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POSITIONING AND INTERACTIVITY OF E-COMMERCE WEBSITES WITHIN SOUTH AFRICA

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POSITIONING AND INTERACTIVITY OF E-COMMERCE WEBSITES WITHIN SOUTH AFRICA

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A research report submitted to the **Faculty of Management, University of the Witwatersrand, Johannesburg,** in partial fulfilment of the requirements for the degree of **Master of Business Administration**

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I would like to dedicate this work

to my wife, Lee, my son, Matthew and my family,

whose support has allowed me to pursue my quest for knowledge.

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I would like to thank a number of people whose support has contributed significantly to the successful completion of this work.

Above all, I thank the Lord for sustaining life and health and for giving me the opportunity to study.

I would like to thank my wife, Lee, who has been my pillar of strength throughout my studies, her unquestionable support has allowed me to commit to finishing my studies.

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ABSTRACT

The aim of this research was to investigate how developments within the Internet and e-commerce environment were perceived and used in South Africa. Pertinent literature was reviewed. Direct quantitative marketing research techniques, using an on-line questionnaire, were used to collect data regarding South African web pages and e-commerce marketing strategies, from a random sample of companies.

The collected data were subjected to Anova tests, factor analysis and cluster analysis, to elicit information related to perceptions about and uses of Internet technology and e-commerce. The results showed distinct differences within the various industry sectors, in their utilisation of their web pages and in how they drive their e-commerce strategies. They also indicated that enormous development has taken place in the web and e-commerce environment across the majority of industry sectors, and that the industry sectors and consumers, as they become accustomed to transacting on the web, can benefit from doing so.

It has also been shown that the e-commerce domain offers enormous potential and competitive advantage for both traditional and 'dot.com' companies, although the net effect is a combination of how geared their particular value chain is to manage the increased complexities of managing a 'virtual' customer and delivering on the promises made by their on-line marketing strategies. Ultimately it will depend on the consumer and their cumulative adoption of the internet as a purchasing channel.

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LIST OF ABBREVIATIONS

ANOVA	Analysis Of Variance
B2B	Business-to-business
B2C	Business-to-consumer
C2B	Consumer to Business
CBD	Central Business District
DSL	Digital Subscriber Line
IT	Information Technology
PC	Personal Computer
SNO	Second Network Operator
TV	Television
URL	Uniform Resource Locator
USAL	Under Serviced Area License (Operator)
VAN	Value Added Network Provider
WWW	World Wide Web

CHAPTER 1

RESEARCH BACKGROUND

"The arrival of the Internet has increased rivalry, especially within the on-line retail channel. Industries with lower entry barriers face greater competitive pressure in the short run reducing aggregate profitability and market prices." (Cassiman, 2002)

1.1 Introduction

Chapter 1 presents the background of the research and the research problems addressed by this research. The assumptions and limitations are also indicated, establishing the framework for this research.

1.2 Research Background

In today's digital environment, information has become more than a commodity; it has become a business advantage. The usage, interpretation and transfer of information, with the added advantage of new technologies and the Internet, has allowed businesses and individuals to become empowered on a global perspective.

The Internet has seamlessly entered our lives and has directly and indirectly had an impact on society. It promises to be the answer to crossing into the digital era of the 21st Century and, with PC's and handheld devices, including cell phones, now having wireless connectivity to the Internet, to have a significant presence in most lives.

Wagonfeld and Deighton (2002) described the Internet as a network of computers interlinked across the globe. It grew out of experiments to link the main computers of the U.S. Department of Defence in the early 1970's and its further growth can be attributed to the World Wide Web (WWW), developed by Tim Berners-Lee at the University of Geneva, Switzerland. The WWW allows for the seamless distribution of any file or data across the Internet, anywhere in the world. With the creation of browsers, such as Microsoft's Internet Explorer and Netscape, the Internet became accessible to anyone with a computer.

With the introduction of broadband communications media and the support of the content-driven Internet, business practises across all environments are being streamlined and optimized to take advantage of this new wave of interconnectivity. Procurement, manufacturing, sales, distribution, logistics, accounting and, especially, marketing, are now facing very dynamic development challenges and growth opportunities.

Traditional marketing channels and media; such as print, TV and radio, are facing the extreme customized marketing methods that the Internet offers. The Internet adds a new dynamic to marketing and corporate communications and effectively changes the way in which business is perceived and transacted. With the use of powerful databases, customer service is taken to a new dimension utilizing the customer interactions and feedback over the web.

European companies have gained experience in online international marketing, especially in the area of multi-lingual product promotions. One example is the website of "Floritel", a French company which delivers flowers to 180 countries in 4 hours. In addition to English, there are German, Spanish, French, Italian, Dutch and Portuguese versions of the site.

1.3 Research Problem Statement

On a global scale, the Internet can easily be claimed to have had significant impact on general business processes; most specifically on the marketing and advertising strategies within small and large organizations. Many international studies have investigated the impact of the Internet on marketing and advertising strategies. However, in no South African context has academic research directly relating to the impact of the Internet on traditional South African businesses and their advertising and marketing strategies been published.

The research problem is to determine the effectiveness of the positioning and interactivity of e-commerce websites in South Africa.

A. The first research sub-problem is to identify the dominant e-commerce Internet domain.
B. The second is to identify the dominant e-commerce web page typology / classification.
C. The third research sub-problem is to determine what level of interactivity is used within South African web pages.

E-business has been defined as the use of electronic means and platforms to conduct a company's business (Kotler, 2003). With the support of the Internet and internal company intranets, businesses are finding faster, more efficient ways to deliver information pertaining to products and services, to consumers and company data, to staff. Numerous companies have also set up extranets, whereby they can directly interface over the Internet with suppliers and manufacturers.

E-commerce goes one step further than e-business: it allows the visitor (consumer) to the website to search for a particular product or service, but also to give and receive feedback from the company and other consumers and further, to complete the transaction on-line. E-commerce can

take place over four major Internet domains (Kotler, 2003): B2C (business-to-consumer), B2B (business-to-business), C2C (consumers to consumers), and C2B (consumers to businesses).

According to Wagonfeld and Deighton (2002), there are four main typologies / classifications for web pages; namely:

A. Classification by corporate purpose;
B. Classification by source of income;
C. Classification by stage of the adoption process;
D. Classification by function.

These typologies are not mutually exclusive, as there are logical overlaps and similarities between the various classifications: the use or selection of each specific typology is in accordance to the pre-requisite requirement and strategy of that organization.

With the advent of technology and the Internet, the level of interactivity over corporate web pages has allowed marketers to move beyond what they could previously do within the traditional print media environment. Now they can drive an entirely new, fully interactive marketing channel. Consumers now have the facilities to participate actively in the persuasion process, by controlling the advertising messages, amount of information received, and the order of the presentation at any time, according to their needs and preferences (Ko, Cho and Roberts, 2005). Depending on the interactivity of a web page, a company can move from having a pure 'point of presence' web page to a fully customizable consumer purchasing interface.

Research by Cho and Cheon (2005) indicates that the three most frequently used levels of interactivity are:

A. Consumer - Message interaction;

B. Consumer - Marketer interaction;

C. Consumer - Consumer interaction.

By analyzing all the above issues: the domain, the typology / classification and the level of interactivity of an e-commerce web page, the true effectiveness of South African e-commerce web pages should be understood.

1.3.1 Assumptions

Based on research by Ko, Cho and Roberts (2005), which looked into the causal relations among motivations for using the Internet and major interactive advertising variables, as identified by Cho and Cheon (2005), the following assumptions were also made:

A. People would actively engage in surfing the Internet to satisfy their particular needs;

B. Different motivations for using the Internet would affect the level of interactivity on the web;

C. Interactivity of the Internet would lead to more positive attitudes towards a website and brand, as well as a higher level of purchasing intention.

These assumptions support the process and reasons for developing an on-line marketing strategy within any organization.

1.3.2 Limitations

Research completed by Cho and Cheon (2005) in the United States, United Kingdom, Japan, and South Korea proved that western websites tend to emphasize consumer-message and consumer-marketer interactivity, whereas eastern websites highlight consumer-consumer interactivity. A similar study would be required within the South African business context. However, the issue of culture, as discussed by Cho and Cheon (2005), is not dealt with in this study because South

Africa can be seen as an emerging technological market and this level of on-line strategic focus (culture) has not been the issue of focus. However, the issue of interactivity in general, as discussed in their research paper, is dealt with in detail in this paper.

One limitation of this research paper is that only companies with existing web pages were audited. This implies that all South African companies that lacked web pages at the time of the study were not analysed. Thus the population sample was biased towards more technologically proficient organizations and/or those with budgets allowing them to pursue on-line marketing strategies.

Another limitation of this research paper is that individuals who responded to the questionnaire may not have had the necessary knowledge and/or capacity to fully understand the context of what was being asked or were not senior enough (position) to have insight into the marketing strategies and on-line initiatives of their respective companies and hence, were not able to complete the questionnaire as successfully as envisioned.

1.4 Composition of Chapters

Chapter 1 describes the background of the research subject and states the research problems dealt with in this study. The assumptions and limitations establishing the framework for this research are indicated.

Chapter 2 covers the current literature supporting the proposed research problem. This chapter also provides a detailed background to the South African Internet access market, PC Penetration and e-commerce as it applies to the Internet. The various e-commerce domains and webpage classifications are noted and on-line interactivity is dealt with in detail.

Chapter 3 describes the data collection methodology. The population group from which the sample was drawn is indicated and the questionnaire used to gather the individual responses from the respective web pages is described.

Chapter 4 covers the proposed data analysis methodology. It explains how the statistical procedures; such as Analysis of Variance tests, Factor Analysis tests and lastly, Cluster Analysis tests, were used to analyze the results obtained from the sampled population group.

Chapter 5 deals with the results from the pilot study. The methodology and results from the actual data collection exercise are also discussed. In addition, the results from the test for normality, as required by the statistical procedures in Chapter 6, are explained.

Chapter 6 covers the results obtained from the actual data analysis. As proposed in Chapter 4, the results from the Analysis of Variance tests, Factor Analysis tests and the Cluster Analysis tests are all explained in detail and their support for the respective research proposition are explained.

Chapter 7 concludes and summarizes the results from the previous chapters and a detailed explanation of the current state of the Internet access market and the e-commerce environment within South Africa is provided.

As this research is non-exhaustive, Chapter 8 provides insight into additional areas of research in support of this research paper. With respect to the South African Internet access market, research subjects over and above those in support of this research paper are also proposed.

CHAPTER 2

LITERATURE REVIEW

"Results suggest that the level of interactivity and the amount of information provided by the website had a significant effect on consumer satisfaction." (Ballantine, 2005)

2.1 Introduction

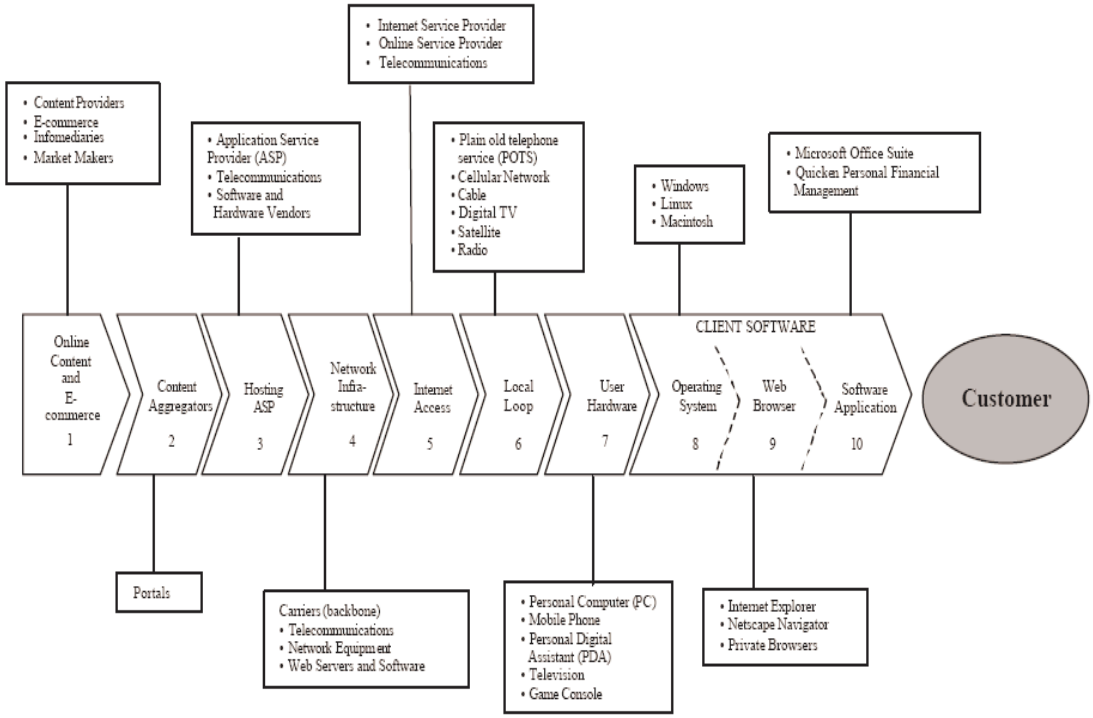
This chapter covers the current literature supporting the research problem and describes in detail the background of the South African Internet access market, PC Penetration and e-commerce as it applies to the Internet. The various e-commerce domains and web page classifications are established and the subject of on-line interactivity is dealt with in detail.

2.2 Background

Considering the traditional marketing environment, where there are multiple channels and mechanisms for getting the product or service to the customer, the online marketing environment is particularly different, with only one interface to the customer. In the 'Online Value chain' in Figure 1 (Cassiman & Sieber, 2002), the three major components of any online trading environment are identified. First is the provisioning of content: here the end product or service is assembled according to the customized specifications of customers. Second is the content aggregation, where the services or products, such as company web pages or portals, are made available to the customers. Third is the communications component, which deals with the

mechanisms for processing and transporting the data to the customer/s *via* the available wireline or wireless telecommunications mediums. Further studies have distinguished between the physical value chain and the virtual value chain, and introduced the concept of the "Marketplace", a virtual realm where products and services exist as digital information and can be delivered through information-based channels (Rayport and Sviokla, 1996)[1].

Figure 1 - The Online Value Chain



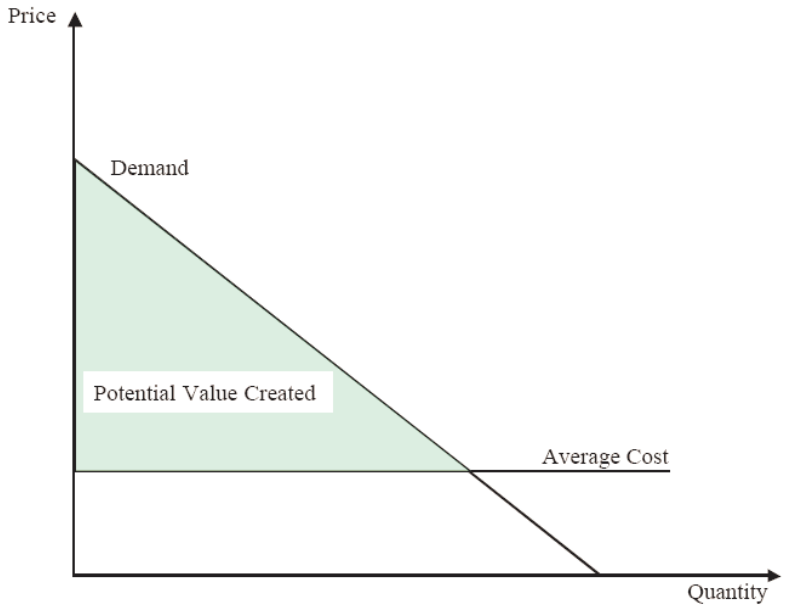
Source: Cassiman & Sieber, 2002

[1] As cited by Wynne, Berthon, Pitt, Ewing and Napoli, 2000)

In a traditional marketing environment the potential value or profit that can be realised within an industry is represented by the area between the demand curve and / or price that the customer is willing to pay for the service or product and the actual 'true' cost of providing that service or product, as shown in Figure 2.

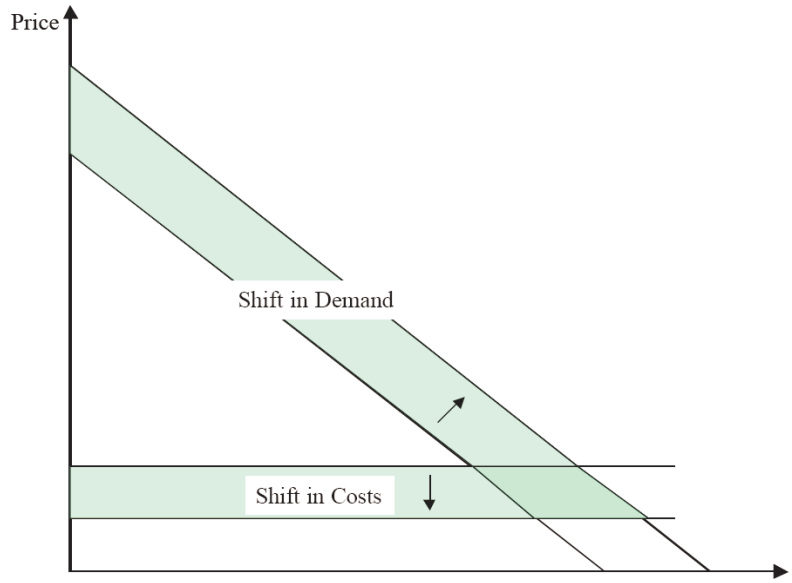
The effect of the Internet and its associated technology on the customer demand and prevailing costs for providing a service or product greatly enhances or grows the effective value and / or profit for a particular service or product in a respective industry. As shown in Figure 3, the area under the curve is larger, owing to the effectiveness and optimization of providing the services and/or products over the Internet.

Figure 2 – Potential Value created in a traditional industry



Source: Cassiman & Sieber, 2002

Figure 3– Enhanced Value created by the Internet



Source: Cassiman & Sieber, 2002

This enhanced value or profit is shown, not only in individual purchases, but also in the volume of goods traded by online shoppers.

The benefits of the Internet to business, and specifically to marketing, can be summarised into three distinct categories. Cho and Cheon (2005) indicate that these are improved interactivity, low setup costs and instantaneous global coverage. Cassiman and Sieber (2002) state that the Internet affects conventional competitive strategies in at least three ways:

A. The greater efficiency generated by lower transaction costs and lower organizational structure overhead costs;
B. The reduction of consumers' search costs, complemented by improved product differentiation and, hence, customers' willingness to pay;
C. The effect that electronic markets (e-commerce) have on pricing and value creation.

Ghosh (1998) further identifies four distinct types of opportunity that the Internet presents. Firstly, through the Internet companies can now create a direct link to the customer or other parties in the value chain, to complete transactions or trade information. Secondly, the technology associated with the Internet allows companies to bypass other parties in the value chain, thereby eliminating cost bottlenecks. Thirdly, companies can now use the Internet to develop and deliver new products and services for new customers. Finally, companies can use the Internet to become the dominant player in the electronic channel of a specific industry or segment, controlling access to customers and setting new business rules.

