

## 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)**

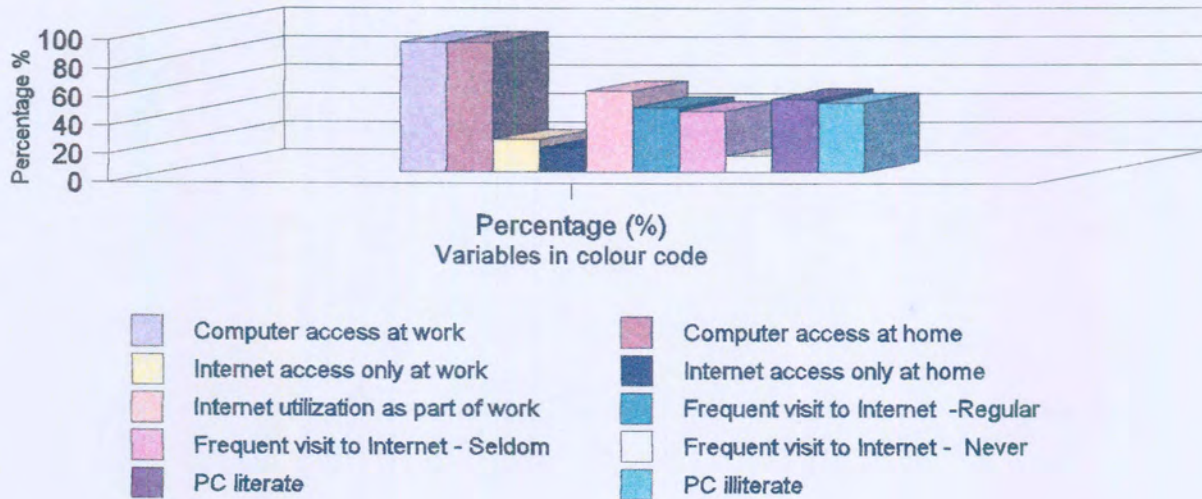
Variable	Percentage (%)
<b>Age (yrs)</b>	
≥ 24 - 33	37,1
≥ 34 - 57	62,9
<b>Gender - male</b>	
	100
<b>Marital status</b>	
Unmarried	22,9
Married	71,4
Divorced/Widowed	5,7
<b>Language preference</b>	
Afrikaans	91,4
English	8,6
<b>Children</b>	
Yes	68,6
No	31,4

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.

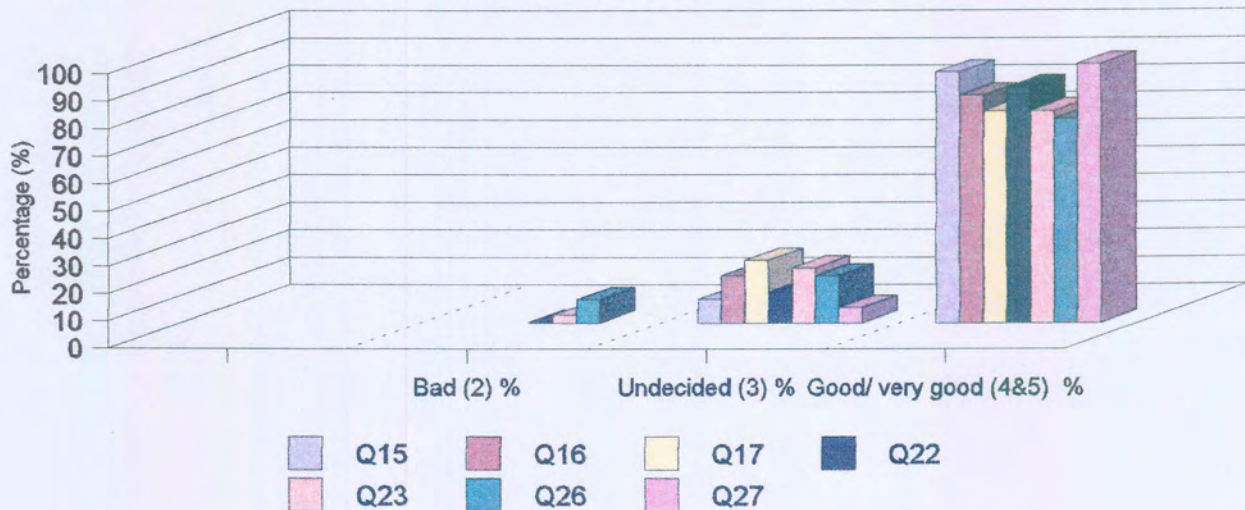
#### **4.1.2 Quantitative analysis of results of Section C1 of the user-evaluation questionnaire**

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	14,3	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)**

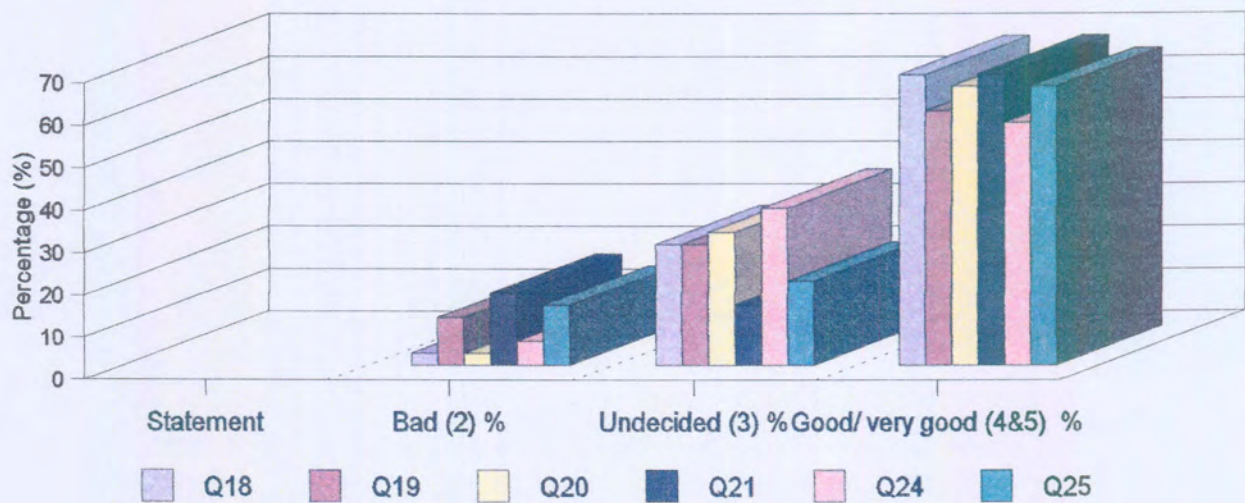


Table 4.3.1 and Chart 4.2.1 clearly indicate that the good to very good rating with each of the statements on the design features is very high, varying from 74,3 to 94,3 percent. However, from Table 4.3.2 and Chart 4.2.2 it can be noted that the percentage vote for the good to very good rating

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)**

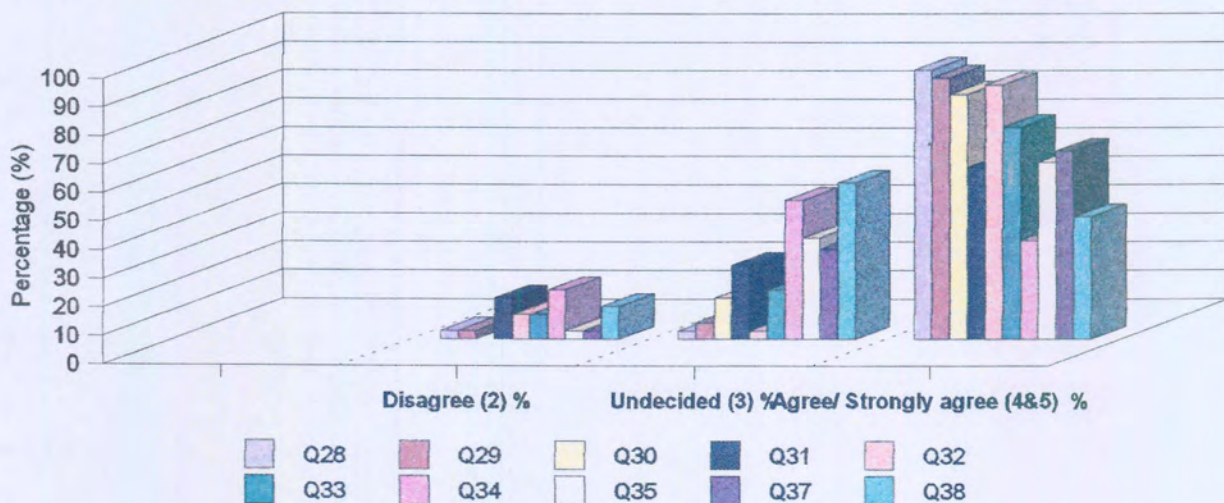


Chart 4.3 depicts respondents' views on whether the web site could enhance communication, customer service and relationship building between the company and themselves. From the results it can be

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.

