishment of a trust relationship between the company, and the clientele?	✓	✓	✓	✓	
Customer service	How would an Internet-based communication web site assist in the forging of loyalties between the company, and the primary clientele?	✓	✓	✓	✓	
Information design	What design factors would best facilitate the communication of the company's services, principles, objectives and products to their primary clientele?	✓	✓	✓	✓	
Web usability	To what extent can a Web-delivered programme provide information that elicits sufficient clientele motivation, acceptance and usage?	✓	✓	✓	✓	✓
	How can the Internet-based communication web site be sustained?	✓	✓	✓	✓	✓
	How can the Internet-based communication web site remain competitive?	✓	✓	✓	✓	✓

3.2.4 Description of data analysis

A combination of qualitative and quantitative analyses was used during this study. The research consisted primarily of a quantitative study, but qualitative measures were used to record the results of the interviews, needs analyses, and feedback discussions with management. In essence the quantitative analysis represents the means by which the researcher and the company's management are able to summarize the results of the research activities by means of tabulation or graphical presentation and statistical analysis. This would assist in objective decision making by the parties involved. Verbal or qualitative analysis of notes was used to draw up some constructive ideas about the design, development and production of the Internet-based communication web site. These constructive ideas were used in the four design phases. Quantitative measures were taken in the formative questionnaire (where Likert scaling was used), the summative questionnaire and the expert review checklist. The results of the usability testing were expressed as mean scores of central tendencies.

The data was analyzed in the following phases:

- Biographical variables on sections A and B of the questionnaire were processed in frequency tables and interpreted in terms of frequency percentages.
- Information design variables on Section C1 and communication and relationship building variables on Section C2 were processed in frequency tables and interpreted in terms of frequency percentages.
- Useful and fun information variables on Sections D and E were processed in frequency tables and interpreted in terms of frequency percentages.
- A comparison interpretation on selected sub groups was drawn in terms of frequency tables to gain insight into their possible impact on the evaluation of the Internet-based communication web site. The independent variables in Sections A and B were used to establish whether groups differed in their responses to the dependent (affected) variables in Sections C1 and C2.The Wilxocon rank sum test for two otherwise identical populations was used to determine

significant differences for the ranking of dependent variables (Section C1 on a 5-point Likert scale, which ranged from very bad (1,) bad (2), undecided (3), good (4), to very good (5) and Sections C2, D and E on a 5-point Likert scale which ranged from strongly disagree (1), disagree (2), undecided (3), agree (4) to strongly agree (5)) between the subgroups:

- Age category A (≤24 - 33yrs)/ B(≥34 - 57yrs)
- PC literacy - Yes/No
- Visit to Internet - Regular/Seldom
- Internet usage - Internet part of work/ Not part of work

- It was decided to investigate the following:
  - Whether different age categories differed significantly in their responses to Section C1 and C2 of the questionnaire. As ages ranged between 24 and 57 years, it was decided to analyze the relationship of the younger age group (≤24 - 33yrs) and the older age group (≥34 - 57yrs) to the dependent variables in Sections C1 and C2 of the questionnaire
  - Whether PC literate and PC illiterate groups differed significantly in their responses to Sections C1 and C2 of the questionnaire
  - Whether there was a significant difference between the responses of respondents who visited the Internet regularly and those who visited it seldom Sections C1 and C2 of the questionnaire
  - Whether groups who used the Internet as part of their work and those that did not, differed significantly in their responses to Sections C1 and C2 of the questionnaire
- The Pearson Chi - Square test for two-way frequency tables was used for testing independence, as well as for measuring the correlation between the variables (BMDP4F

Statistical software: 1990). Leedy (1980: 203-204) states that there is merit in comparing variables with each other by using techniques for the measurements of differences between variables such as the Chi-Square statistic. In this study the results are reported by providing the relevant Chi-Square statistic and the p-value which indicates whether the difference is significant or not. Any p-value greater than 0,05 indicates non-significant differences between various groups' responses to a particular statement. Any p-value equal to or less than 0,05 indicates a significant difference.

The approach adopted is only to report on those questions where a significant difference was found.

- Correlation analyses were used to investigate inter-correlation between variables. The Spearman Correlation Coefficient non-parametric test was used to investigate the measure of the degree and direction of relationships among variables between categories of the sub-groups. If relationships were found it would be possible to make predictions about the specific sub groups and their variables.

The statistical calculations were performed on the mainframe computer of the University of Pretoria with the SAS statistical package (Version 8) and BMDP4F statistical software developed by the Department of Statistics.

3.3 Description of research implementation and evaluation

Evaluation was done to achieve the following:

- To determine the extent to which the expected outcomes have been achieved
- To identify reasons for the observed performance, whether positive or negative
- To provide useful feedback for decision making
- To provide information on technology changes and replacement or updating costs

3.4 Research time frame

In order to plan, design, produce and deliver a good Internet-based communication web site, a lot of time needs to be set aside for researching the subject. Scheduling for the study was carefully worked out at the outset, but this proved to be totally unrealistic. Table 3.11 portrays the actual time frame for the research project.

Table 3.11 Time frame for research study

Activities	Date
• Literature review - preliminary	May/Oct 1999
• Final proposal	Oct/Nov 1999
• Gathering of data	May - Nov 1999
• Grouping of data	Nov/Dec 1999
• First draft of web page	Jan - Apr 2000
• Identification of problems	May 2000
• Development of recommendations	May/June 2000
• Implementation of web page	July 2000
• Data collection	September2000/ May 2001
• Data processing	June/September 2001
• Literature review - final	June/October 2001
• Research report	Oct/Nov 2001

In retrospect it should have been obvious that the time set aside for the research project was a gross underestimation, given the extent of the researchers' work related duties, the company's inability to

deliver information on time due to pressure of other work, slow response time from respondents, and the normal queuing for statistical data processing.

3.5 Setting

The research was done in the Department of Information Science, School of Information Technology at the University of Pretoria and at the headquarters of Novon Crop Protection Company. The usability testing coincided with the Novon company's conference session that took place at the Magalies Park Resort. The Managing Director orchestrated the convenience sampling. The usability testing was done in a boardroom facility at the resort which simulated a workplace setting. The questionnaires were dispatched for completion by post to every agent and dealership of the crop protection company. Due to a lack of Internet connectivity agents were issued with a CD-ROM to ensure access to the company's web site via personal computers. Regular E-mail and telephone conversations reminded them to complete and return the questionnaire to Novon's head office in Isando, Gauteng. The summative evaluation took place at the company's annual conference for their primary clientele.

3.6 Summary

This chapter dealt with the analysis, design, development, implementation and evaluation of the Internet-based communication web site. During the discussion of the planning of the empirical study, special attention was given to different design methods, defining the design specifications, production process and delivery of the web site. Further attention was given to defining the research sample, the development of the questionnaire and the different evaluation methods used in this study. The discussion of the empirical study resolves around the method of gathering data, namely the questionnaire, one-to-one interviews, formal and informal discussions, heuristic usability evaluation, usability testing and summative evaluation. In this study, both quantitative and qualitative methods were used to answer the research question and its subquestions.

In the next chapter the findings of the empirical study will be discussed as they occurred per instrument.

Chapter 4

Research Results

> ***'Our true lover of knowledge naturally strives for reality, and will not rest content with each set of particulars which opinion takes from reality, but soars with undimmed and unwearied passion till he grasps the nature of each thing as it is .....'***
>
> **Plato**

This chapter describes the findings that emerged from the research and attempts to answer the following research questions:

- What are the factors contributing to the success or failure of an Internet-based communication web site implemented to create a corporate image as perceived by primary clients?

This question is divided into five research issues relating to the factors contributing to the success or failure of an Internet-based communication web site, namely communication, marketing, customer service, information design and web usability. Findings are reported as they occurred per instrument and without cross-referencing, as integration of data follows in Chapter 5. The results from the user-evaluation questionnaire, grouped according to four main aspects, are reported first.

4.1 Results from the user evaluation questionnaire

The four main aspects of the questionnaire are reported under the following headings:

- **Section A** - The demographic and personal characteristics of the target population
- **Section B** - Computer and Internet usage experience, access and literacy
- **Section C1** - Evaluation on the information design and the usability of the Internet-based communication web site prototype

- **Section C2** - Communication, relationship building and customer service potential of the Internet-based communication web site prototype

Sections D and E were completed on a voluntary basis by some of the primary clients' spouses and children, and addressed aspects of family empowerment through the provision of 'useful and fun information' by means of a portal of relevant links. The potential of the web site to keep the family informed about the primary client's work environment, the NOVON company and its people was also addressed.

The questionnaires were checked by the researcher for completeness and response patterns; 2 questionnaires were rejected on the basis of incompleteness and detectable response patterns.

4.1.1 Results of biographical variables on Section A and B of the user evaluation questionnaire

Sections A and B of the questionnaire requested general information regarding the respondents, to facilitate comparisons between the independent variables (biographical variable) and dependent variables (questions in the other sections of the questionnaire). The results for Section A and B of the questionnaire are presented in frequency tables and interpreted in terms of frequency percentages. A brief discussion of the data follows each of the respective tables.

Table 4.1 Biographical profile of the group of agents (n=35)

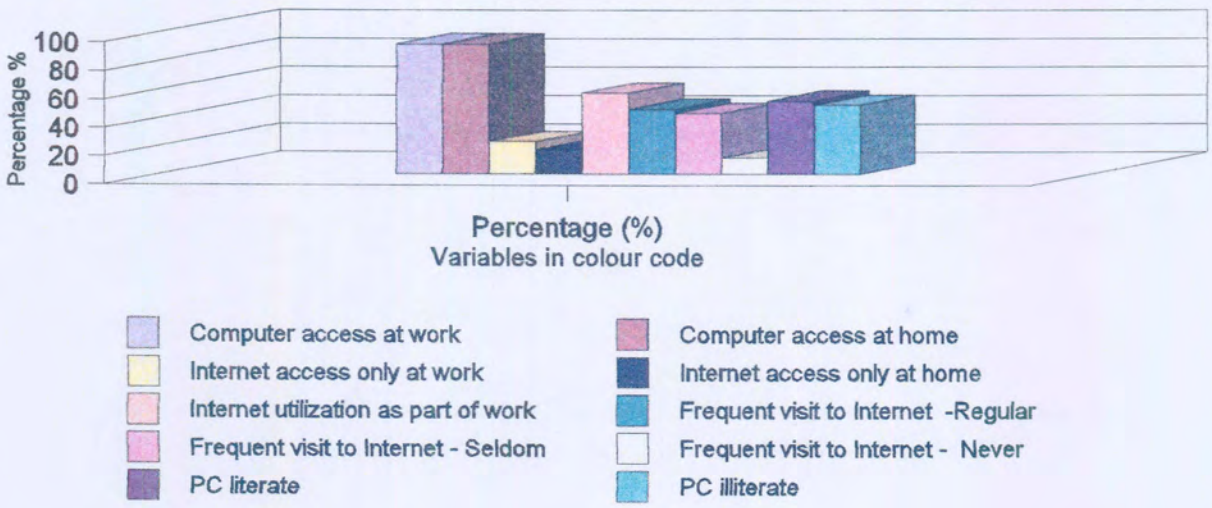
Variable	Percentage (%)
Age (yrs)	
≥ 24 - 33	37,1
≥34 - 57	62,9
Gender - male	100
Marital status	
Unmarried	22,9
Married	71,4
Divorced/Widowed	5,7
Language preference	
Afrikaans	91,4
English	8,6
Children	
Yes	68,6
No	31,4

The distribution of the sample of 35 respondents among the different biographical variables is reflected in Table 4.1. When viewing the results it should become clear that the sample consisted of mainly Afrikaans-speaking (91,4%), married (71,4%) males with children (68,6%). Their ages ranged from 24 to 57 years. The researcher, in consultation with the statistician, divided the age group along the lines of possible exposure to the Internet during formal schooling periods. With the inception of Internet technology in South Africa during the early 1990s it was calculated that 37,1% of the sample could have been exposed to the Internet. For the purposes of analysis two age categories were established: Group A ranging from 24 to 33,99 years and Group B ranging from 34 to 57,99 years.

Table 4.2 Computer and Internet usage experience, access and literacy(n=35)

Variables	Percentage (%)
Computer access at work	91,4
Computer access at home	91,4
Internet access only at work	22,9
Internet access only at home	17,1
Internet utilization as part of work	57,1
Frequent visit to Internet -Regular	45,7
Frequent visit to Internet - Seldom	42,9
Frequent visit to Internet - Never	11,4
PC literate	51,5
PC illiterate	48,6

Chart 4.1 Computer and Internet usage experience, access and literacy



When viewing the results from the table and chart above it should be observed that most of the respondents were able to access the computer either at home (91,4%) or work (91,4%) but only a very small percentage had access to the Internet at both these places (17,1% - 22,9%). However, it should be noted that more that half (57,1%) of the respondents indicated that they used the Internet as part of their work, whether at home, place of work or other undisclosed venue. In addition, 45,7% of the respondents visited the Internet on a regular basis (3 - 4 times /week), only 11,4% did not visit the Internet at all. Nearly half (48,6%) of the respondents indicated that they were PC illiterate.

4.1.2 Quantitative analysis of results of Section C1 of the user-evaluation questionnaire

Section C1 of the questionnaire requested information on the design features of the web site that would ultimately affect its usability. A statement on the design feature of the web site was given, to which the respondents had to reply by awarding a chosen value on a 5-point Likert scale which ranged from very bad (1), bad (2), undecided (3), good (4) to very good (5). For the purposes of analysis, however, categories four and five were combined. The results for Section C1 of the questionnaire are presented in two separate frequency tables and charts and interpreted in terms of frequency percentages. A brief discussion of the data follows Chart 4.2.2.

Table 4.3.1 Rank order of statements relating to the web site's design features (n=35)

Question		Bad (2) %	Undecided (3) %	Good/ very good (4&5) %
Q15	The touch and feel (overall appearance of the web site)	-	8,6	91,4
Q16	Readability of the web site	-	17,1	82,8
Q17	The effectiveness of visual material (graphics, photos, background)	-	22,9	77,2
Q22	The relevance of the information on the web site	2,9	11,4	85,7
Q23	The acceptability of the amount of information per web page	2,9	20,0	77,2
Q26	The consistency of the information presentation	8,6	17,1	74,3
Q27	The overall impression of the web site		5,7	94,3

Chart 4.2.1 Rank order of statements relating to design features (n=35)

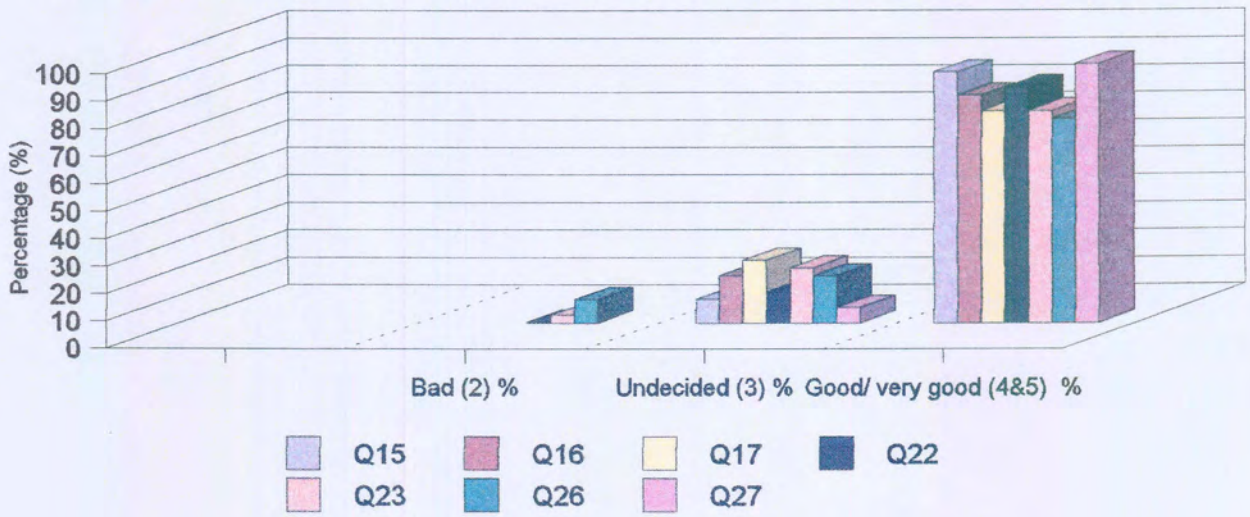


Table 4.3.2 Rank order of statements relating to the web site's design features (n=35)

Question		Bad (2) %	Undecided (3) %	Good/ very good (4&5) %
Q18	User friendliness of the web site	2,9	28,6	68,5
Q19	Ease of navigation	11,4	28,6	60,0
Q20	Navigation options available	2,9	31,4	65,7
Q21	Navigation information available to user	17,1	143	68,6
Q24	Interactivity of the web site	5,7	37,1	57,2
Q25	The association of the web site metaphor with Novon (link between Novon and its agents)	14,3	20,0	65,7

Chart 4.2.2 Rank order of statements relating to design features (n=35)

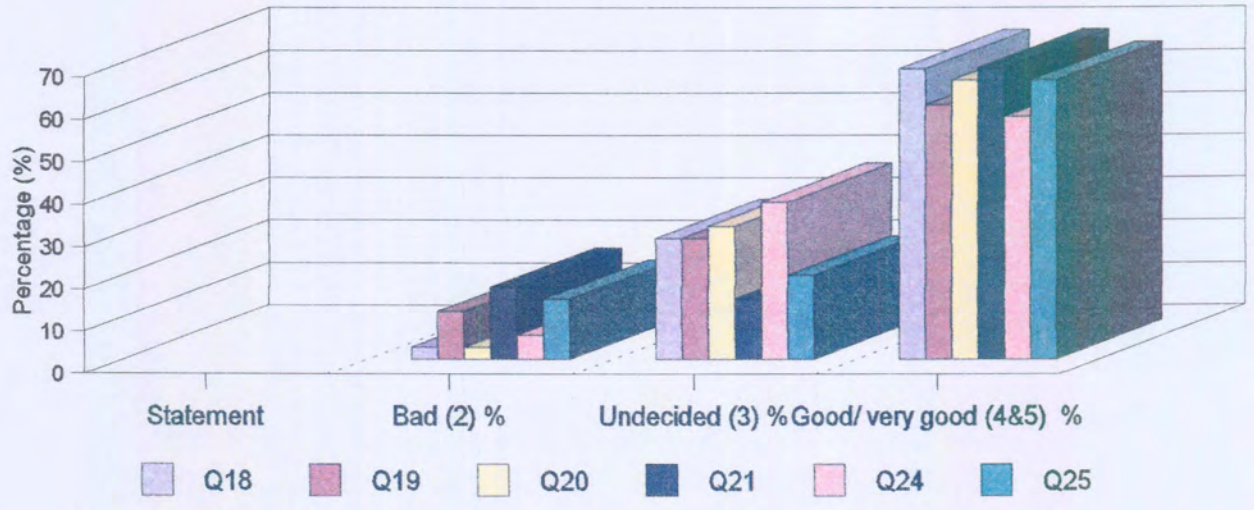


Table 4.3.1 and Chart 4.2.1 clearly indicate that the good to very good rating with each of the statements on the design features is very high, varying from 74,3 to 94,3 percent. However, from Table 4.3.2 and Chart 4.2.2 it can be noted that the percentage vote for the good to very good rating

for the statements portrayed vary between 57,2 and 68,6 percent. Most of the respondents agreed that the overall appearance (91,4%) and impression (94,3%) of the web site were very good with only a 5,7 to 8,6% fallout to the undecided rating. The same sentiment was shared by the respondents with regards to the following design features.

- Readability of web site information (82,8%)
- Relevance of information (77,2%)
- Acceptability of the amount of information per screen (85,7%)
- Effectivity of the visual material (77,2%)
- The consistency of the information presented (74,3%)

With reference to the above features it should be noted that the fallout to the undecided rating was between 11,4 and 22,9 percent.

When viewing the overall picture it becomes clear that a notable percentage of respondents (20,0% to 37,1%) were hesitant to make a decisive choice and opted for rating scale 3, i.e. the undecided option. For the purpose of analyzing this phenomenon attention is drawn to Sections A and B of the questionnaire. The biographical data shows that 48,6% of the respondents indicated that they were PC illiterate, and only 45,7% visited the Internet on a regular basis (3 - 4 times per week). Informal interviews with some of the respondents revealed that they were unfamiliar with the technical Internet language that was used in Section C1 of the questionnaire. This necessitated an undecided vote for some of the statements. It is interesting to note the effect this had on the rating percentage for ranking scales 4 and 5 (Table 4.3.1 & Table 4.3.2). Calculations show that the percentage rating for ranking scales 4 and 5 could have been as high as 100 percent for some of the statements. This demonstration of predisposition to Internet language posed to be an obstacle for completing some of the statements

on the design features of the web site. It is gratifying to note that very few of the respondents were of the opinion that some of the design features were bad. This could possibly be ascribed to a lack of knowledge of design principles.

4.1.3 Quantitative analysis of the results of Section C2 of the user evaluation questionnaire

Section C2 of the questionnaire requested information on the communication, customer service and relationship-building features of the web site that would ultimately enhance or defy the purpose thereof. A statement on the communication, customer service or relationship-building capabilities of the web site was given to which the respondents had to reply by awarding a chosen value on a 5-point Likert scale which ranged from strongly disagree (1), disagree (2), undecided (3), agree (4) to strongly agree(5). For the purposes of analysis, however, categories four and five were combined. The results for Section C2 of the questionnaire are presented in a frequency table and chart and interpreted in terms of frequency percentages. A brief discussion of the data follows Chart 4.3.

Table 4.4 Rank order of statements relating to the web site's communication, customer service and relationship-building capabilities (n=35)

Question		Disagree (2) %	Undecided (3) %	Agree/ Strongly agree (4&5) %
Q28	The web site communicates the goals, objectives, products and services of NOVON.	2,9	2,9	94,3
Q29	The Novon web site has the potential to enhance the relationship between NOVON and its clients.	2,9	5,7	91,5
Q30	The web site would confirm NOVON as brand name.	-	14,3	85,7
Q31	The web site could aid in motivating the clients to make use of NOVON's customer service.	14,3	25,7	60,0

Question		Disagree (2) %	Undecided (3) %	Agree/ Strongly agree (4&5) %
Q32	The NOVON web site has the potential to enhance the communication between Novon and its clients.	8,6	2,9	88,9
Q33	The web site has the potential to be used by its clients.	8,6	17,1	74,2
Q34	The web site has the potential to be used by all members of the family.	17,1	48,6	34,3
Q35	The download speed of the web pages are acceptable.	2,9	35,3	61,7
Q37	The links to other web sites are useful and relevant.	2,9	31,4	65,7
Q38	The web pages on 'useful and fun information for you...' are very useful and effective.	11,4	54,7	42,8

Chart 4.3 Rank order of statements depicted in Table 4.4 (n=35)

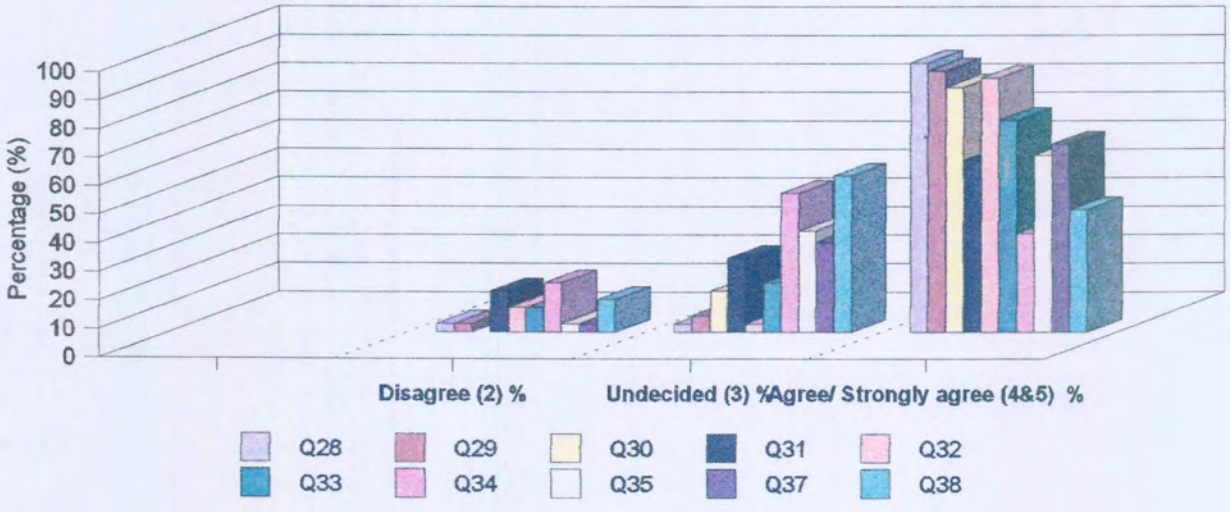


Chart 4.3 depicts respondents' views on whether the web site could enhance communication, customer service and relationship building between the company and themselves. From the results it can be

seen that they agree to strongly agree rating with the following statements for which the ratings are very high, varying from 74,2 to 94,3 percent.

- The web site communicates the goals, objectives, products and services of NOVON (94,3%).
- The Novon web site has the potential to enhance the relationship between NOVON and its clients (91,5%).
- The web site would confirm NOVON as brand name (85,7%).
- The NOVON web site has the potential to enhance the communication between NOVON and its clients (88,9%).
- The web site has the potential to be used by its clients (74,2%).

Twenty one of the 35 agents (60%) responded that the web site could aid in motivating the clients to make use of NOVON's customer service while 25,7% of the respondents were undecided on the matter. This could be due to a lack of insight into relevant literature as reported by numerous researchers in this field of study (Windham, 1999; Sterne, 1996; Peppers & Rogers, 1997; Leen, 2000). Among the respondents, 60% strongly agreed that the download speed of the web pages was acceptable, while 65,7% strongly agreed that the links to other web sites were useful and relevant. However, only 42,8% of the respondents strongly agreed with the statement 'The web pages on "useful and fun information for you...' are very useful and effective. The undecided vote for these statements was relatively high ranging from 28,6 % to 35,3 %.

The reasons behind these undecided votes were that only a very small percentage of the respondents had access to the Internet (17,1% - 22,9%) and nearly half (48,6%) considered themselves to be PC illiterate. The researcher could not intervene through instruction sessions due to the widespread distribution of agents throughout the country. Such intervention would have been at the expense of the

outcome(s) of the main research question. The technological problem of insufficient Internet access was highlighted and addressed early in the development phase of the web site. It was decided to issue the agents with a CD-ROM to ensure access to the company's web site via personal computers, even though external links would not be active. This was not seen as a major problem during the formative evaluation phase, but needed to be addressed as a matter of urgency at some stage by the company.

Interestingly, only 34,3 % of the respondents strongly agreed with the statement "The web site has the potential to be used by all members of the family". The undecided vote for this statement was nearly half (48,6%). This contradicts the result of question 40 where 62,9 % of the respondents were of the opinion that family members would use the web site. This could possibly be contributed to the yes or no response versus the rating scale for ranking the statement in question 34.

Some of the respondents gave the following reasons:

- Families were not interested in their line of work.
- They did not share their interest in the field of agriculture.
- They were PC illiterate.
- They would not understand what the web site was all about.
- They did not need to see the web site.