Boyer and Hult (2005) proved that the ability to predict customer behavioural intentions and satisfaction can all be based on the above four opportunities and their successful implementation: as interpreted by the customer, e-commerce, or on-line trading, affords customers direct access to virtual (centralised) distribution centres (DCs). These DCs are simultaneously delivering customized service, product quality, substantial time-savings and, where applicable, product freshness. The relative importance of each of these four factors differs substantially for new and repeat customers because repeat customers demand a higher level of service and product quality but are less concerned with time savings, as they have gained appreciation of the importance of the first two factors as a trade off for time convenience.

Today, marketers are leveraging these advantages and utilising the real-time communications, rich media formats and interactivity across geographical boundaries of the Internet, to introduce new revenue streams through Internet-enabled e-commerce strategies.

E-commerce, as defined by Blume (2004), involves purchasing goods and services *via* an electronic network (such as the Internet). Normal (voice) use of the telephone system is excluded, as is the use of pure e-mail and telephonic or physical credit card purchases captured

through POS terminals. Transactions do not have to be completed over the network (for example telephone or fax completion is acceptable), but the transaction must be initiated and/or paid for *via* the network.

Watson (2006) points out that E-commerce is already seen to be evolving to multi-faceted u-commerce, where the u implies ubiquitous, universal, unique and unison. A ubiquitous commerce implies a world where everything commercial is connected to everything, including the Internet, thereby allowing seamless communication between devices. "Universal" implies that these devices can all work together anywhere in the world; "unique" implies that the data that an individual works with will be customized to that individual's needs to enhance the data interaction and "unison" implies that, because all these devices are connected and communicating with each other in real time, they are perfectly synchronised and all have access to the same, current data.

The Internet, because it lacks boundaries, is one of the most far-reaching information distribution systems in world today. Mathur, Mathur & Gleason (1998) noted that the Internet spanned more than 150 countries and, owing to its inexpensive set-up costs and fast interchanges, it had levelled the playing fields between large and small businesses because it enabled both to establish a 'global footprint' and marketing strategy.

Cho and Cheon (2005), state that the Internet is commonly represented as one of the most economy-altering technological inventions since the Industrial Revolution. Its impact in this sphere has also been compared to the effect that the railroad had on industrialization (Smith & Rupp, 2003; Drucker, 1999).

2.3 South African Internet Access Market

A primary requirement for understanding the South African business environment is understanding the culture in which South African business is done. Owing to South Africa's very dynamic past and the resulting government legislations and regulations, the South African business community is faced by a number of critical issues. The first is the diversification and limited skills set of the South African population; the second, issues relating to the provisioning of basic services such as water, electricity and communication devices (like telephones and computers), to the entire South African population. South Africa has been disadvantaged with respect to Internet access and, in general, telecoms services. Only now, due to government pressure on the local incumbent telecoms operator, Telkom SA, is a slight increase becoming evident in the national teledensity figures. However, in the central business districts (CBDs) of cities and towns and in most residential areas there is already a suitable level of telecoms access and PC penetration. These issues directly impact on the marketing strategies of all South African businesses and more specifically, on their choices of advertising media to reach their intended audiences.

The South African Internet access market can be described by the following (Blume, 2004):

- Internet penetration levels which closely track the PC penetration levels, where dial-up services are the most popular, accounting for approximately 85% of total consumer connections;
- Leased-line customers, who account for the majority of the large data revenue streams, owing to the high rental charges and who, however, are migrating to higher bandwidth digital subscriber line (DSL) services because of their affordability;
- Small businesses (0 - 49 employees), which account for the highest share of the total business connections, which are mostly dial-up services;

- Corporate market broadband (DSL) connections, which are continually increasing and now constitute the majority of the broadband DSL connections market share.

The South African Internet access market is greatly dependent on the incumbent telecoms operator, Telkom SA, the primary provider of wireline and wireless telecoms services. Because of this, the provisioning of telecoms services is not uniform across South Africa and is heavily biased toward the higher revenue generating areas. Furthermore, owing to the lack of competition, the pricing of dial-up services and broadband DSL services is globally uncompetitive and strongly disfavours the large-scale 'uptake' of these services.

According to Blume (2004) the South African Internet access market is inhibited by the following issues:

- High access prices: South Africa remains a price-sensitive region so the lack of inexpensive, flat-rate dial-up services is an inhibitor to the dial-up market (Call rates and dial-up time are affected by users' monitoring of their 'on-line' expenditure.);
- Low PC penetration: PC penetration levels are low compared to the rest of the world, primarily because computers remain expensive for the average consumer in South Africa;
- Limited Broadband: widespread DSL rollout in South Africa has yet to take place. Businesses seeking a permanent connection to the Internet have to rely on an expensive leased-line or fixed wireless services. While cable is available, the broadband market will remain underdeveloped until the widespread commercial rollout of DSL occurs.

2.4 South African Broadband Penetration

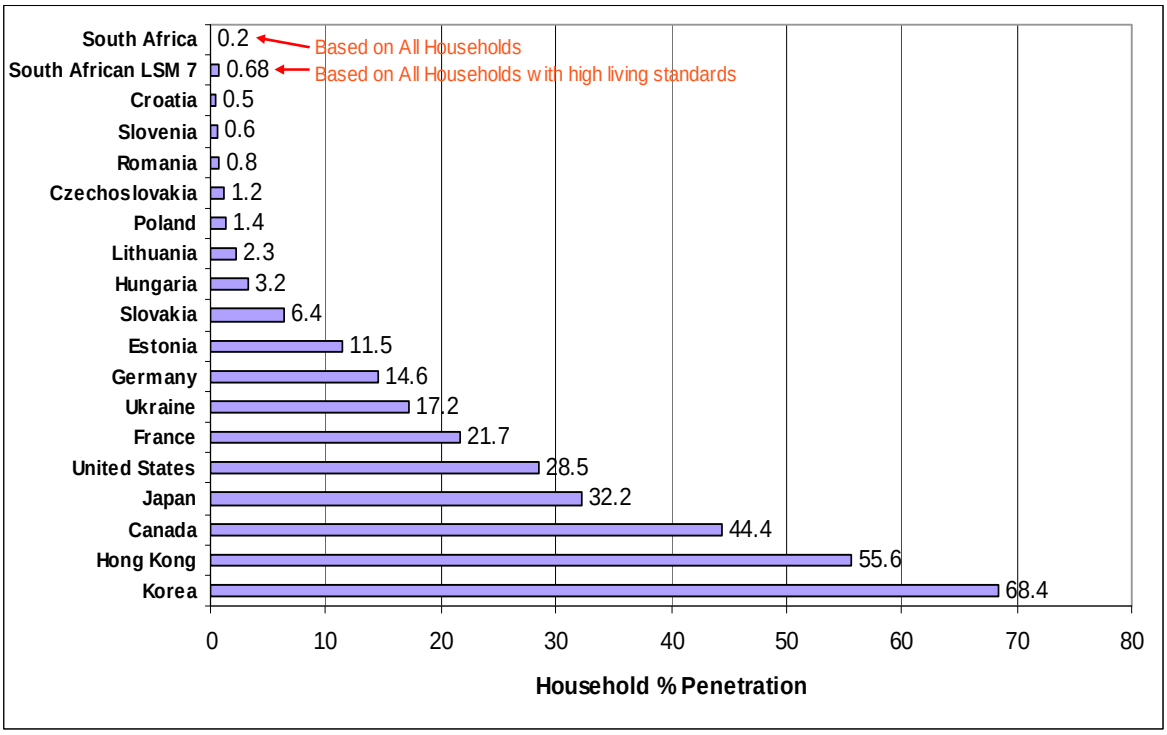
According to Blume (2004), dial-up Internet access services are expected to grow beyond 2008, this growth being driven by consumer demand. Broadband will, however, start to take market

share away from narrowband services but, because of the high costing of these broadband services in South Africa, will not overtake the narrowband market share. In other countries, with narrow band services levelling off and often decreasing, broadband services are starting to cannibalize the Internet market. With the growth of the broadband market, the total revenue generated from both the narrowband and broadband market segments is expected to grow continually over the forecasted period

Figure 4 depicts broadband penetration according to percentage of households using it. Smit and Neilson, (2005) see Korea as the global leader in broadband deployment, with 68.2% penetration. Hong Kong, Canada, and Japan follow with 55.6%, 47.3%, and 33% penetration, respectively. South Africa's poor broadband household penetration (0.17%) can be attributed to the slow roll-out of broadband DSL services by Telkom SA and the high costs related to broadband wireless services. The licensing of the Second Network Operator (SNO) is expected to accelerate the broadband rollout and introduce competitive pricing models to enable cheaper services. To date, there are already a few licensed telecoms service providers; such as "Sentech", Under Service Area Licensed operators (USALs) and numerous value-added Network service providers (VANS). These, along with the accelerated 3G roll-out by the cellular operators, have introduced minor levels of pricing competition into the market.

South Africa is often compared to other 'emerging' markets, either because of their technological abilities, their geographical similarities or their political commonalities. Because of these factors South Africa is often compared to India and Brazil because their political and geographical features are similar, and often to Australia and Canada, because of their technological abilities.

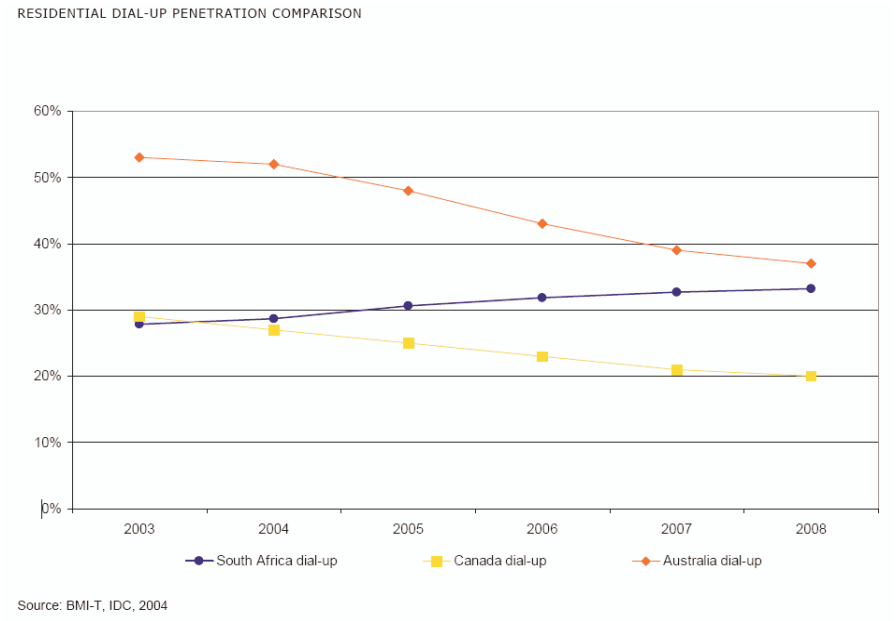
Figure 4 – Global Broadband Household Penetration (end of 2004)



Source: Smit & Neilson, 2005

Figure 5 (Machanik & Neilson, 2004) indicates the level of dial-up Internet penetration in South Africa in the residential market, in comparison with Australia and Canada. The dial-up market in both Australia and Canada is in decline, owing to the adoption of broadband access services in the residential markets in those countries. South Africa, by comparison, is continuing to grow a dial-up base of consumers at a rate of 3% *per annum*.

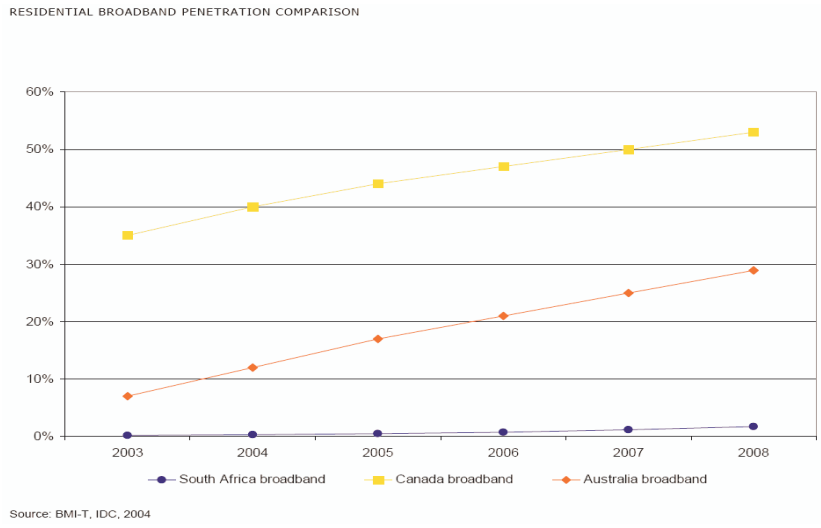
Figure 5 – Dialup Penetration in South Africa, Canada and Australia



Source: Machanik & Neilson, 2004

Figure 6 (Machanik & Neilson, 2004) indicates the level of broadband Internet penetration in South Africa in the residential market, in comparison with Australia and Canada. As South Africa entered the broadband Internet market much later than these countries did, its growth rates are far below theirs.

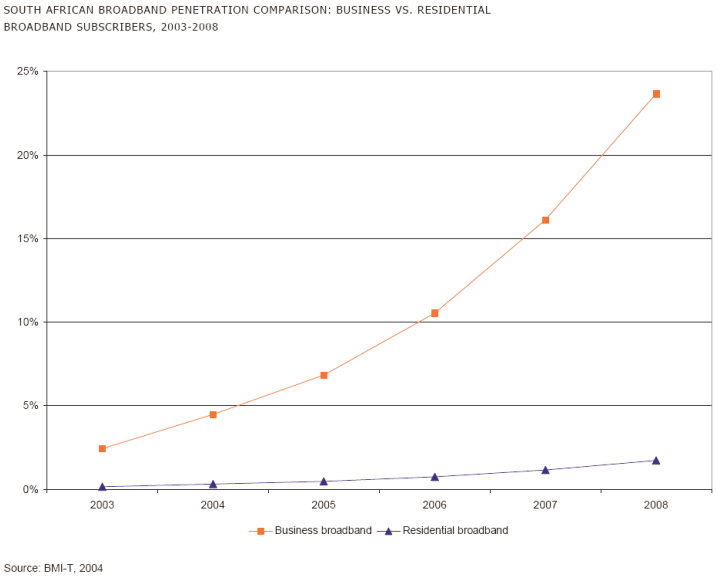
Figure 6 – Residential Broadband Penetration in South Africa, Canada and Australia



Source: Machanik & Neilson, 2004

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Figure 7 – South African Broadband Penetration comparison: Business vs. Residential Broadband Subscribers



Source: Machanik & Neilson, 2004

Figure 7 (Machanik & Neilson, 2004) indicates the significant difference between expected broadband penetration levels in the business and residential markets in South Africa. Business subscribers are expected to take-up broadband access offerings relatively quickly in comparison to residential users

2.5 South African PC Penetration

The South African PC markets drive the Internet connectivity within South Africa. Smit & Neilson (2005) note that South Africa has shown a year-on-year PC growth of 34.3%, attributing this mainly to the strengthening of the rand and respective price decreases. The South African installed PC base is now estimated at 4.61 million and is expected to grow to 6.3 million by 2009 (Smit & Neilson, 2005), as can be seen in Table 1, below.

Table 1 – South African PC Installed Base, 2004 - 2009

PC installed base, 2004-2009

	2004	2005	2006	2007	2008	2009
Desktop PC	3,852,330	4,153,757	4,495,158	4,749,196	4,888,454	5,027,713
Notebook PC	762,164	875,638	987,804	1,079,986	1,182,168	1,284,350
*Wi-Fi cabable	136,692	283,529	452,307	685,340	913,507	1,155,915
Total PCs	4,614,494	5,029,395	5,482,962	5,814,182	6,030,622	6,312,063

Source: BMI-T, 2005

Source: Smit & Neilson, 2005

Desktop PC Internet connectivity through fixed line access is still the majority shareholder in South Africa's Internet connectivity market. The notebook market is currently being stimulated through the cellular and other wireless operator's offering 'mobile' broadband Internet access. The South African PC Internet access forecast, *per* technology can be seen in Table 2 (Smit & Neilson, 2005) below.

Table 2 – South African PC Internet Access connections by Access Type, 2004 - 2009

PC Internet access connections by access type, 2004-2009

	2004	2005	2006	2007	2008	2009
Dial-up, ISDN and leased line	1,074,682	1,147,673	1,206,927	1,243,114	1,246,950	1,191,783
ADSL	36,000	100,000	150,000	210,000	280,000	360,000
Cellular Internet access (for PCs), including GPRS, Edge and WCDMA	11,000	45,000	82,000	146,000	230,000	340,000
Other wireless Internet access, including UMTS-TDD, TD-SCDMA, CDMA 2000 and WiMAX	4,614	20,000	46,000	90,000	152,000	250,000
Total Internet connections	1,126,296	1,312,673	1,485.93	1,694,114	1,920,950	2,191,783

Source: Source: BMI-T, 2005.

Source: Smit & Neilson, 2005

2.6 E-Commerce

According to Wagonfeld and Deighton (2002), online advertising, only equated to simple banner advertisements at the top of web pages, started in 1995. By now advertising over the Internet has taken many forms, such as:

- 'Banner advertisements', typically small rectangular "teasers" that simply create exposure and awareness of the product and whose effectiveness is measured by the "click-through rate", which normally directs the users to a more illustrative, active advertisement revealing the full product details;
- Sponsorships, which include rented space on other products' or companies web pages, the subject matter often being interrelated and hence, serving to provide the user with a more 'complete' picture of the product and associated companies or organizations;
- Classifieds, typically the same as standard print classifieds, they range from standard text to fully interactive adverts and costing is dependent on size, character and the period that the ad 'runs';
- Slotting fees are permanent links that companies pay for in order to be part of the highest traffic sites, are often shown as preferred links in associated web pages and involve a constant presence throughout the navigation of the web page;
- Keyword Search, a type of advertising that involves buying placements on search engines, showing them as the preferred supplier and sometimes including placements of banners or links when the respective key word is requested;
- Interstitials: 'stand-alone' advertisements that appear in a separate browser window while another web page is being loaded (Although proven to be very effective, because new browsers are opened and new content is downloaded, they are claimed to slow down access to destination pages.);
- E-mail advertising, conforming to the traditional 'push' type advertising, where e-mail addresses of potential customers are solicited from other companies or website

registrations and then e-mails containing advertisements are sent to these potential customers.

Attitude towards advertising is well researched in studies of traditional mass media advertising (Chen & Wells, 1999). As e-commerce grows as a defacto industry standard for on-line advertising and trading, 'attitude towards the site' will gain the same level of attention in efforts to develop reliable and valid scales for measuring website and e-commerce effectiveness. To use websites and e-commerce effectively, marketers will benefit from understanding how on-line customers relate to websites as a source of advertising in the general media, since perceptions of websites and e-commerce will affect attitudes towards individual advertisements (Ducoffe, 1996).

E-business is defined as the use of electronic means and platforms to conduct a company's business (Kotler, 2003). With the support of the Internet and internal company intranets, businesses are finding faster, more efficient ways of delivering information pertaining to products and services to consumers, and company data to staff. Numerous companies have also set up extranets, whereby they can directly interface over the Internet with suppliers and manufacturers.

2.7 E-Commerce Domains

E-commerce goes one step further than e-business, not only allowing the visitor (consumer) to the website to search for a particular product or service, but also to give and get feedback from the company and other consumers and to complete the transaction on-line. E-commerce can take place over four major Internet domains (Kotler, 2003): B2C (business-to-consumer), B2B (business-to-business), C2C (consumers to consumers), and C2B (consumers to businesses).