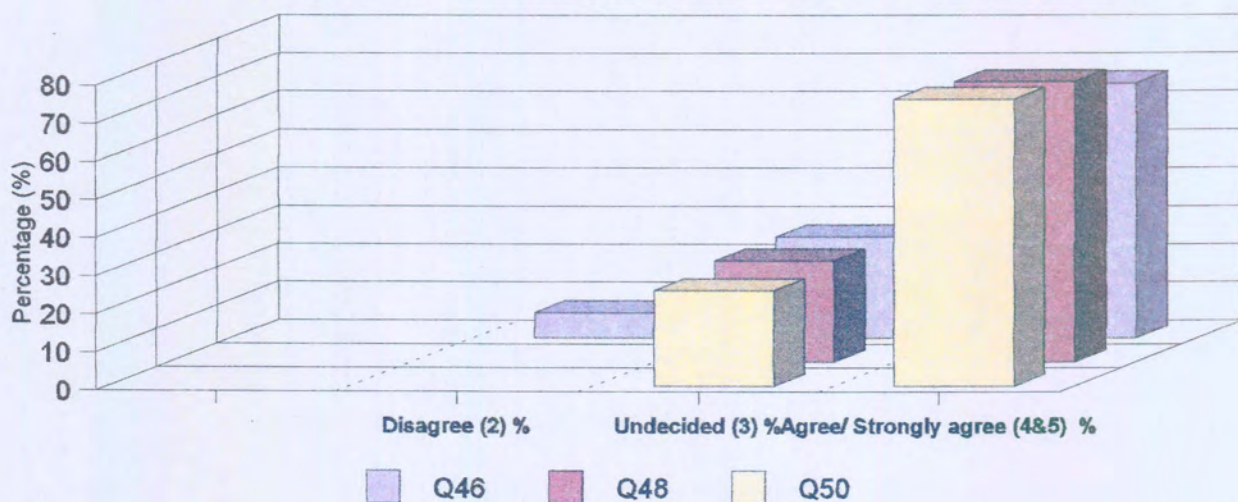
#### **4.1.4 Quantitative analysis of results of Sections D and E of the user evaluation questionnaire**

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

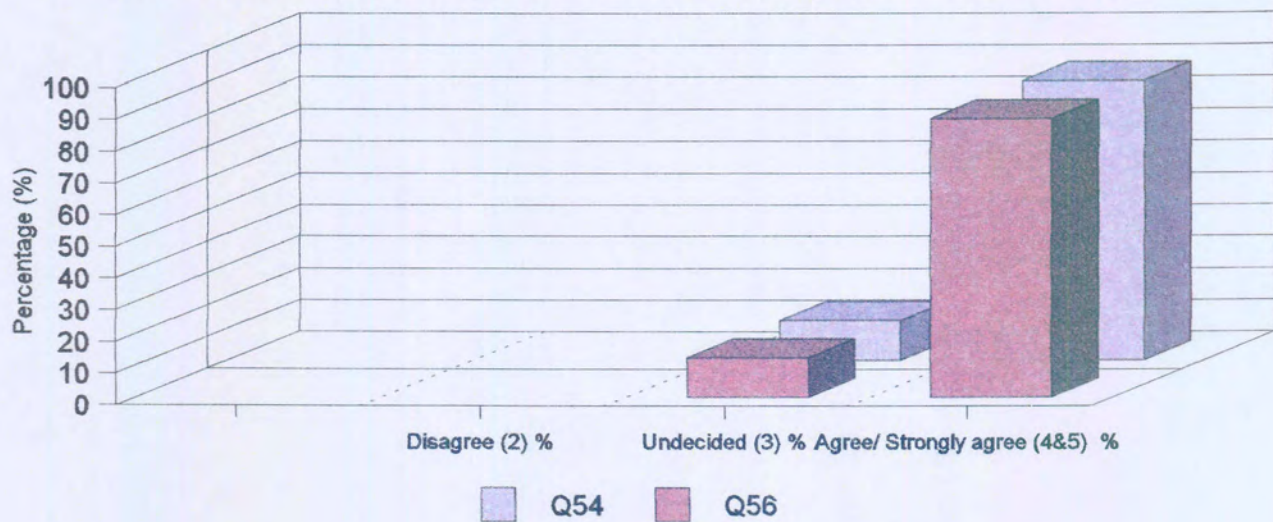
**Chart 4.4 Rank order of statements depicted in Table 4.5 (n=15)**



**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 ( $\leq 24$  - 33yrs)/ B ( $\geq 34$  - 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 Wilcoxon 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 ( $\leq 24 - 33$  yrs) and the older age group ( $\geq 34 - 57$  yrs) 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).

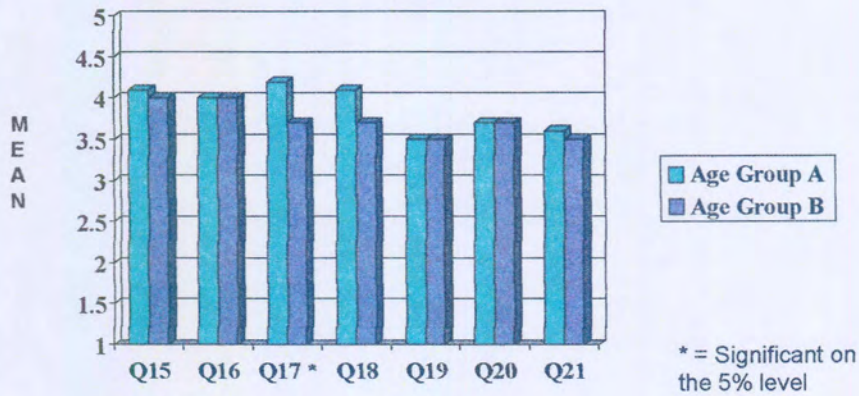
**Table 4.7 Results of the Wilcoxon Rank Sum Test for comparing 'Age Groups' by means of ranking variables (1-5 scale)**

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
<b>Q17</b>	<b>4,2</b>	<b>0,6</b>	<b>3,7</b>	<b>0,5</b>	<b>0,0171*</b>
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					

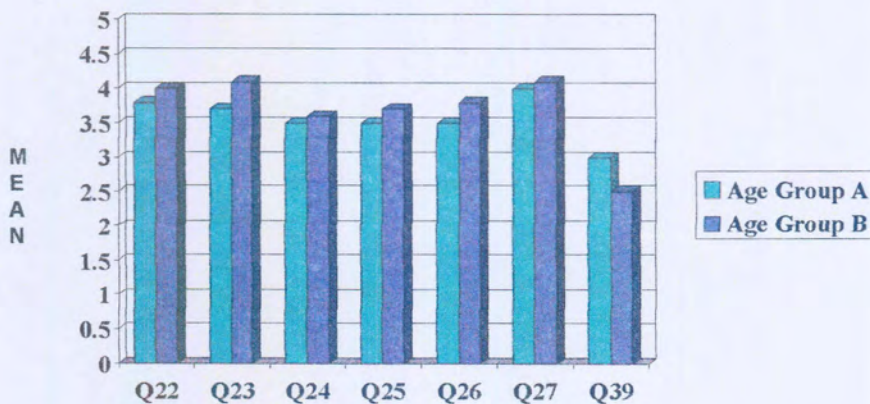
The independent variable (age groups) that does exhibit a significant difference in the review of Table 4.7 is the ranking of question 17 that states that 'The visual material (graphics, photos, background)

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  $\leq$  33 years(n=13)**  
**Age Group B  $\geq$ 34 years(n=22)**



**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  $\leq$  33 years(n=13)**  
**Age Group B  $\geq$ 34 years(n=22)**

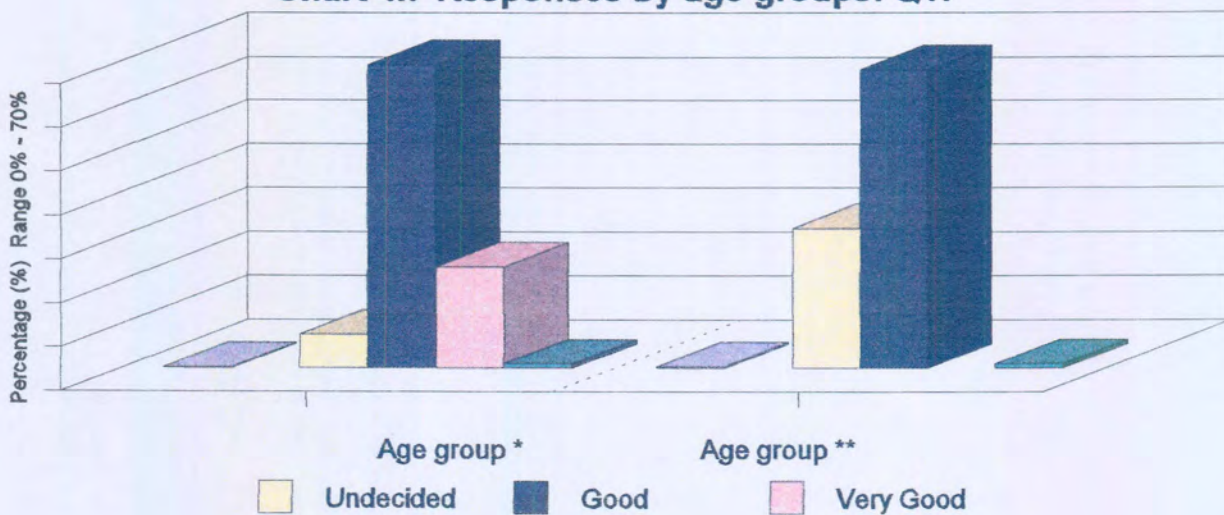


The information contained in Table 4.7 and Chart 4.6.1 needs to be placed into perspective to make it even more meaningful. This can be achieved by calculating the percentage of responses of each group on each question to clarify the nature of the difference. The approach adopted here is only to report 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 ( $\leq 24 - 33$ yrs) (n=13)		Age group ( $\geq 34 - 57$ yrs) (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 ( $\leq 24 - 33$  yrs) (n=13)