Finally, 40 % of the respondents indicated that they would make use of the web site on a daily or weekly basis, while the majority respondents (74,3%) indicated that the most important information on the web site was the following:

- Product information
- Product guide
- Product labels
- Agricultural news and newsletters
- Success stories
- Research results
- Development reports on new products
- Links to relevant sites such as the Weather Bureau, economic forums and SA Agric.

4.1.4 Quantitative analysis of results of Sections D and E of the user evaluation questionnaire

Sections D and E requested input on a voluntary basis from the respondents' spouses and children. Statements that addressed aspects of family empowerment through the provision of 'useful and fun information' by means of a portal of relevant links, as well as the potential of the web site to keep the family informed about the primary client's work environment, the NOVON company and its employees, were given. Respondents had to reply by awarding a chosen value on a 5-point Likert scale which ranged from strongly disagree (1), disagree (2), undecided (3), agree (4) to strongly agree (5). For the purpose of analysis, however, categories four and five are combined. The results for each section are presented in two frequency tables and charts and interpreted in terms of frequency percentages. A brief discussion of the data follows Chart 4.4.2.

Table 4.5 Rank order of statements relating to the web site's external interactivity and communication options and relationship building capabilities with the spouses (n=15)

Question		Disagree (2) %	Undecided (3) %	Agree/ Strongly agree (4&5) %
Q46	The web page dedicated to each family member, "useful and fun information" is very useful and effective.	6,7	26,7	66,7
Q48	The links to other web sites are useful and relevant.	-	26,7	73,3
Q50	The NOVON web site has the potential to keep the family informed about the primary client's work environment, the NOVON company and its employees.	-	25,0	75,1

Chart 4.4 Rank order of statements depicted in Table 4.5 (n=15)

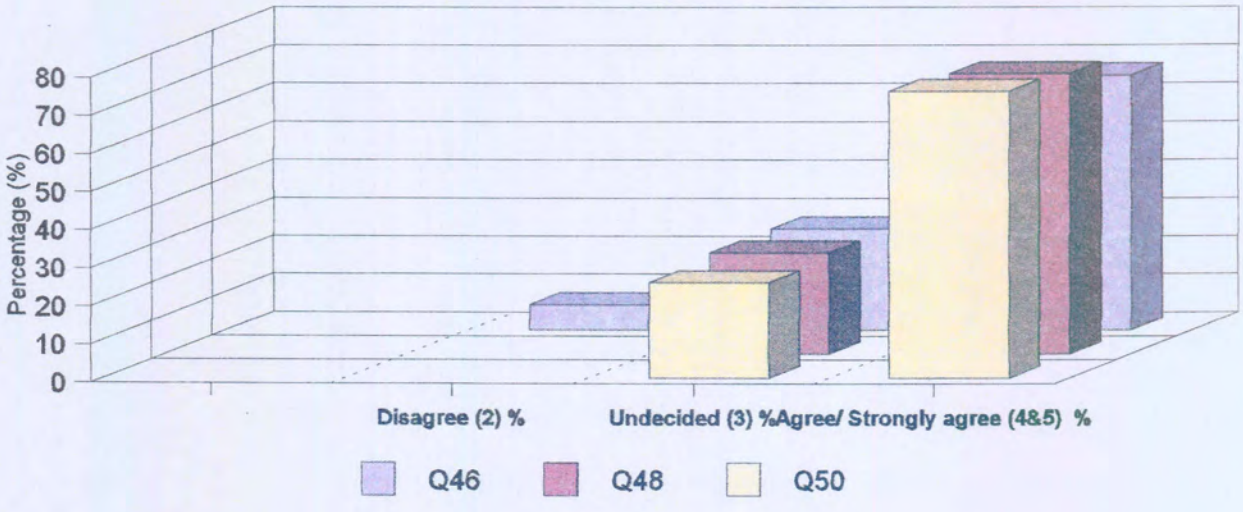
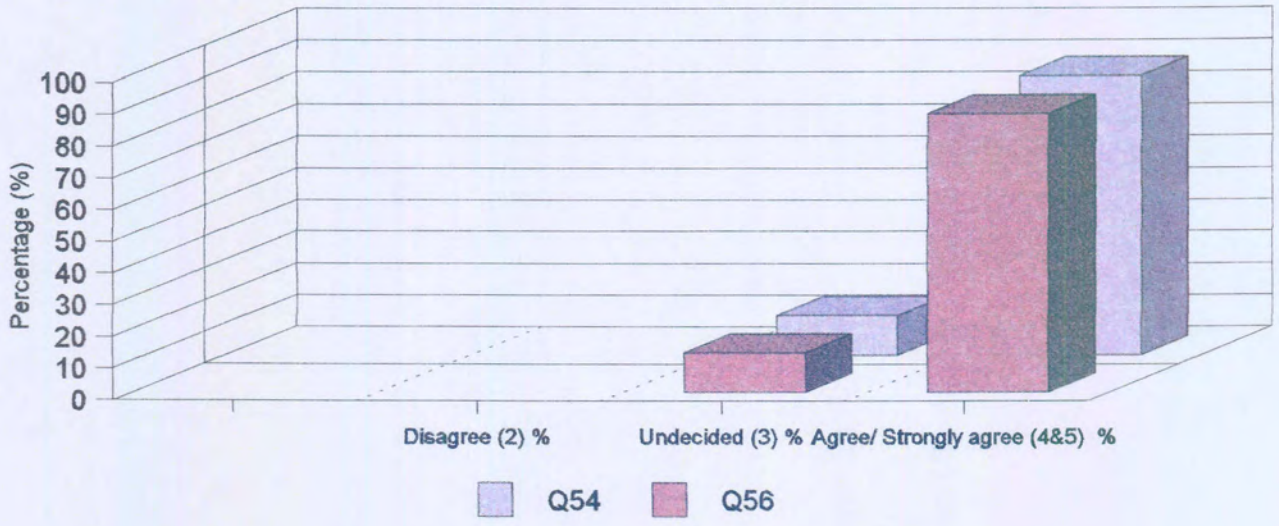


Table 4.6 Rank order of statements relating to the web site's external interactivity and communication options and relationship building capabilities with the children (n=8)

Question		Disagree (2) %	Undecided (3) %	Agree/ Strongly agree (4&5) %
Q54	The web page dedicated to the children, "useful and fun information for the children/little ones" is very useful and effective.	-	12,5	87,5
Q56	The NOVON web site has the potential to keep me informed about my father's work environment, the NOVON company and its people.	-	12,5	87,5

Chart 4.5 Rank order of statements as portrayed in Table 4.6 (n=8)



Both Table 4.5 and Table 4.6 indicate that a very small number of spouses and children, i.e. 15 and 8, completed Sections D and E of the questionnaire respectively. The ages of the children ranged from 7 to 19 years, of which 55,6% were male and 44, 4% female. The researcher needed their input because it seemed fitting to examine their motivation as family members for such a web site. At the outset of the study, respondents were asked to include their families in the research study. However, the majority of respondents did not comply with the request. The researcher is of the opinion that the choice that was given disqualified the necessity.

The family members who did complete the sections, showed a notable positive response (66% - 75,1%; 87,5%), supporting the idea of the inclusion of web pages specially designed for their needs. They were also positive regarding the possibility of accessing the working world of their spouses or fathers by means of the Internet-based communication web site. This is in contrast with the result of question 34, where only 34,3% of the respondents strongly agreed that the web site had the potential to be used by their family members.

4.1.5 The search for differences between sub groups

This section describes the findings that emerged from analyzing the following selected sub groups in an attempt to establish whether these groups differed in their responses to the variables in Section C1 and C2.

- Age category A (≤24 - 33yrs)/ B(≥34 - 57yrs)
- PC literacy - PC illiteracy
- Regular visits to Internet - Irregular visits to Internet (Seldom)
- Internet usage - Internet part of work/ Not part of work

The Wilxocon rank sum test for two otherwise identical populations was used to determine significant differences for ranking variables (Section C1 on a 5-point Likert scale which ranged from very bad (1), bad (2), undecided (3), good (4) to very good (5), and Sections C2, D and E on a 5-point Likert scale, which ranged from strongly disagree (1), disagree (2), undecided (3), agree (4) to strongly agree (5)) between the sub-groups.

The Pearson Chi - Square test for two-way frequency tables was used for testing independence, as well as for measuring the correlation between the variables (BMDP4F statistical software: 1990).

The following variables in Sections C1 and C2 were investigated:

- Whether different age categories differed significantly in their responses to Sections C1 and C2 of the questionnaire. As ages ranged between 24 and 57 years, it was decided to analyze the relationship of the younger age group ($\leq$24 - 33yrs) and the older age group ($\geq$34 - 57yrs) to the dependent variables in Sections C1 and C2 of the questionnaire separately.
- Whether PC literate and PC illiterate groups differed significantly in their responses to Sections C1 and C2 of the questionnaire.
- Whether there was a significant difference between respondents who visited the Internet regularly and those who seldom visited it regarding their responses to Sections C1 and C2 of the questionnaire.
- Whether groups who used the Internet as part of their work and those that did not differed significantly regarding their responses to Sections C1 and C2 of the questionnaire.

The difference between the responses of the subgroups are depicted in corresponding figures below each table. Seeing that a small sample size was used, these results are tentative. Table 4.7 and Chart 4.6 depict the results of the Wilcoxon Rank Sum Test for comparing 'Age Groups' by means of ranking variables (1-5 scale).

Table 4.7 Results of the Wilcoxon Rank Sum Test for comparing 'Age Groups' by means of ranking variables (1-5 scale)

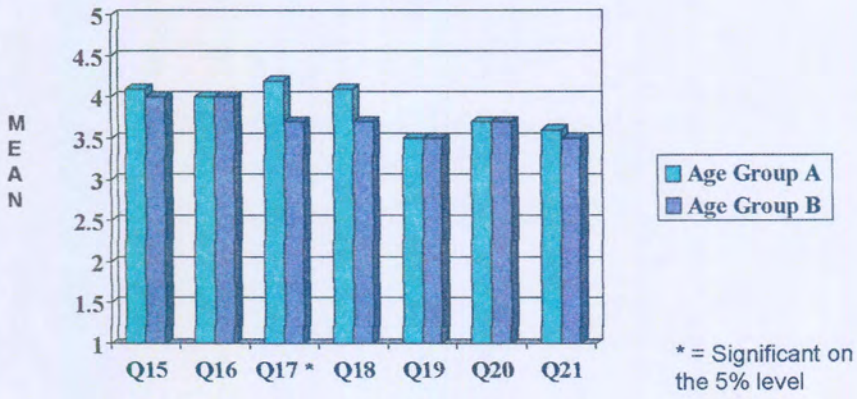
Variables	Age Groups				P
	≤ 33 years (n=13)		≥ 34 years (n=22)		
	Mean	Std. Dev.	Mean	Std. Dev.	
Q15	4,1	0,3	4,0	0,5	0,4050
Q16	4,0	0,6	4,0	0,5	0,8465
Q17	**4,2**	**0,6**	**3,7**	**0,5**	**0,0171***
Q18	4,1	0,8	3,7	0,7	0,1506
Q19	3,5	1,1	3,5	0,7	0,9699
Q20	3,7	0,5	3,7	0,8	0,8925
Q21	3,6	0,8	3,5	0,9	0,6265
Q22	3,8	0,7	4,0	0,5	0,6242
Q23	3,7	0,9	4,1	0,6	0,1135
Q24	3,4	0,7	3,6	0,7	0,6310
Q25	3,5	0,9	3,7	0,9	0,5172
Q26	3,5	0,8	3,8	0,7	0,3278
Q27	4,0	0,4	4,1	0,4	0,5321
Q39	2,8	0,7	2,5	0,7	0,2481

* Significant on the 5% level

The independent variable (age groups) that does exhibit a significant difference in the review of Table 4.7 is the ranking of question 17 that states that 'The visual material (graphics, photos, background)

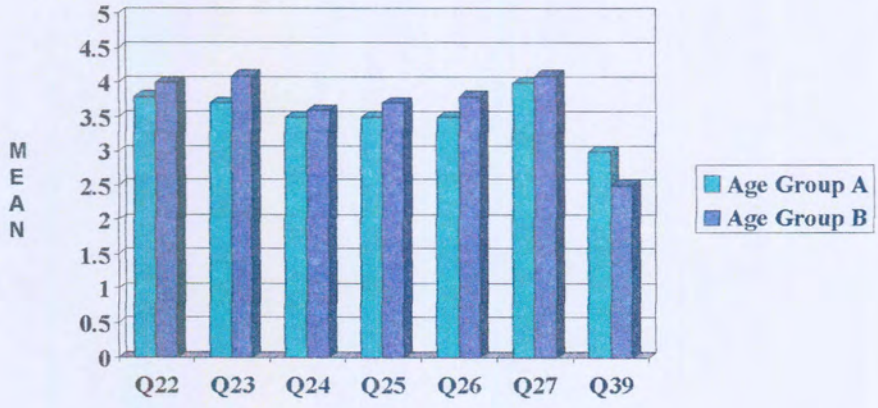
used in the web site is very effective'. The respondents from the two age groups did not differ meaningfully in respect of their responses to the other ranking variables depicted in Table 4.7. The information reported in Table 4.7 is depicted in Chart 4.6.1 and 4.6.2.

Chart 4.6.1 Results of Wilcoxon Rank Sum Test for comparing age groups by means of ranking variables (1- 5 Scale)
Age Group A ≤ 33 years(n=13)
Age Group B ≥34 years(n=22)



* = Significant on the 5% level

Chart 4.6.2 Results of Wilcoxon Rank Sum Test for comparing age groups by means of ranking variables (1- 5 Scale)
Age Group A ≤ 33 years(n=13)
Age Group B ≥34 years(n=22)

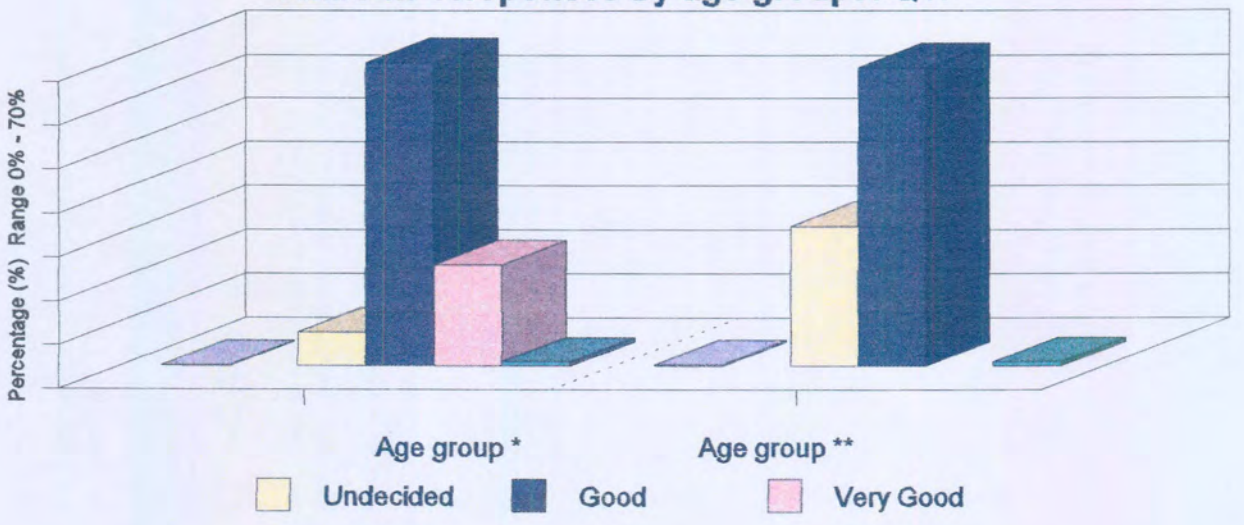


The information contained in Table 4.7 and Chart 4.6.1 needs to be placed into perspective to make it even more meaningful. This can be achieved by calculating the percentage of responses of each group on each question to clarify the nature of the difference. The approach adopted here is only to report on questions where a significant difference was found. The percentages are provided in Table 4.8.

Table 4.8 Percentage responses by age categories: Question 17

Question 17: Statement - The visual material (graphics, photos, background) used in the web site is very effective.						
Response	Age group (≤24 - 33yrs) (n=13)		Age group (≥34 - 57yrs) (n=22)		Row Total	
	Frequency	%	Frequency	%	Frequency	%
Undecided	1	7,69	7	31,82	8	22,86
Good	9	69,23	15	68,18	24	68,57
Very Good	3	23,08	-	-	3	8,57
Col Total	13	100	22	100	35	100

Chart 4.7 Responses by age groups: Q17



Age group* = Age group (≤24 - 33yrs) (n=13)

Age group ** = Age group (≥34 - 57yrs) (n=22)

Table 4.8 and Chart 4.7 depict the differences and similarities in respondents' response to the statement regarding the effectiveness of the visual material (graphics, photos, background) used on the web site. Chart 4.7 indicates that the most notable difference was the difference in the response of the younger agents (23,08%) to the effectiveness of the visual material, rating it as very good while some of the older agents (31,82%) were undecided on the matter. Otherwise, the responses of the two age groups were fairly similar, rating the effectiveness of the visual material (graphics, photos, background) used in the web site as good (69,23% and 68,57%).

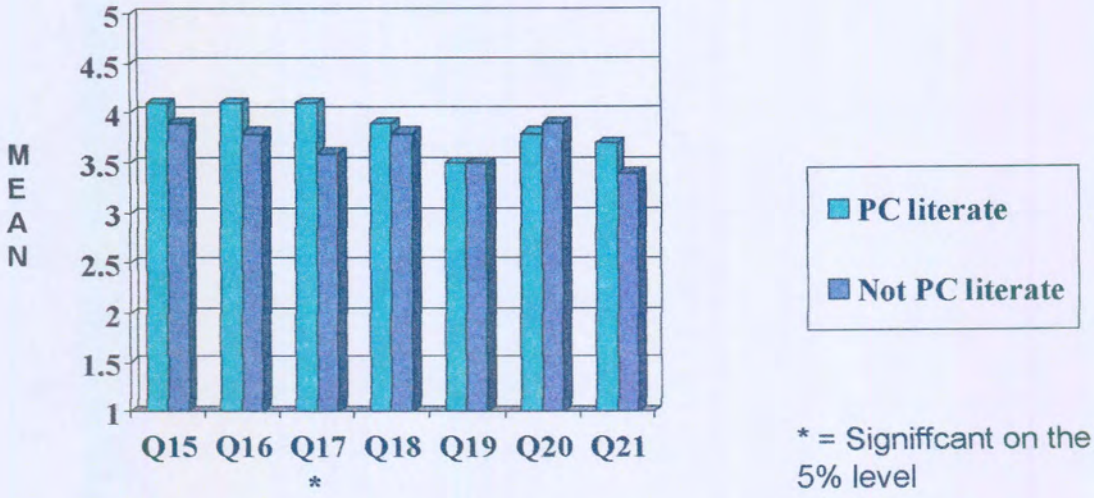
The following section describes the findings that emerged from analyzing the PC literacy - PC illiteracy subgroups in an attempt to establish whether these two groups differed in respect of their responses to the variables in Sections C1 and C2. Table 4.9, Chart 4.8.1 and Chart 4.8.2 depict the results of the Wilcoxon Rank Sum Test for comparing PC literacy and PC illiteracy by means of ranking variables (1-5 scale).

Table 4.9 Results of the Wilcoxon Rank Sum Test for comparing 'PC literacy - PC illiteracy' by means of ranking variables (1-5 scale)

Variables	PC literacy - PC illiteracy				P
	PC literate (n=18)		PC illiterate (n=17)		
	Mean	Std Dev.	Mean	Std Dev.	
Q15	4,1	0,5	3,9	0,3	0,1074
Q16	4,1	0,6	3,8	0,4	0,2198
Q17	**4,1**	**0,5**	**3,6**	**0,5**	**0,0049***
Q18	3,9	0,7	3,8	0,8	0,6914
Q19	3,5	1,0	3,5	0,7	0,7149
Q20	3,8	0,7	3,6	0,6	0,1792
Q21	3,7	0,6	3,4	1,0	0,2639
Q22	4,0	0,7	3,9	0,5	0,3546
Q23	4,0	0,8	3,9	0,7	0,6752
Q24	3,7	0,5	3,4	0,8	0,2650
Q25	3,8	0,9	3,5	0,9	0,4105
Q26	3,8	0,5	3,6	0,9	0,5868
Q27	4,1	0,2	4,1	0,6	0,9398
Q39	2,7	0,7	2,6	0,7	0,6737
*** Significant on the 5% level**					

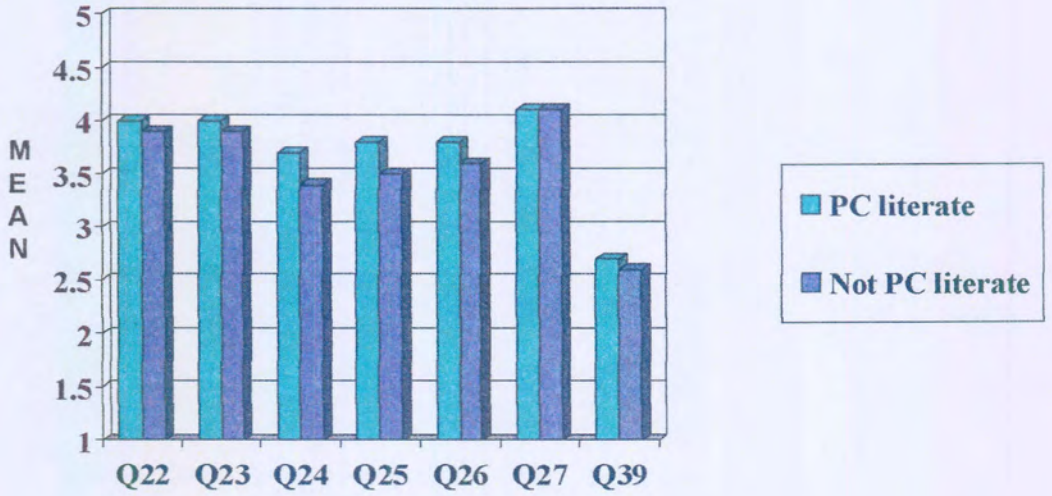
The independent variable (PC literacy and PC illiteracy), which does exhibit a significant difference in the review of Table 4.9, is the ranking of question 17 that states 'The visual material (graphics, photos, background)used in the web site is very effective'. The respondents from the two subgroups did not differ meaningfully in respect of their responses to the other ranking variables depicted in Table 4.9. The information reported in Table 4.9 is illustrated in Charts 4.8.1 and 4.8.2.

Chart 4.8.1 Results of Wilcoxon Rank Sum Test for comparing PC literacy by means of ranking variables (1- 5 Scale)
PC literate (n=18)
PC illiterate (n=17)



* = Signiffcant on the 5% level

Chart 4.8.2 Results of Wilcoxon Rank Sum Test for comparing PC literacy by means of ranking variables (1- 5 Scale)
PC literate (n=18)
PC illiterate (n=17)



To clarify the nature of the difference established in Question 17, the percentages of the responses of each group are calculated and reported in Table 4.10 and Chart 4.9.

Table 4.10 The frequency procedure of PC literacy/PC illiteracy by Question 17 by means of a rating scale (1-5)

Question 17: Statement - The visual material (graphics, photos, background)used in the web site is very effective.						
Response	PC literacy (n=18)		PC illiteracy (n=17)		Row Total	
	Frequency	%	Frequency	%	Frequency	%
Undecided	1	5,56	7	41,8	8	22,86
Good	14	77,78	10	58,2	24	68,57
Very Good	3	16,67	-	-	3	85,7
Col Total	18	100	17	100	35	100

Chart 4.9 The frequency procedure of PC literacy/PC illiteracy by Q17

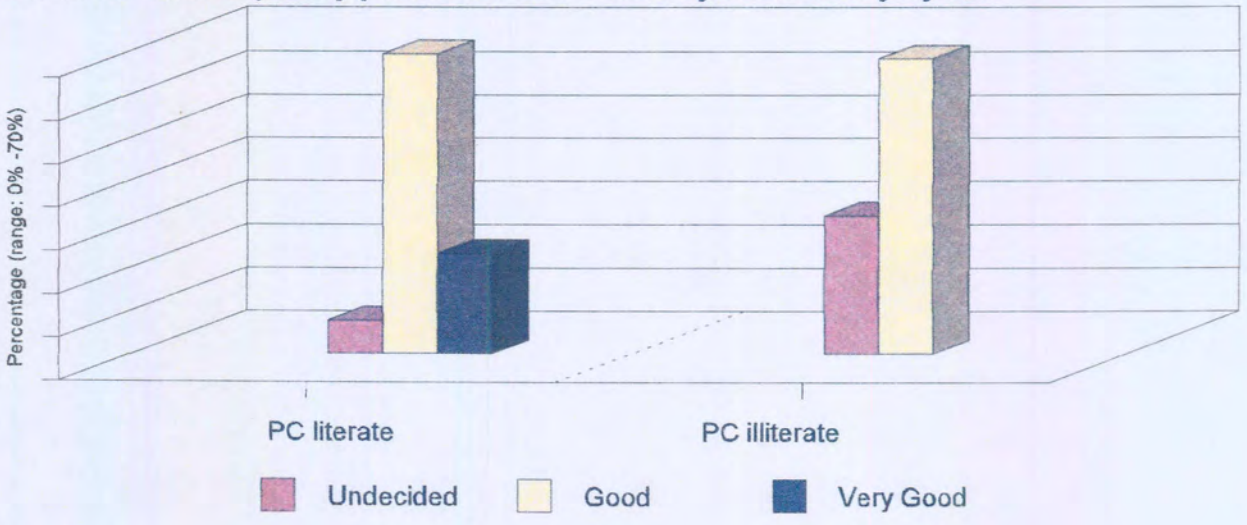


Table 4.10 and Chart 4.9 depict the differences and similarities in respondents' responses to the statement regarding the effectiveness of the visual material (graphics, photos, background) used in the web site. Chart 4.8.1 indicates that the most notable difference was the difference in the response of the PC literate agents (16,67%) to the effectiveness of the visual material, rating it as very good, while some of the PC illiterate agents (41,18%) were undecided on the matter. Regarding rating scale 4 (good) the responses of the two groups differed only slightly, rating the effectiveness of the visual material (graphics, photos, background) used on the web site as good (77,78% and 58,82% respectively).

The following section describes the findings that emerged from analyzing the 'Use of Internet as part of work/Use of Internet not part of work' subgroups in an attempt to establish whether these two groups differ in respect of their responses to the variables in Sections C1 and C2. Table 4.11 and Chart 4.10.1 and 4.10.2 depict the results of the Wilcoxon Rank Sum Test for comparing 'Use of Internet as part of work/Use of Internet not part of work' subgroups by means of ranking variables (1-5 scale).