2.7.1 Business-to-Business

These inter-business transactions account for a substantial part of e-commerce trading. Because of the advantages of trading over the Internet, many companies now benefit from e-commerce

though the global exposure, cheaper set-up and transaction costs and faster turn-around time for an order. Supply chain management has also been facilitated and aided by B2B web pages; as company web pages are proving to have a very positive effect on how inter-company communications and transactions are handled. Web-enabled organizations are using the Internet to facilitate procurement processes, auction sites, spot exchanges, on-line product catalogues, barter sites and product searches, all with the end objective of obtaining the best price. Hence, this price transparency is effectively making the marketplace more efficient, through its global accessibility (Kotler, 2003). The B2B market is claimed to be 10 to 15 times greater than B2C commerce (Kotler, 2003).

2.7.2 Business-to-consumer

In today's e-commerce environment the Internet is proving to be one of the most popular methods used by businesses to deliver to consumers information pertaining to their products and services. Owing to the pure economies of scale, the extent of the client base over the Internet makes business-to-consumer a very attractive proposition, especially in a business environment where price margins and product differentiation is becoming so competitive. The primary function of most corporate web pages is to act as an information source for consumers. Only a few on-line businesses support full transactions and purchasing directly over their websites; examples are Amazon.com and kalahari.net. The B2C model has also been driven by consumer demand, as PC penetration grows, more and more on-line info seekers and shoppers enter the electronic marketplace, so traditional 'brick and mortar' businesses also enter this electronic realm, to retain their market share. Another key dimension of the B2C web model is that it is no longer a 'push' mechanism to be used by marketers but is now commonly seen as a 'pull' mechanism driven purely by customer demand. Because marketers are forced to wait for customers to interact with their respective web pages before any interaction can take place, all web page interaction is customer initiated and controlled. Consumers claim the advantage of e-commerce is its availability, convenience and price-competitiveness. Consumers, however, also

claim that the downside is the security risk, lack of physical interaction and the elimination of sales support. As discussed later, these issues have been circumvented by improved website interactivity.

2.7.3 Consumer-to-consumer

Historically this environment was burdened by the slow process of mail delivery systems operated by post offices. Now the Internet allows for seamless, instantaneous correspondence between consumers. This happens in on-line chat rooms or through on-line e-mail servers, whereby individuals will 'chat' (e-mail) amongst each other and provide feedback regarding a company's respective products and services. This "word of web" (Kotler, 2003) is fast becoming a very influential buying force in the on-line marketplace. The many-to-many nature of communicating over the Internet allows consumers the opportunity to place their own personal advertisements either on specific classified portions of company web pages or, now, on on-line auction sites, which act as 'middlemen', facilitating the transaction for minor commissions.

2.7.4 Consumers to Businesses

Outside of the traditional marketing and advertising environment, companies are now creating facilities and mechanisms that allow consumers to provide marketers and product/service managers with feedback regarding advertisements, prices, customer perceived values, products and services. Furthermore, many companies are now providing open-ended communication channels to allow for on-line feedback, suggestions, complaints and/or requests from the general public. Critical to this model is prompt response to all respective parties, ensuring that each consumer realizes the benefit of this interaction.

Research Proposition 1: South African corporate websites operate mainly within the Business-to-consumer domain.

2.8 E-Commerce Web Page Classifications

Wagonfeld and Deighton (2002) indicate that there are four main typologies / classifications for web pages, namely: classification by corporate purpose, classification by source of income, classification by stage of the adoption process and classification by function. These typologies are not mutually exclusive as there are logical overlaps and similarities between the various classifications, the use or selection of each specific typology is in accordance to the pre-requisite requirement and strategy of that organization.

2.8.1 Classification by Corporate Purpose

In South Africa many businesses and corporations have websites to complement their physical operations, "Click and Mortar" structures (Teo & Tan, 2002) common in organizations all around the world. The purpose or usage of these websites normally conforms to one of the following types:

- The corporate presence, where focus is given to providing communication with investors, suppliers, employers, regulators, and customers, often includes a company overview and, sometimes, financial data in annual reports;
- The promotional presence, where focus is given to promoting the companies products and services, also includes advertising on banners or links on other web pages;
- The transactional presence sites, able to be either 'freestanding' stores or part of 'virtual malls', include on-line transactional facilities such as on-line ordering and payments;
- The conversational presence sites offer customers the facility to provide feedback, converse (on-line) with other customers in chat rooms and also receive daily, weekly or promotional correspondence.

Research Proposition 2: South African corporate websites predominantly have a promotional presence.

2.8.2 Classification by Source of Income

Websites can also contribute to the income of the organization. Income-generating models can exist in isolation or in combination with other income-generating models. They can be classified as the:

- Advertising Support Model, as indicated earlier, a popular form of on-line advertising that includes banners, sponsorships, interstitials and classifieds;
- Subscription Support Model: websites providing a unique or specific function of value to its customers and charging a subscription fee for these services; for example, Harvard Business Review (on-line);
- Cost Elimination Model on-line presence used by many companies, because of the cost benefits and savings offered by the Internet, to maximise savings in their operations and information delivery environments (for example FedEx, *via* their on-line package tracking system);
- Sales Revenue Model, whose revenues are specific to on-line retail and trading, where sales are executed and completed on-line, for example, Kalahari.net;
- Information Trading Model, within which web pages invoke responses from on-line users, either pertaining to product information or to purchase intention, the information then being sold to third parties or manufacturers.

Research Proposition 3: South African corporate websites utilise their websites predominantly as a communication and promotional cost elimination model.

2.8.3 Classification by Stage of Adoption

Throughout the stages of the customer's product adoption process the AIDA (Awareness-interest-desire-action) model is useful, the web providing certain functionality to allow the customer to progress through the following phases:

- Awareness (the web provides a channel for a customer to encounter a product or service that they were not previously aware of);
- Interest, the web page allowing the customer to follow a link or advert leading to further information about the product or service;

- Desire, when the customer decides that the product or service is needed and proceeds to find further customer feedback or product evaluation;
- Action/Adoption, when the web page allows the customer to follow up on the desire by placing an order or facilitating the transaction;
- Retention: provision by the website of follow-up service and correspondence with the customer, to ensure repeat business.

Research Proposition 4: South African corporate websites predominantly promote product and/or service awareness and interest.

2.8.4 Classification by Function

Websites in themselves provide very specific functions, which can be identified as:

- Service Provider, where web pages act as a marketing partner, supporting the physical operations of the business or corporation;
- Community Areas, where web pages provide unbiased information or content to a public audience and, hence, act as pure communication channels.
- Programming, where sites are often sponsored by associated businesses looking to simulate new business by advertising on these web pages and web pages are specifically providing a source of similar information pertaining to a particular subject, product or service;
- Directories, whose web pages provide on-line yellow pages, allowing customers to search and find respective businesses, products, or services.

Research Proposition 5: South African corporate websites are predominantly used as communication and promotional tools, supporting the physical operations of the business or corporation.

2.9 E-Commerce Web Page Interactivity

The interactivity of a corporate website is one of the most advantageous features of having an on-line presence, according to Cho and Cheon (2005). It includes benefits such as 24-hour access channels between marketers and consumers, public relations messages and newsletters, sales promotions, direct marketing, interactive customer services and technical support.

The phrase, "Interactive Advertising", (Hwang & McMillan, 2002) can be used as a synonym for 'On-line Advertising', as this new communications medium now allows a marketer direct contact with the customer. Polaine (2003) defined true interactivity as a feedback loop of action-reaction-interaction involving collaboration or exchange of data and/or information. Ballantine (2005) further argued that interactivity comprises three factors:

A. Speed, or the rate at which input can be assimilated into a mediated environment;
B. Range, which refers to the number of possibilities for action within a mediated environment;
C. Mapping, which refers to the ability of a system to map its controls to changes in a mediated environment.

Berthon, Pitt and Watson (1996) modelled a six-stage process describing the flow of surfer activity on a website. The first stage of the model represents the flow of unaware surfers on the net, who land on the website of an organization, *versus* the direct hits of aware surfers. This describes the 'awareness efficiency' of the website. The second stage aims to get aware surfers to find the website, and is described as the 'locatability / attractability efficiency' of a website. The third stage relates to the 'contact efficiency' of a web page, measuring how effectively an organization transforms hits into visits. The fourth stage looks at the effectiveness of an organization's web page to convert purchases into repurchases. This is measured by a 'conversion efficiency' index. The fifth stage of the model relates to this capability to turn

purchases into repurchases and uses a 'retention efficiency' index to define it further. The last stage of the model looks at the overall average 'website efficiency' index, which takes an average of the first five efficiency indices.

According to Peters (1998) two key principles which underlie the departure of interactive marketing from traditional marketing are, firstly, that computer networks have the ability to facilitate communication from anywhere in the world, at any time and, secondly, that while traditional mass marketing media have predominantly depended upon monologues from firms to consumers, interactive web pages have introduced mass interactive dialogue.

Liu & Shrum (2002) believe that for this "interactive revolution" to be understood and utilised to the full extent of taking on-line advertising to the next level, a clearly defined definition and understanding of the complexities surrounding interactivity, especially within an on-line web environment, is needed. The new media allow the relationship between the marketer and the consumer to be taken to a new level, by opening new horizons of dialogue. According to Peters (1998), many of the current offerings to consumers *via* the Web are not designed to be interactive, but are often simply extensions of the more traditional marketing communications media. Their main appeal is that they are accessed through a computer, with the associated novelty value which the Internet currently holds. In addition to this, it is the technology that supports an on-line environment that also provides the interactivity; hence, the two are seamlessly woven together and the level of interactivity lies with the web development team and not with the marketing department.

In addition to the above, the experience of interactivity obtained from other media channels will help to guide marketing departments to drive the development of the web pages and the particular level of interactivity required by the respective products or services. This would include

behavioural, attitudinal and cognitive model development within the on-line environment, which would direct how the web page would control the information processing and flow to the customer and initiate action from the user, ultimately allowing the transaction to be taken to fruition.

According to Peters (1998) there are four key areas of differentiation with respect to on-line interactive advertising. These are 'Communication Style', 'Social Presence', 'Consumer control of contact' and 'Consumer control of content'. However, they are also commonly included in traditional marketing, especially the first two, so these differentiators can and should be extrapolated. The level of interactivity on a web page has been defined over the past years by numerous other additional 'differentiators' to web pages. These can all be attributed to defining interactivity. However, it is the culmination of all these individual elements, listed below, that has led to true interactivity within web pages.

- On-line ordering / Transactions
- Search Engines
- Data Drills
- Special Interest Data Domains
- Interactive Forms and Tours
- Interactive Games
- 'Members only Tools and Domains
- Quick Quotes
- Online Bulletin Boards
- Chat Rooms
- 'Ask the Expert'
- 'Request For Information' Forms

- Auto-Responders
- Online Video Conferencing
- Distance Learning
- On-line Product Demos
- On-line Newsletters

Massey (2000) argued that the interactivity of communication technologies could be further broken down into the four dimensions described below:

A. *Complexity of choice offered to users.* It is assumed that the more choice and/or content that is offered to the consumer the greater the interactive experience will be. This was confirmed by research done by Ballantine (2005), who found that as the level of interactivity and the amount of information provided by the website increased, so too did the level of customer satisfaction. A study done by Nysveen and Pedersen (2002) proved that a user with previous Internet experience perceives a higher level of the usefulness of a website with interactivity than a user with no prior Internet experience does.
B. *Responsiveness to the user*. Internet technology now allows online marketers to offer interpersonal interactivity with individual consumers. Although often delayed, this will support asynchronous communication, such as e-mail.
C. *Facilitation of interpersonal communication*. This occurs when online marketers allow their websites to be used as conduits through which two audience members could engage each other interpersonally, in real time (chat rooms) or delayed, as before with e-mail.
D. *Ease of adding information to the system*. This is available where users of the website are allowed to add their own personal content or feedback to a particular website, thereby becoming both users and content providers. The time needed to update the website, from

both the marketer's and the consumer's perspective is classified as "Immediacy", and is a measure of how up-to-date the website is.

Web advertisers need to understand and measure the effectiveness of their websites as communication and/or interactive advertising media. Hence, the choice of measurement will depend on the marketers' objectives, time and budgetary constraints and technological ability to gather data. Research done by Bhat, Bevans and Sengupta (2002) indicates that web metrics can be organized into five major objectives including:

A. Website popularity and exposure,
B. Stickiness (ability of a website to attract and hold users' attention) and the quality of customer relationships,
C. Usefulness or relevance of message to users,
D. Co-marketing opportunities, and
E. Effectiveness of user targeting.

By understanding these web metrics and how they influence the success of a website and its interactivity, marketers can create a competitive advantage by driving the correct end-user behaviour on their websites.

As highlighted in Stevens (2004) research, it has been proven that beyond the positioning and interactivity of a web page are other critical factors that determine its success; particularly the success of the e-commerce interactions through that web page. These factors are divided into three broader categories:

A. Organizational Factors,

B. Managerial Factors,

C. Technological Factors.

The organizational factors that are critical to support an e-commerce environment include:

- Developing an “eVision” and aligning this “eVision” to the business strategy, mission, vision, goals and objectives of the organization;
- Developing a sound business model, a necessity for all businesses, where a clear understanding of the value chain in relation to the services and products being offered is required and profitability is dependent upon achieving critical mass, lowering transaction costs and increasing revenue streams;
- Collaborative relationships, including the formation of consortiums, the involvement of internal and external stakeholders in the process, leveraging of existing relationships, providing value to suppliers and consumers and achieving the commitment of suppliers;
- Driving exceptional customer service, to the extent that it becomes a differentiator from competitors (This “Customer-Centric” philosophy involves a value-adding proposition which includes price competitiveness, product differentiation, operational efficiencies, reduced inventories, faster order processing, quicker deliveries and strategic sourcing.);
- The support for a global trading system if required by the organization’s “eVision”.

The managerial factors crucial to the support of an e-commerce environment include:

- Senior Management support is essential, to drive the business engineering process to support the e-commerce environment and to manage the implications of the “eVision” strategy on the culture, attitude and business philosophy of the organization;

- Change Management is crucial, to support the transformation of an organization to an e-commerce environment, and includes people transformation and the management thereof;
- Project Management, which includes managing all the people, processes, objectives, milestones and metrics and aligning the respective resources to execute the project;
- Project flexibility, which implies that the differing needs of suppliers *versus* consumers need to be flexibly managed and these stakeholders need to be driven to support and buy into the value proposition of the "eVision" strategy;
- Business and technical skills are essential; to support the entire e-commerce environment, in an emerging economy and market, an explicit knowledge of the respective industry and the value chains therein is critical. Successful business process engineering and attention to detail will be the two largest challenges to overcome.

The technological factors crucial to support an e-commerce environment are described below.

- Efficient integration of back-end systems within the organization, and those of buyers and suppliers. These systems include enterprise resource planning, supply chain management and customer relationship management systems. The shortcomings of expensive middleware systems and the operations and support of dual systems limit the success and profitability of an e-commerce environment.
- Security management is essential to keeping stakeholder information and transactional data secure. Security breaches can result in broken value-chain relationships and lack of confidence in future transactions. The implementation of Virtual Private Networks (VPNs) provides an added level of security over the traditional public Internet. However, because this is always not possible within the public domain, the use of proven encryption software on all transactions is critical.

The behaviour of on-line e-commerce customers clearly indicates the benefits of using Internet technology to deliver on-line service to customers. Ghosh (1998) explains that there are three benefits to the service and level of interactivity that customers receive over the Internet: firstly, companies are able to leverage the Internet technology to give the same level of service to customers that they would have received from a salesperson; secondly, utilising the Internet technology, companies are now able to personalize the customer's interaction with the web page, thereby ensuring customer satisfaction and loyalty; thirdly, utilising the Internet technology, companies can provide valuable new products and services inexpensively, thereby passing those savings back to the customer.

Research by Cho and Cheon (2005) indicates that the three most frequently used classifications for interactivity are:

A. Consumer - Message interaction;
B. Consumer - Marketer interaction;
C. Consumer - Consumer interaction.

2.9.1 Consumer - Message Interaction

Cho and Cheon (2005) define this as the user's interaction with messages: how the user can select, search, edit, and modify the form and content of mediated messages by interacting with the messages. Cho and Cheon (2005) found that this implied interactivity used certain keywords to describe interactivity: "user influence on the form and content", "choice over various levels of information", and "modifying the form and content".

2.9.2 Consumer - Marketer Interaction

Cho and Cheon (2005) define this as two-way interaction between consumers and marketers. Research has shown that Western cultures (South Africa is categorised in this sector along with

United States and the U.K.) value individualism and reject hierarchic status, which makes power distance or authority recognition an uncomfortable proposition. According to Cho and Cheon (2005), Western websites may tend to lessen the distance between consumers and marketers in an attempt to maintain and create more horizontal relationships through two-way interaction between the two groups.

2.9.3 Consumer – Consumer Interaction

Cho and Cheon (2005) define this as interactivity amongst consumers. In today's competitive environment, consumer feedback allows new buyers to have first-hand knowledge about product or service satisfaction. Certain websites go as far as letting consumers enter a "chat-room" environment to enrich this interaction and possibly, allow for more autonomous feedback sessions. Cho and Cheon (2005) indicate that western cultures are likely to identify themselves as individual entities and place value in individual feedback.

Research Proposition 6: South African Websites use mainly Consumer – Message interactivity

2.10 Summary of research Propositions

The following are the proposed research propositions:-

- **Research Proposition 1**: South African corporate websites operate mainly within the Business-to-Consumer domain.
- **Research Proposition 2**: South African corporate websites predominantly have a promotional presence
- **Research Proposition 3**: South African corporate websites utilise their websites predominantly as a communication and promotional cost elimination model.
- **Research Proposition 4**: South African corporate websites predominantly promote product and/or service awareness and interest.

- **Research Proposition** 5: South African corporate websites are predominantly used as communication and promotional tools, supporting the physical operations of the business or corporation.
- **Research Proposition 6**: South African Websites use mainly Consumer – Message interactivity

CHAPTER 3

PROPOSED DATA COLLECTION

"The World Wide Web (WWW or simply the Web) has attracted a great deal of attention in recent years, perhaps significantly, in the influential business press" (Berthon, Pitt & Watson, 1996)

3.1 Introduction

Chapter 3 deals with the data collection methodology. This chapter explains the population group from which the sample was drawn and the questionnaire used to gather the responses of individuals with respect to their companies web pages.

Direct quantitative marketing research techniques, using an on-line questionnaire, were used to collect data regarding their web pages and e-commerce marketing strategies, this was done from a random sample of companies.

The initial goal of the data collection was for a link (Uniform Resource Locator [URL] Address) for the respective on-line questionnaire to be electronically mailed (e-mail) to each of the respective companies selected from the random sample, whereby the recipient within each respective company would answer the questions in sections A and B of the questionnaire (shown in Appendix A).

Depending on the success on the above exercise and the number of actual responses, if the desired results were not achieved, an independent study utilizing the same questionnaire would be conducted on a random sample from within the initial list of companies. This would allow for a standardized study to be completed: hence, still providing usable data for analysis.

3.2 Sample

The sample population was drawn from the total list of available on-line South African businesses. Telkom SA's "Yellow Pages" on-line directory services at URL address: http://www.yellowpages.co.za was used in collecting the list of South African business websites and their respective e-mail addresses.