Age group \*\* = Age group ( $\geq 34 - 57$  yrs) (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)**

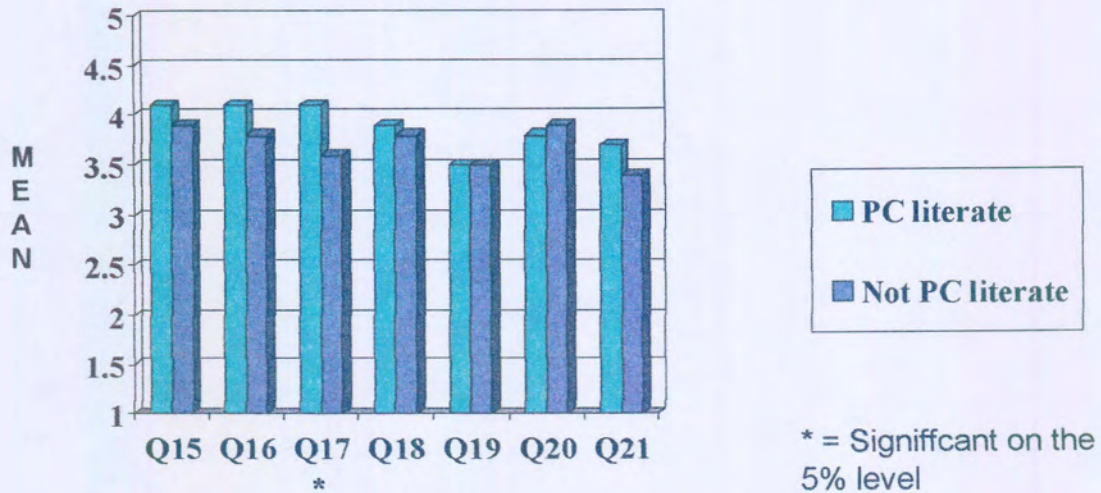
Variables	PC literacy - PC illiteracy				P
	PC literate (n=18)		PC illiterate (n=17)		
	Mean	Std Dev.	Mean	Std Dev.	
Q15	4,1	0,5	3,9	0,3	0,1074
Q16	4,1	0,6	3,8	0,4	0,2198
Q17	<b>4,1</b>	<b>0,5</b>	<b>3,6</b>	<b>0,5</b>	<b>0,0049*</b>
Q18	3,9	0,7	3,8	0,8	0,6914
Q19	3,5	1,0	3,5	0,7	0,7149
Q20	3,8	0,7	3,6	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**

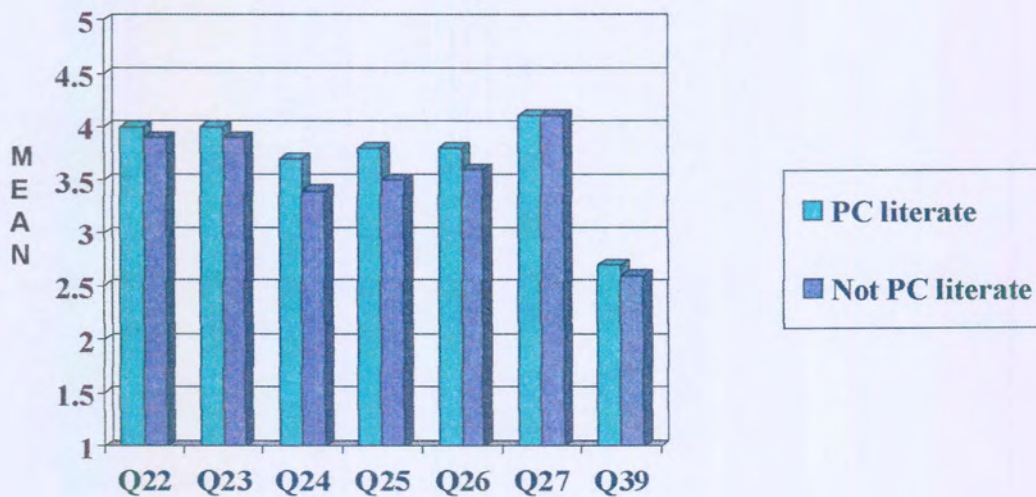
The independent variable (PC literacy and PC illiteracy), which does exhibit a significant difference in the review of Table 4.9, is the ranking of question 17 that states ‘The visual material (graphics, photos, background) used in the web site is very effective’. The respondents from the two subgroups 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)



**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**

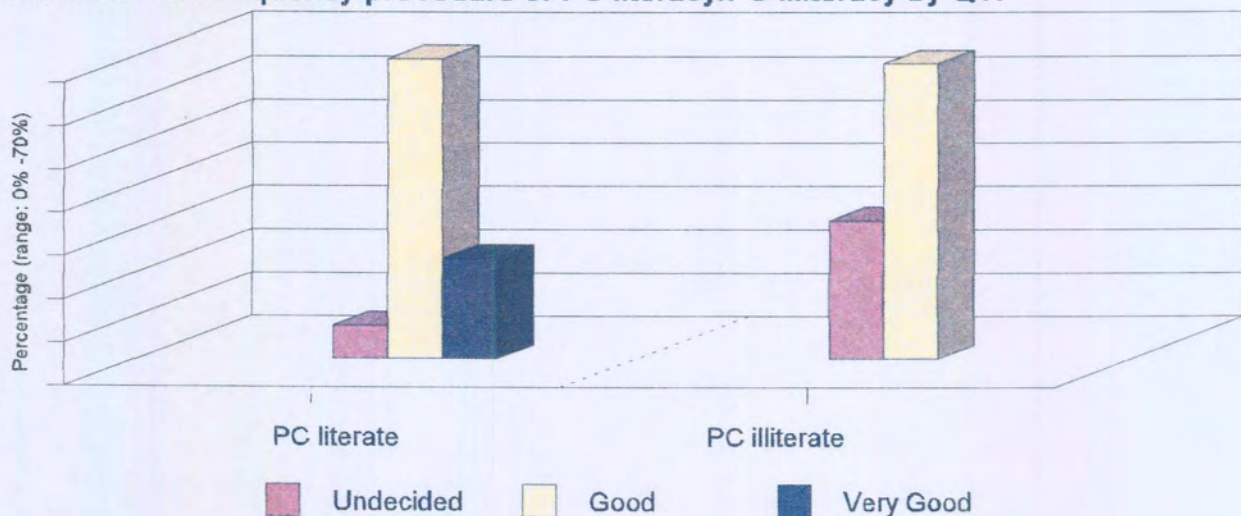




Table 4.10 and Chart 4.9 depict the differences and similarities in respondents' responses to the statement regarding the effectiveness of the visual material (graphics, photos, background) used in the web site. Chart 4.8.1 indicates that the most notable difference was the difference in the response 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).

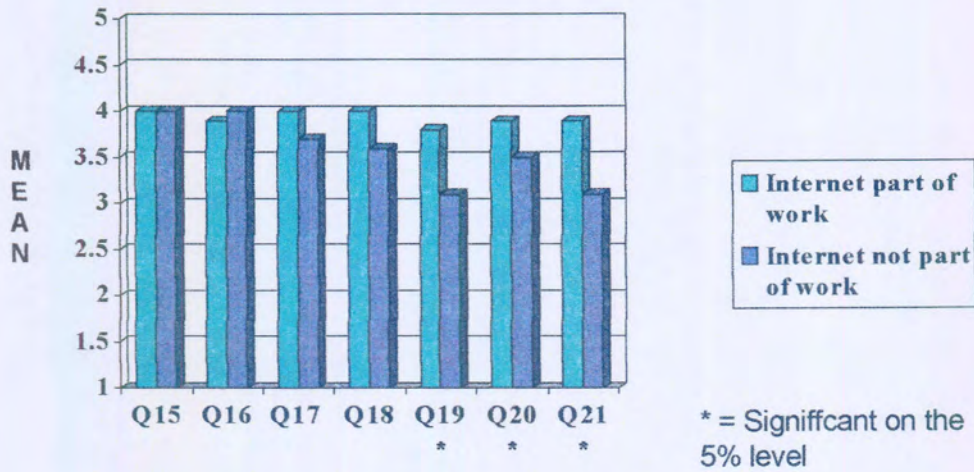
**Table 4.11 Results of the Wilcoxon Rank Sum Test for comparing “Use of Internet as part of work/Use of Internet not part of work” by means of ranking variables (1-5 scale)**

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
<b>* Significant on the 5% level</b>					