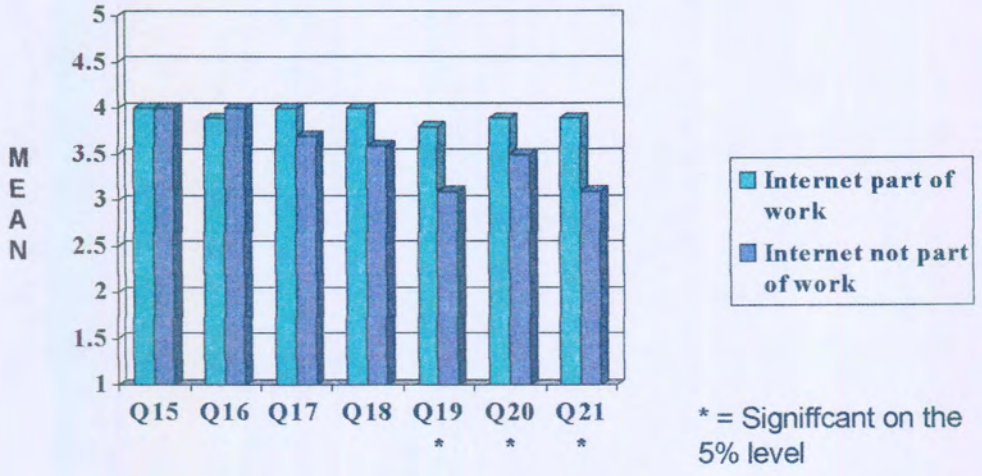
Table 4.11 Results of the Wilcoxon Rank Sum Test for comparing "Use of Internet as part of work/Use of Internet not part of work" by means of ranking variables (1-5 scale)

Variables	'Use of Internet as part of work/Use of Internet not part of work'				P
	Use of Internet as part of work (n=20)		Use of Internet not part of work (n=15)		
	Mean	Std Dev.	Mean	Std Dev.	
Q15	4,0	0,3	4,0	0,5	1,0000
Q16	3,9	0,6	4,0	0,5	0,5850
Q17	4,0	0,5	3,7	0,6	0,2361
Q18	4,0	0,6	3,6	0,8	0,1258
Q19	**3,8**	**0,7**	**3,1**	**0,9**	**0,0222***
Q20	**3,9**	**0,6**	**3,5**	**0,6**	**0,0226***
Q21	**3,9**	**0,6**	**3,1**	**0,9**	**0,0107***
Q22	3,9	0,7	4,1	0,5	0,3278
Q23	3,9	0,9	4,1	0,5	0,3116
Q24	3,7	0,7	3,3	0,6	0,810
Q25	3,7	0,9	3,7	0,9	0,9712
Q26	3,7	0,7	3,7	0,7	0,5692
Q27	4,1	0,4	4,0	0,4	0,4766
Q39	2,7	0,6	2,7	0,8	0,8970

*** Significant on the 5% level**

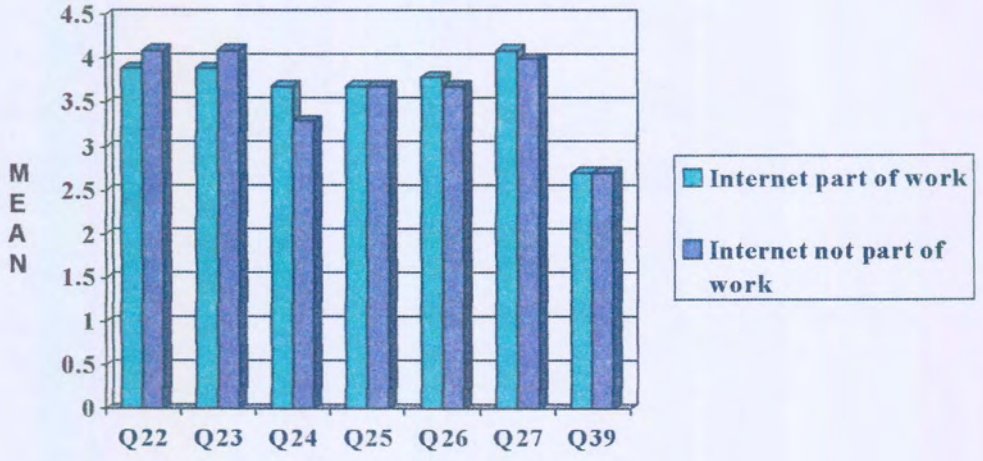
The independent variable (Use of Internet as part of work/Use of Internet not part of work) that does exhibit a significant difference in the review of Table 4.11 is the ranking of Question 19, 20 and 21 that states. 'The ease of navigation, navigation options and navigation information available to the user on the web site are very effective'. The respondents from the two subgroups did not differ meaningfully in respect of their responses to the other ranking variables portrayed in Table 4.11. The information reported in Table 4.11 is illustrated in Charts 4.10.1 and 4.10.2.

Chart 4.10.1 Results of Wilcoxon Rank Sum Test for comparing Internet utilization as part of work by means of ranking variables (1- 5 Scale)
Internet part of work (n=20)
Internet not part of work (n=15)



* = Signiffcant on the 5% level

Chart 4.10.2 Results of Wilcoxon Rank Sum Test for comparing Internet utilization as part of work by means of ranking variables (1- 5 Scale)
Internet part of work (n=20)
Internet not part of work (n=15)



To clarify the nature of the differences established in Question 19, 20 and 21, the percentages of responses of each group are calculated and reported in Table 4.12.1 to 4.12.3 and Charts 4.11.1 to 4.11.3.

Table 4.12.1 The frequency procedure of Internet utilization as part of work versus no Internet utilization as part of work by Question 19 by means of a rating scale (1-5)

Question 19: Statement - The ease of navigation						
Response	Internet utilization as part of work versus (n=20)		No Internet utilization as part of work (n=15)		Row total	
	Frequency	%	Frequency	%	Frequency	%
Very bad	-	-	1	6,67	1	2,86
Bad	1	5,0	2	13,33	3	8,57
Undecided	4	20,0	6	40,00	10	28,57
Good	13	65,0	6	40,00	19	54,29
Very good	2	10,0	-	--	2	5,71
Col total	20	100	15	100	35	100

Chart 4.11.1 The frequency procedure of Internet use vs No Internet use by Q19

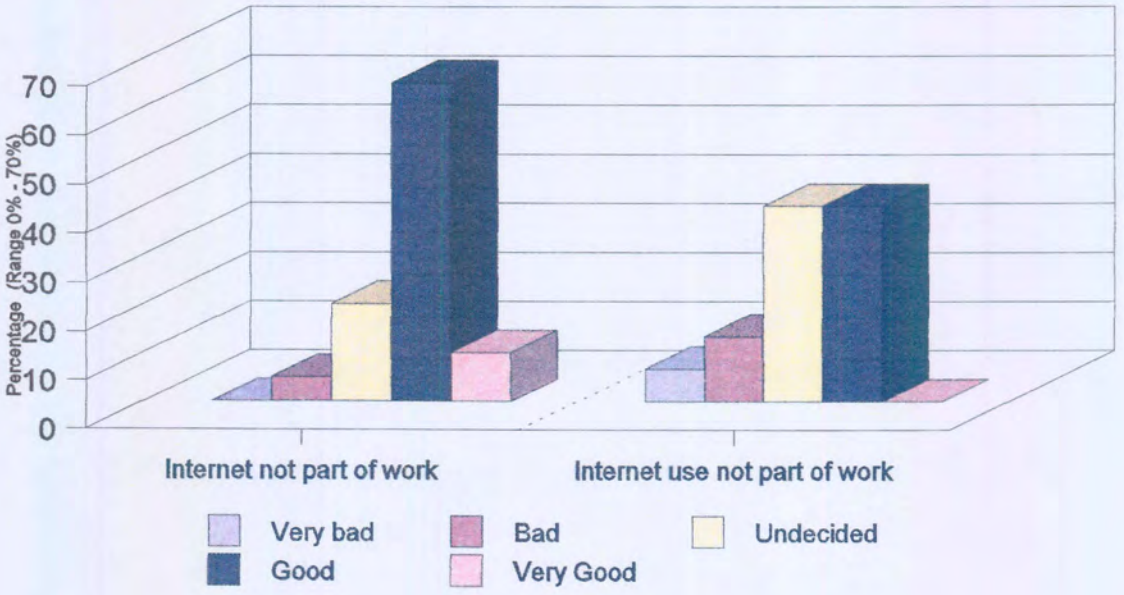


Table 4.12.1 and Chart 4.11.1 depict the differences in respondents' responses to the statement regarding the ease of navigation of the web site. Chart 4.11.1 shows that the most notable difference was the difference in the response of the agents who used the Internet as part of their work (75,0%) to the ease of navigation, rating it as good to very good, while agents who did not use the Internet as part of their work (40,0%) rated it good and 40 % were undecided on the matter. There are no real similarities in their responses.

To clarify the nature of the differences established in Question 20, the percentages of responses of each group are calculated and reported in Table 4.12.2 and Chart 4.11.2.

Table 4.12.2 The frequency procedure of Internet utilization as part of work versus no Internet utilization as part of work by Question 20 by means of a rating scale (1-5)

Question 20: Statement - Navigation options available to user						
Response	Internet utilization as part of work versus (n=20)		No Internet utilization as part of work (n=15)		Row total	
	Frequency	%	Frequency	%	Frequency	%
Very bad	-	-	-	-	-	-
Bad	1	5,0	-	-	1	2,86
Undecided	2	10,0	9	60,0	11	31,43
Good	15	75,0	5	33,33	20	57,14
Very good	2	6,67	1	6,67	3	8,57
Col total	20	100	15	100	35	100

Chart 4.11.2 The frequency procedure of Internet use vs No Internet use by Q20

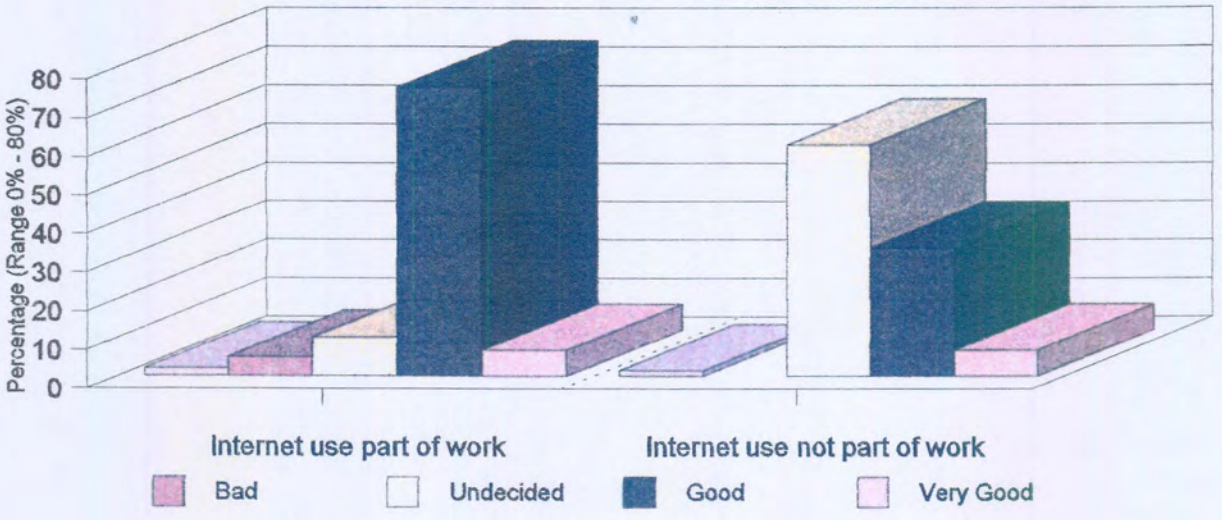


Table 4.12.2 and Chart 4.11.2 depict the differences and similarities in respondents' responses to the statement regarding the navigation option available on the web site. Chart 4.11.2 shows that the most notable difference was the difference in the responses of the agents that used the Internet as part of their work (81,67%) to the statement on navigation options, rating it as good to very good, while agents who did not use the Internet as part of their work(40,0%) rated it good, with as much as 60% of this group being undecided on the matter.

To clarify the nature of the differences established in Question 21 the response percentages of each group are calculated and reported in Table 4.12.3 and Chart 4.11.3.

Table 4.12.3 The frequency procedure of Internet utilization as part of work versus no Internet utilization as part of work by Question 21 by means of a rating scale (1-5)

Question 21: Statement - Navigation information available to user						
Response	**Internet utilization as part of work versus (n=20)**		**No Internet utilization as part of work (n=15)**		**Row total**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Very bad	-	-	-	-	-	-
Bad	1	5,0	5	33,3	6	17,1
Undecided	2	10,0	3	20,0	5	14,3
Good	16	80,0	7	46,7	23	65,7
Very good	1	5,0	-	-	1	2,9
Col total	20	100	15	100	35	100

Chart 4.11.3 The frequency procedure of Internet use vs No Internet use by Q21

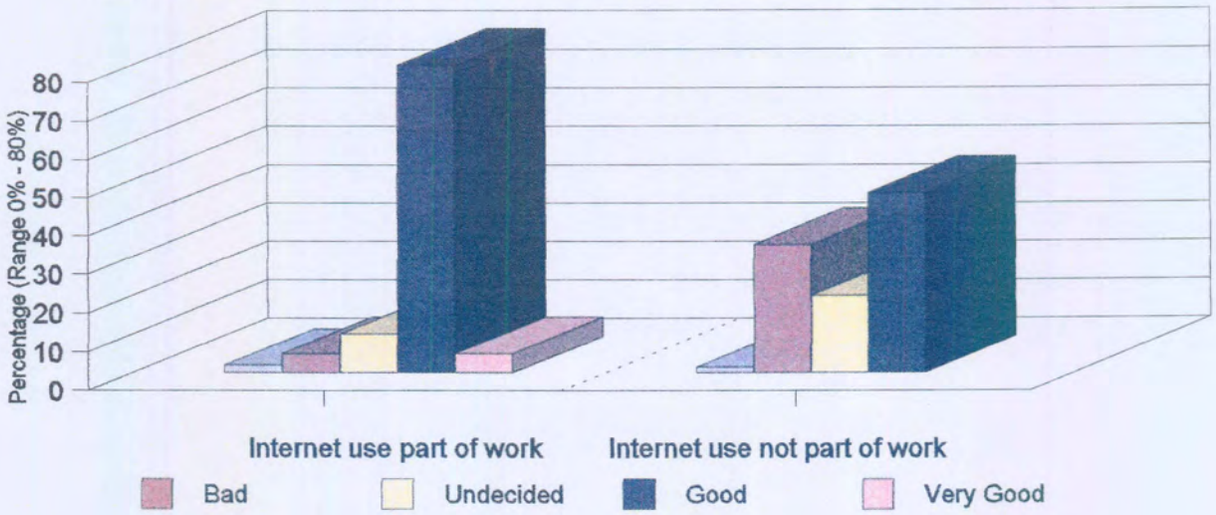


Table 4.12.3 and Chart 4.11.3 depict the differences and similarities in respondents' responses to the statement regarding the navigation information available on the web site. Chart 4.11.3 clearly illustrates that the most notable difference was the difference in the response of the agents that used the Internet as part of their work (85,0%) to the statement on navigation information available, rating it as good to very good while agents who did not use the Internet as part of their work(46,7%) rated it good while as much as 33,3 percent of this group rated it as bad.

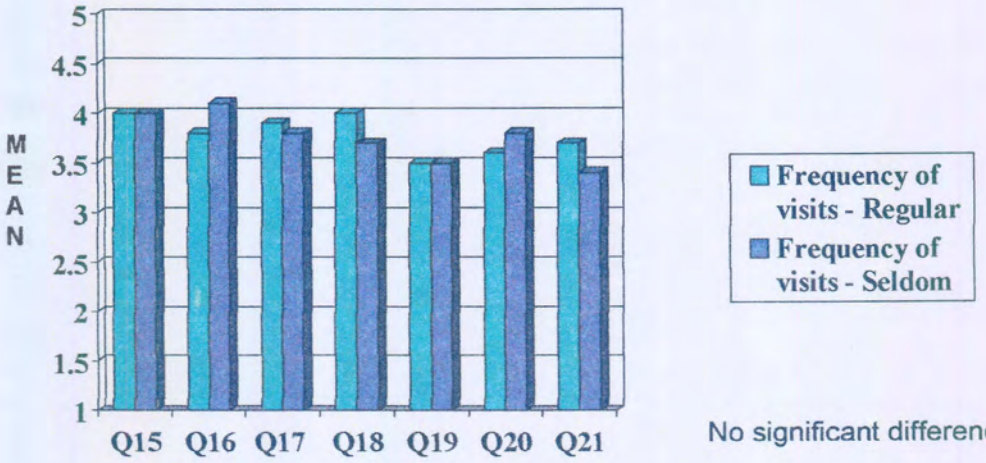
The following section describes the findings that emerged from analyzing the "Regular visits to the Internet versus Irregular visits to Internet (Seldom)" sub groups in an attempt to establish whether these two groups differ in their responses to the variables in Section C1 and C2. Table 4.13 and Chart 4.12.1 and 4.12.2 depict the results of the Wilcoxon Rank Sum Test for comparing "Regular visits to the Internet versus Irregular visits to Internet (Seldom)" sub groups by means of ranking variables (1-5scale).

Table 4.13 Results of the Wilcoxon Rank Sum Test for comparing 'Regular visits to the Internet versus Irregular visits to Internet (Seldom)' by means of ranking variables (1-5 scale)

Variables	'Regular visits to the Internet versus Irregular visits to Internet (Seldom)'				P
	Regular visits to the Internet (n=16)		Irregular visits to the Internet (n=19)		
	Mean	Std. Dev.	Mean	Std. Dev.	
Q15	4,0	0,4	4,0	0,5	1,0000
Q16	3,8	0,5	4,1	0,5	0,1886
Q17	3,9	0,6	3,8	0,5	0,4406
Q18	4,0	0,7	3,7	0,7	0,2466
Q19	3,5	1,0	3,5	0,8	0,8690
Q20	3,6	0,6	3,8	0,7	0,6668
Q21	3,7	0,8	3,4	0,8	0,3255
Q22	3,9	0,7	4,0	0,5	0,6815
Q23	3,9	0,9	4,1	0,6	0,5835
Q24	3,6	0,6	3,5	0,7	0,7514
Q25	3,4	1,0	3,9	0,8	0,1142
Q26	3,6	0,7	3,8	0,7	0,2581
Q27	4,0	0,5	4,1	0,3	0,4795
Q39	2,6	0,6	2,7	0,7	0,3490
* Significant on the 5% level					

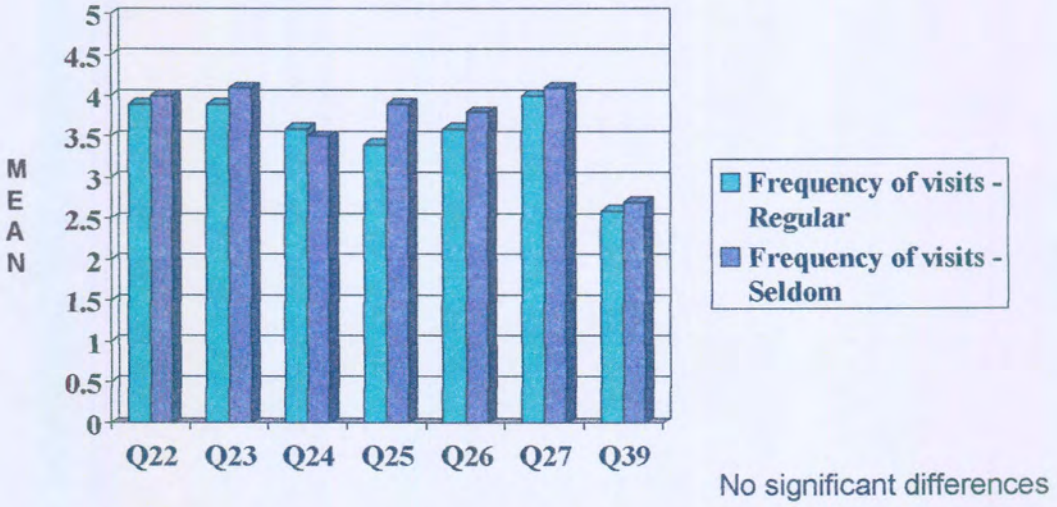
The respondents from the two sub groups did not differ meaningfully in their responses to the other ranking variables portrayed in Table 4.13. The information reported in Table 4.13 is portrayed in Chart 4.12.1 and 4.12.2.

Chart 4.12.1 Results of Wilcoxon Rank Sum Test for comparing frequency of visits to Internet by means of ranking variables (1- 5 Scale)
Visits to Internet – Regular (Daily to 3-4/week) (n=16)
Visits to Internet - Seldom (1-2/month)(n=19)



No significant differences

Chart 4.12.2 Results of Wilcoxon Rank Sum Test for comparing frequency of visits to Internet by means of ranking variables (1- 5 Scale)
Visits to Internet – Regular (Daily to 3-4/week) (n=16)
Visits to Internet - Seldom (1-2/month)(n=19)



No significant differences

This concludes the analysis of differences between subgroups.

The followings section reports on the search for significant differences between subgroups (independent variables) in response to the questions/statements in Section C1 and C2 (dependent variables) of the questionnaire.

It was found that significant differences for ranking dependant variables Section C1 on a 5-point Likert scale, which ranged from very bad (1), bad (2), undecided (3), and good (4) to very good (5) and Sections C2, D & E on a 5-point Likert scale, which ranged from strongly disagree (1), disagree (2), undecided (3) and agree (4) to strongly agree (5)) do exist between the sub-groups. The results can be summarized by stating that there are five dependent variables on which there is a significant difference between the responses of the different sub groups.

There was an overall positive agreement on the dependent variables in Sections C1 and C2 by the following subgroups:

- Age category A (≤24 - 33yrs)
- PC literate
- Regular visits to Internet
- Internet usage - Internet part of work

However, when viewing the results it becomes clear that there was a definite lack in decision making by the following subgroups:

- Age category B(≥34 - 57yrs)
- PC illiterate
- Irregular visits to Internet (Seldom)

- Internet usage - Internet not part of work

For easy reference, the variables on which a significant difference exit between the subgroups are shown in Table 4.14.

Table 4.14 Summary of dependent variables in respect of which a significant difference exists between the different subgroups

Question 17: Statement - The visual material (graphics, photos, background) used on the web site is very effective.	
Sub group	**Significant differences**
Age group (≤24 - 33yrs)/ Age group (≥34 - 57yrs)	The most notable difference was the difference in the response of the younger agents (23,08%) to the effectiveness of the visual material, rating it as very good, while some of the older agents (31,82%) were undecided on the matter. Otherwise, the responses of the two age groups were quite similar, rating the effectiveness of the visual material (graphics, photos, background) used on the web site as good (69,23% and 68,57% respectively).
PC literacy/PC illiteracy	The most notable difference was the difference in the response of the PC literate agents (16,67%) to the effectiveness of the visual material, rating it as very good while some of the PC illiterate agents (41,18%) were undecided on the matter. With regards to rating scale 4 (good) the responses of the two groups differed only slightly, rating the effectiveness of the visual material (graphics, photos, background) used in the web site as good (77,78% and 58,82% respectively).
Question 19: Statement - The ease of navigation	
Sub group	**Significant difference**
Internet utilization as part of work versus / No Internet utilization as part of work	The most notable difference occurred in respect of the question concerning ease of navigation, with the agents that used the Internet as part of their work (75,0%), rating it as good to very good, while agents who did not use the Internet as part of their work (40,0%) rated it good and 40% were undecided. There are no real similarities in their responses.
Question 20: Statement - Navigation options available to user	
Sub group	**Significant difference**
Internet utilization as part of work versus no Internet utilization as part of work	The most notable difference with regard to the statement relating to navigation options was the difference between the response of the agents that used the Internet as part of their work (81,67%), who rated it as good to very good, while agents who did not use the Internet as part of their work (40,0%) rated it good, with as much as 60 % of this group remaining undecided on the matter.
Question 21: Statement - Navigation information available to user	
Sub group	**Significant difference**
Internet utilization as part of work versus no Internet utilization as part of work	The most notable difference in this regard was the difference in the response of the agents that used the Internet as part of their work (85,0%) who rated it as good to very good, while agents who did not use the Internet as part of their work (46,7%) rated it good, with as much as 33,3 % of this group rating it as bad.

This concludes the findings on the user evaluation questionnaire. The results from the usability test are reported in the following section.

4.2 Results from the usability test

The usability test consisted of the following three basic usability-related questions.

- Can users complete their tasks satisfactorily? [Effectiveness]
- How long do users take? [Efficiency]
- Are users satisfied? [Satisfaction]

The test situation was made as natural as possible by simulating a working environment. The observers were as unobtrusive as possible and observed the test in silence. The task instructions informed the users what they needed to achieve, without giving any clues about which web site features to use.

The usability of the web site was evaluated by a convenience sampling of the proposed end users. Information gathered from the thinking aloud protocol did not need to be aggregated or analysed before it could be used. The recorded measures were counting items of equal value that were used to establish acceptance. The results for the recorded measures are presented in frequency tables and interpreted in terms of frequency percentages. A brief discussion of the data follows each table.

Participants were requested to complete a questionnaire on the above-mentioned usability metrics. The questionnaire requested information on the effectiveness, efficiency and satisfaction features of the web site. A statement on the effectiveness, efficiency and satisfaction features of the web site

was given, to which the participants had to reply by awarding a chosen value on a 5-point Likert scale which ranged from strongly disagree (1), disagree (2), undecided (3) and agree (4)to strongly agree (5). For the purposes of analysis, however, categories four and five are combined to ensure a less fragmented measure. The results are presented in frequency tables and charts and interpreted in terms of frequency percentages. A brief discussion of the data follows each graphic representation.

The findings of the usability questionnaire are reported under the following headings:

- **Section A** - The demographic and personal characteristics of the target population, as well as computer literacy and Internet usage
- **Section B** - Results on the efficiency of the Internet-based communication web site prototype
- **Section C** - Results on the satisfaction of the Internet-based communication web site
- **Section D** - Results on the effectiveness of the Internet-based communication web site prototype

4.2.1 Results of biographical variables on Section A of the usability test

Section A of the test requested general information regarding the respondents, who were selected by means of convenience sampling. Data obtained from users in each category for the sample of users that represented the intended user group are presented in a frequency table and interpreted in terms of frequency percentages . A brief discussion of the data follows Table 4.15.

Table 4.15 Biographical profile of the group (n=13)

User profile	Area managers (n=6) Percentage (%)	Agents (n=7) Percentage (%)
Age range	41 - 55 years old	30 - 56 years old
Gender - male	100%	100%
Language preference		
Afrikaans	83,34%	100%
English	16,66%	-
Frequent visit to Internet		
Regular (3 - 4 x per week)	33,32%	28,57%
Seldom (1 - 2 x month)	33,33%	28,57%
Never	16,66%	42,86%
PC literacy		
Literate	16,66%	14,28%
Enough experience to cope	-	14,28%
Lack PC skills	83,33%	57,14%
Illiterate	-	14,28%

The distribution of the sample of 13 participants among the different biographical variables is illustrated in Table 4.15. When viewing the results it should become clear that the sample consisted mainly of Afrikaans-speaking males (92,3%). An examination of the user profile of each group of participants, shows that both groups indicated a lack of computer skills (area managers: 83,33%; agents: 71,42%) and only a third (area managers: 33,32%; agents: 28,57%) visited the Internet on a regular basis. The main difference between the two groups is their employment status, which represents the end-user group.