The target was to send the e-mail to three hundred (300) randomly selected companies, representing as many industry segments as possible. It was envisioned that a sample of more than a hundred completed responses would be returned, with an expected 33% response rate, however, an optimistic response rate of 50% would allow for more than 150 responses to be collected.

3.3 Instrument

Respondents were to be sent an on-line web questionnaire developed specifically for this study. Each respondent, representing the company that they work for and pertinently also representing the marketing and advertising divisions within that company would complete the questionnaire with respect to their company's web page and e-commerce marketing strategy.

3.3.1 Section A – Generic Company Profile

Section A of the on-line questionnaire (shown in Appendix A) requested the respondent to complete a generic company profile for their respective company: Table 3 gives an overview of the questions and the respective data descriptors in Section A.

Table 3 – Section A Questionnaire Fields

Question	Data Entry	Data Type	Data Descriptor
Company Name	User Input	Text	String 256 Characters
Company Website URL Address	User Input	Text	String 256 Characters
Industry Sector	Drop Down List	Text	String 256 Characters

Where there were no rules to the entering of certain data (data entry was open to user discretion); for example, "Company Name" and "Company Website URL Address", these fields remained 'open'. This user-specific data did not affect the outcomes of this research.

Where the data were specific to the focus of this research paper they were restricted to a pre-defined list of options. The use of drop-down boxes facilitated the process of selection, ensuring rigid data integrity and standardization for usability in the data analysis component of this research.

The Industry Sector drop down box reflected the following broad range of prevalent industry sectors:

- Banking,
- Food/Hospitality Services,
- Industrial/Manufacturing,
- IT/Telecoms,
- Logistics/Transportation,
- Medical/Pharmaceutical,
- Mining,

- Retail.

3.3.2 Section B – Marketing Strategy Questionnaire

Section B of the on-line questionnaire (Appendix A) was specifically used to collect data from the sample of identified companies, concerning their ratings of their on-line marketing strategies and e-commerce web pages.

In accordance to the literature review, the 'Domains', 'Classifications' and 'Levels of Interactivity' and their respective constructs pertaining to on-line marketing strategies and e-commerce web pages were identified, these are listed below.

A. E-Commerce Web Page Marketing Domains
    i. Business-to-business
    ii. Business-to-consumer
    iii. Consumer-to-consumer
    iv. Consumer to Business

B. E-Commerce Web Page Classifications
    i. Classification by corporate Purpose
    ii. Classification by source of income
    iii. Classification by Stage of Adoption
    iv. Classification by Function

C. E-Commerce Web Page Level of Interactivity
    i. Consumer - Message interaction
    ii. Consumer - Marketer interaction
    iii. Consumer - Consumer interaction

Incorporating the theory from the above constructs, a comparative, itemized rating was used for the second part of the on-line questionnaire, each respondent indicated *via* a five point 'Likert' scale[2] their ratings pertaining to each question with respect to the above constructs. The 'Likert' technique presents a set of attitude statements. Respondents to the on-line questionnaire were asked to express agreement or disagreement with each of the proposed statements.

3.4 Questionnaire Integrity and Validity

For the purposes of ensuring the questionnaire integrity and validity a pilot survey would be run on a pre-selected sample of companies, to eliminate any ambiguous statements, negative statements or statements which might seem unduly 'leading'; for example, "Does your on-line marketing strategy include an e-commerce model?"

The pilot would also include running the test on a group of companies whose attitudes were known. For example, a company that does not have an on-line marketing strategy or where their e-commerce on-line presence would be expected not to favour the classification by functionality or the level of interactivity. If they did, it could be assumed that something was wrong with the questionnaire and its structure. If they did not, then the test could be assumed to be valid.

If necessary, an expert in the field of on-line marketing strategies and/or e-commerce web pages will need to check the content validity of the questionnaire. Lastly, as discussed previously, if this survey did not produce the desired results with respect to data integrity and validity, an independent study would need to be conducted on the random list of web pages to produce the required data sample.

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[2] The Likert technique presents a set of attitude statements, allowing respondents to express agreement or disagreement of a five-point scale, with "Undecided" or "Neutral" being the middle position.

To ensure that the there is consistency between the stated problem, the respective sub-problems, the respective research propositions and the proposed questionnaire, a consistency matrix was constructed. Table 42 (shown in Appendix B) indicates that all dimensions of the stated problem and the respective sub-problems are covered by the questions in the proposed questionnaire and lastly, there are no miscellaneous questions within the proposed questionnaire that have no specific purpose or validity.

CHAPTER 4

DATA ANALYSIS METHODOLOGY

"While the world wide web works well as a fancy display device, its real power lies in interactivity. Indeed, with the right interactive design and components, a drearily ordinary site can be transformed into a sophisticated marketing and sales tool that offers every visitor a highly personalized, highly responsive experience." (Dysart, 1998)

4.1 Introduction

Chapter 4 covers the proposed data analysis methodology, this includes an explanation of the use of statistical procedures such as Analysis of Variance tests, Factor Analysis tests and lastly, Cluster Analysis tests to analyze the results obtained from the sampled population group.

The research objectives were supported by the outputs of an ANOVA hypothesis test. Therefore, with respect to the resulting data set a comparison of the means for the different population groups was performed to test the validity of the proposed research propositions.

In addition to this, a further investigation to determine any unknown underlying factors was also done on the resulting data set, for purely investigative purposes. Factor Analysis, in particular exploratory Principal Component Analysis (PCA), was used to perform the task of identifying these underlying factors. Cluster analysis was also performed on the resulting data set, to

determine whether any unknown underlying associations or groupings could be determined from the results.

4.2 ANOVA Tests

In accordance to the industry sectors available in the drop down box in Section A of the on-line questionnaire, the resulting data set allowed for more than two population groups. For this reason a one-way analysis of variance was used. This is a generalization of a two sample *t* test, used to test whether the means from several populations groups are all equal, and if not, which are significantly different from each other.

The one-way ANOVA procedure is usually run in two stages. In the first, the test for the null hypothesis of equal means is tested, and if the resulting *p*-values are not sufficiently small, then there will be insufficient evidence to reject the equal means hypothesis, and the analysis will stop. If, however, the resulting *p*-values are sufficiently small, it is assumed with a certain level of confidence that the means for the different population groups are not equal. Then the second stage is used to discover which means are significantly different from which other means. For this, a pair-wise comparison (paired-sample *t* test) was used, by performing a hypothesis test for the differences between two population means (Albright, Winston & Zappe, 2003)

4.2.1 ANOVA Test Assumptions

ANOVA tests, as with many other statistical procedures, are reliant on the resulting data set to be normally distributed. To test for normality, a *Chi-square goodness-of-fit* test was performed on the resulting data set. This test looks at the observed frequencies of the population group and compares these with the expected frequency for a normally distributed population group. If the two sets of frequencies are sufficiently similar, it can be assumed that the null hypothesis of normality can be accepted; otherwise it should be rejected.

4.3 Factor Analysis

Factor analysis is a statistical interdependence technique that originated in psychometrics and allows for the number of variables in an observed data set to be reduced. Furthermore, it detects structure in the relationships between variables and allows these relationships to be re-classified according to the underlying or latent structures (dimensions).

For the purpose of this research, Factor Analysis was used for:

- **Data reduction (Parsimony)** - Factor analysis is useful for reducing a mass of information to a manageable description. The management, analysis, and understanding of such data are facilitated by reducing them to their common factor patterns. These factors concentrate and index the dispersed information in the original data and can therefore replace the numerous characteristics without much loss of information (Rummel, 1970);
- **Structure** - Factor analysis can also be used to discover the basic structure of a particular environment. Data collected on a large sample of groups and factor analyzed can help disclose this structure (Rummel, 1970) & (PA 765, 2005);
- **Classification or description** - Factor analysis was used to group interdependent variables into descriptive categories (clusters) (Rummel, 1970);
- **Hypothesis testing** - Since the meaning usually associated with "dimension" is that of a cluster or group of highly intercorrelated characteristics or behaviour, factor analysis was used to test for their empirical existence. Which web page characteristics or marketing strategies should, by theory, be related to which dimensions can be postulated in advance and statistical tests of significance can be applied to the factor analysis results (Rummel, 1970);
- **Exploration** - Unknown domains may be explored through factor analysis. It can reduce complex interrelationships to a relatively simple linear expression and can highlight non-

evident relationships. It thus fulfils some functions of the laboratory and enables the researcher to untangle interrelationships, to separate different sources of variation, and to partial out or control for undesirable influences on the variables of concern (Rummel, 1970).

The two most common methods of Factor Analysis, used for extracting underlying factors from a sample data set are:

- **Principal Components Analysis (PCA)** - In Principal Components Analysis, the total variance in the data is considered. The diagonal of the correlation matrix consists of unities, and full variance is brought into the factor matrix. Principal Components Analysis is recommended when the primary concern is to determine the minimum number of factors that will account for the maximum variance in the data for use in subsequent multivariate analysis. These factors are called principal components, and are appropriate when creating a typology of variables or reducing attributed space (Malhorta, 1996). PCA is appropriate for most social science and marketing research purposes.

- **Principal (common) Factor Analysis (PFA)** - In PFA, the factors are estimated only on the basis of common variance. Communalities are inserted in the diagonal of the correlation matrix. This method is appropriate when the primary concern is to identify the underlying dimensions and the common variance is of interest. This method is also known as principal axis factoring (Malhorta, 1996).

The primary difference between factor analysis and principal components analysis concerns the meaning of the dimensions: whereas the goal of principal components analysis is parsimony, factor analysis is concerned, in addition, with what is referred to as underlying structure

(Rummel, 1970). ‘‘Factor analysis is based on the fundamental assumption that some underlying factors, which are smaller in number than the number of observed variables, are responsible for the covariation among the observed variables’’ (Kim and Mueller, 1978)[3].

4.3.1 Factor Analysis Assumptions

Factor analysis is part of the multiple general linear hypothesis (MLGH) family of procedures (PA 765, 2005). It is closely related to regression analysis and applies many of the same assumptions:

- **Bi-linear data points** - Factor analysis requires a set of bi-linear data points in matrix form, implying that the row entities and column entities must be independent of each other (Rees and Lochmüller, 1994). Factor analysis is a linear procedure: as with multiple linear regression, nonlinear transformation of selected variables may be a pre-processing step. The smaller the sample size, the more important it is to screen data for linearity;
- **No selection bias/proper specification** - The exclusion of relevant variables and the inclusion of irrelevant variables in the correlation matrix being factored will affect the factors which are uncovered. This dilemma creates a chicken-and-egg problem. Note: this is not just a matter of including all relevant variables. Also, if variables are arbitrarily deleted in order to produce a "cleaner" factorial solution, erroneous conclusions about the factor structure will result;
- **No outliers** - Outliers can impact correlations heavily and thus distort factor analysis. ‘Mahalanobis’ distance (Kim and Mueller, 1978)[4] may be used to identify cases which are

[3] As cited in PA 765, 2005.

[4] As cited in PA 765, 2005.

multivariate outliers, and these may then be removed from the analysis prior to factor analysis;

- **Interval data** - Data are to be converted to interval data prior to analysis, Ordinal and Categorical data can also be analysed using factor analysis: however, the interpretation of the factors can be very difficult;
- **Orthogonality** - The unique factors should be uncorrelated with each other or with the common factors;
- **Underlying dimensions shared by clusters of variables are assumed** - If this assumption is not met, the "garbage in, garbage out" (GIGO) principle applies. Factor analysis cannot create valid dimensions (factors) if none exist in the input data;
- **Adequate sample size** - At a minimum, there must be more cases than factors. The rule of 10 can be applied, implying that there should be at least 10 cases for each item in the instrument being used (PA 765, 2005).

4.3.2 Factor Analysis Data Integrity

Communality, h^2, is the squared multiple correlation for the variable using the factors as predictors. The communality measures the percent of variance in a given variable explained by all the factors jointly and may be interpreted as the reliability of the indicator (PA 765, 2005). When an indicator variable has a low communality, the factor model is not working well for that indicator and possibly it should be removed from the model. If the communality exceeds 1.0, there is a spurious solution, which may reflect too small a sample or that the chosen factors are too few.

Rotation of the axis (Varimax Rotation) serves to make the output more understandable and is usually necessary to facilitate the interpretation of factors. For solutions with two or more factors, prior to rotation the first axis will lie in between the clusters of variables and, in general, the

variables will not sort well on the factors. Rotation of the axes causes the factor loadings of each variable to be more clearly differentiated by factor (PA 765, 2005).

The criteria for determining the number of factors are dependent on a number of various tests, (Malhorta, 1996 & Dunteman, 1989)[5]. For the purpose of this research a combination of the first three tests (criterion) was used:

- **Kaiser criterion** - A common rule of thumb for dropping the least important factors, all components with eigenvalues under 1.0, from the analysis;
- **Scree plot** - The Cattell scree test plots the components as the X axis and the corresponding eigenvalues as the Y axis. Moving toward the right, toward later components, the eigenvalues drop. When the drop ceases and the curve makes an elbow toward a less steep decline, all further components after the one starting the elbow should be dropped;
- **Variance explained criteria** - Some researchers simply use the rule of keeping enough factors to account for 90% (sometimes 80%) of the variation. Where the researcher's goal emphasizes parsimony (explaining variance with as few factors as possible), the criterion could be as low as 50%;
- **Joliffe criterion** - A less-used, more liberal rule of thumb which may result in twice as many factors as the Kaiser criterion, the Joliffe rule is to crop all components with eigenvalues under 0.7;
- **Comprehensibility** - Though not a strictly mathematical criterion, there is much to be said for limiting the number of factors to those whose dimension of meaning is readily comprehensible. Often these are the first two or three.

[5] As cited in PA 765, 2005

4.4 Cluster Analysis

In accordance to the research objectives of this research paper, the outputs of Cluster Analysis were also used as an additional classification method, to organize the sample of responses into respective categories or homogeneous groups called clusters (Malhorta, 1996); in contrast to the standard use of factor analysis, which is used to explicate relationships among variables (Julnes, 1999). Cluster analysis is also called classification analysis or numerical taxonomy (Malhorta, 1996).

The theory of Cluster Analysis is based on the belief that the resulting numerical categories assist researchers in describing the phenomena of interest and the relationships among them. This assistance depends, as in the case of principal components analysis and factor analysis, on the value achieved in reducing the complexity of the real world down to more manageable categories. To the extent that the categories derived refer to real distinctions between entities, cluster analysis offers the promise of highlighting real similarities among subsets of phenomena, along with real differences between subsets (Bailey, 1994 as cited in Julnes, 1999).

4.4.1 *k*-Means Clustering

The *k*-Means Clustering methodology, useful when a hypothesis concerning the number of clusters is already in the cases or variables (StatSoft, 2003) was used. When the number of predisposed clusters that should be found in the sampled data is known, the *k*-Means clustering algorithm will be able to produce exactly *k* different clusters of greatest possible distinction. Therefore, the results of the cluster analysis should be useful in supporting or disproving the reviewed literature.

CHAPTER 5

DATA COLLECTION

"With the heralding of the new "interactive age" direct marketing seems poised to have its reliance on individual customer contact vindicated." (Peters, 1998)

5.1 Introduction

Chapter 5 deals with the results from the pilot study. The methodology and results from the actual data collection exercise are discussed and results for the test for normality, as required by the statistical procedures in Chapter 6, are explained.

5.2 Pilot Study

The pilot study, in which a sample of subject matter experts within Telkom's Sales and Marketing division were approached to complete the questionnaire with respect to Telkom's web page and other various sales portals that they managed, proved to be very successful. The results returned with the expected distributions and means for the known population group, and were again validated in a post study, with the same subject matter experts. Consensus was arrived at, indicating that the questionnaire would return the desired results in accordance to the objectives of the research propositions.

5.3 External Study

The original intention of e-mailing the URL link for the on-line questionnaire to the random list of companies and their respective e-mailing addresses proved to be unsuccessful, because:

- Firstly, access to a database of names of companies that have websites proved to be very difficult, as no individual or company was willing to disclose this information, owing to the client confidentiality clauses signed with customers;
- Secondly, gaining access to the correct e-mail addresses for the same list of companies proved to be even more complicated, as the listed e-mail addresses on the public websites; such as, www.yellowpages.co.za, listed the e-mail addresses of either their help desks or client contact centres. The individuals at these addresses either interpreted the e-mails as "Junk Mail" (Spam) and deleted them or, if they did take the time to fill in the questionnaire, produced results that were mostly erroneous, because of being incomplete or because of a lack of understanding and/or interpretation of the questions.

For this reason it was decided that an independent self-study would be done by an external third party. The reason for this was to ensure an unbiased, consistent view of the questionnaire and respective web pages. A PhD student at the University of the Witwatersrand Electrical Engineering Department was approached and briefed on how to complete the questionnaire. The same on-line questionnaire was used to capture the results for each of the respective companies; the results were then downloaded from the centralised database which served the on-line website.

The random sample of companies was obtained from the following locations:

- www.yellowpages.co.za
- www.jse.co.za
- www.ananzi.co.za (on-line query for South African web Pages)
- www.aardvark.co.za (on-line query for South African web Pages)

5.4 Resulting Data Set

From the above self study, a total of 100 web pages were analysed. However, 5 questionnaires were unusable because their data was either incomplete or erroneous: that is, the web page was either unavailable or lacked any content to analyse. The distribution of the remaining 95 web pages into the respective industry sectors is shown in Table 4.

For the purposes of this research, the population groups with very small representivity, "Food/Hospitality Services", "Medical/Pharmaceutical" and "Logistics/Transportation", were grouped together to leave five primary industry sectors, shown in Table 5.

Table 4 – Division of Web Pages into Industry Sectors

Industry Sector	Count
Banking	23
Food/Hospitality Services	2
Industrial/Manufacturing	22
IT/Telecoms	14
Logistics/Transportation	5
Medical/Pharmaceutical	2
Mining	16
Retail	11
Grand Total	**95**

Table 5 – Proposed Division of Web Pages into Five Primary Industry Sectors

Industry Sector	Count
Banking	23
Industrial/Manufacturing	22
IT/Telecoms	14
Mining	16
Retail and Other	20
Grand Total	**95**

5.5 Test for Normality

As the resulting data set consisted of categorical ordinal data, the respective data analysis (ANOVA test), as indicated in the previous chapter, could be applied directly on the resulting data set, by fitting distributions to the data using the χ^2 statistic (Lind, Marchal & Wathen, 2006). This distribution-fitting approach is found to have a higher level of accuracy and improved validity on the final data analysis results when compared to the traditional approaches that either assume an interval level scale or use the rescaling approach, where correspondence analysis is used (Stacey, 2005).

5.5.1 Distribution Fitting Algorithm Approach

Stacey (2005) defined the above as: " An algorithmic rather than arithmetic approach that estimates the values of the parameters (typically means and standard deviations) of distributions of underlying attitudes (for example normal or log-normal distributions) together with the attitudinal threshold, that would result in the best fit with the observed categorical response frequencies". This alternative approach thus analyses ordinal level response data which involves the fitting of hypothesized distributions to the observed response data. Furthermore, this approach maintains that data can generally be regarded as interval data and should not be re-scaled before proceeding with statistical analysis (Stacey, 2005).

For this purpose a *Chi-square goodness-of-fit* test was performed on the resulting data set. The results are shown in Table 6.