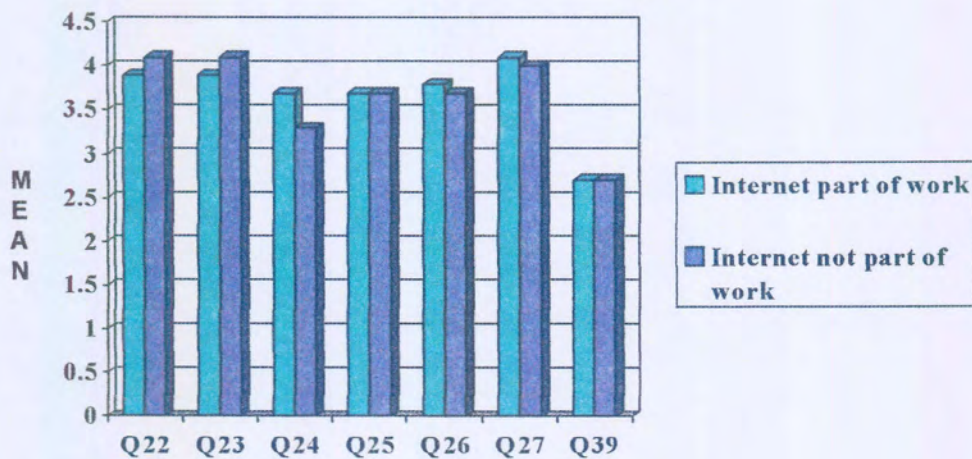
The independent variable (Use of Internet as part of work/Use of Internet not part of work) that does exhibit a significant difference in the review of Table 4.11 is the ranking of Question 19, 20 and 21 that states. 'The ease of navigation, navigation options and navigation information available to 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)



**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**

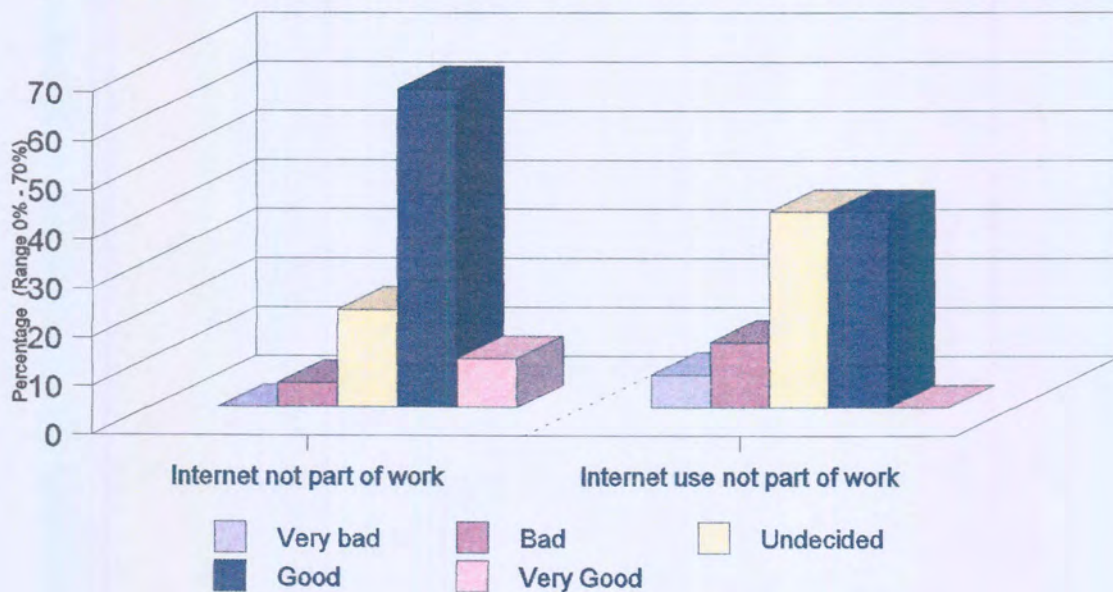


Table 4.12.1 and Chart 4.11.1 depict the differences in respondents' responses to the statement regarding the ease of navigation of the web site. Chart 4.11.1 shows that the most notable difference was the difference in the response of the agents who used the Internet as part of their work (75,0%) to 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

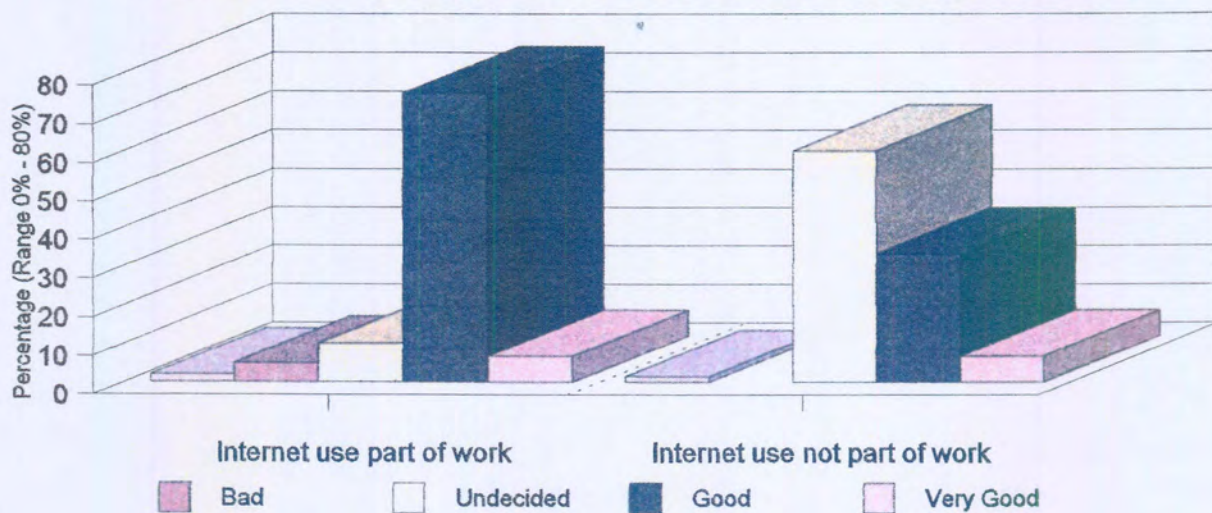


Table 4.12.2 and Chart 4.11.2 depict the differences and similarities in respondents' responses to the statement regarding the navigation option available on the web site. Chart 4.11.2 shows that the most notable difference was the difference in the responses of the agents that used the Internet as part 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)**

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



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

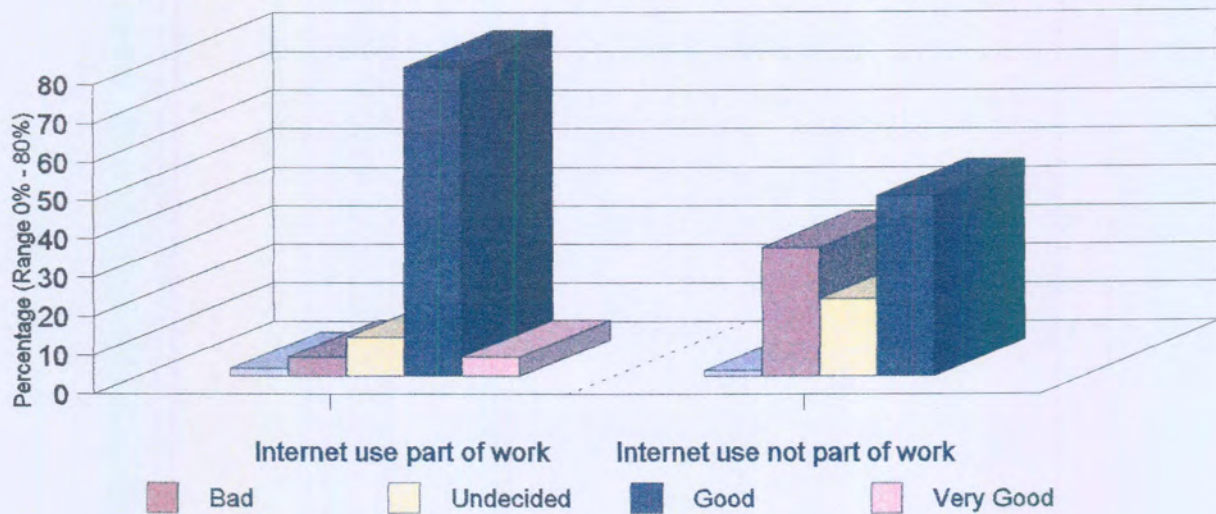


Table 4.12.3 and Chart 4.11.3 depict the differences and similarities in respondents' responses to the statement regarding the navigation information available on the web site. Chart 4.11.3 clearly illustrates that the most notable difference was the difference in the response of the agents that used 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).

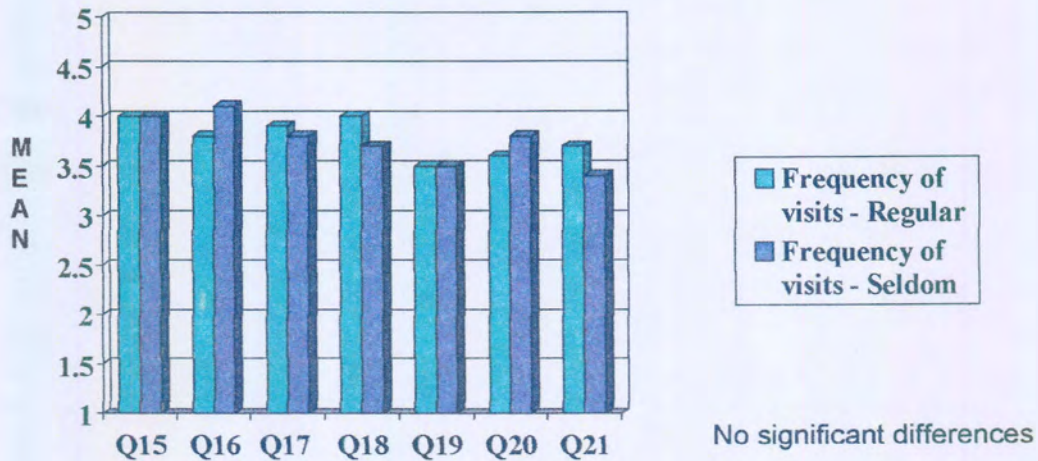
**Table 4.13 Results of the Wilcoxon Rank Sum Test for comparing 'Regular visits to the Internet versus Irregular visits to Internet (Seldom)' by means of ranking variables (1-5 scale)**

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	
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
<b>* Significant on the 5% level</b>					

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.