4.2.2. Results of Section B to D of the usability evaluation questionnaire

Section B of the questionnaire requested information on the efficiency of the Internet-based web based communication web site prototype (Appendix F). Statements on the efficiency of the web site were given, to which the participants had to reply by awarding a chosen value on a 5-point Likert scale which ranged from strongly disagree (1), disagree (2), undecided (3) and agree (4) to strongly agree (5). Data obtained from users in each category for the sample of users that represented the intended end-user group is presented in frequency tables and interpreted in terms of frequency percentages. A brief discussion of the data follows the graphical representations.

Table 4.16.1 Rank order of statements relating to the efficiency of the web site (n=13)

Question 1: Statement - I completed the performance tasks in a very short period of time						
Response	Agents		Area managers		Row total	
Scale (1-5)	Frequency	%	Frequency	%	Frequency	%
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	1	16,7	1	7,69
Undecided	-	-	-	-	-	-
Agree	4	57,1	4	66,6	8	61,54
Strongly agree	3	42,9	1	16,7	4	30,77
Col total	7	100	6	100	13	100

Question 2: Statement - The down load speed of the web pages are acceptable						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	-	-	-	-
Undecided	1	14,3	-	-	1	7,69
Agree	1	14,3	-	-	1	7,69
Strongly agree	5	71,4	6	100	11	84,62
Col total	7	100	6	100	13	100

Question 3: Statement - The links work efficiently						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	-	-	-	-
Undecided	-	-	-	-	-	-
Agree	5	71,4	-	-	5	38,46
Strongly agree	2	28,6	6	100	8	61,54
Col total	7	100	6	100	13	100

Chart 4.13.1 The frequency procedure of agents and area managers by Q1 by means of a rating scale (1-5)

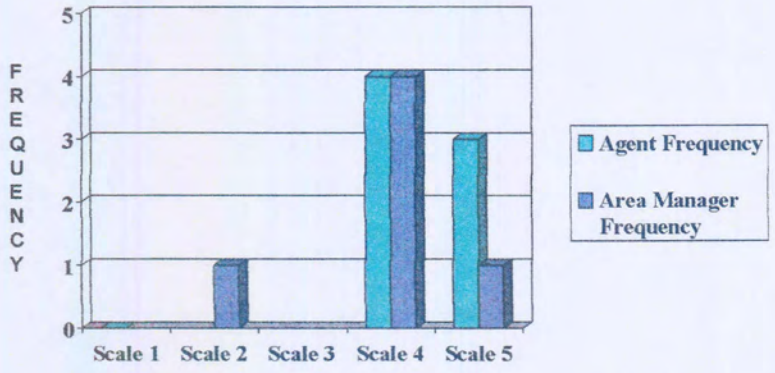


Chart 4.13.2 The frequency procedure of agents and area managers by Q2 by means of a rating scale (1-5)

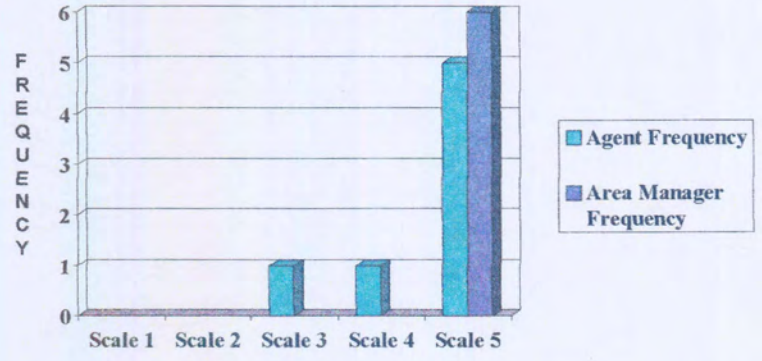


Chart 4.13.3 The frequency procedure of agents and area managers by Q3 by means of a rating scale (1-5)

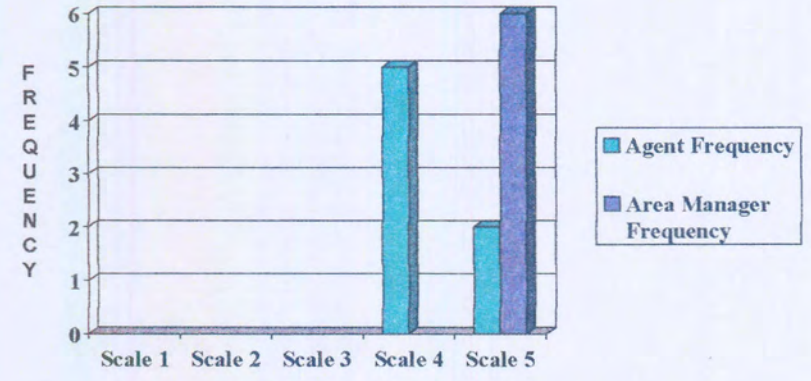


Table 4.16.1 and Charts 4.13.1 - 4.13.3 depict the similarities in participants' responses to the statements regarding the efficiency of the web site. The charts clearly illustrate that the majority of the agents and area managers were notably satisfied with the statements on the efficiency of the web site. Both groups agreed to and strongly agreed to the statements (Q - Q3).

Section C of the questionnaire describes the findings that emerged from analysing the responses of the agents and area managers to the statements relating to the satisfaction experienced from using the web site. The ratings of the statements by both the participants are depicted in Table 4.16.2 and Charts 4.13.4 to 4.13.8.

Table 4.16.2 Rank order of statements relating to the satisfaction of the web site (n=13)

Question 4: Statement - It was easy to complete the performance tasks						
Response scale (1-5)	**Agents**		**Area managers**		**Row total**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	-	-	-	-
Undecided	-	-	-	-	-	-
Agree	6	85,7	2	33,3	5	61,54
Strongly agree	1	14,3	4	66,7	8	38, 46
Col total	7	100	6	100	13	100
Question 5: Statement - It was easy to find the information						
Response scale (1-5)	**Agents**		**Area managers**		**Row total**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	-	-	-	-
Undecided	-	-	3	50	3	23,08
Agree	5	71,4	-	-	5	38,46
Strongly agree	2	28,6	3	50	5	38,46
Col total	7	100	6	100	13	100

Question 6: Statement - It was easy to understand the navigation information						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	-	-	-	-
Undecided	1	14,3	-	-	1	7,69
Agree	2	28,6	1	16,6	3	23,08
Strongly agree	4	57,1	5	83,4	9	69,23
Col Total	7	100	6	100	13	100
Question 7: Statement - The web navigation is easy to use						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	-	-	-	-
Undecided	-	-	-	-	-	-
Agree	4	57,1	2	33,3	6	46,15
Strongly agree	3	42,9	4	66,7	7	53,85
Col Total	7	100	6	100	13	100
Question 8: Statement - I am satisfied with the user friendliness of the web site						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	-	-	-	-
Undecided	-	-	-	-	-	-
Agree	5	71,4	2	33,4	7	53,85
Strongly agree	2	28,6	4	66,7	6	46,15
Col total	7	100	6	100	13	100

Chart 4.13.4 The frequency procedure of agents and area managers by Q4 by means of a rating scale (1-5)

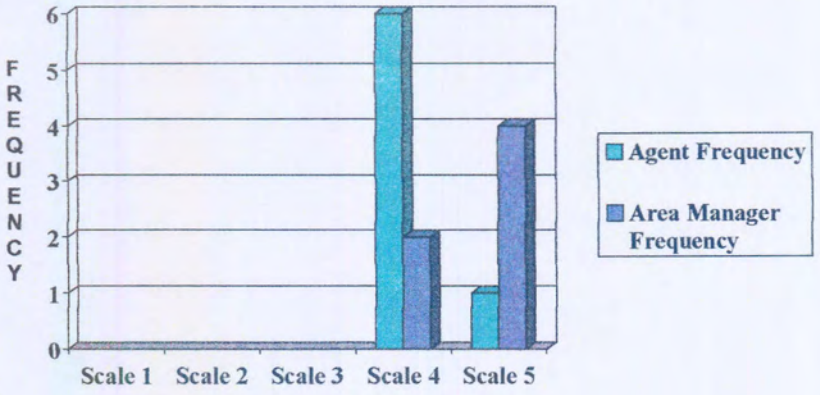


Chart 4.13.5 The frequency procedure of agents and area managers by Q5 by means of a rating scale (1-5)

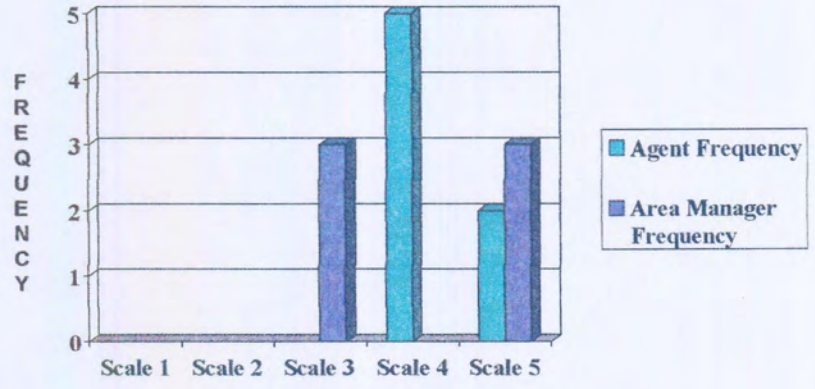


Chart 4.13.6 The frequency procedure of agents and area managers by Q6 by means of a rating scale (1-5)

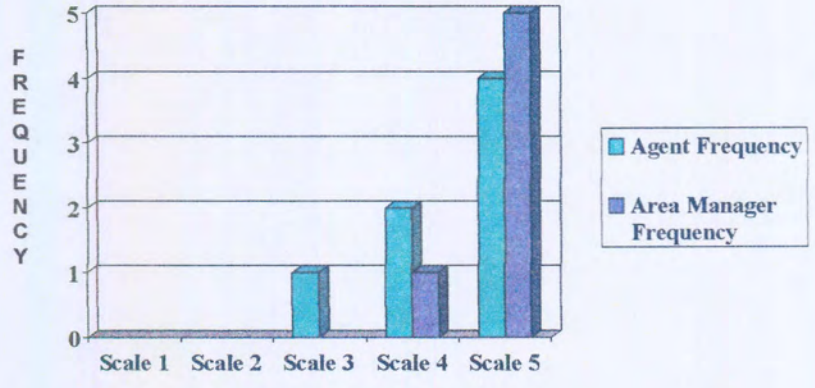


Chart 4.13.7 The frequency procedure of agents and area managers by Q7 by means of a rating scale (1-5)

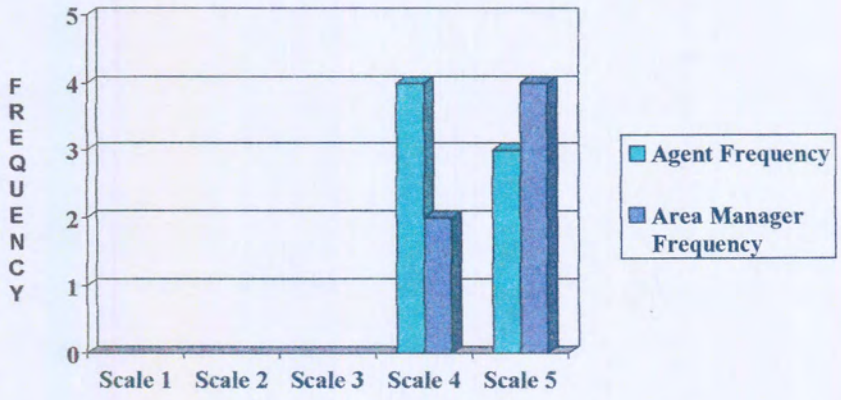
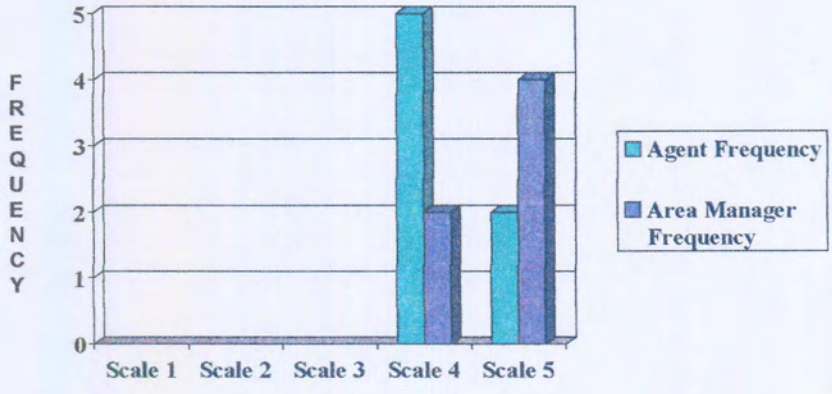


Chart 4.13.8 The frequency procedure of agents and area managers by Q8 by means of a rating scale (1-5)



The results of Table 4.16.2 and Charts 4.13.4 to 4.13.8 show a positive tendency, indicating agreement with most of the statements relating to satisfaction.

There was agreement to strong agreement by the area managers on the following statements:

- It was easy to complete the performance tasks (agree: 33,3%; strongly agree: 66,7%).
- It was easy to understand the navigation information (agree: 16,6%; strongly agree: 83,4%).
- The web navigation is easy to use (agree: 33,3%; strongly agree: 66,7%).
- I am satisfied with the user friendliness of the web site (agree:33,4%; strongly agree: 66,7%).

There was also agreement to strong agreement by the agents on the above-mentioned statements:

- It was easy to complete the performance tasks (agree: 28,6%; strongly agree: 57,1%).
- It was easy to understand the navigation information (agree: 71,4%; strongly agree: 28,6%).
- The web navigation is easy to use (agree: 57,1%; strongly agree: 42,9%).
- I am satisfied with the user friendliness of the web site (agree: 71,4%; strongly agree: 28,6%).

The sum of agreement to strong agreement varies from 76,92 % to 100 %, indicating a strong trend of agreement with all the statements on satisfaction.

In Section D a statement on the effectiveness of the web site was given, to which the participants had to reply by awarding a chosen value on a 5-point Likert scale which ranged from very bad (1), bad (2), undecided (3) and good (4) to very good (5). The results for Section D are presented in frequency tables and charts and interpreted in terms of frequency percentages. A brief discussion of the data follows the graphic representations.

Table 4.16.3 Rank order of statements relating to the effectiveness of the web site (n=13)

Question 9: Statement - The amount of information per web page						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Very bad	-	-	-	-	-	-
Bad	-	-	-	-	-	-
Undecided	1	14,3	1	16,6	2	15,4
Good	5	71,4	3	50,0	8	61,5
Very good	1	14,3	2	33,4	3	23,1
Col Total	7	100	6	100	13	100
Question 10: Statement - The navigation information available						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Very bad	-	-	-	-	-	-
Bad	-	-	-	-	-	-
Undecided	1	14,3	-	-	1	7,69
Good	5	71,4	-	50,0	8	61,54
Very good	1	14,3	6	50,0	4	30,77
Col Total	7	100	6	100	13	100
Question 11: Statement - The readability of the information						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Very bad	-	-	-	-	-	-
Bad	-	-	-	-	-	-
Undecided	-	-	-	-	-	-
Good	3	42,9	-	-	3	23,08
Very good	4	57,1	6	100	10	76,92
Col total	7	100	6	100	13	100

Question 12: Statement - The touch and feel of the web site						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Very bad	-	-	-	-	-	-
Bad	-	-	-	-	-	-
Undecided	-	-	-	-	-	-
Good	3	42,9	1	16,6	4	30,77
Very good	4	57,1	5	83,4	9	69,23
Col total	7	100	6	100	13	100

Chart 4.13.9 The frequency procedure of agents and area managers by Q9 by means of a rating scale (1-5)

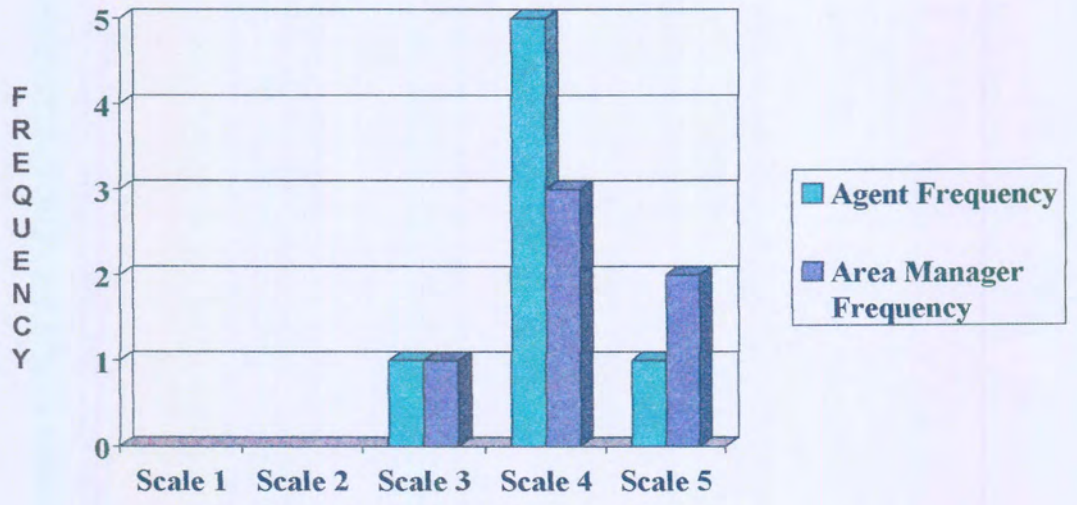


Chart 4.13.10 The frequency procedure of agents and area managers by Q10 by means of a rating scale (1-5)

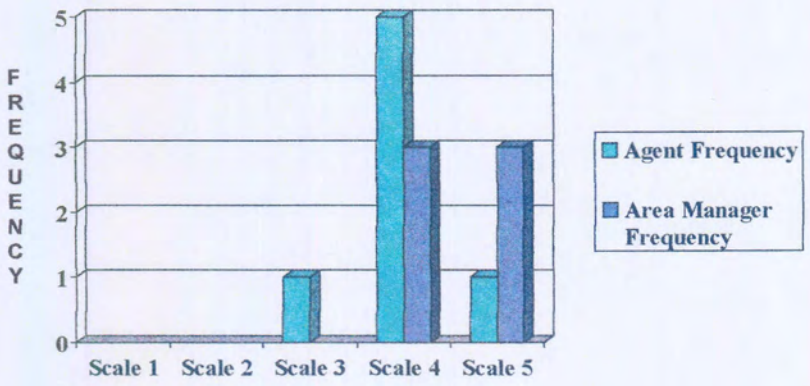


Chart 4.13.11 The frequency procedure of agents and area managers by Q11 by means of a rating scale (1-5)

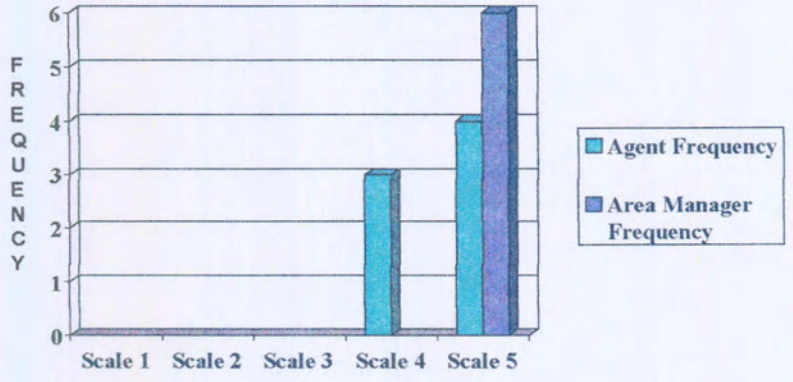
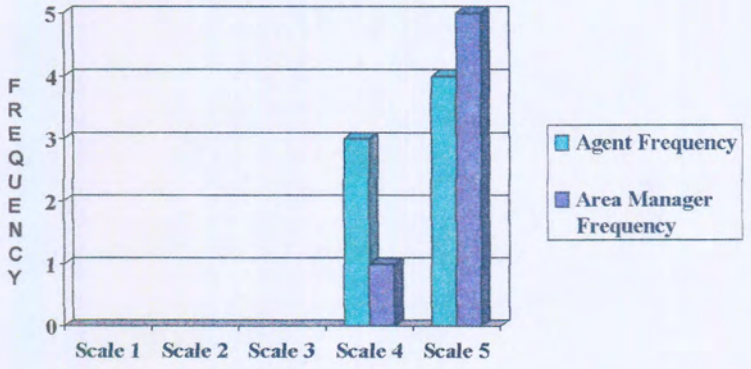


Chart 4.13.12 The frequency procedure of agents and area managers by Q12 by means of a rating scale (1-5)



It is evident from Table 4.16.3 and Chart 4.13.9 to 4.13.12 that there are in excess of 84,6%, good to very good ratings for all the statements on the effectiveness of the web site. The statements on the readability of the information and the touch and feel of the web site received the strongest support.

There were good to very good ratings by the area managers on the following statements:

- The amount of information per web page (good: 50,0%; very good: 33,4%).
- The navigation information available (good: 50,0%; very good: 50,0%).
- The readability of the information (very good: 100%).
- The touch and feel of the web site (good: 16,6%; very good: 83,4%).

There were good to very good ratings by the agents on the following statements:

- The amount of information per web page (good: 71,4%; very good: 14,3%).
- The navigation information available (good: 71,4%; very good: 14,3%).
- The readability of the information (good: 42,9%: very good: 57,1%).
- The touch and feel of the web site (good: 42,9%: very good: 57,1%).

The sum of good to very good ratings varies from 84,6% to 100%, indicating a strong trend of agreement with all the statements on the effectiveness of the web site.

This concludes the analysis of the data from the usability questionnaire. It is evident from the results that both groups were of the opinion that the web site withstood the test for usability on the measures of the effectiveness, efficiency and satisfaction.

4.2.3 Results of the performance tasks of the usability test

The aim of the usability test was to validate the usability of the Internet-based communication web site for the Novon Crop Protection company. Representative users were asked to complete typical tasks, and measures (number of mouse clicks and seconds per task) were taken of effectiveness, efficiency and satisfaction. The usability test results are presented in frequency tables and charts and interpreted in terms of frequency percentages. The mean extent to which each task was completed and correctly completed scored as a percentage. A brief discussion of the data follows the graphic representations (Charts 4.14.1 - 4.14.4), where after the information gathered from the thinking aloud protocol that was used in conjunction with the performance measurements, is reported (see p162).

Tables 4.17.1 and 4.17.2 depict the results of the usability test.

Table 4.17.1 Results of the usability test: Area managers (clicks and seconds per task)

Area managers (n = 6)																		
Task	1		2		3		4		5		6		Average		Std Dev.		Median	
	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.
1	3	01:18	4	00:33	3	00:26	4	00:26	4	00:27	4	00:11	3.67	00:33	0.5164	0.01457	4	00:30
2	5	01:13	5	00:50	3	00:36	3	00:37	3	00:48	3	00:21	3.67	00:44	1.0328	0.01111	3	0.03
3	4	02:35	4	01:29	4	01:01	3	00:16	3	00:29	6	01:49	4.00	01:16	1.09545	0.03298	4	0.03
4	3	01:25	2	00:46	2	00:18	3	01:49	3	00:35	4	00:19	2.83	00:52	0.75277	0.02356	3	0.02
5	3	01:17	3	00:11	3	00:19	3	00:10	3	00:08	3	00:05	3.00	00:21	0	0.01744	3	0.01
6	3	01:34	3	00:21	3	00:08	5	00:54	4	00:43	3	00:12	3.50	00:38	0.83666	0.0206	3	0.03
7	4	01:00	4	00:29	3	00:26	8	01:34	3	00:51	4	00:19	4.33	00:46	1.8619	0.0178	4	0.02
8	2	01:34	4	00:44	5	00:35	4	00:18	5	00:23	6	00:21	4.33	00:39	1.36626	0.01812	4.5	0.02
9	5	01:44	3	00:22	2	00:26	3	00:13	3	00:21	3	00:19	3.17	00:34	0.98319	0.02186	3	00:24
10	4	01:51	7	02:08	5	00:40	9	02:07	7	01:04	3	00:22	5.83	01:22	2.2286	0.02928	6	01:27
Ave	3.60	01:33	3.90	00:47	3.30	00:29	4.50	00:50	3.80	00:34	3.90	00:25	3.83	00:46				

Table 4.17.2 Results of the usability test: Agents (clicks and seconds per task)

Agents (n = 7)																						
	1		2		3		4		5		6		7		Average		Std Dev.		Median	
Task	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.	Click	Sec.	Clicks	Sec.	Clicks	Sec.	Clicks	Sec	Clicks	Sec.	Clicks	Sec.	Clicks	Sec.
1	4	00:27	3	00:52	4	01:09	4	00:36	4	00:18	4	00:34	4	00:08	3.9	00:34	0.378	0.014	4	00:34
2	3	00:23	3	00:08	4	02:38	4	00:41	3	01:03	3	00:26	3	00:27	3.3	00:49	0.488	0.035	3	00:27
3	2	00:48	3	00:35	3	01:24	3	00:23	5	01:29	3	00:42	6	01:09	3.6	00:55	1.3973	0.018	3	0.03
4	2	00:05	3	00:08	2	00:07	2	00:04	2	00:08	2	00:18	2	00:07	2.1	00:08	0.378	0.003	2	0
5	3	00:11	3	00:08	3	00:12	3	00:10	3	00:11	3	00:41	3	00:14	3	00:15	0	0.008	3	0
6	9	01:18	3	00:15	4	01:03	6	01:55	9	01:59	3	00:41	6	01:22	5.8	01:13	2.5635	0.026	6	0.05
7	2	00:38	7	00:49	4	01:07	3	01:25	3	00:22	6	02:19	11	02:08	5.1	01:15	3.132	0.031	4	0.05
8	3	00:17	4	01:26	5	01:38	4	00:15	3	01:22	5	00:31	3	00:17	3.9	00:49	0.8997	0.026	4	0.02
9	3	00:18	3	00:08	3	01:59	3	00:28	3	00:07	3	00:35	3	00:05	3	00:31	0	0.028	3	0.01
10	5	01:47	4	00:42	5	02:06	4	00:44	5	01:25	4	01:38	4	00:55	4.4	01:19	0.5345	0.023	4	0.06
Ave	3.6	00:37	3.6	00:31	3.7	01:20	3.6	00:40	4	00:50	3.6	00:50	4.5	00:41	3.8	00:47				