Table 6 – Chi-square Goodness-of-fit test results

Questions	μ	σ	σ^2	LCL_μ	UCL_μ	p-value	LCL_σ	UCL_σ
B1	0.57	1.14	1.31	0.34	0.80	0.0000	1.00	1.33
B2	0.30	1.21	1.46	0.06	0.55	0.0163	1.06	1.41
B3	0.67	1.22	1.50	0.42	0.91	0.0000	1.07	1.43
B4	0.41	0.72	0.53	0.27	0.56	0.0000	0.63	0.85
B5	0.05	0.83	0.69	-0.12	0.21	0.5849	0.72	0.97
B6	-0.31	1.15	1.33	-0.54	-0.08	0.0106	1.01	1.35
B7	-0.09	0.80	0.64	-0.25	0.07	0.2618	0.70	0.94
B8	-0.51	0.90	0.81	-0.69	-0.33	0.0000	0.79	1.05
B9	0.30	0.49	0.24	0.20	0.40	0.0000	0.43	0.58
B10	-0.35	0.81	0.66	-0.51	-0.18	0.0001	0.71	0.95
B11	-0.37	0.96	0.91	-0.56	-0.18	0.0003	0.84	1.12
B12	-0.49	0.74	0.55	-0.64	-0.34	0.0000	0.65	0.87
B13	-0.34	0.90	0.81	-0.52	-0.16	0.0003	0.79	1.05
B14	0.17	0.65	0.42	0.04	0.30	0.0113	0.57	0.76

Population Mean =	0.00	0.90	0.85
Population σ^2_μ =	0.15		
Population χ^2 =	27.89		
p value =	0.9994		
Confidence level =	95%		
Total variance =	1.00		

H_0: $\mu = 0$

H_A: $\mu \neq 0$

Where:-

μ : Represents the average

σ : Represents the standard deviation, which is measure of variability (the root square of the variance

σ^2 : Represents the variance

LCL_μ : Represents the lowest control limit of the average

UCL_μ : Represents the upper control limit of the average

p-value : Represents the observed level of significance. A low *p*-value provides evidence for rejecting the null hypothesis and accepting the alternative hypothesis

LCL_σ : Represents the upper control limit of the standard deviation

UCL_σ : Represents the upper control limit of the standard deviation

The *p*-value for the test for normality was 0.9994: therefore, the higher the *p*-value, the more evidence there is that the data did come from a normally distributed population (Lind, Marchal & Wathen, 2006). Hence, the pre-condition for normality had been met and the required statistical procedures could be performed.

CHAPTER 6

DATA ANALYSIS RESULTS

"To assess the risks and opportunities, you need to know what's possible." (Ghosh, 1998)

6.1 Introduction

Chapter 6 covers the results from the actual data analysis. As proposed in Chapter 4, the results from the Analysis of Variance, Factor Analysis and the Cluster Analysis tests are all explained in detail and their support for the respective research proposition is explained.

6.2 ANOVA Tests Results

6.2.1 Research Proposition 1: South African corporate websites operate mainly within the business-to-consumer domain.

The constructs for this research proposition are represented by the following questions:

- B1 - The results from the ANOVA test returned a *p*-value of 0.0395, indicating that the five population means are *not* equal. Therefore, across the five industry sectors it is not perceived that these web pages all operate mainly within the business-to-business domain. The results for the paired-sample *t* test are shown in Figure 8.

Figure 8 - Research Proposition 1 - Question B1 Population Means

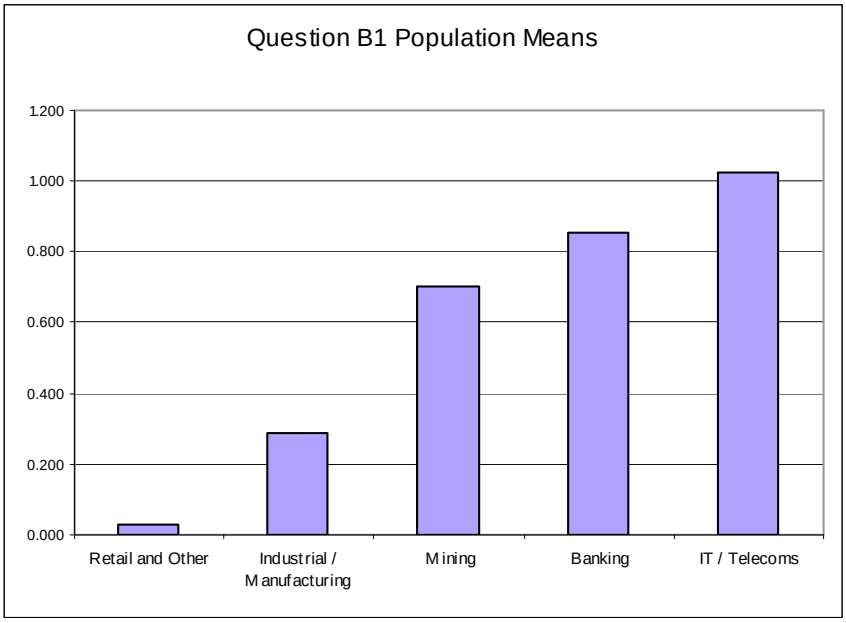


Table 7 – Research Proposition 1 - Question B1 Population Means Groupings

Group 1 - Supporting Business-to-Business Web Page Marketing Domain	Group 2 – Not fully Supporting Business-to-Business Web Page Marketing Domain
• IT / Telecoms • Banking • Mining	• Retail and Other • Industrial / Manufacturing

With respect to Figure 8 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 7.

- B2 - The results from the ANOVA test returned a *p*-value of 0.0487, indicating that the five population means were *not* equal. Therefore, across the five industry sectors the perception was not that these web pages all operate mainly within the business-to-consumer domain. The results for the paired-sample *t* test are shown in Figure 9.

Figure 9 - Research Proposition 1 - Question B2 Population Means

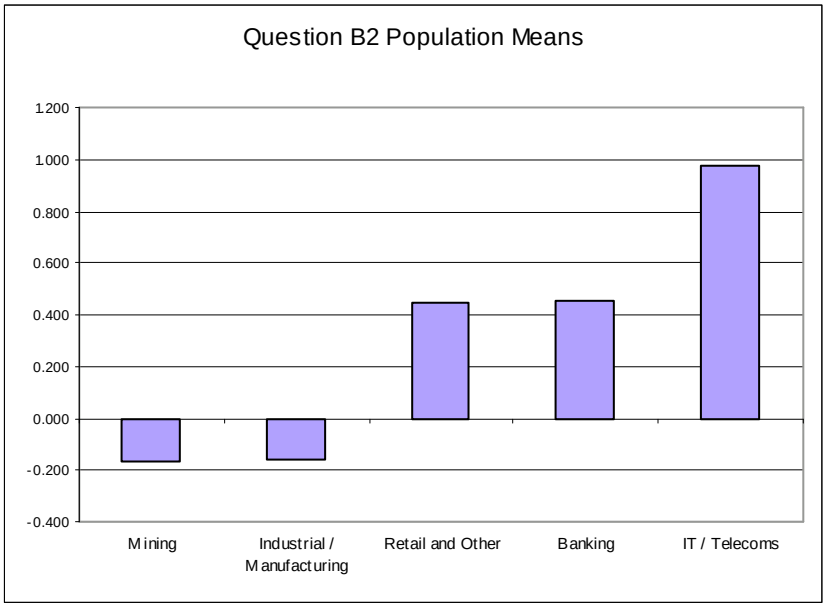


Table 8 - Research Proposition 1 - Question B2 Population Means Groupings

Group 1 - Supporting Business-to-Consumer Web Page Marketing Domain	Group 2 – Not Supporting Business-to-Consumer Web Page Marketing Domain
• IT / Telecoms • Banking • Retail and Other	• Mining • Industrial / Manufacturing

With respect to Figure 9 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 8.

- B8 - The results from the ANOVA test returned a *p*-value of 0.0005, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages all operate mainly within the consumer-to-consumer domain. The results for the paired-sample *t* test are shown in Figure 10.

Figure 10 - Research Proposition 1 - Question B8 Population Means

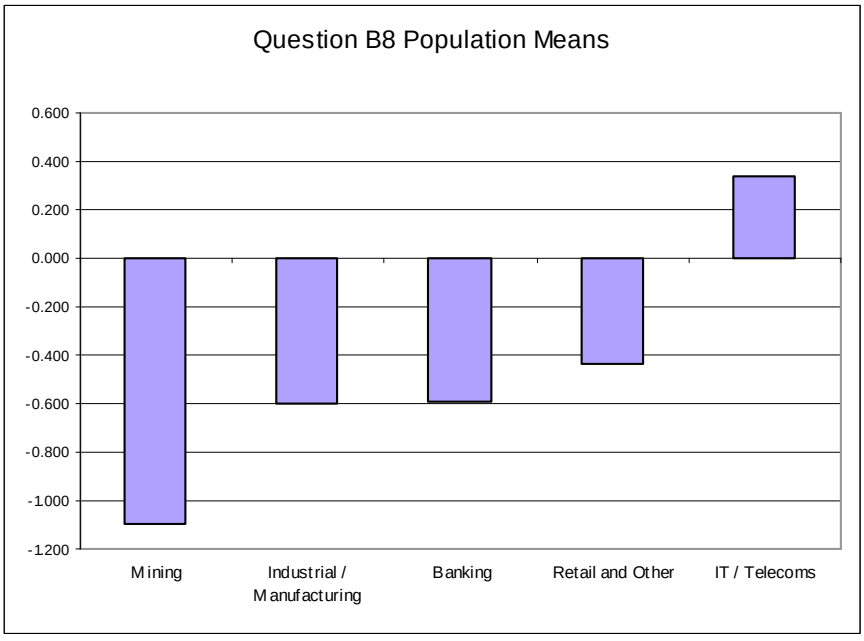


Table 9 - Research Proposition 1 - Question B8 Population Means Groupings

Group 1 - Supporting Consumer-to-Consumer Web Page Marketing Domain	Group 2 – Not Supporting Consumer-to-Consumer Web Page Marketing Domain
• IT / Telecoms	• Mining • Industrial / Manufacturing • Banking • Retail and Other

With respect to Figure 10 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 9.

- B14 - The results from the ANOVA test returned a *p*-value of 0.2276, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it is not perceived that these web pages all operate mainly within the consumer to business domain. The results for the paired-sample *t* test are shown in Figure11.

Figure 11 - Research Proposition 1 - Question B14 Population Means

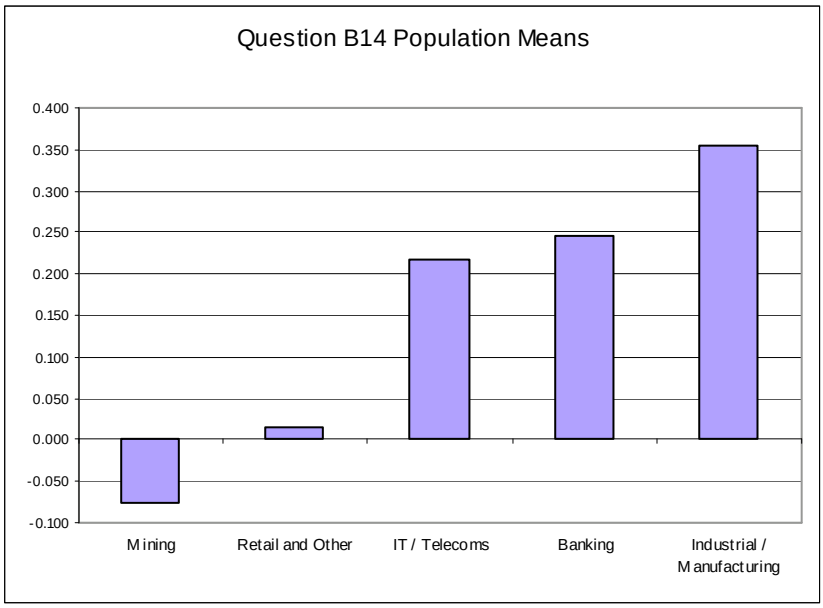


Table 10 - Research Proposition 1 - Question B14 Population Means Groupings

Group 1 - Supporting Consumer-to-Business Web Page Marketing Domain	Group 2 – Not Supporting Consumer-to-Business Web Page Marketing Domain
• Industrial / Manufacturing • Banking • IT / Telecoms • Retail and Other	• Mining

With respect to Figure 11 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 10.

6.2.1.1 Research Proposition 1 - Conclusion

From the above analysis and the actual values for the different population means it is clear that the business-to-business marketing domain is the prevalent model, particularly in the IT/Telecoms, Banking, Mining and Industrial / Manufacturing industry sectors. **The proposed research proposition was, therefore, not supported.**

However, within the IT/Telecoms and Banking industry sectors it is also shown that these industry sectors operate within both business-to-business and business-to-consumer marketing domains, with the Retail and Other industry sector predominantly operating within the business-to-consumer marketing domain.

Only within the IT / Telecoms industry sector are consumers' interactions with other consumers allowed for on their web pages, possibly because of their advanced knowledge and understanding of the technology required to implement such functionality on their web pages. Lastly, although not very prevalent, within the Industrial / Manufacturing, Banking and IT / Telecoms industry sectors, these respective web pages also allow for certain interaction between the consumer and the companies themselves. This is done *via* on-line mailing functionality or on-line customer feedback forms.

6.2.2 Research Proposition 2: South African corporate websites only have a promotional presence.

The constructs for this research proposition are represented by the following questions.

- B3 - The results from the ANOVA test returned a *p*-value of 0.0214, indicating that the five population means are *not* equal so, across the five industry sectors, it was not perceived that these web pages all have a corporate presence. The results for the paired-sample *t* test are shown in Figure 12.

Figure 12 - Research Proposition 2 - Question B3 Population Means

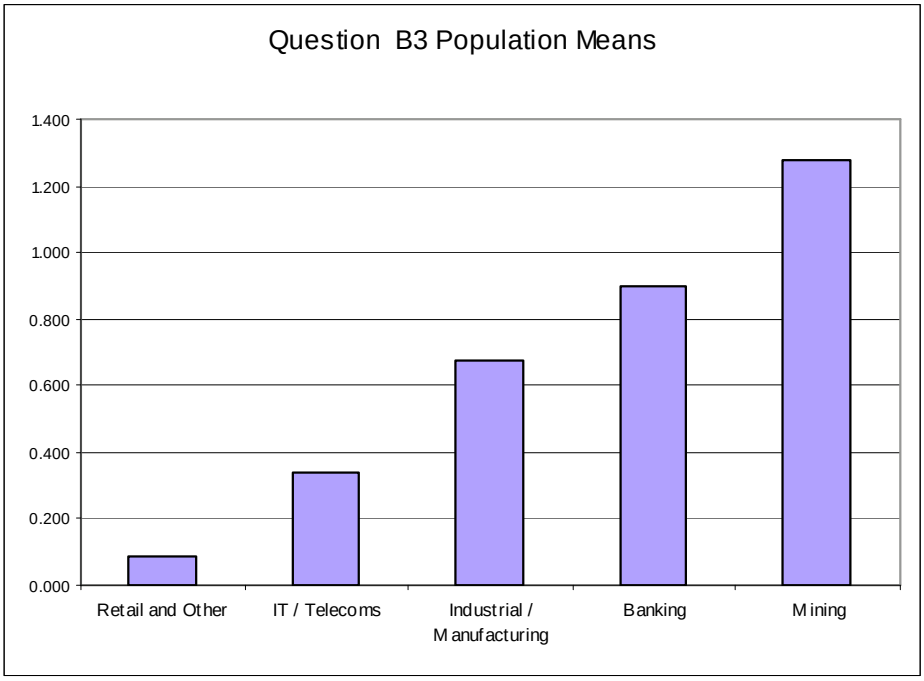


Table 11 - Research Proposition 2 - Question B3 Population Means Groupings

Group 1 - Supporting a Corporate Presence	Group 2 – Indicating Support for a Corporate Presence
• Mining • Industrial / Manufacturing • Banking	• Retail and Other • IT / Telecoms

With respect to Figure 12 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 11.

- B4 - The results from the ANOVA test returned a *p*-value of 0.0619, indicating that the five population means were *not* equal so, across the five industry sectors, it was not perceived that these web pages all have a strong promotional presence. The results for the paired-sample *t* test are shown in Figure 13.

Figure 13 - Research Proposition 2 - Question B4 Population Means

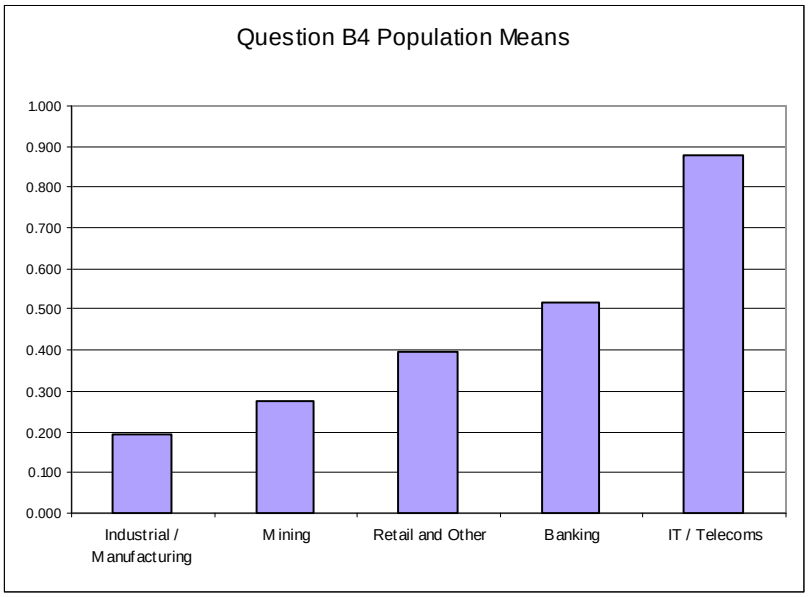


Table 12 - Research Proposition 2 - Question B4 Population Means Groupings

Group 1 - Supporting a Strong Promotional Presence	Group 2 – Indicating Support for a Promotional Presence
• IT / Telecoms • Banking • Retail and Other	• Industrial / Manufacturing • Mining

With respect to Figure 13 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 12.

- B5 - The results from the ANOVA test returned a *p*-value of 0.2144, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages all have a conversational presence. The results for the paired-sample *t* test are shown in Figure 14.