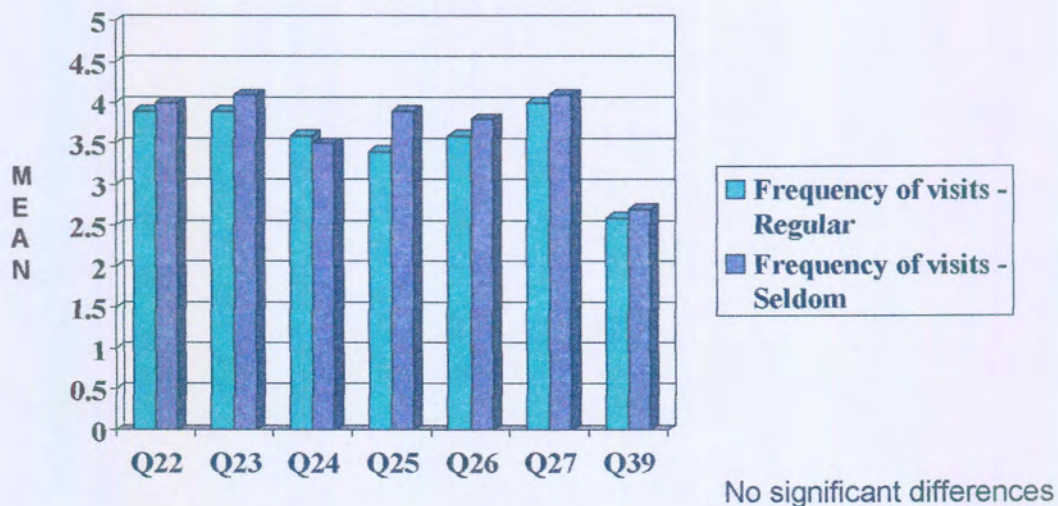
**Chart 4.12.1 Results of Wilcoxon Rank Sum Test for comparing frequency of visits to Internet by means of ranking variables (1- 5 Scale)**

Visits to Internet – Regular (Daily to 3-4/week) (n=16)  
 Visits to Internet - Seldom (1-2/month)(n=19)



**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)



This concludes the analysis of differences between subgroups.

The following 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 ( $\leq 24$  - 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 ( $\geq 34$  - 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 exist 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**

<b>Question 17: Statement - The visual material (graphics, photos, background) used on the web site is very effective.</b>	
<b>Sub group</b>	<b>Significant differences</b>
Age group ( $\leq 24$ - 33yrs)/ Age group ( $\geq 34$ - 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).
<b>Question 19: Statement - The ease of navigation</b>	
<b>Sub group</b>	<b>Significant difference</b>
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.
<b>Question 20: Statement - Navigation options available to user</b>	
<b>Sub group</b>	<b>Significant difference</b>
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.
<b>Question 21: Statement - Navigation information available to user</b>	
<b>Sub group</b>	<b>Significant difference</b>
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)**

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

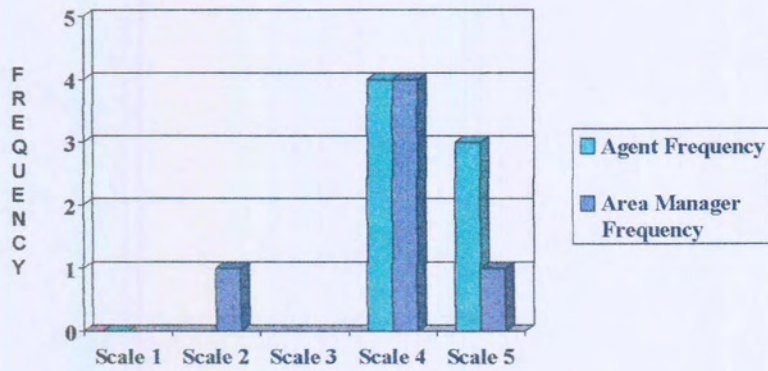
<b>Question 1: Statement - I completed the performance tasks in a very short period of time</b>						
<b>Response</b>	<b>Agents</b>		<b>Area managers</b>		<b>Row total</b>	
<b>Scale (1-5)</b>	<b>Frequency</b>	<b>%</b>	<b>Frequency</b>	<b>%</b>	<b>Frequency</b>	<b>%</b>
<b>Strongly disagree</b>	-	-	-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



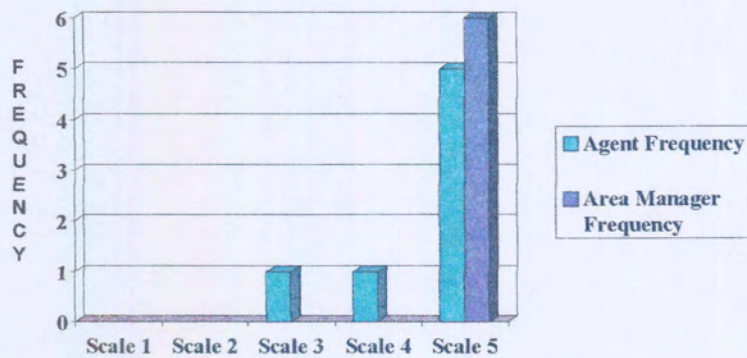
<b>Question 2: Statement - The down load speed of the web pages are acceptable</b>						
Response scale (1-5)	Agents		Area managers		Row total	
	Frequency	%	Frequency	%	Frequency	%
Strongly disagree	-	-	-	-	-	-
Disagree	-	-	-	-	-	-
Undecided	1	14,3	-	-	1	7,69
Agree	1	14,3	-	-	1	7,69
Strongly agree	5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



**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)**

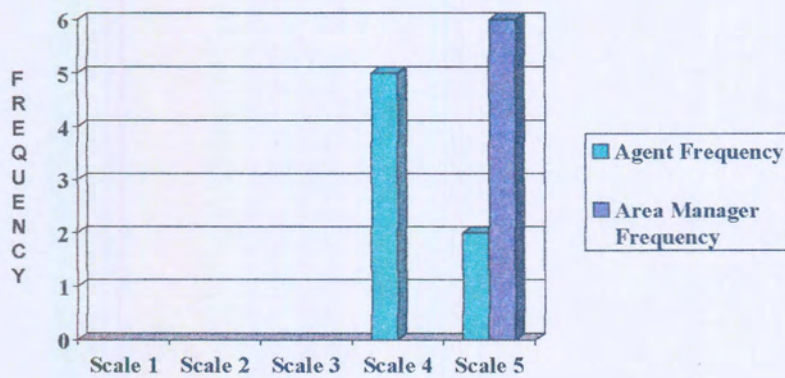


Table 4.16.1 and Charts 4.13.1 - 4.13.3 depict the similarities in participants' responses to the statements regarding the efficiency of the web site. The charts clearly illustrate that the majority of the agents and area managers were notably satisfied with the statements on the efficiency of the web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

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



<b>Question 6: Statement - It was easy to understand the navigation information</b>						
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
<b>Col Total</b>	<b>7</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>13</b>	<b>100</b>
<b>Question 7: Statement - The web navigation is easy to use</b>						
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
<b>Col Total</b>	<b>7</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>13</b>	<b>100</b>
<b>Question 8: Statement - I am satisfied with the user friendliness of the web site</b>						
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
<b>Col total</b>	<b>7</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>13</b>	<b>100</b>



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

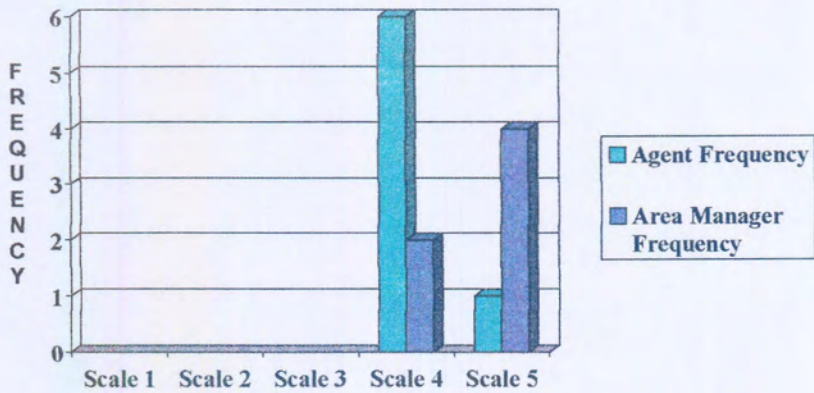


Chart 4.13.5 The frequency procedure of agents and area managers by Q5 by means of a rating scale (1-5)