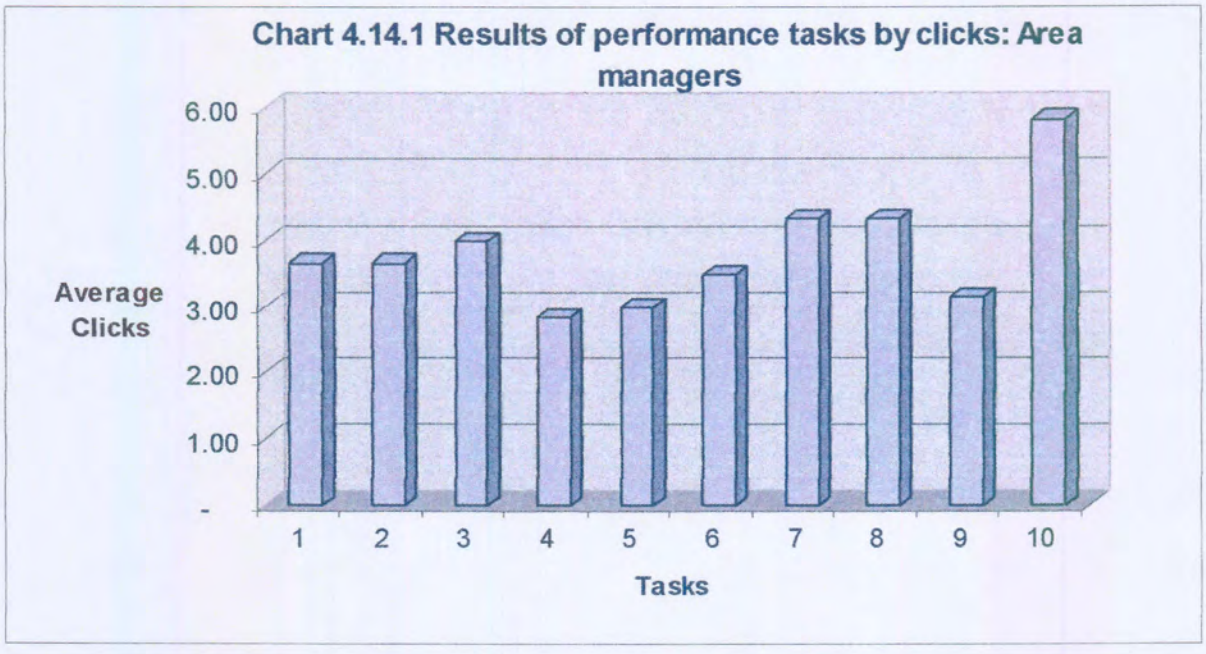
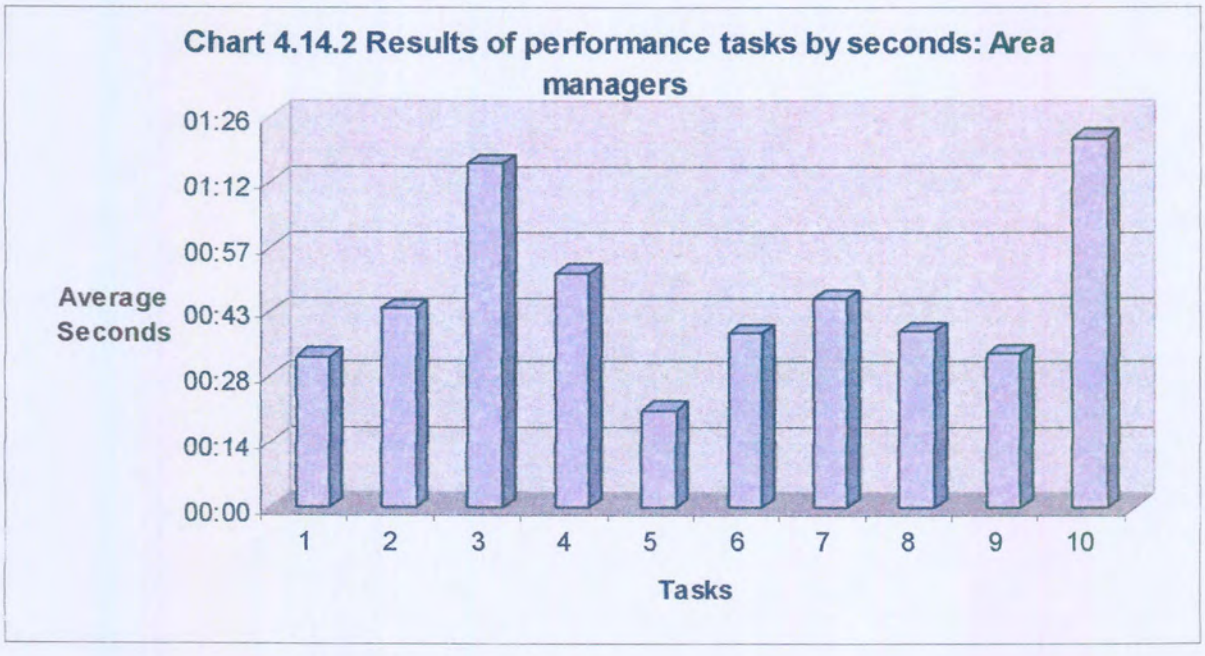


Chart 4.14.1 depicts the performance task results (total mouse clicks per task) of the participating area managers of the Novon Crop Protection company. Nine of the ten tasks were successfully completed within fewer than five mouse clicks. Chart 4.14.2 shows the total task time used by the area managers for completing each task. Eighty percent of the tasks were completed in less than 52 seconds, of which the fastest clocked 21 seconds.



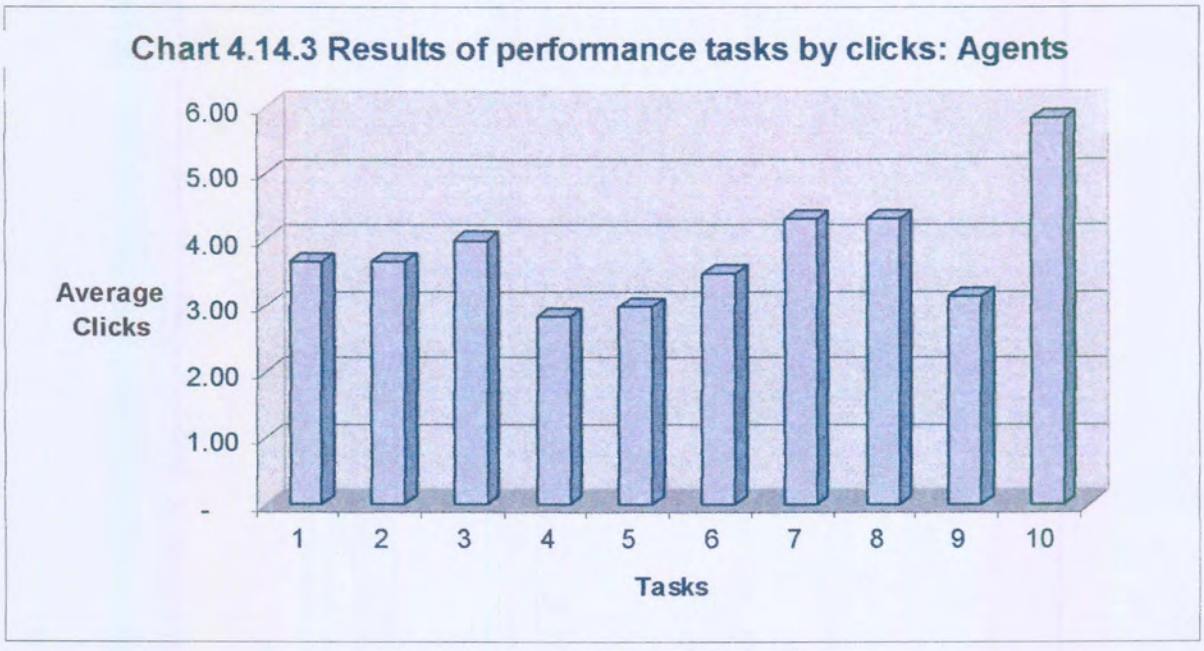
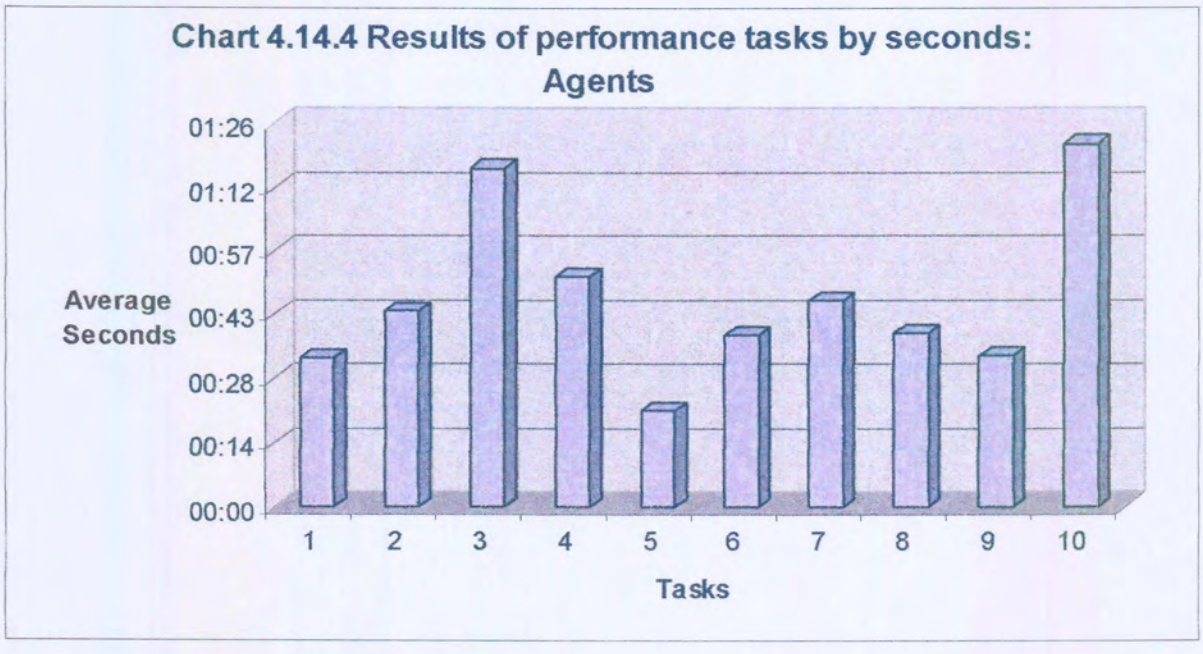


Chart 4.14.3 shows the performance task results (total mouse clicks per task) of the participating agents of the Novon Crop Protection company. Eight of the ten tasks were successfully completed within less than 4 mouse clicks, while the other tasks were completed in fewer than six mouse clicks. Chart 4.14.4 shows the total task time used by the agents for completing each task. Seventy percent of the tasks were completed in less than 55 seconds, of which the fastest clocked 8 seconds.



When viewing the results it should be remembered that most of the participants lacked PC skills (77,38%). In addition a large percentage (69,04%) of the participants seldom to never accessed the Internet. However, from the performance results it is evident that the total clicks and task times were very good, and the mean results of the effectiveness and efficiency metrics were high. This applies to both groups.

During the execution of the thinking aloud protocol some of the participants made the following comments with regards to the usability of the web site.

- *Hey, this is cool!* (With reference to alt tags)
- *Wow, this is unbelievable, anyone can operate this!* (With reference to user control)
- *Shucks, it helps if one reads what is on the screen.* (With reference to the home page)
- *Hey, we need this, but who will fund it?* (With reference to the web site)
- *Very fast, quite impressive!* (With reference to the down load speed)
- *It is cutely put together.* (With reference to the web site)
- *Excellent reference source!* (With reference to product information)
- *Easy to contact other agents.* (With reference to the 'contact us' information)

It is evident from the results that the basically inexperienced participants were able to perform the tasks effectively and efficiently and that the web site prototype met the needs of the intended users.

Further comments gathered from the thinking aloud protocol, as well as structured comments obtained from the participants after the usability test, are reflected in Table 4.17.3.

Table 4.17.3 Comments attached by participants to the Internet-based communication web site after usability testing

Category	☺	☹	Comments
Finance		x	Area manager realises the importance of the web site, but the financial manager focuses on the expense of acquiring appropriate hardware and software.
Access		x	Limited access at home and dealerships
Computer skills		x	A large percentage of participants indicated that they lacked basic PC skills
Holistic approach of the web site - (useful and fun information for the family)	x		A small percentage of participants mentioned that their spouses were 'in charge' of the computer at home. The participants expressed the opinion that their families would use the web site, and that they were eager to show them the web site.
Professional look versus paper-based files	x		One of the agents suggested that a CD and laptop computer instead of a thick paper-based file would present a more professional image to their clients.
The web site and CD as information sources	x		The agents cite it to be a textbook on different company issues such as the mission, vision and goals, which could be used to their advantage when visiting a farmer or handling an enquiry.

It is clear from Table 4.17.3 that the participants gave positive comments about the web site, stating positive outcomes. They did, however, show concern about the following issues:

- Lack of computer skills
- Lack of access to the Internet
- Concern regarding the expense of acquiring appropriate hardware and software

Observation validates these comments, as the participants spoke freely and without hesitation to the observer.

4.2.4 Results of the heuristic evaluation questionnaire

The interface of the prototype web site was scrutinized by a usability expert and each element of the interface was evaluated against commonly accepted principles. The results for the heuristic usability evaluation are reported in Appendix D. Table 4.18.1 and 4.18.2 provides a summary on the results.

Table 4.18.1 Summary of Experts' Web Production Checklist

Rating (5=good, 1=bad)	**Verify that the following items are correct and working**
Content	
4	Spelling and grammar
5	Site includes critical information (Contact info, What company does, Help, etc.)
4	Page titles (<title> tag), headers & button labels are correct and consistent
Graphics & layout	
5	All images marked with ALT tags (check by not loading images)
4	Download time is acceptable
4	Image quality is acceptable
3	Text layout: spacing, fonts and font sizes
4	Graphics are aligned
User preferences compatibility	
1	Layout works on all window sizes and prints out without cutting off the page
3	Reasonable layout for all typical fonts and font size settings
HTML and coding	
1	Metatags on every page
3	Java & JavaScript code has been fully functionally tested

Table 4.18.2 Heuristic Evaluation of Web site

Evaluation factor	Weighting %	Value 0-100	Score Wt x Value
Content	30	88	2640
Navigation & Interaction	20	52	1033
Readability	10	63	625
Structure	8	47	373
Page Layout	8	60	480
Graphics	8	66	528
Use of colour	8	58	460
Hyperlinks	8	60	480
Total score	**100**	**62**	**6620**
		(Max=100)	(Max=10000)

Tables 4.18.1 and 4.18.2 depict a summary of the expert's view on the web site prototype. The expert verified the following items of the web site for correctness and workability by means of comments and a rating scale (1 = bad; 5 = good; indicated in brackets):

- Content (4 - 5)

  The content appears to be relevant for the subject domain and should be interesting and of value to the user.

  Site includes critical information (Contact info, What company does, Help, etc.)

  Page titles (<title> tag), headers and button labels are correct and consistent.

  About 35 documents are untitled.

  Check grammar and spelling.

- Graphics and layout (3 - 5)

  Download time is acceptable, but not for pages with complex layout and animation.

Image quality is acceptable, but unnecessary colour depth is used for small images .

All images are marked with ALT tags.

- User preferences and compatibility (1 - 3)

  Layout works on all window sizes and prints out without cutting off the page.

  Layout is not resizeable.

  Reasonable layout for all typical fonts and font size settings, but not for higher resolutions.

- HTML & coding (1 - 3)

  No Metatags on pages

  Java & JavaScript code has been fully functionally tested, but there is some redundant or inefficient script.

The usability expert gave the following weighted value scores (indicated in brackets) to the following evaluation factors:

- Content (2640)
- Navigation and interaction (1033)
- Readability (625)
- Structure (373)
- Page layout (480)
- Graphics (528)
- Use of colour (460)
- Hyperlinks (480)

The total weighted value score out of a possible 10 000 for the above-mentioned evaluation factors is 6620.

From this score it can be deduced that the prototype needed some modifications and corrections to reach a usability score of at least 80%.

The usability expert concluded the report with the following statement:

> *'There is little doubt that this product will contribute significantly to the image of your client, internally as well as externally. It may also have a definite impact on their quality of service and therefore the quality of this product should not be taken lightly.'*

4.2.5 Results from the summative evaluation

This section describes the findings that emerged from analysing the data from the summative evaluation (page 95), in an attempt to investigate whether the web site caused demonstrable effects on the following specifically defined project outcomes, these being to:

- Determine whether the Internet-based communication web site is usable by its primary clients.
- Determine if the Internet-based communication web site is suitable for its tasks and working environment.
- Determine whether the Internet-based communication web site assists in creating and establishing sustainable customer-relationship in a period of corporate change.
- Establish the Internet access of the primary clients in order to motivate the crop protection company to budget for the acquisition of new and/or relevant technology.

Results by number of percentage are displayed in the following tables and charts.

Table 4.19.1 Results on the importance of the Internet-based communication web site and information technology in the future of business

Response	Primary clients (n = 237)
	Frequency %
Yes, very important	92,2
Yes, but with reservations	3,6
Undecided on the matter	1,2
No, not important	3,0
	100

Chart 4.15.1 Importance of the web site and information technology

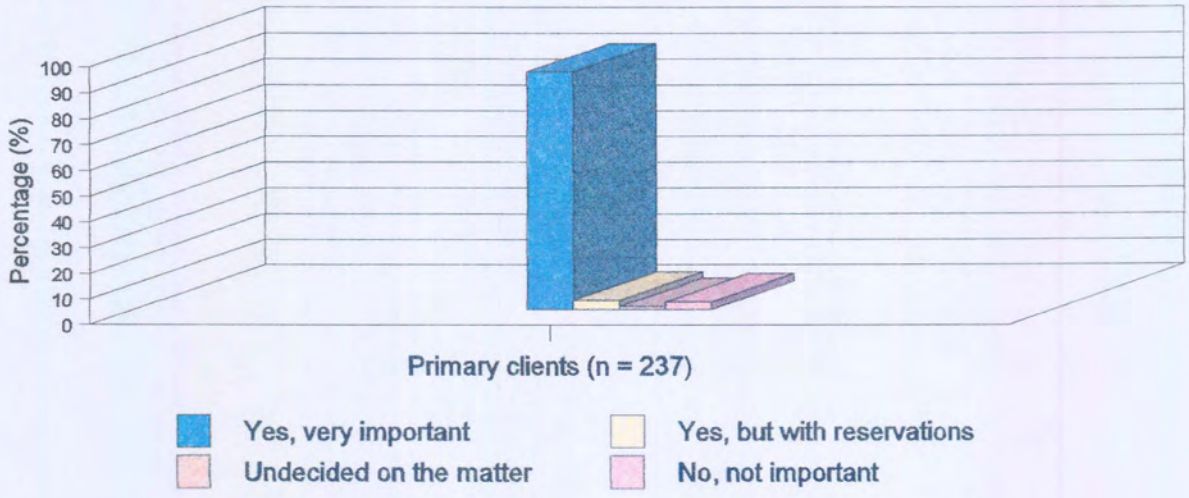
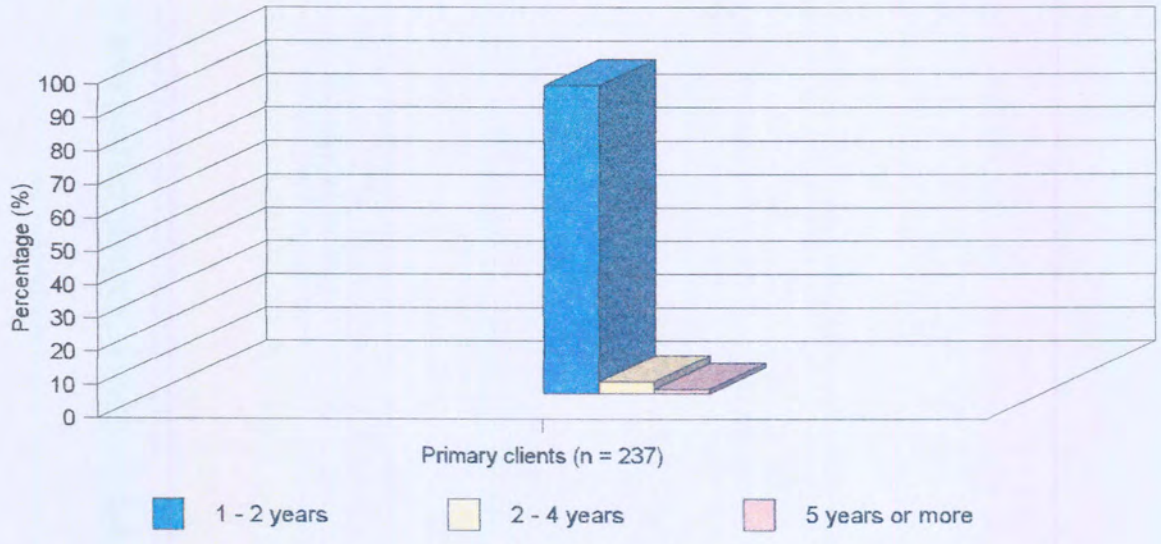


Table 4.19.1 and Chart 4.15.1 depict the clients' responses to the statement regarding the important role that the Internet-based communication web site and information technology will play in the future of their business. The charts clearly illustrate that the majority of the 237 clients (92%) agreed with the statement. This demonstrates that the Internet-based communication web site is usable by its primary clients and is suitable for its tasks and working environment.

Table 4.19.2 Results on how soon the Internet-based communication web site and information technology will become completely part of the business operation

Response	Primary clients (n = 237)
	Frequency %
1 - 2 years	92,2
2 - 4 years	3,6
5 years or more	1,2
	100

Chart 4.15.2 Client's response to time frame



Clients responded very similarly to a time frame of one to two years, for fully integrating the Internet-based communication web site and information technology into their businesses. In the group, 92%supported a one to two-year period. This confirms the desire of the clients to incorporate the web site and necessary information technologies, which will inevitably create, establish and/or enhance sustainable customer-relationship between the company and themselves. It can be deduced that any usability problems would have negatively impacted on their responses.

Table 4.19.3 Results on the number of clients with access to e-mail

Response	Primary clients (n = 237)
	Frequency %
Yes, have access	68
No, do not have access	32
	100

Chart 4.15.3 Access to e-mail

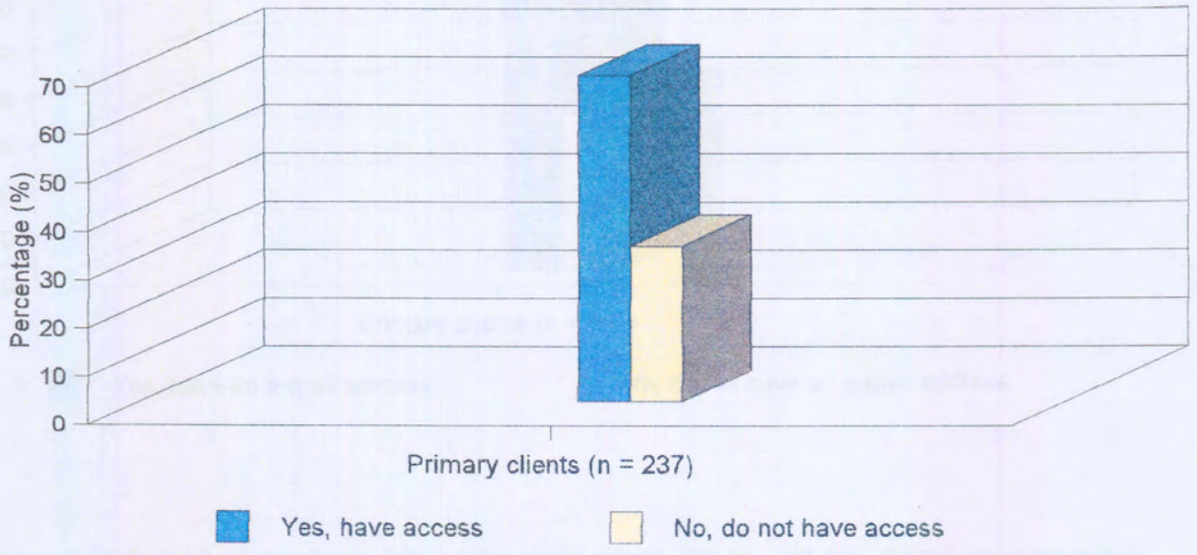
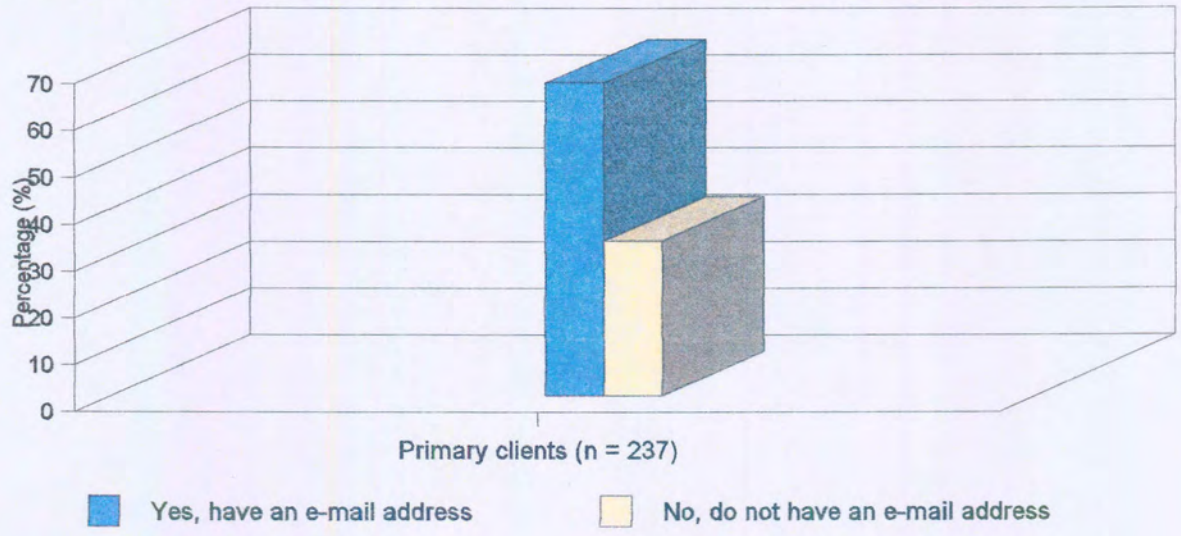


Table 4.19.4 Results on how many clients have an e-mail address

Response	Primary clients (n = 237)
	Frequency %
Yes, have an e-mail address	67
No, do not have an e-mail address	33
	100

Chart 4.15.4 Client's response to have an e-mail address



Charts 4.15.3 and 4.15.4 indicate that a third of the clients (32,3% - 33,1%) did not have access to e-mail and also did not have e-mail addresses. This demonstrates that these clients lack access to the Internet and the company needs to budget for the acquisition of new and/or relevant technology to establish Internet access to all its primary clients.

4.3 Summary

The aim of this chapter was to set out the results of the empirical data of the study.

Empirical statistics were provided by means of explanatory tables and charts which were arranged according to the questions and statements in the applied evaluation assignments.

The results were analysed quantitatively to indicate the extent to which the respondents concurred with the main research question and outcomes. Qualitative analysis was also provided to determine which additional suggestions were of use for inclusion in the Internet-based communication web site and for discussion with the company in question.

A search for significant differences between subgroups in respect to their responses to the statements in the evaluation questionnaire was also included

The nucleus of this chapter involved establishing the success or failure of an Internet-based communication web site, developed for a business-to-business company, in creating a corporate image as perceived by primary clients. An analysis of the results of the factors that contribute to the success or failure of such a web site revealed the following:

Information design and web usability

- According to the respondents, the Internet-based communication web site did adhere to information design principles and the web usability metrics. This is in contrast with the formative findings of the Human-Computer Interface specialist, who proposed certain refinements to achieve a higher degree of usability.