Figure 14 - Research Proposition 2 - Question B5 Population Means

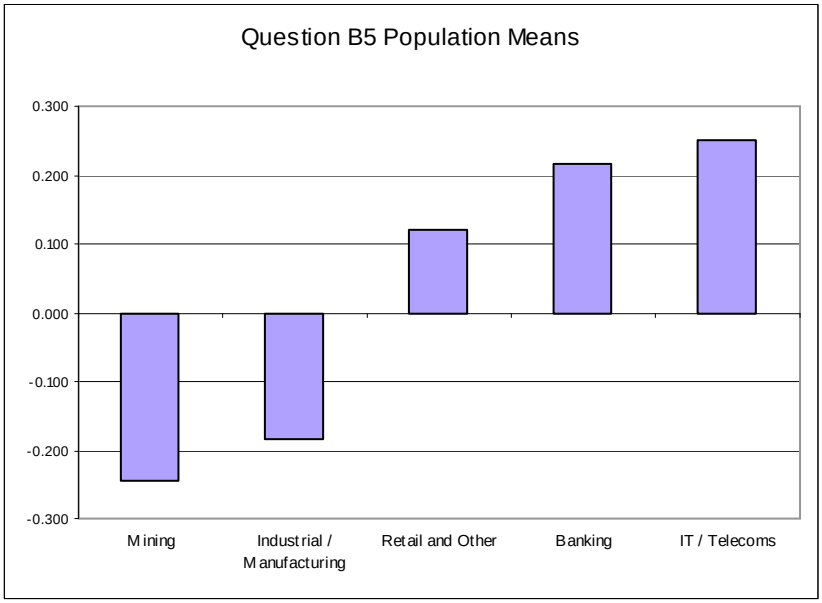


Table 13 - Research Proposition 2 - Question B5 Population Means Groupings

Group 1 - Supporting a Conversational Presence	Group 2 – Not Supporting a Conversational Presence
• IT / Telecoms • Banking • Retail and Other	• Mining • Industrial / Manufacturing

With respect to Figure 14 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 13.

- B6 - The results from the ANOVA test returned a *p*-value of 0.0011, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages all have a transactional presence. The results for the paired-sample *t* test are shown in Figure 15.

Figure 15 - Research Proposition 2 - Question B6 Population Means

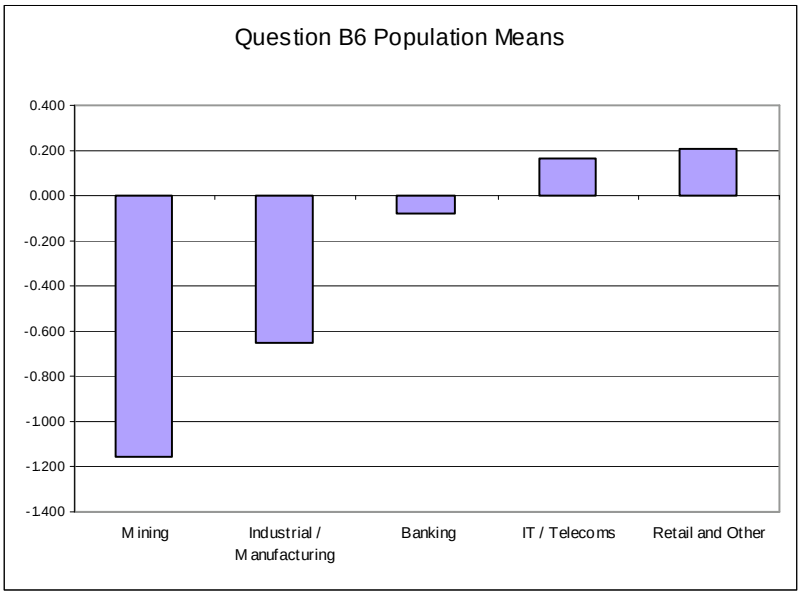


Table 14 - Research Proposition 2 - Question B6 Population Means Groupings

Group 1 - Supporting a Transactional Presence	Group 2 – Not Supporting a Transactional Presence
• Retail and Other • IT / Telecoms • Banking	• Mining • Industrial / Manufacturing

With respect to Figure 15 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 14.

6.2.2.1 Research Proposition 2 - Conclusion

From the above analysis and the actual values for the different population means it is clear that South African web pages are used mainly to promote their corporate presence, particularly in the Mining, Banking and Industrial / Manufacturing industry sectors.

Within the IT/Telecoms, Banking and Retail and Other industry sectors it was shown that these industry sectors also have a very strong promotional presence. These industry sectors also have a conversational presence, allowing for consumers to provide product and/or service feedback to the respective companies. **The proposed research proposition was, therefore, only partially supported.**

Again, only within the Retail and Other, IT/Telecoms and Banking industry sectors is there an indication of a transactional presence. Since these industry sectors support both a corporate and a promotional presence, this could be expected, as these companies would obviously want their on-line customers to complete their transactions on-line at the same time (real time).

6.2.3 Research Proposition 3: South African corporate websites utilise their websites purely as a cost elimination model.

The constructs for this research proposition are represented by the following questions.

- B9 - The results from the ANOVA test returned a *p*-value of 0.004, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages are all used as advertising support models. The results for the paired-sample *t* test are shown in Figure 16.

Figure 16 - Research Proposition 3 - Question B6 Population Means

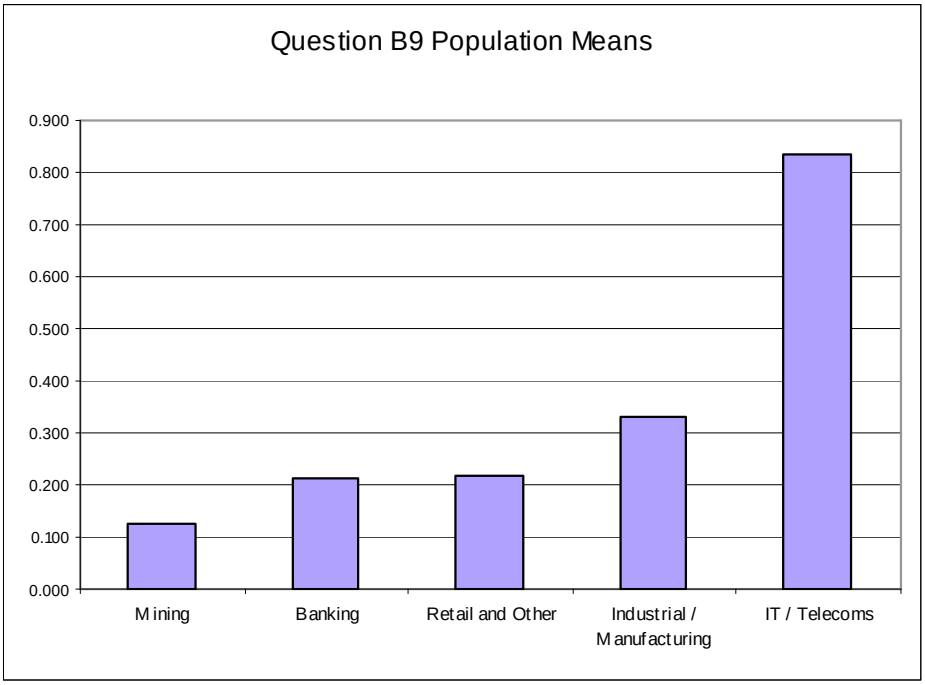


Table 15 - Research Proposition 3 - Question B9 Population Means Groupings

Group 1 - Supporting an Advertising Support Model	Group 2 – Indicating Support for an Advertising Support Model
• IT / Telecoms	• Mining • Banking • Retail and Other • Industrial / Manufacturing

With respect to Figure 16 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 15.

- B10 - The results from the ANOVA test returned a *p*-value of 0.0212, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages are all used as subscription support models. The results for the paired-sample *t* test are shown in Figure 17.

Figure 17 - Research Proposition 3 - Question B10 Population Means

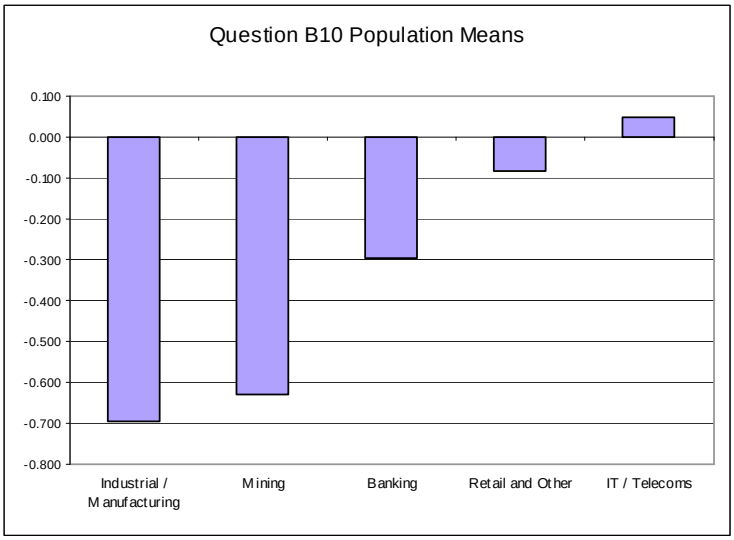


Table 16 - Research Proposition 3 - Question B10 Population Means Groupings

Group 1 - Supporting a Subscription Support Model	Group 2 – Not Supporting a Subscription Support Model
• IT / Telecoms • Retail and Other	• Industrial / Manufacturing • Mining • Banking

With respect to Figure 17 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 16.

- B11 - The results from the ANOVA test returned a *p*-value of 0.0192, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages are all used as cost elimination models. The results for the paired-sample *t* test are shown in Figure 18.

Figure 18 - Research Proposition 3 - Question B11 Population Means

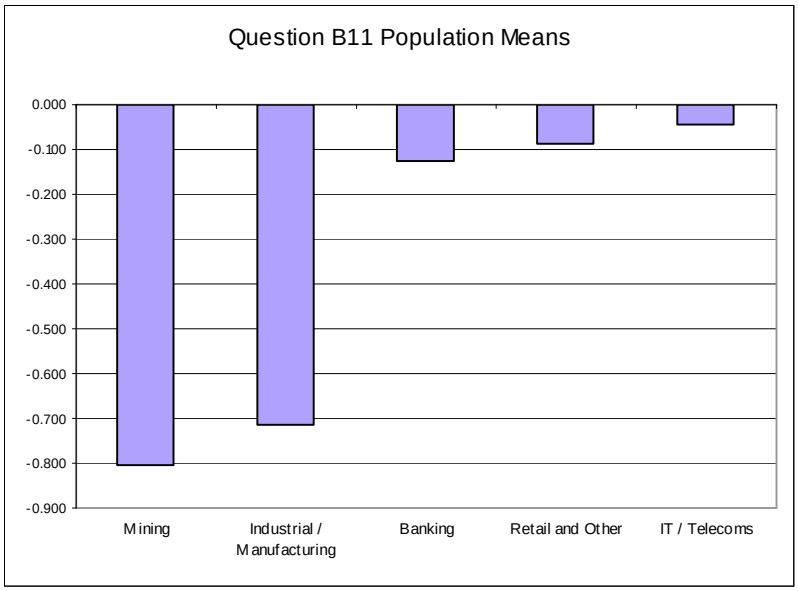


Table 17 - Research Proposition 3 - Question B11 Population Means Groupings

Group 1 – Not Supporting a Cost Elimination Model	Group 2 – Indicating slight Support for a Cost Elimination Model
• Mining • Industrial / Manufacturing	• IT / Telecoms • Retail and Other • Banking

With respect to Figure 18 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 17.

- B6 - The results from the ANOVA test returned a *p*-value of 0.0011, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages are all used as sales revenue models. The results for the paired-sample *t* test are shown in Figure 19.

Figure 19 - Research Proposition 3 - Question B6 Population Means

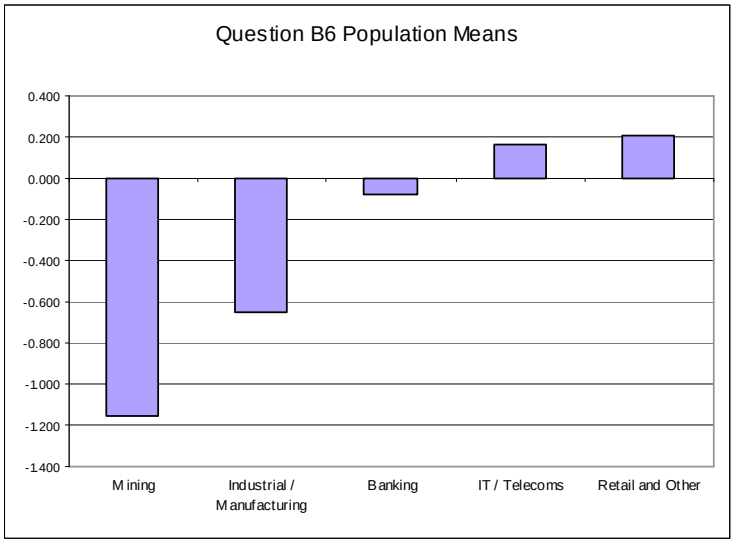


Table 18 - Research Proposition 3 - Question B6 Population Means Groupings

Group 1 - Supporting a Sales Revenue Model	Group 2 – Not Supporting a Sales Revenue Model
• Retail and Other • IT / Telecoms • Banking	• Mining • Industrial / Manufacturing

With respect to Figure 19 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 18.

- B12 - The results from the ANOVA test returned a *p*-value of 0.0004, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages are all used as information trading models. The results for the paired-sample *t* test are shown in Figure 20.

Figure 20 - Research Proposition 3 - Question B12 Population Means

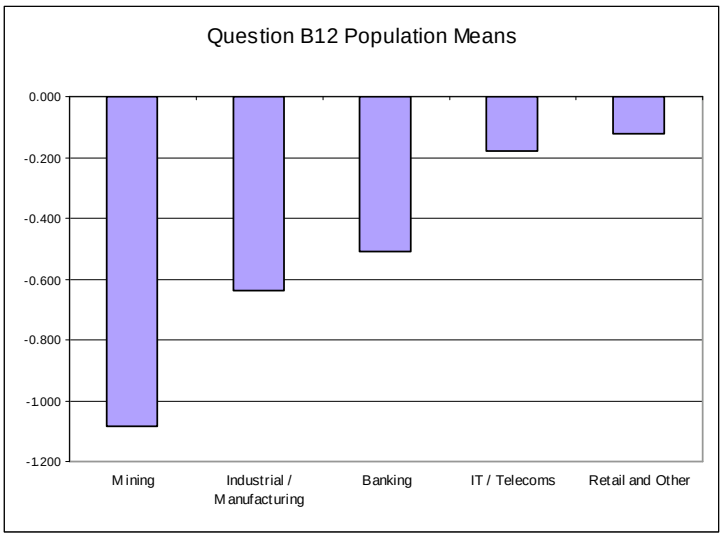


Table 19 - Research Proposition 3 - Question B12 Population Means Groupings

Group 1 – Not Supporting an Information Trading Model	Group 2 – Indicating slight Support for an Information Trading Model
• Mining • Industrial / Manufacturing • Banking	• Retail and Other • IT / Telecoms

With respect to Figure 20 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 19.

6.2.3.1 Research Proposition 3 - Conclusion

From the above analysis and the actual values for the different population means it is clear that South African web pages are used mainly as an advertising support model. This is prevalent across all industry sectors. **The proposed research proposition was, therefore, not supported.**

However, with respect to the IT/Telecoms industry sector, as these companies do not often have a physical establishment and often exist only within the space of the Internet, their advertising is holistically contained within the same realm, so this business environment can be seen as an additional cost-elimination model. This is, moreover, supported by the fact that this industry sector also indicated their predominant support for the use of their web pages to be a cost-elimination model. Hence, when viewed in this perspective this form of on-line advertising can be seen as a cost elimination model.

Within the IT/Telecoms and the Retail and Other industry sectors it was shown that these also make some use of the subscription support model, whereby, on-line customers will subscribe for a fee, to get access to certain data or information; such as stock exchange trading prices, business reviews or rankings. For the same sectors it was also shown that these industry sectors also make some use of the information trading model, whereby these web pages collect data from their on-line customer base and pass this on to other companies at a cost. This typically takes the form of an on-line poll or voting forms with respect to a particular service or product and its ranking against other similar or alternate products or services.

Within the IT/Telecoms, Retail and Other and Banking industry sectors there is an indication of a sales revenue model. As indicated before, since these industry sectors are supporting both a corporate and a promotional presence, this could be expected, as these companies would obviously want their on-line customers to complete their transactions on-line at the same time (real time).

6.2.4 Research Proposition 4: South African corporate websites only promote product and/or service awareness and interest.

The constructs for this research proposition are represented by the following questions.

- B4 - The results from the ANOVA test returned a *p*-value of 0.0619, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages all have a strong awareness and interest focus on the stage of the consumer's adoption process. The results for the paired-sample *t* test are shown in Figure 21.

Figure 21- Research Proposition 4 - Question B4 Population Means

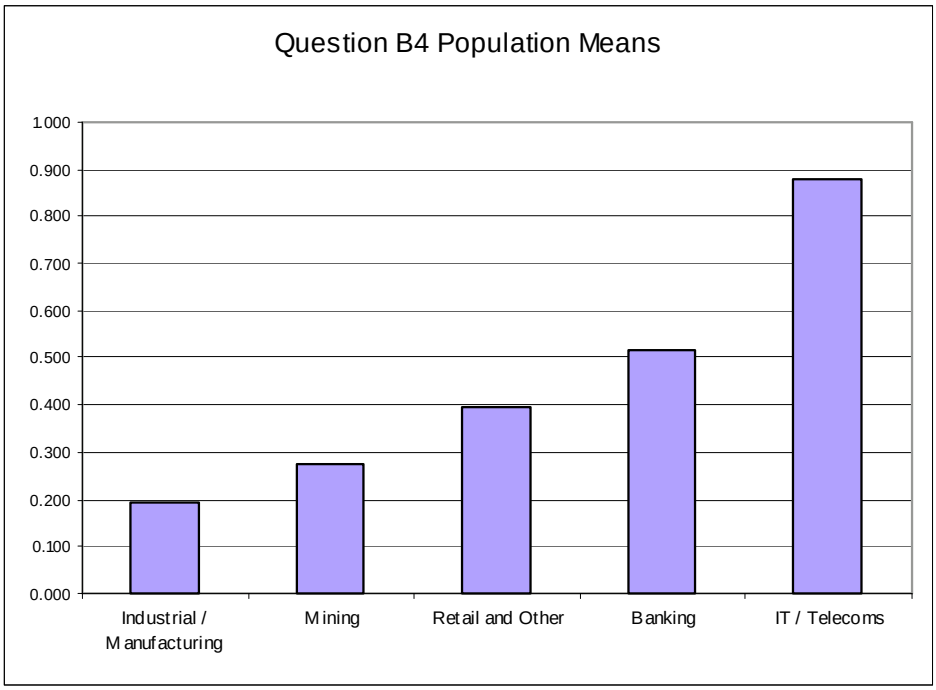


Table 20 - Research Proposition 4 - Question B4 Population Means Groupings

Group 1 - Supporting a strong Awareness and Interest focus on the stage of the consumer's adoption process	Group 2 – Indicating Support for Awareness and Interest focus on the stage of the consumer's adoption process
• IT / Telecoms • Banking • Retail and Other	• Industrial / Manufacturing • Mining

With respect to Figure 21 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 20.

- B8 - The results from the ANOVA test returned a *p*-value of 0.0005, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages all have a desire focus on the stage of the consumer's adoption process. The results for the paired-sample *t* test are shown in Figure 22.