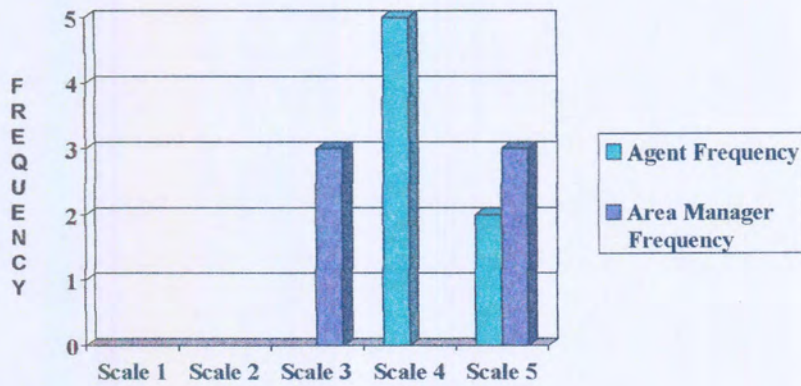
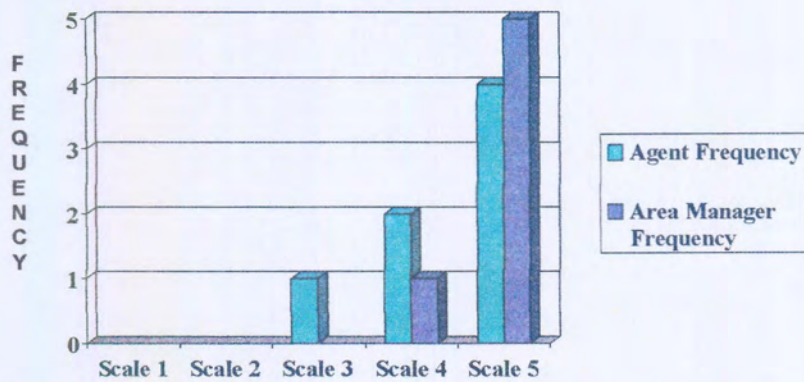
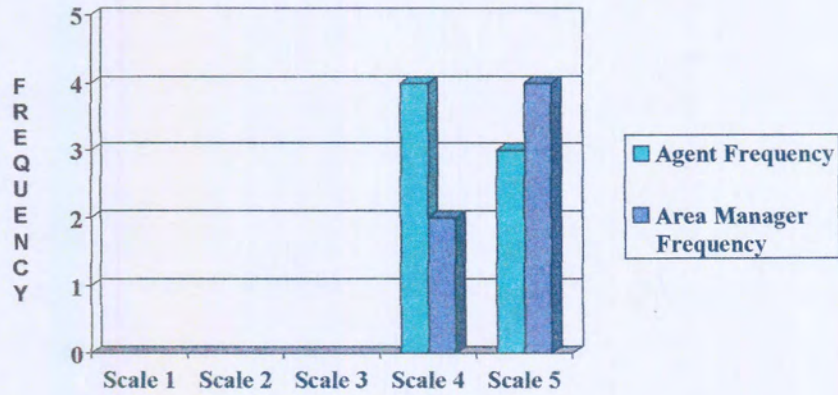


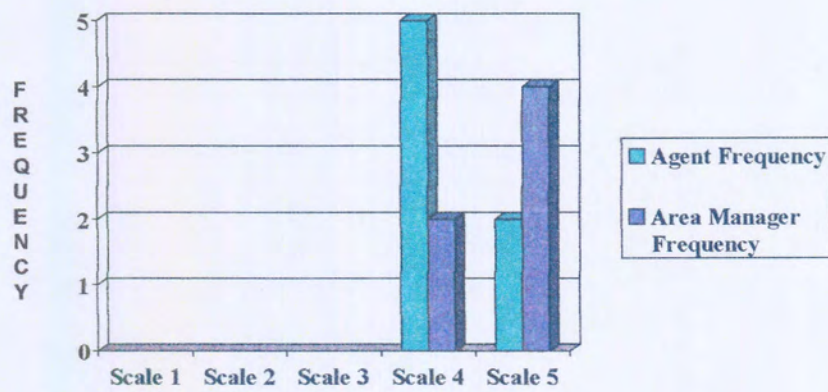
Chart 4.13.6 The frequency procedure of agents and area managers by Q6 by means of a rating scale (1-5)



**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)**

<b>Question 9: Statement - The amount of information per web page</b>						
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
<b>Question 10: Statement - The navigation information available</b>						
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
<b>Question 11: Statement - The readability of the information</b>						
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)

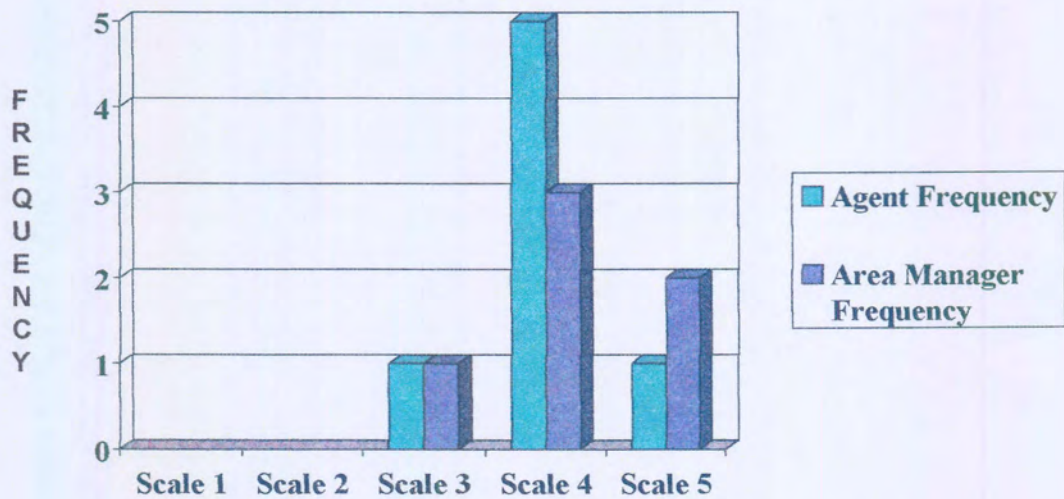




Chart 4.13.10 The frequency procedure of agents and area managers by Q10 by means of a rating scale (1-5)

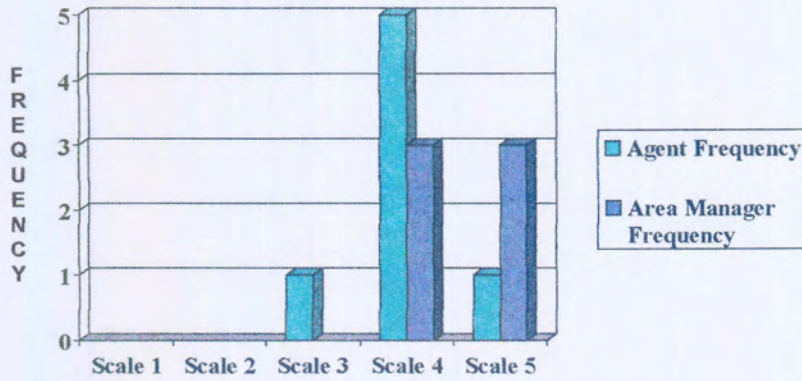


Chart 4.13.11 The frequency procedure of agents and area managers by Q11 by means of a rating scale (1-5)

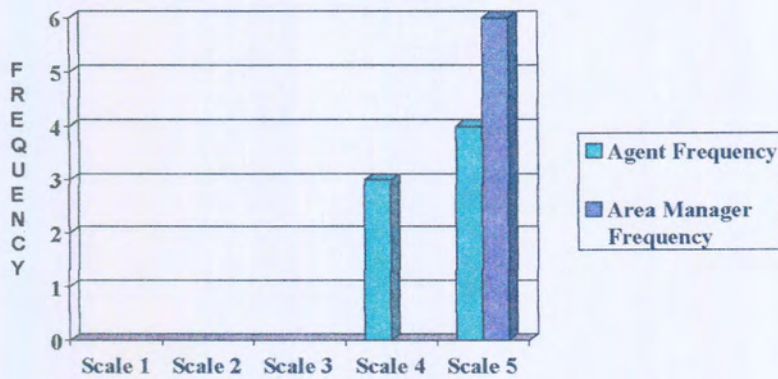
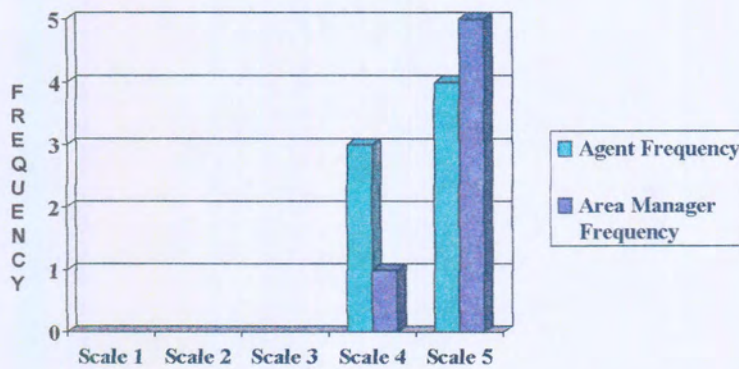


Chart 4.13.12 The frequency procedure of agents and area managers by Q12 by means of a rating scale (1-5)