- Respondents expressed positive responses to the following information design and usability measures:

  Readability of web site information (82,8%);

  Relevance of information (77,2%);

  Acceptability of the amount of information per screen (85,7%);

  Effectivity of the visual material (77,2%);

  Consistency of the information presentation (74,3%); overall appearance (91,4%); and impression (94,3%) of the web site.

- A total of 60% of the respondents strongly agreed that the download speed of the web pages was acceptable, while 65,7% strongly agreed that the links to other web sites were useful and relevant.

- The results of the usability test and questionnaire, which consisted of effectiveness, efficiency and satisfaction measures, clearly illustrated that the majority of the participants were satisfied with the statements on the efficiency of the web site. Participants agreed to and strongly agreed with the statements on efficiency, showed a positive tendency, indicating agreement with most of the statements on satisfaction. They also indicated a strong trend of agreement with all the statements on the effectiveness of the web site.

- It is evident from the results that participants were of the opinion that the web site had withstood the test for usability on the measures of the effectiveness, efficiency and satisfaction thereof.

- Results of the performance tasks of the usability test revealed that the basically inexperienced participants were able to perform the tasks effectively and efficiently and that the web site prototype met the needs of the intended users.The participants also gave positive comments about the web site, stating positive outcomes.

- When viewing the results it should be remembered that most of the participants lacked PC skills (77,38%). In addition a large percentage (69,04%) of the participants seldom to never accessed the Internet. Nonetheless the performance results shows that the total clicks and task times where very good, and the mean results of the effectiveness and efficiency metrics high.

- The participants pointed out that they were concerned about the following issues:

  Lack of computer skills

  Lack of access to the Internet

  Concern regarding the expense of acquiring appropriate hardware and software

- The usability expert was of the opinion that the web site would contribute significantly to the image of the company, internally as well as externally, and that it could also have a definite impact on the quality of service rendered (see Appendix C).

- The search for significant differences between subgroups revealed that there were differences between the subgroups. When viewing the overall picture it becomes clear that a notable percentage of respondents (20,0% to 37,1%) were hesitant to make decisive choices and opted for rating scale 3, the undecided choice. The only difference on certain statements was that some groups were hesitant to make a decision.

The following section reports the findings that emerged from the various research issues.

Communication, relationship marketing and customer service

- The respondents indicated a strong conviction that the communication, customer service and relationship building features of the web site could enhance communication, customer service and relationship building between themselves and the company (see Table 4.4).
- A large percentage (60%) of the respondents were of the opinion that the web site could aid in motivating the clients to make use of the company's customer service.
- Respondents strongly agreed with the following statements:

  The web site communicates the goals, objectives, products and services of the company (94,3%).

  The web site has the potential to enhance the relationship between the company and its clients (91,5%).

  The web site would confirm the company as a brand name (85,7%).

  The web site has the potential to enhance communication between the company and its clients (88,9%).

  The web site has the potential to be used by its clients (74,2%).

- However, only 42,8% of the respondents strongly agreed with the statement 'The web pages on "useful and fun information for you..." are very useful and effective'. The undecided vote for these statements was relatively high, ranging from 28,6% to 35,3%. The reasons behind these undecided votes were that only a very small percentage of the respondents had access to the Internet (17,1% - 22,9%) and nearly half (48,6%) felt that they were PC illiterate.

- Nearly half of the respondents (40%) indicated that they would make use of the web site on a daily or weekly basis, while the majority of the respondents (74,3%) indicated that the most important information on the web site was the following:

  Product information

  Product guide

  Product labels

  Agricultural news and newsletters

  Success stories

  Research results

  Development reports on new products

  Links to relevant sites such as the weather bureau, economic forums and SA Agric

- The summative evaluation confirmed the desire of the clients to incorporate the web site and necessary information technologies, which would assist in creating, establishing and/or enhancing a sustainable customer relationship between the company and themselves. It can be deduced that any usability problems would have negatively impacted on their responses.

- The vast majority of respondents (92%) were determined to fully integrate the Internet-based communication web site and information technology into their businesses within a one to two-year period (see Table 4.19.1 - Table 4.19.2).

- One third of the clients indicated that they still did not have access to e-mail and also did not have e-mail addresses (see Table 4.19.3 - Table 4.19.4). This demonstrated the urgency with which the company needed to budget for the acquisition of new and/or relevant technology to ensure Internet links with all its primary clients.

Finally, it was found that only 34,3% of the respondents strongly agreed with the statement 'The web site has the potential to be used by all members of the family'. A very small number of spouses and children participated in the survey. It is the researcher's opinion that the clients did not attempt to include their families in the research study.

Participating family members were of the opinion that they would certainly use the web site (see Table 4.5). A notable positive response (66% - 75,1%; 87,5%) was reported in support of the idea to include web pages specially designed for their needs. They were also positive with regards to the possibility of accessing the working world of their spouses or fathers by means of the Internet-based communication web site. This contrasts sharply with the response of the main respondents, of whom only 34,3% strongly agreed that the web site had the potential to be used by their family members.

Chapter 5 consists of conclusions and recommendations which arose from this study.

Chapter 5

Conclusions and recommendations

> *'What do I know of man's destiny?*
> *I could tell you more about radishes.'*
>
> **Samuel Beckett**

5.1 Introduction

The following research question was posed in Chapter 1: 'What factors contribute to the success or failure of an Internet-based communication web site implemented to create a corporate image as perceived by primary clients?'

In order to find an answer to this question, various subquestions were identified, which individually and collectively provided answers.

Chapter 4 presents the findings of a research project designed to obtain at these answers, which contributed to answering the research question.

5.2 Answers to subquestions

In order to answer the research question, the answers to the following issues are reported.

- Communication
- Marketing
- Customer service
- Information design
- Web usability

5.2.1 Communication

The sub-questions that were addressed are the following:

- **How can an Internet-based communication web site assist a company to continually communicate the principles, objectives, products and services to their dealerships and their agents (primary clientele)?**

- **How can product orientated and services information be disseminated to potential and existing clientele?**

- **How can the use of The World Wide Web assist in establishing and/or enhancing business-to-business networks, at a time of corporate change without compromising standards or alienating existing customers?**

The literature study, as discussed in Chapter 2, revealed that the WWW significantly impacts on the lives of individuals and the global society as a whole.

It has been suggested in the literature that we have an unprecedented opportunity to harness technological advancements for the purpose of making substantial progress towards a truly global economy and a real global society. However, it will not happen without strong leadership and joint efforts from both governments and businesses at the national and international levels. Companies cannot compete in today's environment unless their employees are skilled and capable of both innovation and intelligent decision-making, acknowledging the role of technology, but also focussing on people, content and quality (Toffler,1999; Gore & Bangemann,1999).

The study has shown that the communication features of the Internet-based communication web site could enhance communication between a company and its customers. This was due mainly to the relevance of the contents of the web site and the inclusion of communication features such as the following:

- The goals, objectives, products and services of the company
- Contact information
- Product information, product guide and product labels
- Relevant industry agricultural news and newsletters
- Success stories
- Research results
- Reports on new products
- Links to relevant sites such as the Weather Bureau, economic forums and SA Agric

The respondents showed a determination to integrate fully the Internet-based communication web site and information technology into their businesses within a year or two. However, this posed a problem as a third of the clients did not have access to e-mail and did not have e-mail addresses. According to the literature, e-mail access maintains ongoing organization and marketing communications via regular e-mail announcements and newsletters. This demonstrated the urgency with which the company needed to budget for the acquisition of new and/or relevant technology to ensure Internet access to all its primary clients.

Although low-cost access to high-capacity communications, wherever and whenever demand arises, will be essential in order to meet the needs of the multimedia marketplace (Gilhooly, 1999:46), the company has decided, based on these results, to provide an integrated services digital network (ISDN) free of charge to all its primary clients. This technology that has been developed for high speed, broadband data communications, will definitely enhance communication between the company and its primary clients.

From the results it is clear that access, as shown by this research, is and will continue to be the key bottleneck in telecommunications (Gilhooly, 1999:46).

The ability of the people to access and cope with Internet technology, also proved to be a problem in this research project. A large percentage of the respondents indicated that they were PC illiterate (48,6%), and lacked basic PC skills. According to the literature, criteria such as income, education, age and gender cause the largest gap in the Digital Divide (Nua Internet Surveys, June 19th, 2000)(Online). This research shows the same tendencies.

The search for significant differences between subgroups with regard to their responses to some of the abovementioned variables revealed that there were significant differences between the following subgroups:

- Age category A (≤24 - 33yrs)/ B(≥34 - 57yrs)
- PC literacy - PC illiteracy
- Regular visits to Internet - Irregular visits to Internet
- Internet usage - Internet part of work/ Not part of work

When viewing the overall picture it becomes clear that a notable percentage of respondents (20,0% to 37,1%) were hesitant to make decisive choices and opted for rating scale 3, the undecided choice. The only difference in respect of certain statements was that some groups were hesitant to make a decision.

The significant differences between the abovementioned subgroups confirm that criteria such as education and age may cause the largest gap in the Digital Divide (see page 23). There is scope for greater promotion of computer skills training in the corporate environment, especially for those who comply with the criteria that contribute to the Digital Divide.

An attractive web site with a clear and attractive metaphorical structure, which is used to convey a corporate mission, principles, objectives and services can assist a business-to-business company in establishing or enhancing a business-to-business network. Business-to-business companies can be assisted by an Internet-based communication web site that disseminates product-orientated and services information to their clients in an user-friendly context. By employing a user-friendly, effective and efficient web site, companies will enhance continuing relationships.

5.2.2 Marketing

This section examines the subquestion on marketing.

- **How would an Internet-based communication web site assist in the establishment of a trust relationship between the company, and its primary clientele?**

The literature study on relationship marketing stressed how important it is for companies to deploy new strategic marketing perspectives, centred on customers and customer service. This section reflected on relationship marketing objectives and ways to build strong relationships between marketers and customers, and provided guidelines for implementing a web strategy that supports and reinforces the core business strategy of a company.

The response from the study showed that people are the key to any effective relationship. The way to build the strongest link between a company and its clients is to establish a learning relationship (Gordon, 1998:9).

The researcher found that the following steps needed to be incorporated in the project to establish this relationship:

- Find out what the customer needs are through interaction and feedback (see Table 3.1).
- Meet these needs by customizing the product or service and specifications (see Table 3.2).
- Continue interaction and feedback to learn more about the customer's individual needs (see Table3.3).
- A web site should interact with customers in a very human-like way.

In the literature, Gordon (1998:9) defines relationship marketing as 'the ongoing process of identifying and creating new value with individual customers and then sharing the benefits from this over a lifetime of association'. The researcher found that this rang true, and for companies to succeed in the new global economy, they needed to understand, focus and manage the ongoing collaboration between themselves and their customers for mutual value creation and sharing through interdependence and organizational alignment.

Through the involvement of the primary clients in both the formative - and the summative evaluation, new value was created for the clients, which was shared between the company and themselves. The clients became collaborators and not just passive recipients or participants in evaluation trials. With the inclusion of the clients into the design process, a philosophy of participatory or cooperative design started to appear. According to Schneiderman (1998) a participatory design approach increases user involvement, which leads to more accurate information about tasks and a greater sense of ownership and participation and a more successful implementation of the end product. This was not the original intention of the researcher who started out with a user-centered design approach which is a philosophy based on the needs and interests of the clients, with an emphasis on making the web site usable and understandable while keeping the design control in the hands of the designer. However it was the company who showed a willingness to design and align its business processes, communication, technology and people in support of the value that individual clients want. It became apparent to the researcher that with

the involvement of the clients in the design process a slight shift from the user-centered design method to the participatory design methods occurred.

It is evident from the information gathered in Chapter 4 that the respondents felt strongly about the ability of the Internet-based communication web site to enhance relationship building between themselves and the company. The response from the summative evaluation confirmed the desire of the clients to incorporate the Internet-based communication web site and necessary information technologies. They were of the opinion that it would assist in enhancing their relationship with the company.

It is further the belief of the researcher that the company should persist with the inclusion of web-related activities for the whole family. Although response from the primary clients on this matter was negative, their spouses and children showed a notably positive response to the idea. They were also positive towards the possibility of accessing the working world of their spouses or fathers by means of the Internet-based communication web site. This could empower spouses and children with relevant information, advice, entertainment, guidance and resources. It could further result in advanced communication between the different parties, thus strengthening the customer relationship.

A web site enables users to become visitors and communicators in the most complete sense implied by these concepts. These qualities enhance the potential for continuing relationships. The web site has succeeded in creating the context needed to build continuing relationship with clients (see Tables 4.19.1 - 4.19.2) through their involvement in the design process.

5.2.3 Customer service

This section examines the subquestion on customer service.

- **How would an Internet-based communication web site assist in the forging of loyalties between the company and its primary clientele?**

According to the literature study, customer service in an era of one-to-one marketing means bringing our focus down from the corporation to the customer. This shift from the monolithic to the many comes after a move from the mainframe to the microcomputer (Sterne, 1996: 209 - 211). As the customer comes closer and the business gets flatter, the value chain becomes shorter. This in turn highlights the importance of maintaining the relationship between the two entities. Companies now have a tool that allows them to know their customer more intimately than ever before. However, the success of the relationship between the customer and business depends on co-operation on three fronts - technology, operations and customer contact. Although information systems departments have worked with operations for years and operations have been engaged with customer service, co-operation between the three fronts was lacking. From the discussion it could be concluded that business should focus on what is necessary and what is possible in the electronic customer service environment of a new global economy. The progression of giving the customer more and more access to product information, problem resolution information, people, and processes, leads to customer integration.

The researcher found that the following customer service features needed to be incorporated in the Internet-based communication web site to enhance the company - customer relationship:

- **Provide Web site interactivity that enables users to learn more about the company, and its products and services.**
- **Provide customers with engaging content – not propaganda.**

- **Provide content with depth.** The content should hold their attention, empower them, and cause them to want to come back. This engagement, which is not an easy technique to master, could increase productivity because clients usually visit a site with a specific purpose in mind (see Table 4.4).

It is evident from the information gathered through the evaluation questionnaire, the expert review and the usability testing that the designed web site did comply with the above mentioned criteria for online customer service features. According to the literature (Windham, 1999:6; Leen, 20001:21; Borenstein, 1999:211), it is essential to act on what the customer says in order to build trusting and loyal relationships. The response from the study has also shown that the customer service features of the Internet-based communication web site could enhance the relationship between a company and its customers. Respondents were of the opinion that the web site had the potential to be used by its clients. Thus, the use of two-way interactive communications and feedback mechanisms would enable companies to learn more about their primary clients, which will translate into better customer service.

Customer service entails giving clients access to a company's information.

The web site has succeeded in creating a suitable context for the provision of customer service.

The web site has succeeded by constantly keeping the clients informed and making them feel part of the company (see Table 4.4).

5.2.4 Information design and web usability

The subquestions that were addressed are the following:

- **What design factors would best facilitate the communication of the company's services, principles, objectives and products to their primary clientele?**
- **To what extent can a Web-delivered programme provide information that elicits sufficient clientele motivation, acceptance and usage?**
- **How can an Internet-based communication web site be made sustainable?**
- **How can an Internet-based communication web site stay competitive?**

The literature review reiterated the importance of information design and web usability to arrive at an acceptable Internet-based communication web site. According to Davis and Merrit (1998: 33), interactive information design consists of the interface components - and the technologies behind them, which are the canvas, paints, and picture frames that are used to meet the communication challenge. Various aspects play an important role in interface design (Holzschlag, 1998: 77; Davis & Merrit, 1998: 33). These aspects need to be considered as they influence the effectiveness and accessibility of a web site. The designer considered the five aspects of interface design, namely the metaphor, clarity, consistency, orientation and navigation, in the design project, as was indicated in Chapters 3 and 4.

It is evident from the literature study that the achievement of product usability is not an easy task, and many developers fail in their efforts to improve the user-friendliness of their software applications because they do not recognise the importance of accounting for user requirements from early on in the process of software development (Bevan, 2000 (Online);Usability First™, 2001 (Online)). According to the literature, good information architecture that is based on customers' needs, applied skilfully by designers, will facilitate web navigation. Therefore, the researcher consulted with the client on the developing structure, navigation, style, technical components and web design principles from early stages of the development life cycle of the design phase.

Iterative development was employed by the designer, which progressively refined the design through evaluation from the early stages. The evaluation steps enabled the designer to incorporate user and client feedback until the system reached an acceptable level of usability.

The researcher used the following evaluation methods for ensuring usability:

- Paper prototyping
- Machine prototyping
- Usability testing

It was evident from the usability expert's review that the web site needed adjustments to enhance its usability. This helped the researcher to improve the web site before it was tested by the intended end users. From the respondent's perspective the usability of the Internet-based communication web site was good, as indicated by their responses to the usability questionnaire and the ease with which they performed the usability test. Results from the user evaluation questionnaire indicated that more attention needed to be given to navigation features, as some of the subgroups found it more difficult to use. The summative evaluation also confirmed the desire of the clients to incorporate the web site and necessary information technologies. It can be deduced that major usability problems would have impacted negatively on their responses. It is the researcher's belief that continuous improvement to the web site would be to the advantage of both the company and the client. The researcher is convinced that the involvement of the clients in the design process and not the Hawthorne effect, extensively contributed to the usability of the web site. Furthermore, during the design and development process it became clear that progression of user involvement in the design of the web site resulted in a shift from the typical user-centred design process to a more participatory design method which is closely tied to new theories of learning based on constructivist underpinnings (Carr, 1997; Reigeluth, 1996; Wills,

2000) and with incorporating new interactive technologies into instruction (Corry, Frick & Hansen, 1997; Norman, 1988).

The research supports the observation in the literature that the five aspects of interface design and employing design principles are important to arrive at an acceptably developed web site. By employing various evaluation methods, companies will enhance the usability of their web site which in turn will enhance sustainability. Clients are assisted by web sites that have been designed and executed efficiently, effectively and satisfactorily (see Tables 4.3.1 - 4.3.2). Involvement of clients in the design process are crucial to arrive at a usable end product. Only with active argument for inclusion of users as a valuable design resource will more possibilities for participatory design open because few designers otherwise will see the value of complicating design.

5.3 Limitations

When the researcher became involved in this research project, the company in question had already de-merged from their mother company and was anxious to get an Internet-based communication web site up and running. A due date was set that left the researcher with only six month to review relevant literature, master a web editing tool, and design, develop and test the web site.

Because of the time constraints and the enormous size of the web site (699 files, 258 HTML files, 9776 links) attention to the finer details of the following web technologies had to be limited:

- Dummy documents
- Redundant documents

- Metatags on every page
- Resizable layout for higher resolution screens

Although this had no negative effect on the intended users, it could cause problems when viewed externally by other viewers.

The hardware and software available to the researcher comprised a given variable which restricted the design capabilities of the researcher.

Technology failure, whether caused by a power failure or system hanging, must always be anticipated when developing a web site of this kind. During the development phase the system failed a day before delivering the web site. This caused unnecessary anxiety that could have been prevented by the use of reliable back-up software and hardware.

However, notwithstanding the limitations, the research project proved to be of value to the company and its clients.

5.4 Recommendations

Three recommendations are offered. These relate to the evaluation questionnaire, and the Internet-based communication web site, and to the company in question.

It is recommended that, should a study similar to this one be conducted in the future, special attention be given to the wording of web-related questions. Certain web-related words were unfamiliar to the respondents and this may have influenced respondents to opt for the undecided

vote. The results obtained through the study are not invalidated by this comment, however, as the statements were strongly supported by the respondents.

With reference to the design and development of an Internet-based communication web site the following holds true:

- Do not undertake anything without approval from the client.
- Match the Web technologies and design to the business strategy and customer requirements.
- Do not underestimate the importance of usability testing.

> ***'We all benefit from having our work critiqued, but better to have it done in the soft light of concept introspection than in the harsh glare of product failure.'***
>
> **Davis and Merrit (1998:53)**

Finally, the results of this study showed that respondents need Internet access and PC skills training. To the delight of the researcher the company has since provided ISDN lines and terminals free of charge to all its primary clients.

From the literature study it was deduced that companies should integrate their marketing, sales, and customer service departments' activities into one integrated web system, because this would essentially 'pull' the clients through the logical sequence of consuming. Business-to-business web sites must enable users to perform their jobs more efficiently. This was taken up by the company management and the researcher is delighted to report that the company is investigating the inclusion of an Intranet site in the web system. This will empower business customers to do the things they need to do without human intervention.

A further recommendation is that the company should consider the inclusion of FAQs, discussion areas and online help in their web system.

It is recommended, should a study similar to this one be conducted that the future researcher go beyond user-centered design to a participatory design approach, where clients and instructional designers would be deeply involved in the actual decision-making together with the design and development team. Furthermore, the new ethical demands placed on instructional designers and the merit, worth and value of a participatory design approach could be fully explored and incorporated in design activities.

5.5 Conclusion

It is hoped that this research has shed some light on the use of an Internet-based communication web site in support of customer relationships in a business-to-business context. To conclude, an effort should be made by software engineers, instructional designers and developers to involve clients in the design, development and evaluation process to arrive at a usable end product. Only with active argument for inclusion of users as a valuable design resource will more possibilities for participatory design open because few software engineers, instructional designers or developers otherwise will see the value of complicating design. For it is true that it is remarkably easy not to share the power of the design and development team with the intended users of the design.

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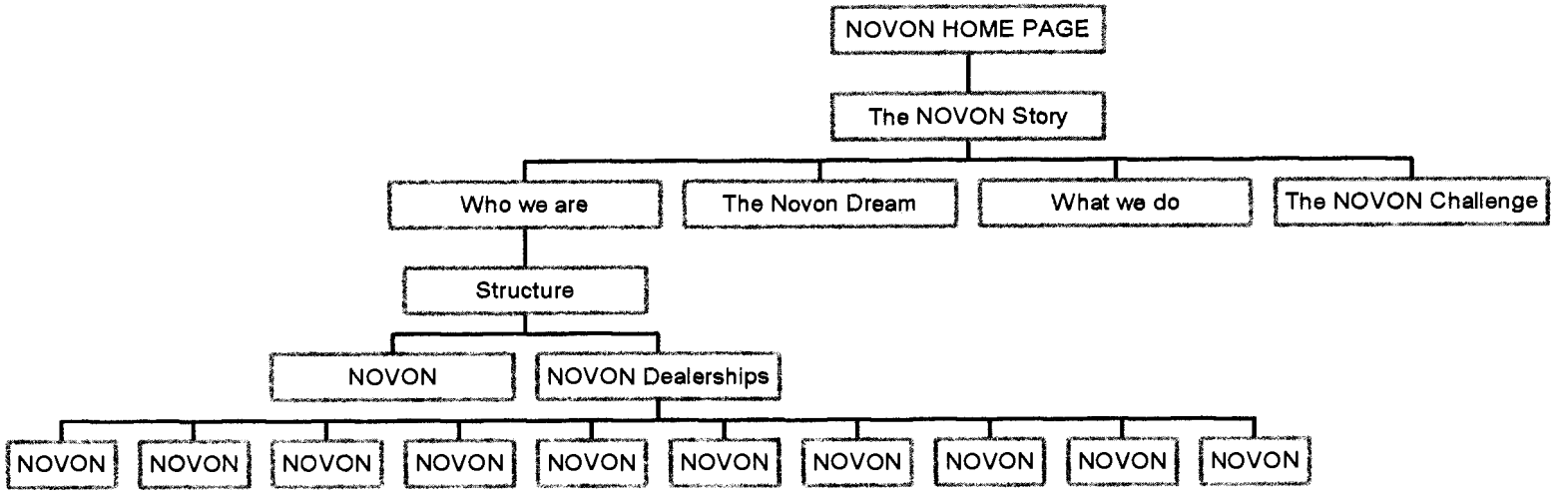
Appendix A

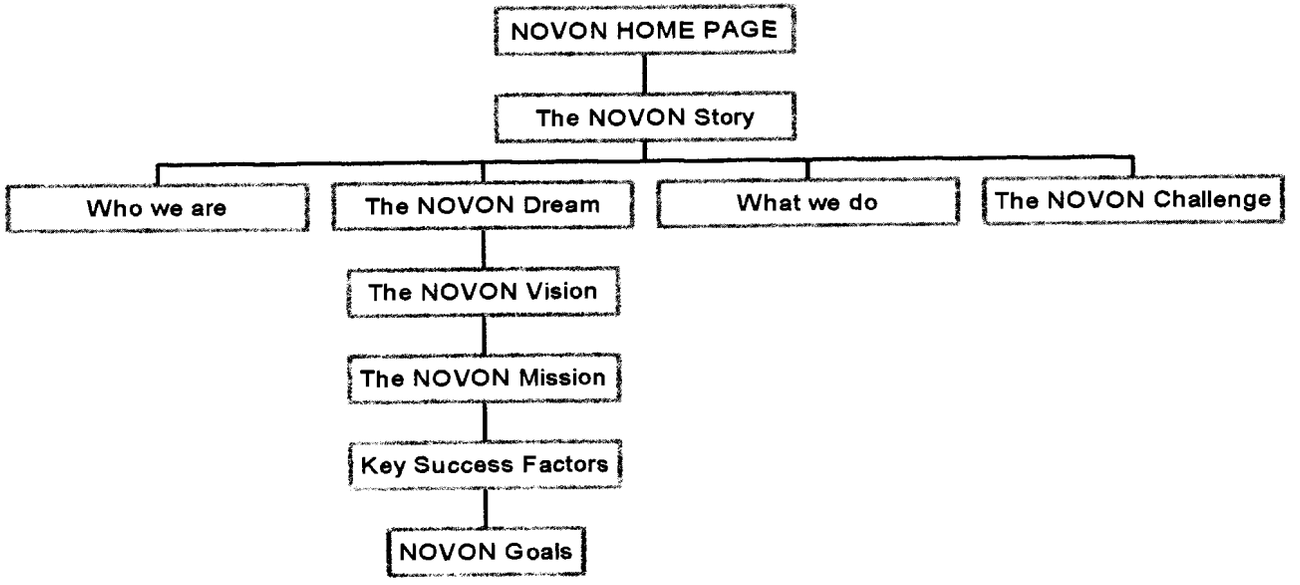
Preliminary site map

WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION

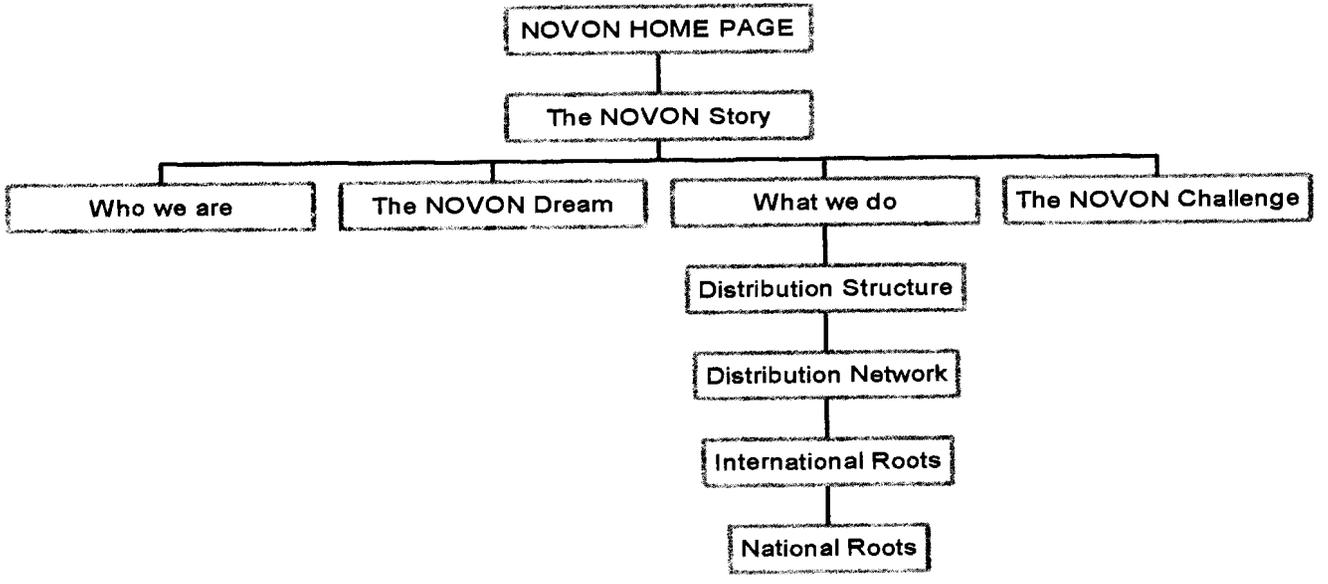
WEBSITE PROTOTYPE FOR NOVON CROP PROTECTION



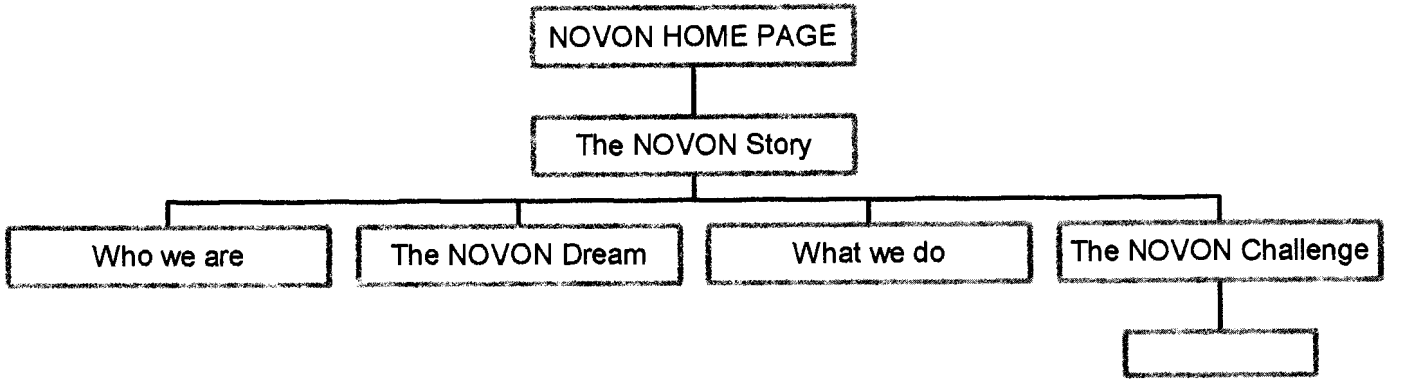
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