Figure 22 - Research Proposition 4 - Question B8 Population Means

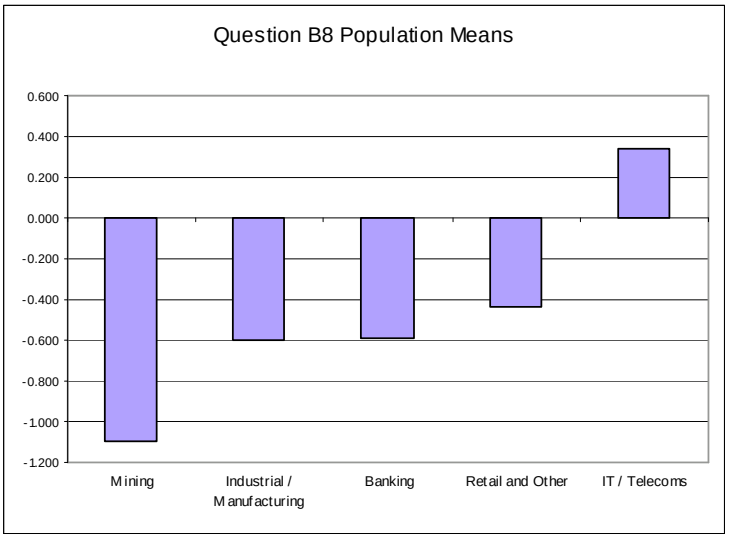


Table 21 - Research Proposition 4 - Question B8 Population Means Groupings

Group 1 - Supporting a Desire focus on the stage of the consumer's adoption process	Group 2 – Not Supporting a Desire focus on the stage of the consumer's adoption process
• IT / Telecoms	• Mining • Industrial / Manufacturing • Banking • Retail and Other

With respect to Figure 22 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 21.

- B6 - The results from the ANOVA test returned a *p*-value of 0.0011, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages all have an action/adoption focus on the stage of the consumer's adoption process. The results for the paired-sample *t* test are shown in Figure 23.

Figure 23 - Research Proposition 4 - Question B6 Population Means

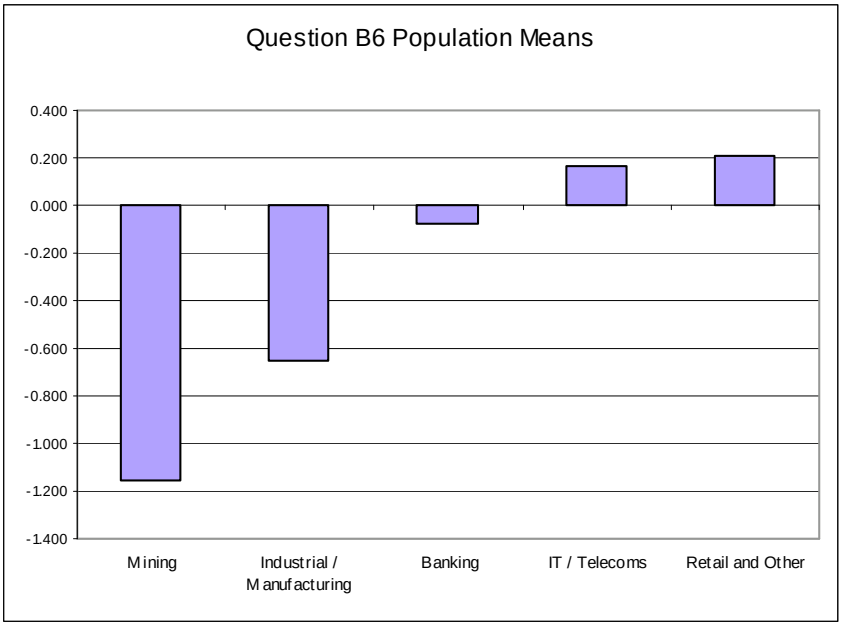


Table 22 - Research Proposition 4 - Question B6 Population Means Groupings

Group 1 - Supporting a Action/Adoption focus on the stage of the consumer's adoption process	Group 2 – Not Supporting a Action/Adoption focus on the stage of the consumer's adoption process
• Retail and Other • IT / Telecoms • Banking	• Mining • Industrial / Manufacturing

With respect to Figure 23 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 22.

- B7 - The results from the ANOVA test returned a *p*-value of 0.0090, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was

not perceived that these web pages all have a retention focus on the stage of the consumer's adoption process. The results for the paired-sample *t* test are shown in Figure 24.

Figure 24 - Research Proposition 4 - Question B7 Population Means

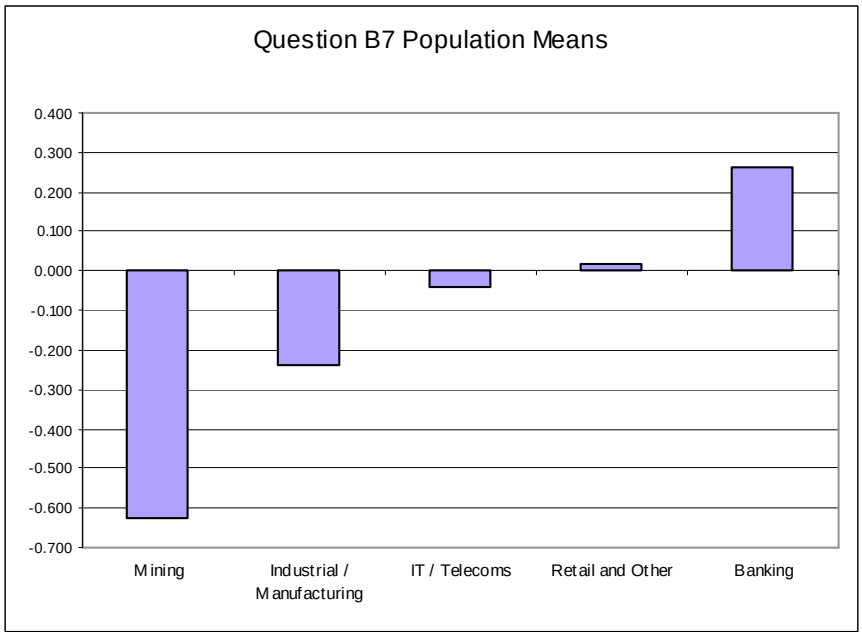


Table 23 - Research Proposition 4 - Question B7 Population Means Groupings

Group 1 - Supporting a Retention focus on the stage of the consumer's adoption process	Group 2 – Not Supporting a Retention focus on the stage of the consumer's adoption process
• Banking • Retail and Other • IT / Telecoms	• Mining • Industrial / Manufacturing

With respect to Figure 24 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 23.

6.2.4.1 Research Proposition 4 - Conclusion

From the above analysis and the actual values for the different population means it is clear that South African web pages are used mainly to promote an awareness and interest focus on the stage of the consumer's adoption process, particularly in the IT/Telecoms, Banking, Retail and Other and Mining industry sectors. **The proposed research proposition was, therefore, supported.**

However, only the IT / Telecoms industry sector these web pages allow for consumers to interact with other consumers on their web pages and serve their desire to find out more about a product or service.. Again this could possibly be due to their advanced knowledge and understanding of the technology to implement such functionality on their web pages

Again, only within the IT/Telecoms, Retail and Other and Banking industry sectors is there an indication that these web pages support the action/adoption stage of the consumer's adoption process by allowing for on-line transactions to take place.. These industry sectors were also the only sectors to indicate their support for the retention of the consumer's adoption process by providing follow-up services to on-line customers.

6.2.5 Research Proposition 5: South African corporate websites are only used as service providers, supporting the physical operations of the business or corporation.

The constructs for this research proposition are represented by the following questions.

- B9 - The results from the ANOVA test returned a *p*-value of 0.004, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages are all used as service providers; that is, acting as a marketing partner, supporting the physical operations of the business or corporation. The results for the paired-sample *t* test are shown in Figure 25.

Figure 25 - Research Proposition 5 - Question B9 Population Means

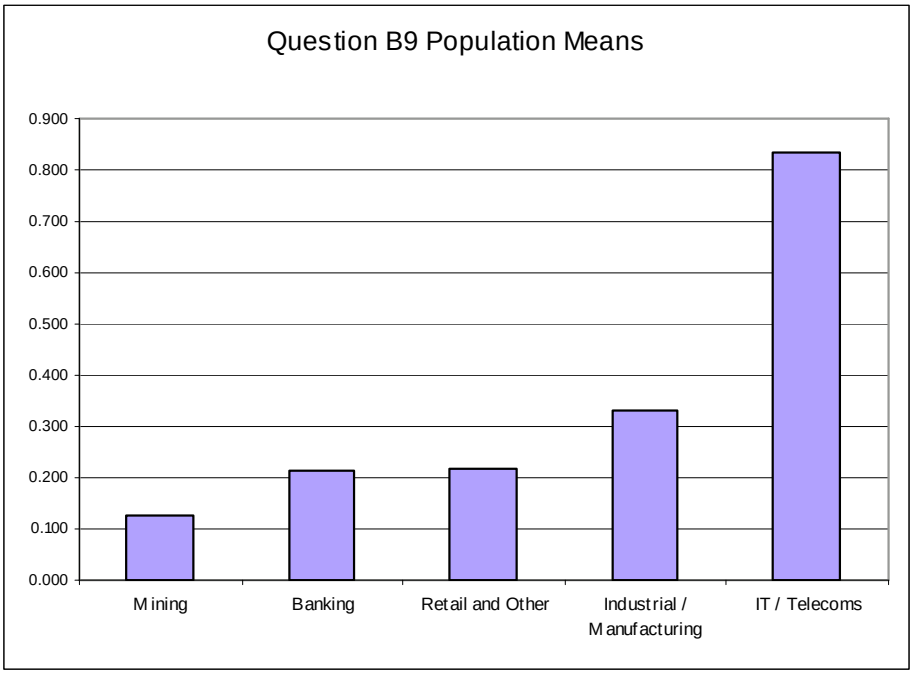


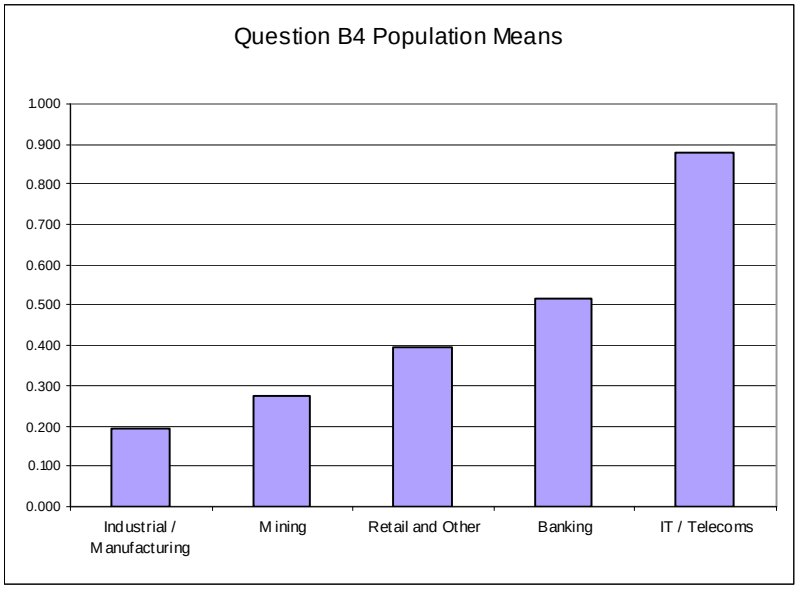
Table 24 - Research Proposition 5 - Question B9 Population Means Groupings

Group 1 – Fully Supporting a Service Provider Model	Group 2 – Indicating Support for a Service Provider Model
• IT / Telecoms	• Mining • Banking • Retail and Other • Industrial / Manufacturing

With respect to Figure 25 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 24.

- B4 - The results from the ANOVA test returned a *p*-value of 0.0619, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages are all used as community areas providing information

Figure 26 - Research Proposition 5 - Question B4 Population Means



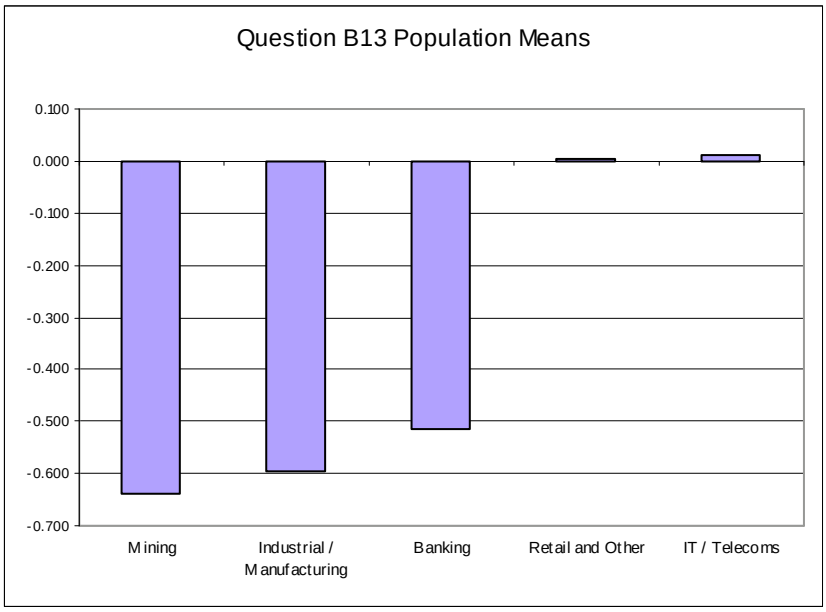
or content to a public audience, acting as pure communication channel. Also it was not perceived that these web pages are all used to provide information pertaining to a particular product or service or used to provide on-line yellow pages, allowing customers to search and find respective businesses, products, or services. The results for the paired-sample *t* test are shown in Figure 26.

With respect to Figure 26 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 25.

Table 25 - Research Proposition 5 - Question B4 Population Means Groupings

Group 1 – Fully Supporting an on-line communication channel	Group 2 – Indicating Support for an on-line communication channel
• IT / Telecoms • Banking • Retail and Other	• Industrial / Manufacturing • Mining

Figure 27 - Research Proposition 5 - Question B13 Population Means



- B13 - The results from the ANOVA test returned a *p*-value of 0.0659, indicating that the five population means were *not* equal. Therefore, across the five industry sectors it was not perceived that these web pages provide an on-line search engine, allowing customers to search and find respective businesses, products, or services on their web pages and/or other web pages. Also it was not perceived that these web pages are all used to provide information pertaining to a particular product or service, or used to provide on-line yellow pages allowing customers to too search and find respective businesses, products, or services. The results for the paired-sample *t* test are shown in Figure 27.

Table 26 - Research Proposition 5 - Question B13 Population Means Groupings

Group 1 – Fully Supporting an on-line search engine	Group 2 – Indicating Support for an on-line search engine
• IT / Telecoms • Retail and Other	• Mining • Industrial / Manufacturing • Banking

With respect to Figure 27 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 26.

6.2.5.1 Research Proposition 5 - Conclusion

From the above analysis and the actual values for the different population means it is clear that South African web pages are used mainly as an on-line communication channel, this is prevalent for all industry sectors. However, again for all industry sectors, there was also data to support that these industry sectors use their web pages as a service provider, supporting the physical

operations of the business or corporation; however, the results were not as strong at those supporting the usage of their web pages as an on-line communication channel. **The proposed research proposition was, therefore, only partially supported.**

The IT/Telecoms industry sector indicated the strongest support for an on-line Service Provider model; this again could be expected as the businesses within this industry sector often only operate within the on-line environment and would require established interfaces within their functional value chains to operate efficiently and profitably.

Within the IT/Telecoms and Retail and Other industry sectors it is also shown that these industry sectors are the only sectors that provided some sort of on-line search engine.

6.2.6 Research Proposition 6: South African Websites use mainly Consumer – Message interactivity

The constructs for this research proposition are represented by the following questions:

- B4 - The results from the ANOVA test returned a *p*-value of 0.0619, indicating that the five population means are *not* equal, therefore, across the five industry sectors it is not perceived that these web pages are all used to support on-line Consumer - Message interaction/s. The results for the paired-sample *t* test are shown in Figure 28.

With respect to Figure 28 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 27.

Figure 28 - Research Proposition 6 - Question B4 Population Means

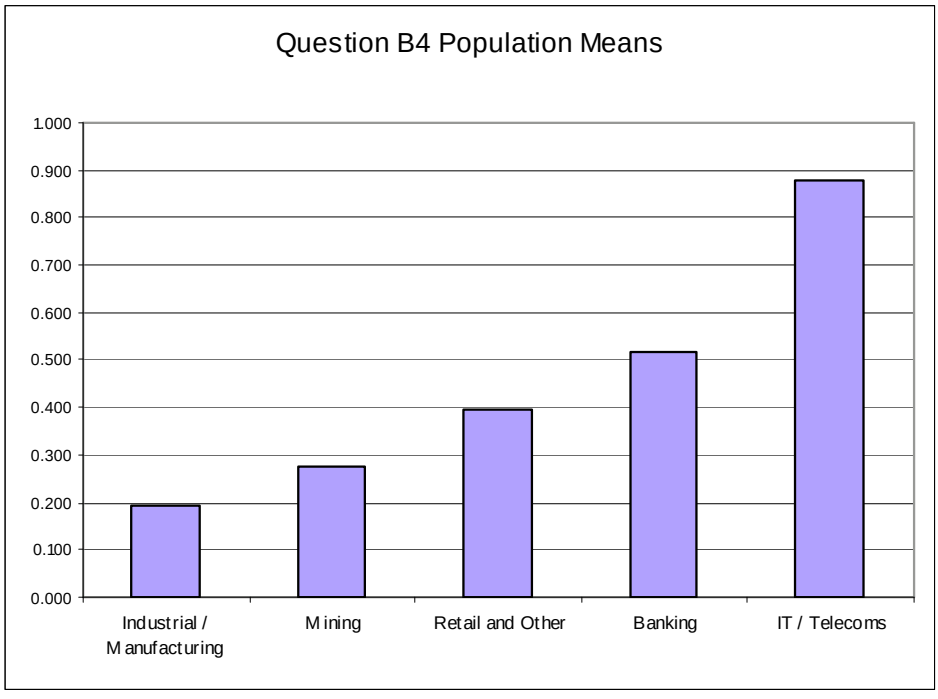
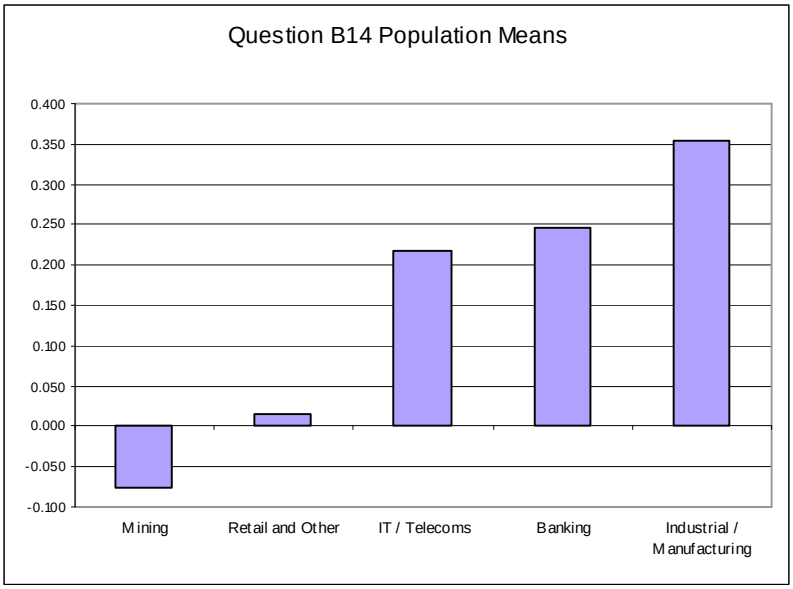


Table 27 - Research Proposition 6 - Question B4 Population Means Groupings

Group 1 – Fully Supports on-line Consumer - Message interaction/s	Group 2 – Indicating Support for on-line Consumer - Message interaction/s
• IT / Telecoms • Banking • Retail and Other	• Industrial / Manufacturing • Mining

Figure 29 - Research Proposition 6 - Question B14 Population Means



- B14 - The results from the ANOVA test returned a *p*-value of 0.2276, indicating that the five population means are *not* equal, therefore across the five industry sectors it is not perceived that these web pages are all used to support on-line Consumer - Marketer interaction/s. The results for the paired-sample *t* test are shown in Figure 29.