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
<b>Ave</b>	<b>3.60</b>	<b>01:33</b>	<b>3.90</b>	<b>00:47</b>	<b>3.30</b>	<b>00:29</b>	<b>4.50</b>	<b>00:50</b>	<b>3.80</b>	<b>00:34</b>	<b>3.90</b>	<b>00:25</b>	<b>3.83</b>	<b>00:46</b>				

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

Agents (n = 7)																				
Task	1		2		3		4		5		6		7		Average		Std Dev.		Median	
	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	00:03
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	00:00
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	00:00
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	00:05
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	00:05
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	00:02
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	00:01
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	00:06
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				

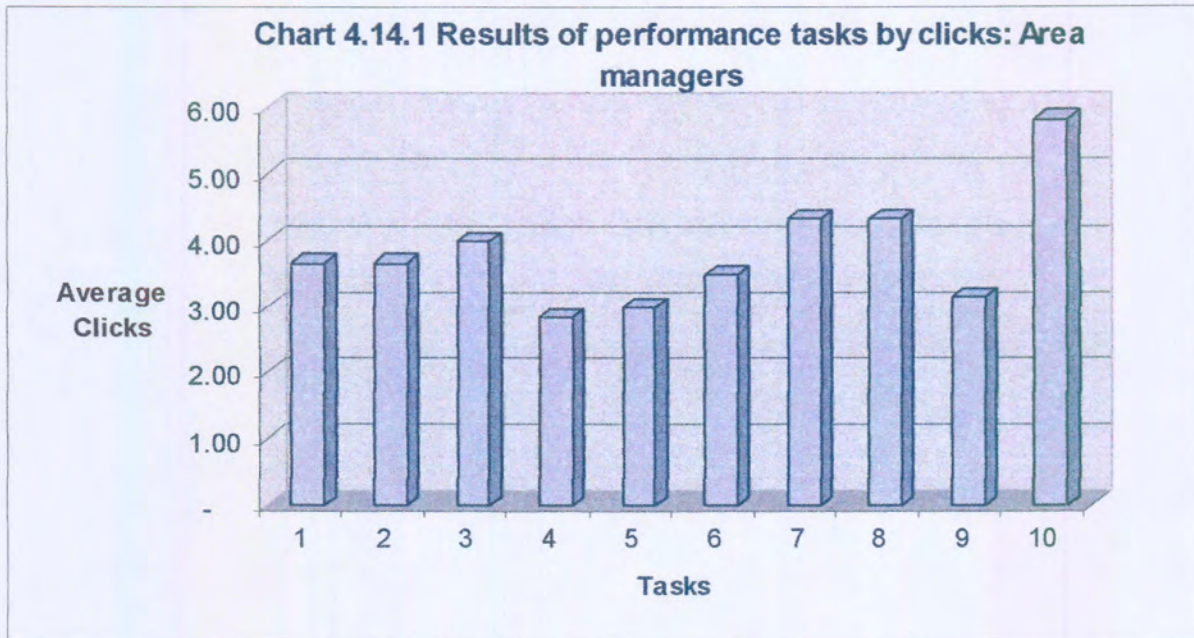
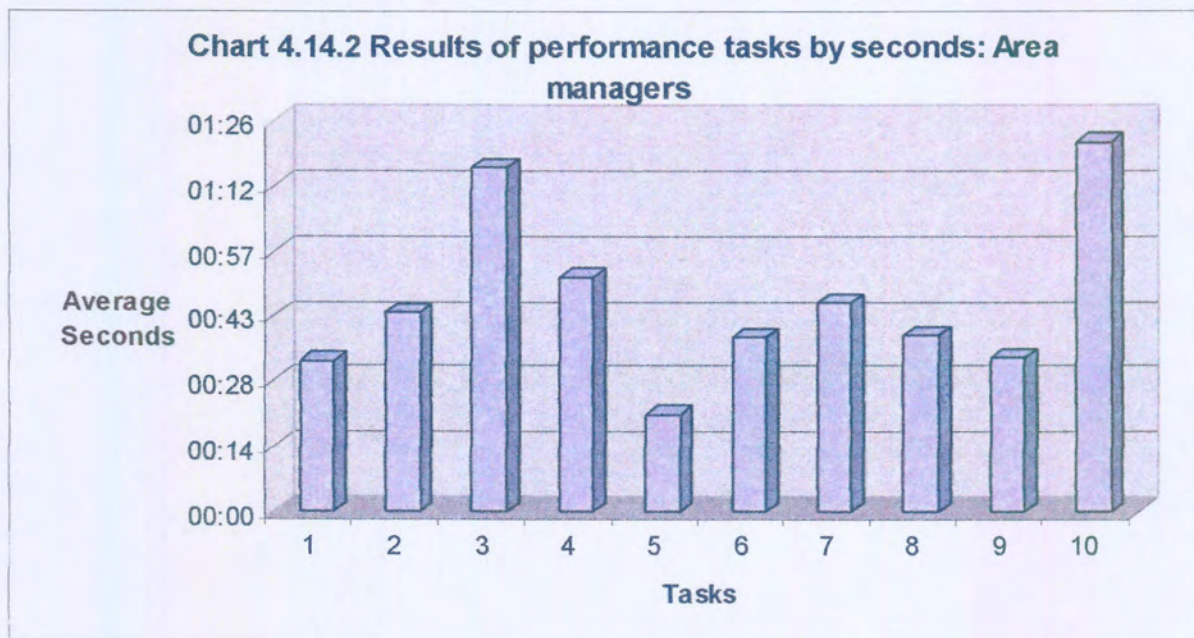


Chart 4.14.1 depicts the performance task results (total mouse clicks per task) of the participating area managers of the Novon Crop Protection company. Nine of the ten tasks were successfully completed within fewer than five mouse clicks. Chart 4.14.2 shows the total task time used by the area managers 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 Results of performance tasks by clicks: Agents**

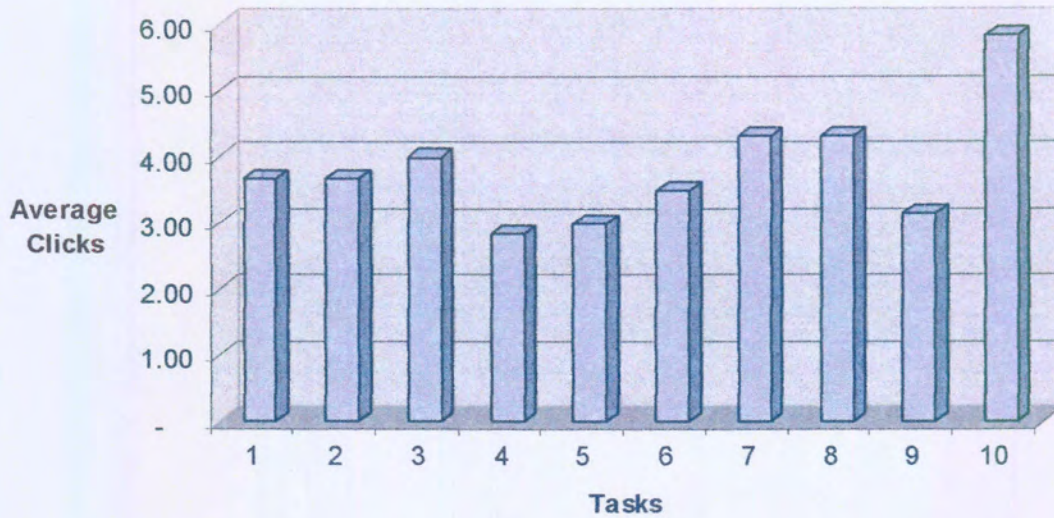
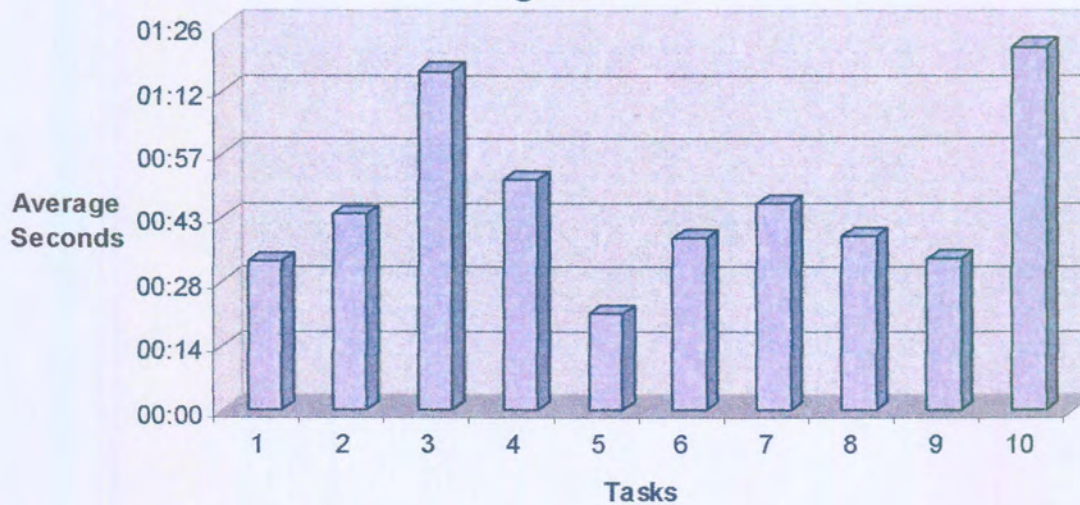


Chart 4.14.3 shows the performance task results (total mouse clicks per task) of the participating agents of the Novon Crop Protection company. Eight of the ten tasks were successfully completed within less than 4 mouse clicks, while the other tasks were completed in fewer than six mouse clicks. Chart 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.