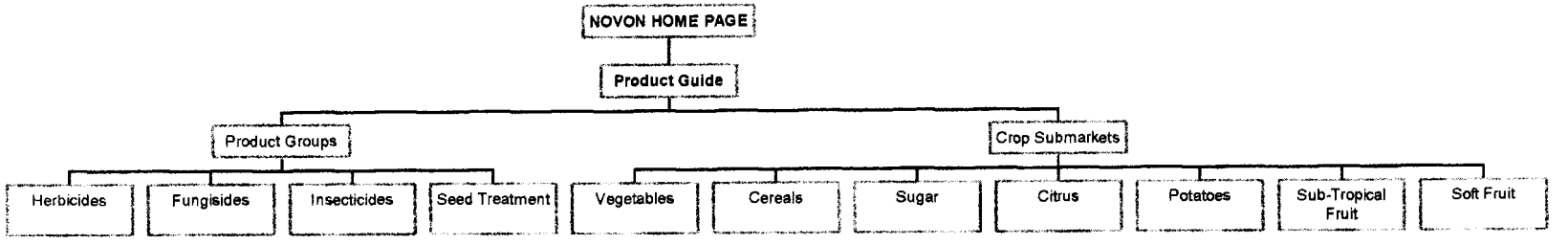
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



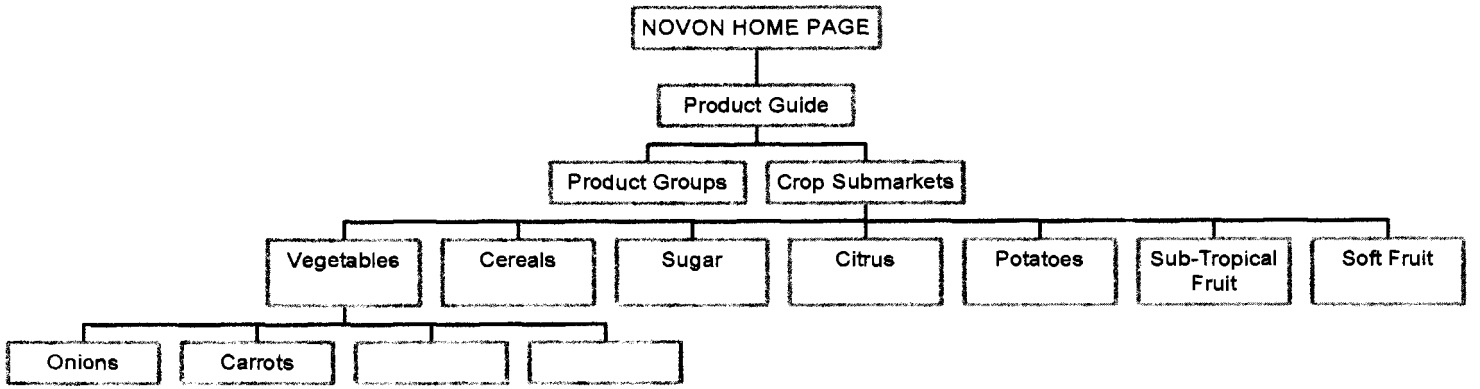
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



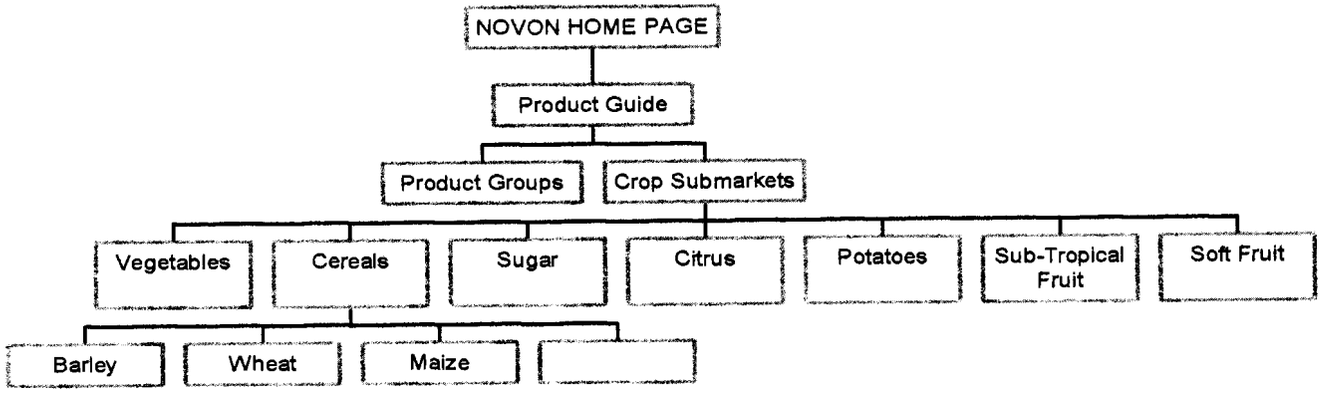
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



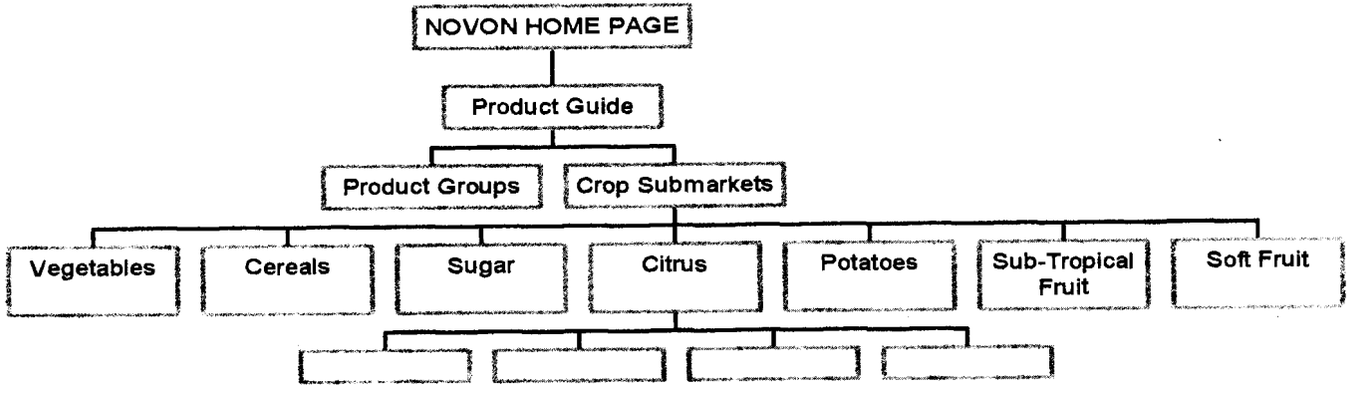
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



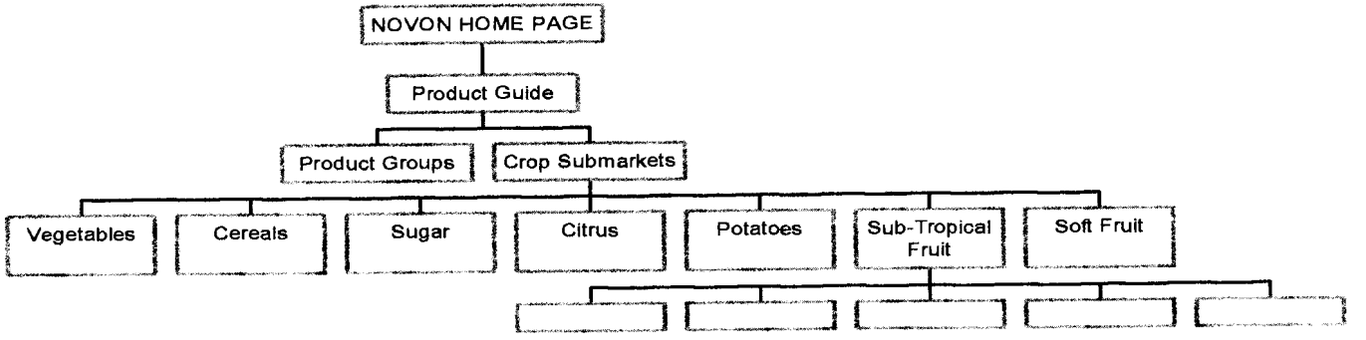
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



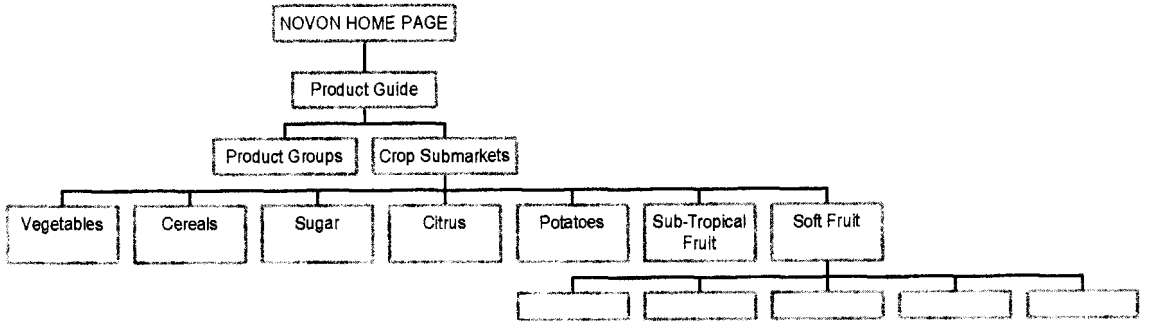
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



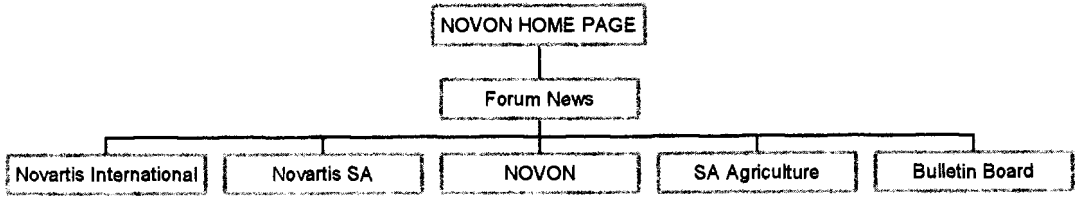
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



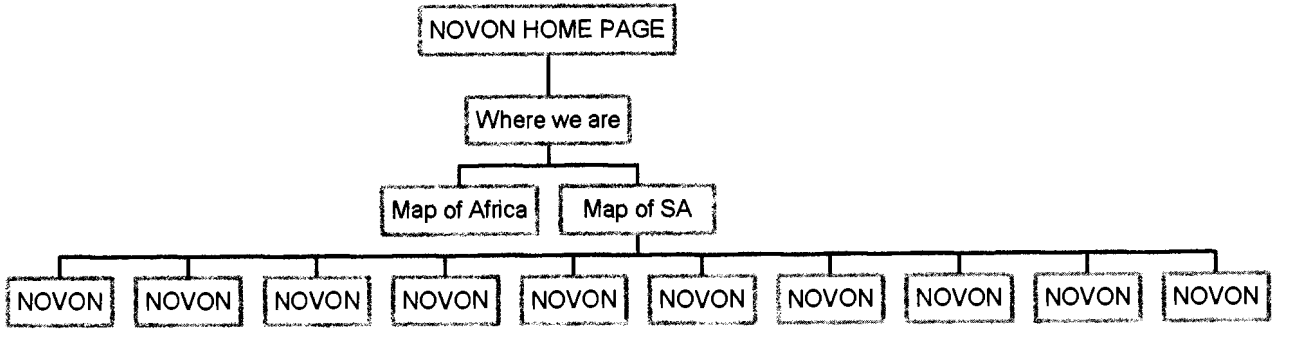
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



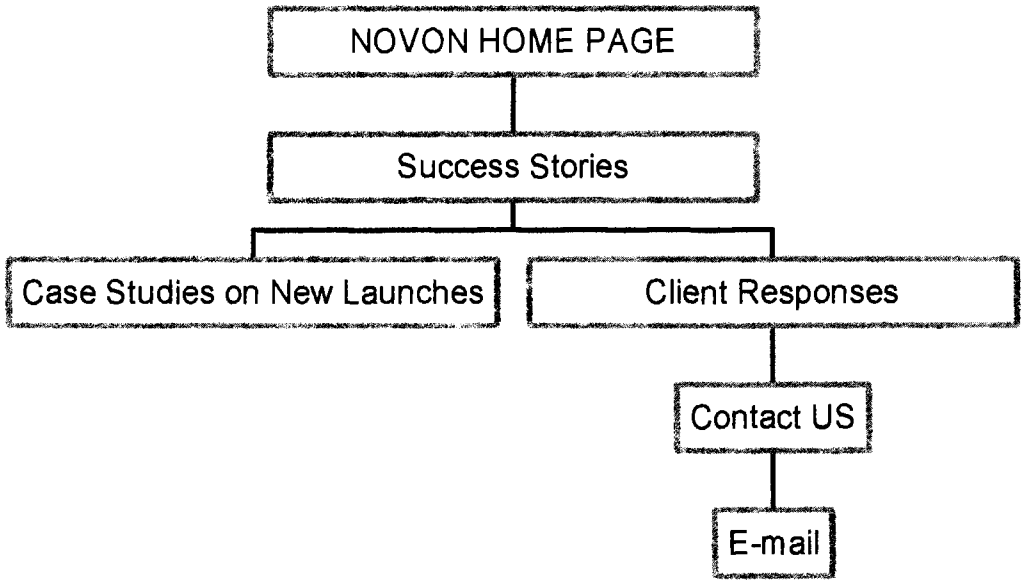
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



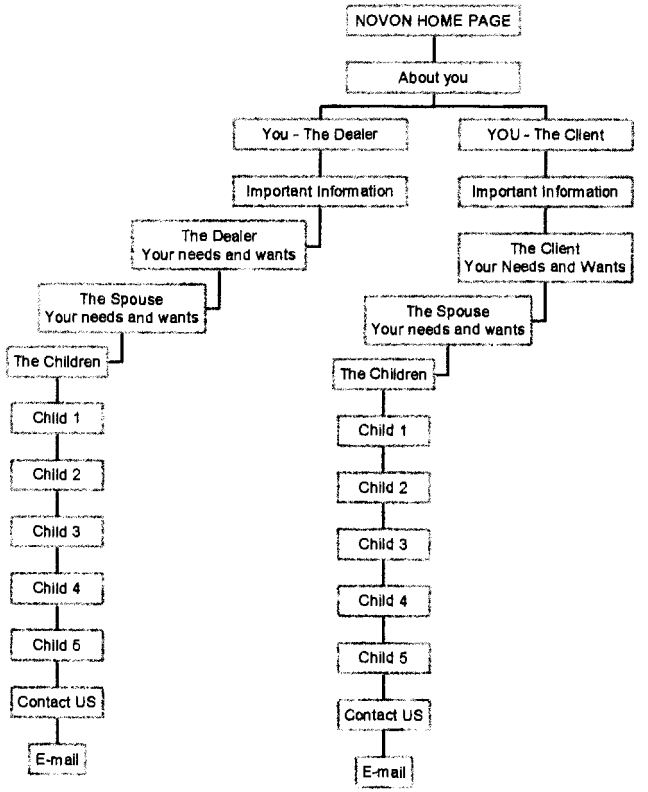
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



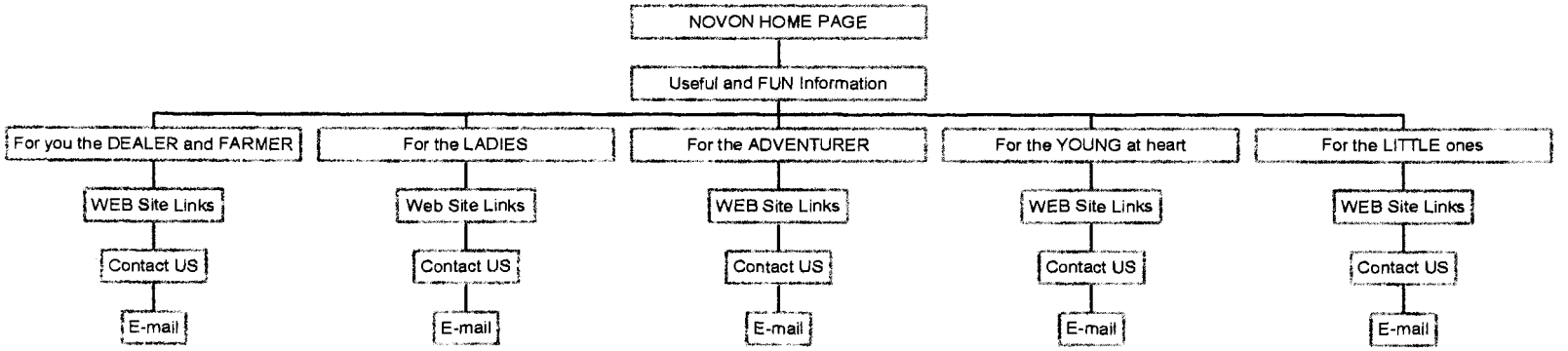
WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



WEB SITE PROTOTYPE FOR NOVON CROP PROTECTION



Appendix B

Questionnaire

NOVON
GEWAS BESKERMING
CROP PROTECTION

NOVON webwerf - Prototipe evaluering

VENNOTE IN KWALITEIT
PARTNERS IN QUALITY

Jaargang 2000

www.novoncp.co.za

NOVON OESBESKERMING

Geagte Respondent

I.S. Prototipe evaluering – NOVON webwerf

NOVON Oesbeskerming het dit goed gedink om 'n webwerf te ontwikkel wat vir u van waarde kan wees.

Voordat die webwerf finaal gepubliseer kan word is dit van uiterste belang dat u, en lede van u gesin (waar van toepassing) die prototipe volgens gegewe kriteria evalueer.

U mening kan net bydra tot die sukses van die finale produk. Enige voorstelle sal in ag geneem word.

U ontvang 'n CD met die NOVON webwerf asook 'n vraelys – u moet asb. die vraelys voltooi, en so gou as moontlik in die gefrankeerde koevert terug stuur. Die CD bly u eiendom om in u werksomgewing gebruik te word. Die webwerf verskaf ook bruikbare inligting aan u eggenoot en kinders (waar van toepassing). Dit sal waardeer word indien u eggenoot en/of kinders (waar van toepassing) die vrae in die verband op die vraelys sal voltooi.

Let asb. op die volgende:

Die vraelys word anoniem ingevul.
In hierdie vraelys word inligting omtrent uself, rekenaar toegang en gebruik, web toegang en gebruik, en rekenaarvaardigheid verlang.

Die vraelys is in die volgende afdelings ingedeel.

A. Demografiese inligting
B. Vaardighede
C. Evaluering van die NOVON webwerf prototipe.
D. Evalueringsvrae vir u eggenoot (waar van toepassing).
E. Evalueringsvrae vir u kind (waar van toepassing).

Algemene instruksies

Die meeste vrae word beantwoord deur slegs 'n kruisie in die toepaslike blokkie te trek.

Die ander vrae vereis dat antwoorde skriftelik ingevul moet word.

Vul slegs die ruimtes links van die soliede vertikale lyn in.

Stuur asb. die voltooide vraelyste voor einde Augustus 2000 terug aan:

Chris van Eeden
Posbus 810
Isando
1600

Datum: _____

Respondent nr. ☐☐☐ 1-3

Kaart nr. ☐☐ 4-5

Afdeling A

1. Ouderdom _____ jare

V1 ☐☐ 6-7

2. Geslag:

Manlik	1
Vroulik	2

V2 ☐ 8

3. Huwelikstaat:

Ongetroud	1
Getroud	2
Geskei/vervreemd/weduwee/wewenaar	3

V3 ☐ 9

4. Huistaal:

Afrikaans	1
Engels	2

V4 ☐ 10

5. Kinders:

Ja	1
Nee	2

V5 ☐ 11

6. Dui u beroep aan:

Besturende Direkteur	1
Area Bestuurder	2
Streeks Bestuurder	3
Finansiële Bestuurder	4
Persoonlike assistent	5
Agent	6
Kommersiële Boer	7
Administratiewe beampte	8
Onderwyser	9
Dosent	10
Professionele beroep (bv. dokter, fisioterapeut, sielkundige, apteker) Spesifiseer asb.	11
Ander: spesifiseer asb.	12

V6 ☐☐ 12 - 13

Afdeling B

In hierdie afdeling word inligting oor u rekenaar gebruik en vaardighede verlang.

1. Gebruik u 'n rekenaar (PC) as deel van u werk?

Ja	1
Nee	2

2. Gebruik u die internet as deel van u werk?

V7 ☐ 14

Ja	1
Nee	2

V8 ☐ 15

3. Indien u nie in 'n beroep staan nie, gebruik u 'n rekenaar tuis?

Ja	1
Nee	2

V9 ☐ 16

4. Het almal in die gesin toegang tot 'n rekenaar tuis ?

Ja	1
Nee	2

5. Het u toegang tot die internet?

V10 ☐ 17

Ja - by die werk	1
Ja – by die huis	2
Ja – by die huis & werk	3
Nee	4

V11 ☐ 18

6. Indien u toegang tot die internet het, dui aan watter tipe webwerwe u die meeste besoek (bv. sport, nuus, landbou).

_____
_____
_____
_____
_____
_____

V12 ☐☐ 19-20

7. Hoe gereeld besoek u die internet?

Daagliks	1
Weekliks (3-4 x week)	2
1 – 2 keer per maand	3
Minder as 1 keer per maand	4
Nooit	5

V13 ☐ 21

8. Met watter stelling stem u die meeste saam:

Ek beskou myself as PC geletterd.	1
Ek het genoeg rekenaarvaardighede om self reg te kom.	2
Ek voel my PC vaardighede is nie voldoende nie.	3
Ek kan nie 'n rekenaar gebruik nie.	4

V14 ☐ 22

Afdeling C

In hierdie afdeling word inligting oor die web prototipe verlang. Neem u tyd om die webwerf te ondersoek.

In die volgende gedeelte moet u asb. aantoon in watter mate u met die volgende stellings saam stem al dan nie.

Afdeling C1

Die formaat van hierdie gedeelte is soos volg:

'n Stelling word aan u voorgehou wat u asb. moet beoordeel op 'n 5 punt skaal.

Die 5 punt skaal het die volgende waardes:

1 - Baie swak
2 - Swak
3 - Kan nie besluit nie
4 - Goed
5 - Baie goed

1. Die voorkoms van die webwerf.

1 baie swak	2 swak	3 kan nie besluit nie	4 goed	5 baie goed

V15 ☐ 23

2. Die leesbaarheid van die webwerf inligting.

1 baie swak	2 swak	3 kan nie besluit nie	4 goed	5 baie goed

V16 ☐ 24

3. Die effektiwiteit van visuele materiaal (foto's, grafika, agtergrond).

1 baie swak	2 swak	3 kan nie besluit nie	4 goed	5 baie goed

V17 ☐ 25

4. Die gebruikersvriendelikheid van die webwerf.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V18 ☐ 26

5. Die gemak van navigasie.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V19 ☐ 27

6. Verskeidenheid van navigasie moontlikhede.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V20 ☐ 28

7. Navigasie inligting beskikbaar aan gebruiker.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V21 ☐ 29

8. Die algemene relevansie van die webwerf inhoud.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V22 ☐ 30

9. Die aanvaarbaarheid van die hoeveelheid inligting per web bladsy.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V23 ☐ 31

10. Interaksie tussen gebruiker en webwerf.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V24 ☐ 32

11. Die assosiasie van die webwerf metafoor met NOVON (skakel tussen NOVON en sy kliënte).

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V25 ☐ 33

12. Die konsekwentheid (konstantheid) waarmee inligting aangebied word.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V26 ☐ 34

13. Die algemene indruk wat die webwerf skep.

1	2	3	4	5
baie swak	swak	kan nie besluit nie	goed	baie goed

V27 ☐ 35

Afdeling C2

In die volgende gedeelte moet u aantoon in watter mate u met die volgende stellings saamstem al dan nie.

Die formaat van hierdie gedeelte is soos volg:

'n Stelling word aan u voorgehou wat u asb. moet beoordeel op 'n 5 punt skaal.

Die 5 punt skaal het die volgende waardes.