**Chart 4.14.4 Results of performance tasks by seconds: Agents**



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
<b>Content</b>	
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
<b>Graphics &amp; layout</b>	
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
<b>User preferences compatibility</b>	
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
<b>HTML and coding</b>	
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 W	Value V	Score W 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
<b>Total score</b>	<b>100</b>	<b>62</b>	<b>6620</b>

(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 resizable.*

*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**

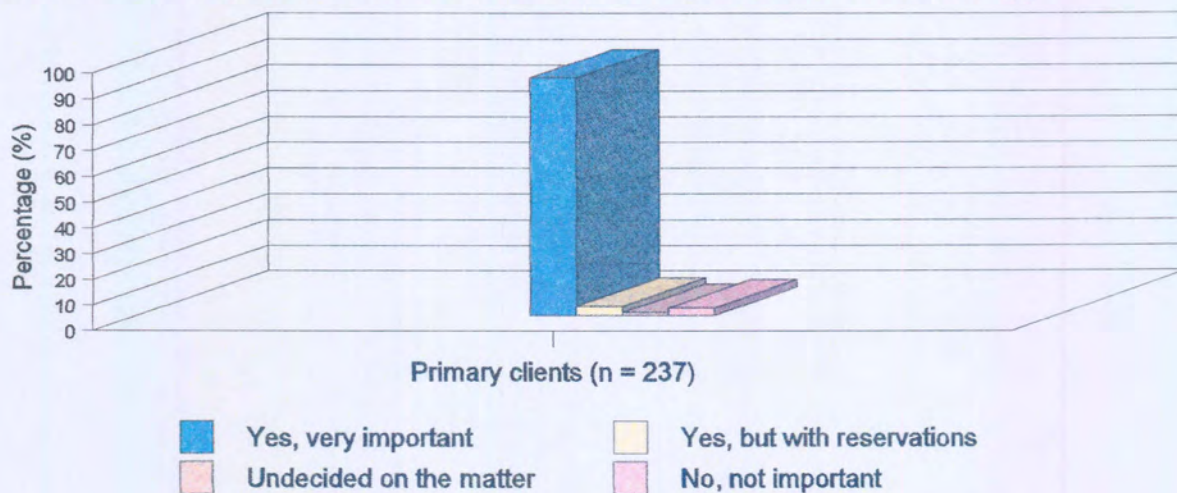


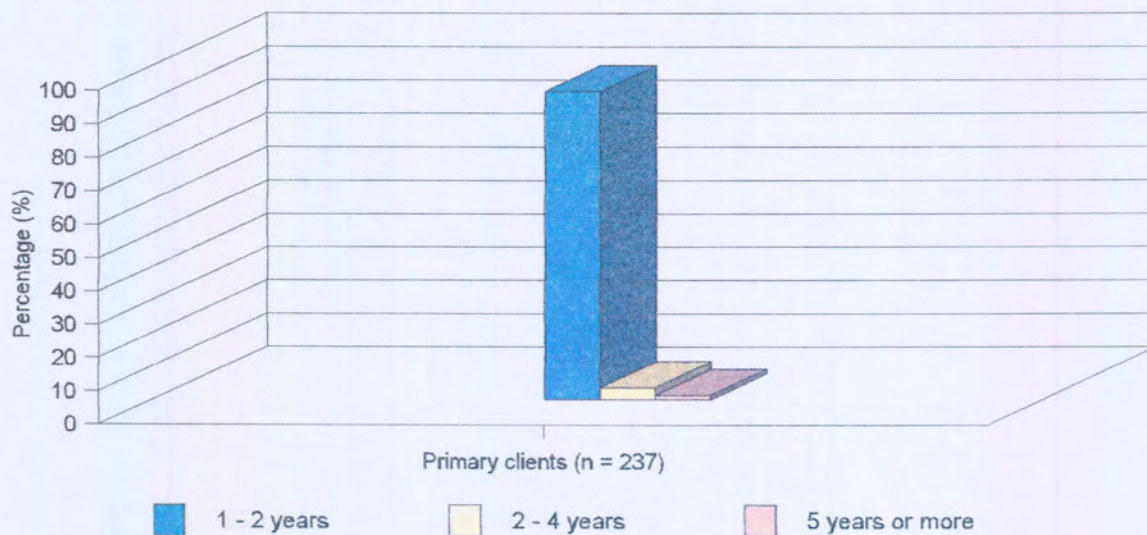
Table 4.19.1 and Chart 4.15.1 depict the clients' responses to the statement regarding the important role that the Internet-based communication web site and information technology will play in the future of their business. The charts clearly illustrate that the majority of the 237 clients (92%) agreed 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**



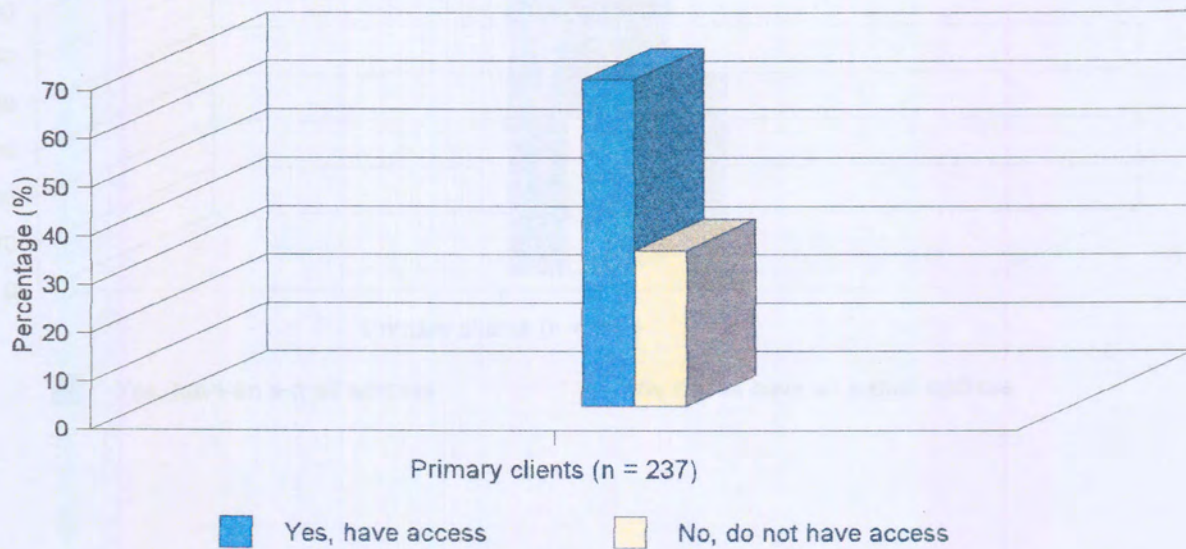
Clients responded very similarly to a time frame of one to two years, for fully integrating the Internet-based communication web site and information technology into their businesses. In the group, 92% supported a one to two-year period. This confirms the desire of the clients to incorporate the web 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 Client's response to have an e-mail address

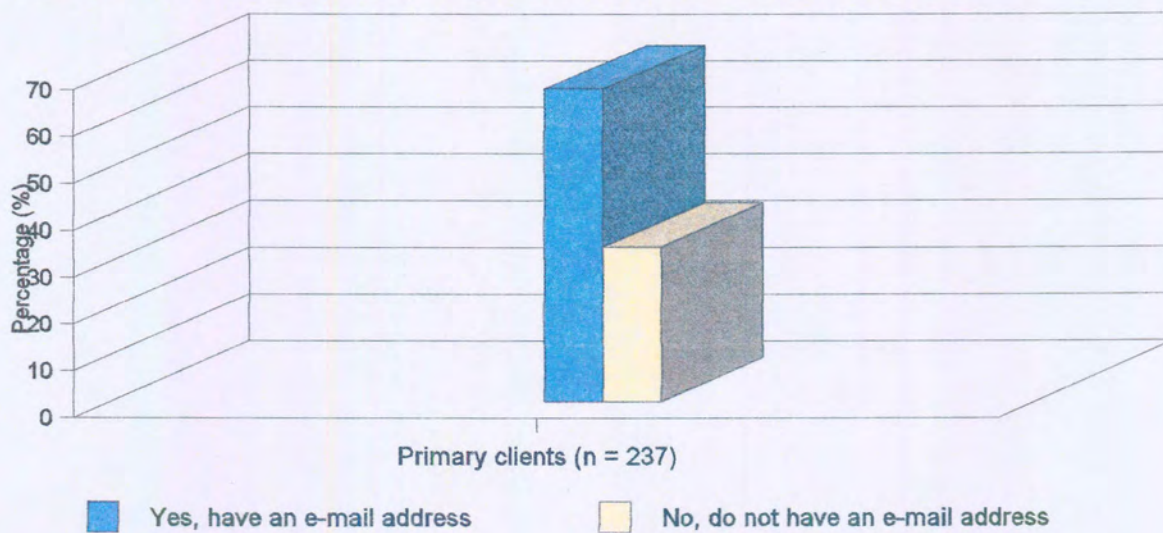
**Chart 4.15.3 Access to e-mail**



**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 were 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 ( $\leq 24$  - 33yrs)/ B ( $\geq 34$  - 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 Table 3.3).
- 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 (Steme, 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, 2000:21; 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.