1. Stem beslis nie saam nie.
2. Stem nie saam nie.
3. Kan nie besluit nie.
4. Stem saam.
5. Stem beslis saam.

1. Die webwerf kommunikeer die beginsels, doelwitte, produkte en dienste van NOVON.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V28 ☐ 36

2. Die webwerf het die potensiaal om goeie verhoudings tussen NOVON en sy kliënte te vestig.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V29 ☐ 37

3. Die webwerf sal bydra om NOVON se beeld te bevestig.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V30 ☐ 38

4. Die webwerf kan aangewend word om kliënte te motiveer om van NOVON se kliënte diens gebruik te maak.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V31 ☐ 39

5. Die webwerf het die potensiaal om die kommunikasie tussen NOVON en sy vennote te verbeter.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V32 ☐ 40

6. Die webwerf het die potensiaal om deur sy kliënte gebruik te word.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V33 ☐ 41

7. Die webwerf het die potensiaal om deur die kliënt se gesin gebruik te word.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V34 ☐ 42

8.a. Die aflaaityd van die web bladsye is aanvaarbaar.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V35 ☐ 43

8.b. Indien u in 8a 'n 1 of 2 aangedui het, waaraan is dit moontlik te wyte?

V36 ☐☐ 44 -45

_____

9. Die addisionele "LINKS" (skakels) na ander webbladsye wat verskaf word is baie bruikbaar en relevant.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V37 ☐ 46

10. Die webbladsye vir elke gesinslid **"useful and fun information for you ...."** is baie bruikbaar en effektief.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V38 ☐ 47

Die volgende vrae vereis dat antwoorde skriftelik ingevul moet word.

1. Hoe gereeld dink u sal u die webwerf besoek?

Daagliks	1
Weekliks (3-4 x week)	2
1 – 2 keer per maand	3
Minder as 1 keer per maand	4
Nooit	5

V39 ☐ 48

2. Dink u ander lede van u gesin sal van hierdie webwerf gebruik maak?

Ja	1
Nee	2

V40 ☐ 49

Indien nee, gee 'n moontlike rede.

_____

_____

_____

_____

V41 ☐☐ 50-51

3. Watter soort inligting op die NOVON webwerf sal vir u die meeste waarde hê?

_____

_____

_____

V42 ☐☐ 52-53

4. Dek die belangstellings vraelys op die webwerf die aspekte wat u persoonlik raak?

Ja	1
Nee	2

V43 ☐ 54

5. Indien nee, watter aspekte behoort bygevoeg te word?

_____

_____

_____

_____

V44 ☐☐ 55-56

6. Watter "browser" en " browser platform" het u gebruik om na die webwerf te kyk?

Internet Explorer 2.0	1
Internet Explorer 3.0	2
Internet Explorer 4.0 of hoër	3
Netscape Navigator 2.0	4
Netscape Navigator 3.0	5
Netscape Navigator 4.0 of hoër	6
Ander	7
Onseker	8

V45 ☐ 57

Baie dankie vir u samewerking en u bydrae – dit word opreg waardeer!

Afdeling D

Hierdie gedeelte moet asb. deur u eggenoot (waar van toepassing) voltooi word.

In die volgende gedeelte moet u aantoon in watter mate u met die volgende stellings saamstem al dan nie.

Die formaat van hierdie gedeelte is soos volg:

'n Stelling word aan u voorgehou wat u asb. moet beoordeel op 'n 5 punt skaal.

Die 5 punt skaal het die volgende waardes.

1. Stem beslis nie saam nie.
2. Stem nie saam nie.
3. Kan nie besluit nie.
4. Stem saam.
5. Stem beslis saam.

1. Die webbladsye vir elke gesinslid **"useful and fun information for you ...."** is baie bruikbaar en effektief.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V46 ☐ 58

Indien u opsie 1 of 2 gemerk het, gee moontlike redes vir die besluit.

_____

_____

_____

_____

V47 ☐☐ 59-60

Die addisionele "LINKS" (skakels) na ander webbladsye wat verskaf word is baie bruikbaar en relevant.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V48 ☐ 61

Indien u opsie 1 of 2 gemerk het, gee moontlike redes vir die besluit.

_____

_____

_____

_____

V49 ☐☐ 62-63

2. Die webwerf het die potensiaal om u as eggenoot in te lig en op hoogte te hou aangaande die werksaamhede van u man, NOVON en sy mense.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V50 ☐ 64

Indien u opsie 1 of 2 gemerk het, gee moontlike redes vir die besluit.

_____

_____

_____

_____

V51 ☐☐ 65-66

Baie dankie vir u samewerking en u bydrae – dit word opreg waardeer!

Afdeling E

Hierdie gedeelte moet asb. deur een van u kinders (waar van toepassing) voltooi word.

V52 ☐☐ 66- 67

1. Ouderdom _____ jare
2. Geslag:

Manlik	1
Vroulik	2

V53 ☐ 68

In die volgende gedeelte moet u aantoon in watter mate u met die volgende stellings saamstem al dan nie.

Die formaat van hierdie gedeelte is soos volg:

'n Stelling word aan u voorgehou wat u asb. moet beoordeel op 'n 5 punt skaal.

Die 5 punt skaal het die volgende waardes.

1. Stem beslis nie saam nie.
2. Stem nie saam nie.
3. Kan nie besluit nie.
4. Stem saam.
5. Stem beslis saam.

1. Die webbladsye vir die kinders "**useful and fun information for the children/little ones ....**" is baie bruikbaar en effektief.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V54 ☐ 69

Indien u opsie 1 of 2 gemerk het, gee moontlike redes vir die besluit.

_____

_____

_____

_____

V55 ☐☐ 70-71

2. Die webwerf het die potensiaal om u as kind in te lig en op hoogte te hou aangaande die werksaamhede van u pa, NOVON en sy mense.

1	2	3	4	5
stem beslis nie saam nie	stem nie saam nie	kan nie besluit nie	stem saam	stem beslis saam

V56 ☐ 72

Indien u opsie 1 of 2 gemerk het, gee moontlike redes vir die besluit.

_____

_____

_____

_____

V57 ☐☐ 73-74

Baie dankie vir u samewerking en u bydrae – dit word opreg waardeer!

Groete

Tertia van Eeden (Projek ontwikkelaar) 17/ 06/2000

Appendix C

Expert report

NOVON Prototype Usability Evaluation
Comments

SITE CONTENTS

1. The content appears to be relevant for the subject domain and should be interesting and of value to the user.
2. NOTE: Plural of "URL" is "URLs", not "URL's"
3. Check incorrect spelling of "Microsoft" in index.htm
4. Questionnaire: Is this questionnaire intended to be used also by the public? If yes, large portions of it will be inappropriate. Even for internal use portions of it will be difficult to understand.
5. News Focus: "News Letter" should be one word. Consider changing the name to simply "News".
6. "Happy hunting - it can only get better!" - What does this mean?
7. Absail Africa <http://www.millennia.co.za/abseilafrica> Check incorrect spelling of "abseil"
8. Check grammar in Questionnaire: "Computer Literated" should be "Computer Literate"
9. Questionnaire - the question about "User-friendliness" is invalid without defining the criteria for the respondent in greater detail. How many respondents will understand what is meant by "navigation", "consistency", "interaction" or "download"? Also, the use of checkboxes for mutually exclusive choices (Section C) will make it possible for respondents to check more than one criterion, where only one should be allowed. (Radio buttons should be used for mutually exclusive choices, check boxes for mutually INclusive options.)

USER

1. The user's mental model is unknown, so it is not possible to say to what extent the structure and presentation of the web site would support or inhibit the formation of a coherent conceptual model. However, the usability of the web site would be significantly improved by paying special attention to this aspect, especially as this would assist in the development of a metaphor that would aid in navigation and also coherence of the entire structure.
2. There is no obvious indication of the main orientation of the web site - was it meant to support primarily a task-orientation or in information architecture orientation? In the case of a task-orientation, there is an obvious lack of procedural information and possibly over-emphasis of declarative knowledge.

3. More evaluation of user experience and behaviour should be conducted in real work situations.
4. It is likely that the organisation will benefit from a design that also makes provision for procedural information. This implies that task analyses (coupled with information requirements and performance criteria) should be done for key categories of web site users.
5. With future iterations of the web site, cognisance should be taken of business performance criteria (i.e. how will the organisation know if the web site contributed to improved quality of client service?)

PAGE LAYOUT

1. Site map difficult to read - why not make it similar to e.g. alternatep_usefulfuninfo_children.htm. Alternatively, improve "visual chunking" with subtly different column colours
2. Location (visibility) of "Home" link too obscure. Should be more prominent (See "Visual Presentation" below)
3. Layout and readability of the **product information** pages should be improved - this is critical information and deserves even more careful treatment than some other sections!

VISUAL PRESENTATION

1. The "splash page" (index.htm) serves no other purpose than to choose a language - why not combine this with the English Home page?
2. Consider using rollover buttons (Novon "boog") for visual feedback. This will provide some visual interest, reduce need for training and strengthen the affordance of hyperlinks. There is also an inconsistency - sometimes they are clickable and sometimes not (e.g. novon_index1.htm). (See "Example.htm" on CD for a possible method of visual feedback in the form of a simple rollover image)
3. The Partners logo is a bit over-used, and used in an inconsistent manner. Using it as a "Top" link is fine, but a smaller device would have interfered less with the layout. This logo could have been better used as a "Home" button. (See also "Example" on CD)
4. Avoid non-standard fonts (e.g. "American Classic") that are unlikely to be on a user's computer.
5. The use of Aqua as a primary text colour is acceptable, but then there should be a definite distinction between links, body text and headings. Consider using the darker blue of the Novon logo (e.g. #003366) for body text for better readability. For headings the dark red (#993333) found in the Novon logo could be very effectively used for level 1 headings. Captions under pictures could use the Aqua (#006699) currently used as body text.
6. Font faces could be varied slightly to provide some subtle visual texture to pages without impairing readability (e.g. Arial for captions and Verdana for body text). Key paragraphs or important information should also be emphasised slightly by using slightly different fonts from the same family.

7. Avoid italic text for sizes less than 14 points.

STRUCTURE

1. The structure is not very clear and you will find that the user will go back to the home page frequently just to regain context (i.e. a familiar starting point). This is aggravated by the lack of visual distinction between the main sections. How about using a miniature version of the circular menu on every page to show "you are here"?
2. Alternatively, consider using a top frame for a nav bar that would offer consistent access to all main sections. (The bottom nav bar is often scrolled off the page and would not be the first navigation method chosen by the user).

NAVIGATION, INTERACTION & HYPERLINKS

1. Links should look like links - stick to the conventions (affordance)
2. Another inconsistency - sometimes words are clickable, sometimes not
3. Circular menu (index_eng.htm) - why not make words into links?
4. Some redundant links are used (i.e. link to the current page)
5. Some redundant links to top of page (i.e. when page has not scrolled away from top - e.g. novon_story.htm)
6. Make a clear distinction between links (e.g. "**The NOVON Story**" on the Main Menu), labels (e.g. "**Arts & culture**" and instructions e.g. "**Click the site you which to visit**" (Note the typo in the last sentence: "which" instead of "wish" - this appears in several places)
7. The Novon Home Page link in the navigation bar and the "Home" link should be the same - the Novon Home Page (index.htm) serves little purpose and could be combined with the home page (index_eng.htm). If in future both languages are available, the link could be in the nav bar instead of to the Novon Home Page which serves no other purpose than to choose a language.

GRAPHICS

1. The animation on page novon_vision.htm adds no value and can at best be described as "gratuitous".
2. Unnecessary colour depth in most images - an average of at least 15% saving in size would have been possible by reducing colour depth to 8, 6 or even 4 bit (16 colours).
3. Type of image (GIF or JPEG) sometimes incorrectly used.
4. Page "novon_success_cruiser_benefits.htm" - don't use JPEG for images with a lot of text - rather use GIF. (This image could have been recreated in HTML).

TECHNICAL

1. About 35 untitled documents (Note: be careful when uploading the website - several dummy documents are included on the CD that don't belong on the web site)
2. Some redundant script appears in some pages (e.g. left behind after converting layers into tables).
3. Recommended that you use a CSS for consistency and ease of formatting.
4. The inclusion of a full-text search facility, or at least a comprehensive indexed search facility, is strongly recommended.

CONCLUSION AND RECOMMENDATIONS

There is little doubt that this product will contribute significantly to the image, of your client, internally as well as externally. It may also have a definite impact on their quality of service and therefore the quality of this product should not be taken lightly.

It is recommended that:

1. Modifications and corrections be made as suggested in this document
2. A formal usability test with users be conducted with users before the web site is released. Such a test should ideally conform to the principles and criteria of ISO 9241-11. This would enable your client to quantitatively assess the usability of the product in terms of Effectiveness, Efficiency and Satisfaction.

Appendix D

Expert review checklist

JHA Design
Web Production Checklist

Client: Tertia van Eeden

Project/Site name: Novon Prototype

URL: index.htm (on CD-ROM supplied)

Works/Done	Doesn't work	Didn't check	Rating (5=good, 1= bad)	Verify the following items are correct and working before putting the website online	Comments
				Content	
X			4	Spelling and grammar	Some errors & typos found
X			5	Site includes critical information (Contact info, What company does, Help, etc.)	
X			4	Page titles (<title> tag), headers & button labels are correct and consistent	About 35 documents are untitled
		X		Client notes reviewed and all requirements handled	
				Graphics & Layout	
X			5	All images marked with ALT tags (check by not loading images)	Not consistent
X			4	Download time is acceptable	Not pages with complex layout & animation
X			4	Image quality is acceptable	Unnecessary colour depth for small images
X			3	Text layout: spacing, fonts and font sizes	
X			4	Graphics are aligned	Some errors found
				Browser compatibility	
		X		Test in Windows & Mac (watch for colour problems)	
X				Test on Netscape 3 & 4 & MS Explorer 3, 4 & 5	
				User Preferences Compatibility	
	X		1	Layout works at all window sizes and prints out without cutting off the page	Layout not resizable
X			3	Reasonable layout for all typical fonts and font size settings	Yes, but not for higher resolutions
				HTML & Coding	
		X		Test ALL links on EVERY page with the site up at its final location	
		X		Test e-mail links by sending mail (or at least careful proofreading)	
	X		1	Metatags on every page	No metatags
X			3	Java & JavaScript code is fully functionally tested	Some redundant or inefficient script
		X		Mission-critical code has gone through a code review	
				Documentation (document this in the Client folder)	
		X		Fonts and colours are correct and recorded	
		X		Client contact information	
		X		File organisation & location & any unusual naming conventions	
				Submission	
		X		Yahoo, etc.	
		X		Submit-it	
		X		Market-specific indexes	
				General	
		X		Check with a modem and/or intranet for speed problems	
		X		Verify domain name is working (where applicable)	
		X		Account representative has been notified that job is completed	
		X		Account representative has been notified that job is completed	
		X		Add to web client list/database	

NOTES

See separate document.

Appendix E

Heuristic evaluation form

Heuristic Evaluation of Web Site

Evaluation Area	Weighting	Score	Score Weighted
Content	30	88	2640
Navigation & Interaction	20	52	1033
Readability	10	63	625
Structure	8	47	373
Page layout	8	60	480
Graphics	8	66	528
Use of colour	8	58	460
Hyperlinks	8	60	480
Total Score	**100**	**62**	**6620**
		(Max=100)	(Max=10000)

Evaluated System	NOVON Prototype
Evaluator	Tertie van Eeden
WEB Site	Novon
Evaluator	JH
Evaluation Date	5/6/2000

(0=Never, 10=Always)

User: Content & Objectives	Score
Is the content of interest & value to the user?	9
Does the content attract more users?	8
Is the content being kept current?	8
Is copyright of material respected?	10
Is the content in good taste (style, etc.)?	9

User: Readability	
Are the pages easy to read for the user?	7
Do the page elements follow a logical sequence?	6
Are type fonts readable, attractive and properly sized?	6
Will the pages display properly with various browsers?	6

Presentation: Page layout	
Is there a good balance in the use of white space?	7
Does the visual organisation add to readability and meaning?	7
Is the page layout consistent?	5
Are elements arranged to fit within the browser window without unmotivated scrolling?	5

Presentation: Use of colour	
Are colours attractive, harmonious and appealing to most users?	7
Does the use of colour aid the user in understanding the content?	5
Is colour used consistenly?	7
Has adequate consideration been given to subjective or associative meanings of colour?	4

Structure	Score
Is the site layout & structure easy to understand?	4
Can the user maintain a sense of position in the site?	4
Is the loading and display time acceptable?	6

Interaction: Navigation	
Is the mode of navigation clear?	5
Is the sequence of displays predictable?	4
Can the user navigate readily from page to page?	4
Are the syntactic details of the interaction simple enough?	4
Is the feedback adequate?	7
Is it easy to return to the starting (Home) location?	7

Interaction: Hyperlinks	
Do links enhance the purpose and use of the site?	6
Do all links contribute to the purpose of the site?	6
Are the links easy for users to find?	6
Are hyperlinks treated in a consistent manner (behaviour and appearance)?	6

Presentation: Graphics	
Are graphics clear and attractive?	7
Do the graphics contribute to the purpose of the page?	7
Do graphics contribute to understanding?	7
Are graphics optimised to speed up loading time?	6
Do graphics aid users with navigation?	6

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HEURISTIC USABILITY EVALUATION

Jacques Hugo Associates

PROGRAM/SYSTEM NAME	Novon Prototype
USER/ORGANISATION	Tertia van Eeden
	Novon

		CRITERIA	Semantic scale	RATING (1 - N/A or 10 - high)	Comments
		USER			**USER**
1	1.1	Mental model	Not accommodated / Accommodated	7	
2	1.2	Metaphor	Not appropriate / Appropriate	6	
3	1.3	Working memory ("rule of 7")	Limitations not respected / Respected	6	
4	1.4	Physical ergonomics	Not accommodated / Accommodated	0	
		DISPLAY & INTERFACE			**DISPLAY & INTERFACE**
5	2.1	Screen layouts	Inhibit tasks / Simplify tasks	6	
6	2.2	Display identification	Never / Always	7	
7	2.3	Characters	Unreadable, Fuzzy / Readable, sharp	7	
8	2.4	White space surrounding characters or blocks	Inadequate / Adequate	7	
9	2.5.1	Highlighting: Levels of intensity or bold	Difficult to distinguish / Clear	7	
10	2.5.2	Highlighting - Underscoring	Inappropriate / Appropriate	6	
11	2.5.3	Highlighting: Reverse background/foreground	Inappropriate / Appropriate	0	
12	2.5.4	Highlighting: Blinking	Inappropriate / Appropriate	0	
13	2.5.6	Highlighting: colour changes	Inappropriate / Appropriate	0	
14	2.6	Video quality	Poor / Excellent	0	
15	2.7	Audio quality	Poor / Excellent	0	
		INTERACTION			**INTERACTION**
16	3.1	Dialogue: Number of operations per task	Many / Few	6	
17	3.2	Dialogue: Operations relate to tasks	Never or distantly / Close, always	6	
18	3.3	Dialogue: Beginnings, middles and ends of tasks marked	Confusing / Clear	6	
19	3.4.1	Work proceeds from top to bottom	Never / Always	6	
20	3.4.2	Navigation: Sequence of displays	Confusing / Clear	5	
21	3.4.3	Navigation: Next screen in sequence	Unpredictable / Predictable	5	
22	3.4.5	Maintain sense of position in system	Impossible / Easy	4	

23	3.5	Syntactic details	Overwhelming / Limited	4	
24	3.6	Pace of interaction	Too slow / Fast enough	7	
25	3.7	Data entry operations are echoed	Too slow / Fast enough	8	
26	3.8	Response time for most operations	Too slow / Fast enough	8	
27	3.9	Destructive operations / Error protection	Not protected / Protected	0	
28	3.1	Going back to change values	Complex / Simple	0	
29	3.11	Undoing operations	Complex / Simple	0	
30	3.12	Interaction device (keyboard, mouse, touch screen, etc)	Inappropriate / Appropriate	9	
31	3.13.1	Language: Terminology	Not related to task domain / Related	8	
32	3.13.2	Language: Naming of fields	Cryptic, ambiguous / Precise, clear	0	
33	3.13.3	Language: Abbreviations	Confusing, cryptic / Consistent, clear	9	
34	3.13.4	Language consistency	Inconsistent / Consistent	8	
35	3.14.1	Feedback: Information	Inappropriate / Appropriate	0	
36	3.14.2	Feedback: Too little feedback	Always / Never	0	
37	3.14.3	Feedback: Too much feedback	Always / Never	0	
38	3.14.4	Feedback is user controlled	Never / Always	0	
39	3.14.5	Feedback link between operations and result	Confusing / Clear	0	
40	3.15.1	Messages: Tone of error messages	Nasty / Friendly	0	
41	3.15.2	Correction of errors	Complex / Simple	0	
42	3.15.3	Meaningful prompts	Not provided / Provided	1	
		INFORMATION			**INFORMATION**
43	4.1	Information load per screen too high	Always / Never	6	
44	4.2	Information load per screen too low	Always / Never	7	
45	4.3	Access to information	Complex / Easy	5	
46	4.4	On-line help	Not available / Very useful	0	
47	4.5	Contents of on-line help	Confusing / Clear	1	
48	4.6	Reference manuals	Not available / Adequate	0	
49	4.7	Information to complete tasks	Must be memorised / Is visible	6	
50	4.8	Structure of information	Obscure / Recognisable	4	
51	4.9	Organisation of help	Confusing / Clear	0	
		LEARNING			**LEARNING**
52	5.1	Getting started	Difficult / Easy	6	
53	5.2	Learning more features	Difficult / Easy	6	
54	3.3	Use by different levels of experience	Not accommodated / Easy	0	
55	5.4	Novices can use subset	Not available / Easy	0	

56	5.5	Expert users can add shortcuts / features	Not possible / Easy	0	
57	5.6	User can taylor the interface	Impossible / Easy	0	
58	5.7	Relearning after intermittent use	Difficult / Easy	7	
		INSTRUCTIONS			**INSTRUCTIONS**
59	6.1	Task instructions	Confusing / Clear	6	
60	6.2	Instructions for commands or options	Confusing / Clear	0	
61	6.3	Instructions for getting help	Not given / Clear	0	
62	6.4.1	Consistency: Instruction position	Inconsistent / Always consistent	5	
63	6.4.2	Consistency: Instruction grammar	Inconsistent / Always consistent	8	
64	6.4.3	Consistency: Instruction tone	Inconsistent / Always task related	8	
65	6.4.4	Consistency: Task related	Inconsistent / Always task related	8	
66	6.5	Instructions on how to fix errors	Not given / Clear and helpful	0	
		OVERALL			**OVERALL**
67	7.1		Terrible / Excellent	6	
68	7.2		Frustrating / Satisfying	6	
69	7.3		Dull / Stimulating	7	
70	7.4		Difficult / Easy	6	
71	7.5		Inadequate power / Adequate power	7	
			Total Score	**274**	
			Usability Index (minimum target = 80%)	**62%**	

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GENERAL COMMENTS

Completed by:
Jacques Hugo
5 June 2000

Appendix F

Usability Testing

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

NOVON

OES BESKERMING

NOVON webwerf - Bruikbaarheidstoetsing

Jaargang 2000 *www.novoncp.co.za*

Geagte Respondent

I.S. Bruikbaarheidstoetsing – NOVON webwerf

Voordat die webwerf finaal gepubliseer kan word is dit van uiterste belang dat webwerf bruikbaarheidstoetsing gedoen word, om sodoende die effektiwiteit van die webwerf te evalueer.

Let asb. op die volgende:

Die program gebruiker word op geen stadium geevalueer nie, slegs die bruikbaarheid van die webwerf word getoets.

Algemene inligting

'n Verskeidenheid navigasie take word aan u opgedra om so vinnig as moontlik uit te voer.

Éen of twee persone hou die proses dop om so die programbruikbaarheid te evalueer.

Die resultate word aangewend om die bruikbaarheid van die webblad aan te pas indien nodig.

Baie dankie vir u samewerking!

VENNOTE IN KWALITEIT
PARTNERS IN QUALITY

Navigasie take

1. Vind die etiketinligting van die insekdoder Acarol.
2. Vind die tabel met die oesbeskermingsmiddels wat op appels en pere gebruik word.
3. Vind die artikel 'Herbicide resistance in the RSA' in die NOVON nuusbrief.
4. Vind Novartis SA se 'link' na die nuusbrief.
5. Vind die weerburo se 'link' op die 'News focus : SA Agriculture' webbladsy.
6. Vind NOVON se 'mission statement'.
7. Vind 'NOVON organisation structure'.
8. Vind die webbladsy wat die 'NOVON partners' (Agri Oos, Agri Wes ens.) aandui.
9. Vind 'NOVON Protecta' d.m.v die 'SA map' wat verskaf word.
10. Vind Lina Havenga se e-pos adres via die 'NOVON organisation' webbladsy.

Respondent se beroep:

Area hoof	
Finansiële bestuurder	
Agent	
Ander	

Respondent nr:_____

Taak	Clicks	Sek.	Kommentaar
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Webwerf bruikbaarheidsvraelys Respondent no._____

1. Ouderdom in jare: _____

2. Met watter stelling stem u die meeste saam:

Ek beskou myself as PC geletterd.	1
Ek het genoeg rekenaarvaardighede om self reg te kom.	2
Ek voel my PC vaardighede is nie voldoende nie.	3
Ek kan nie 'n rekenaar gebruik nie.	4

3. Hoe gereeld besoek u die internet?

Daagliks	1
Weekliks (3-4 x week)	2
1 – 2 keer per maand	3
Minder as 1 keer per maand	4
Nooit	5

In die volgende gedeelte moet u aantoon in watter mate u met die volgende stellings saamstem al dan nie.

Die formaat van hierdie gedeelte is soos volg:

'n Stelling word aan u voorgehou wat u asb. moet beoordeel op 'n 5 punt skaal.

Die 5 punt skaal het die volgende waardes:

Stem beslis nie saam nie	Stem nie saam nie	Kan nie besluit nie	Stem saam	Stem beslis saam
1	2	3	4	5

Werking van die webwerf

	1	2	3	4	5
Ek kon die inligting vinnig vind					
Ek is te vrede met die aflaaispoed van die webbladsye					
Ek is te vrede met die werking van die webwerfskakels (links)					

Gebruikers tevredenheid

	1	2	3	4	5
Origens was dit maklik om die take uit te voer					
Dit was maklik om die inligting te vind					
Die navigasie inligting was maklik om te verstaan					
Die webwerf navigasie is maklik om te gebruik					
Ek voel te vrede met die webwerf se gebruikersvriendelikheid					

In die volgende gedeelte moet u aantoon in watter mate u met die volgende stellings saamstem al dan nie.

'n Stelling word aan u voorgehou wat u asb. moet beoordeel op 'n 5 punt skaal.

Die 5 punt skaal het die volgende waardes:

Baie swak	Swak	Kan nie besluit nie	Goed	Baie goed
1	2	3	4	5

Effektiwiteit van die webwerf

	1	2	3	4	5
Die doeltreffendheid van die hoeveelheid inligting per web bladsy					
Die doeltreffendheid van navigasie inligting beskikbaar aan gebruiker					
Die leesbaarheid van die webwerf inligting					
Die aanvaarbaarheid van die web voorkoms					

Baie Dankie!