With respect to Figure 29 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 28.

Table 28 - Research Proposition 6 - Question B14 Population Means Groupings

Group 1 - Fully Supports on-line Consumer - Marketer interaction/s	Group 2 – Not Supporting on-line Consumer - Marketer interaction/s
• Industrial / Manufacturing • Banking • IT / Telecoms • Retail and Other	• Mining

- B8 - The results from the ANOVA test returned a *p*-value of 0.0005, indicating that the five population means are *not* equal, therefore, across the five industry sectors it is not perceived that these web pages are all used to support on-line Consumer - Consumer interaction/s. The results for the paired-sample *t* test are shown in Figure 30.

Figure 30 - Research Proposition 6 - Question B8 Population Means

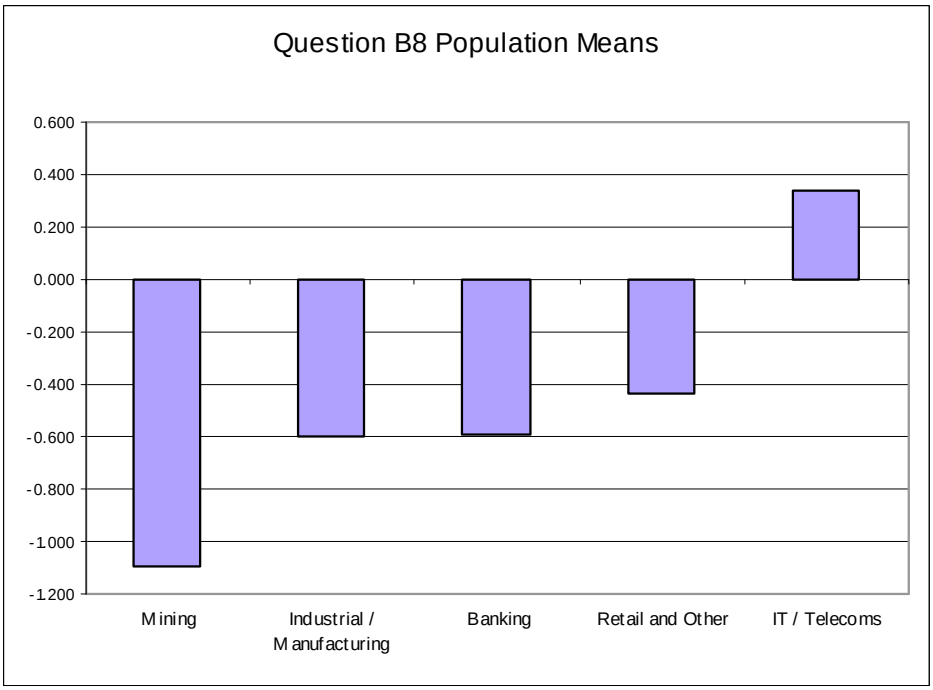


Table 29 - Research Proposition 6 - Question B8 Population Means Groupings

Group 1 - Fully Supports on-line Consumer - Consumer interaction/s	Group 2 – Not Supporting on-line Consumer - Consumer interaction/s
• IT / Telecoms	• Mining • Industrial / Manufacturing • Banking • Retail and Other

With respect to Figure 30 and resulting *p*-values for the paired-sample *t* test with a significance level of 1%, the different population means for the different industry sectors are shown in Table 29.

6.2.6.1 Research Proposition 6 - Conclusion

From the above analysis and the actual values for the different population means it is clear that South African web pages are used mainly to a promote on-line consumer – message interaction/s. This is prevalent across all industry sectors. **The proposed research proposition was, therefore, supported.**

Within the Industrial / Manufacturing, Banking, IT / Telecoms and Retail and Other industry sectors it was shown that these industry sectors also support consumer – marketer interaction/s allowing for consumers to provide product and/or service feedback to the respective companies and marketing departments.

Only within the IT / Telecoms industry sector do these web pages allow for on-line consumers to interact with other on-line consumers (consumer – consumer interaction), to find out more about specific product/s and/or service/s. This again could be possibly due to their advanced

knowledge and understanding of the technology to implement such functionality on their web pages

6.3 Factor Analysis Results

For the purpose of the principal components analysis, the ordinal data are assumed to have an interval level scale. For purposes of this statistical analysis procedure, this assumption is valid (Bendixen & Sandler, 1995).

Principal components analysis, using Varimax rotation, was performed on the resulting data set for questions B1 to B14. The results are shown in Table 30.

As indicated previously, using the Kaiser criterion, the first five factors were used. As their respective eigenvalues are all above 1, these factors explain 67.34% of the total variance in the data set.

Table 30 – Principal Component Analysis using Varimax Rotation Results

Eigenvalues after Varimax Rotation				
No.	**Eigenvalue**	**Individual Percent**	**Cumulative Percent**	**Scree Plot**
1	3.691886	26.37	26.37	||||||
2	1.267191	9.05	35.42	||
3	1.641604	11.73	47.15	|||
4	1.712818	12.23	59.38	|||
5	1.113902	7.96	67.34	||
6	0.906384	6.47	73.81	||
7	0.694546	4.96	78.77	|
8	0.645932	4.61	83.39	|
9	0.582845	4.16	87.55	|
10	0.520876	3.72	91.27	|
11	0.427952	3.06	94.33	|
12	0.323471	2.31	96.64	|
13	0.251191	1.79	98.43	|
14	0.219403	1.57	100	|

Utilising these five selected factors, the respective factor scores were obtained for questions B1 to B14.

Table 31 shows the actual factor scores (loadings) for the five selected factors:

Table 31 – Factor Loadings after Varimax Rotation

Factor Loadings after Varimax Rotation					
	Factors				
Variables	Factor1	Factor2	Factor3	Factor4	Factor5
B1	-0.041745	-0.831073	0.127670	0.110032	0.232864
B2	-0.332264	0.653911	0.327501	0.148982	0.273244
B3	0.053293	-0.083581	-0.034998	-0.033236	0.923948
B4	-0.216003	0.007750	0.785464	0.126892	0.135112
B5	-0.204371	-0.251911	0.225788	0.659806	-0.007238
B6	-0.792044	0.082171	0.022879	0.221834	-0.031467
B7	-0.150434	-0.013732	-0.112251	0.801506	0.040142
B8	-0.740251	-0.100332	0.245489	0.134386	0.118417
B9	-0.128518	0.000279	0.767263	0.068472	-0.152097
B10	-0.747391	0.087292	0.171884	0.055526	-0.110541
B11	-0.806526	0.034769	-0.069409	0.258520	0.024778
B12	-0.713327	0.018765	0.171134	0.210610	0.143208
B13	-0.730130	0.073295	0.207611	-0.062198	-0.184743
B14	-0.151732	0.216435	0.282943	0.627260	-0.076135

Table 32 shows a bar chart for the absolute factor scores (loadings) for the five selected factors:

Table 32 – Bar Chart of Absolute Factor Loadings after Varimax Rotation

Bar Chart of Absolute Factor Loadings after Varimax Rotation					
	Factors				
Variables	Factor1	Factor2	Factor3	Factor4	Factor5
B1	|	|||||||||||||||	|||	|||	|||||
B2	||||||	||||||||||||	||||||	|||	||||||
B3	||	||	|	|	|||||||||||||||
B4	|||||	|	|||||||||||||	|||	|||
B5	|||||	||||||	|||||	||||||||||||	|
B6	||||||||||||||	||	|	|||||	|
B7	||||	|	|||	|||||||||||||||	|
B8	|||||||||||||	|||	||||	|||	|||
B9	|||	|	|||||||||||||	||	||||
B10	|||||||||||||	||	||||	||	|||
B11	|||||||||||||||	|	||	||||||	|
B12	||||||||||||||	|	||||	|||||	|||
B13	||||||||||||||	||	|||||	||	||||
B14	||||	|||||	|||||	||||||||||	||

Table 33– Bar Chart of Communalities after Varimax Rotation

Bar Chart of Communalities after Varimax Rotation					
	Factors				
Variables	Factor1	Factor2	Factor3	Factor4	Factor5
B1	|	|||||||||||||	|	|	||
B2	|||	||||||||	|||	|	||
B3	|	|	|	|	|||||||||||||||
B4	|	|	|||||||||||	|	|
B5	|	||	||	||||||||	|
B6	||||||||||||	|	|	|	|
B7	|	|	|	||||||||||||	|
B8	||||||||||	|	||	|	|
B9	|	|	||||||||||	|	|
B10	||||||||||	|	|	|	|
B11	|||||||||||||	|	|	||	|
B12	||||||||||	|	|	|	|
B13	||||||||||	|	|	|	|
B14	|	|	||	|||||||	|

Table 33 shows a bar chart of the communalities after Varimax rotation, for the five selected factors. From this analysis it is evident that the 14 questions are sufficiently represented by one of the selected five factors, with very little overlap in representivity between the five. The breakdown of the 14 questions into the 5 factors, in prioritized order of representivity, is shown in Table 34.

Table 34 – Proposed Factors in relation to Questions

Factor Structure Summary after Varimax Rotation				
Factor1	**Factor2**	**Factor3**	**Factor4**	**Factor5**
B11	B1	B4	B7	B3
B6	B2	B9	B5	
B10			B14	
B8				
B13				
B12				

Table 35 – Literal Explanation for Proposed Factors

Factor	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor Name	**News 24**	**The Star**	**Classifieds**	**Personals**	**Business Day**
Description	These businesses utilize the web as their primary channel to create awareness in the market and generate revenue, hence establishing a pure on-line presence ("Click and Mortar").	These businesses utilize the web as an additional channel to create awareness in the market, thereby supporting the physical "Brick and Mortar" operation.	These businesses utilize the web to promote awareness for their products and services	These businesses utilize the web to create and maintain relationships with their customers	These businesses utilize the web as an additional channel to convey corporate information
Constructs	Cost Saving Model	Business to Business Model	Promotional Presence	Retention Model	Corporate Presence
	Transactional Presence	Business to Consumer Model	Service Provider Model	Conversational Presence	
	Subscription Model			Consumer - Business Model	
	Consumer - Consumer Model				
	On-line Directory				
	Information Trading Model				

Using the constructs for each respective question, Table 35 provides a literal explanation for each of the five factors. The table also shows the respective constructs, grouped in priority order *per* factor. The use of print media titles provides an interesting juxtaposition in explaining these five new e-commerce, on-line marketing strategies, as they themselves utilise very similar marketing strategies specific to their respective channels.

Because the above factors represent the entire population group, as a further analysis, the different industry sectors were also tested against the five factors. To achieve this, an analysis of variance test was performed on each factor, using the factor scores for each of the questions relating to the specific industry sectors.

6.3.1 Factor 1 Industry Sector Analysis of Variance Test Results

As a prerequisite to this statistical procedure, the test for normality was performed. For Factor 1 it is proven that the factor scores are normally distributed. Hence, a standard ANOVA test was performed. The results from the ANOVA test returned a *p*-value of 0.000206, indicating that the

five population means were *not* equal. Therefore, all the industry sectors have varying support for Factor 1.

Figure 31 shows the resulting population means for the various industry sectors, indicating their support for Factor 1. The groupings of the various industry sectors with respect to their support for Factor 1 are shown in Table 36.

Figure 31 – Factor 1 – Factor Scores Population Means

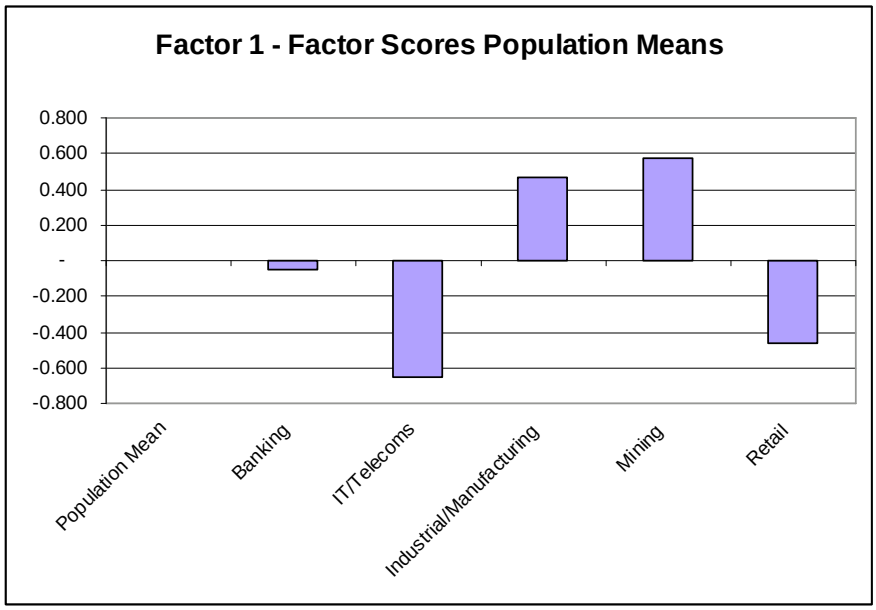


Table 36 - Factor 1 Industry Sector Population Means Groupings

Group 1 –Supporting Factor 1	Group 2 – Not Supporting Factor 1
• Mining • Industrial / Manufacturing	• IT / Telecoms • Retail and Other • Banking

6.3.2 Factor 2 Industry Sector Analysis of Variance Test Results

As a prerequisite for this statistical procedure, the test for normality was performed. For Factor 2 it was proven that the factor scores were NOT normally distributed, so a non parametric Kruskal-Wallis ANOVA test was performed (Hanke & Reitsch, 1994). The results from the Kruskal-Wallis One-Way ANOVA test indicated that the five population means were *not* equal. Therefore, all the industry sectors had varying support for Factor 2.

Figure 32 shows the resulting population means for the various industry sectors indicating their support for Factor 1. The groupings of the various industry sectors with respect to their support for Factor 2 are shown in Table 37.

Figure 32 – Factor 2 – Factor Scores Population Means

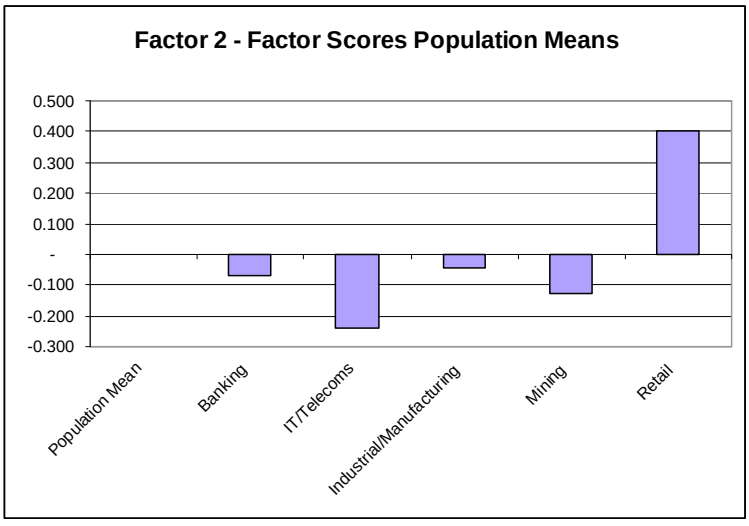


Table 37 - Factor 2 Industry Sector Population Means Groupings

Group 1 –Supporting Factor 2	Group 2 – Not Supporting Factor 2
• Retail and Other	• IT / Telecoms • Mining • Banking • Industrial / Manufacturing

6.3.3 Factor 3 Industry Sector Analysis of Variance Test Results

As a prerequisite for this statistical procedure the test for normality was performed. For Factor 3 it was proven that the factor scores were NOT normally distributed, hence, a non parametric Kruskal-Wallis ANOVA test was performed (Hanke & Reitsch, 1994). The results from the Kruskal-Wallis One-Way ANOVA test indicated that the five population means were *not* equal. Therefore, all the industry sectors have varying support for Factor 3.

Figure 33 – Factor 3 – Factor Scores Population Means

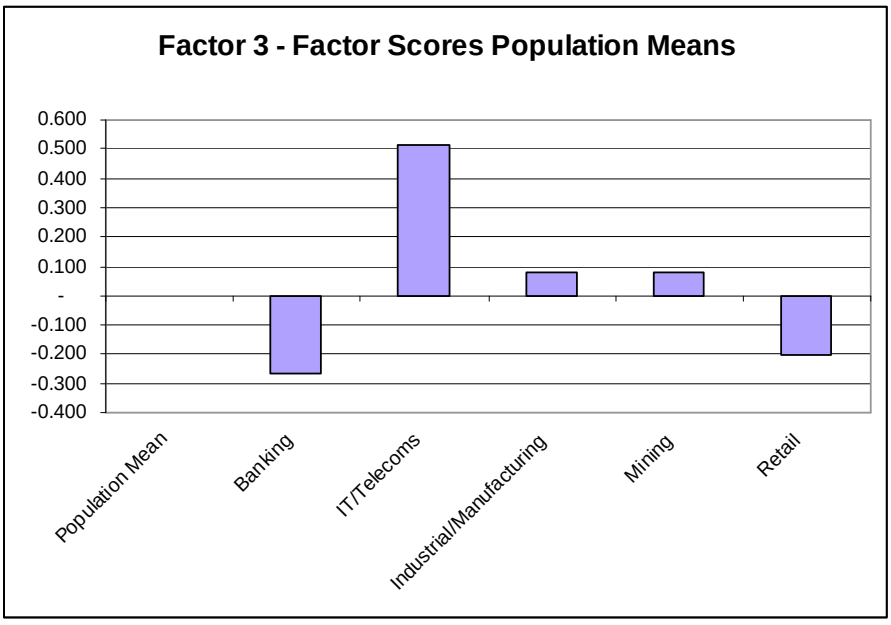


Table 38 - Factor 3 Industry Sector Population Means Groupings

Group 1 –Supporting Factor 3	Group 2 – Not Supporting Factor 3
• IT / Telecoms • Mining • Industrial / Manufacturing	• Banking • Retail and Other

Figure 33 shows the resulting population means for the various industry sectors, indicating their support for Factor 3. The groupings of the various industry sectors with respect to their support for Factor 1 are shown in Table 38.

6.3.4 Factor 4 Industry Sector Analysis of Variance Test Results

As a prerequisite for this statistical procedure, the test for normality was performed. For Factor 4 it was proven that the factor scores were NOT normally distributed. Hence, a non parametric Kruskal-Wallis ANOVA test was performed (Hanke & Reitsch, 1994). The results from the Kruskal-Wallis One-Way ANOVA test indicated that the five population means were *not* equal. Therefore, all the industry sectors have varying support for Factor 4.

Figure 34 shows the resulting population means for the various industry sectors, indicating their support for Factor 4. The groupings of the various industry sectors with respect to their support for Factor 1 are shown in Table 39.

Figure 34 – Factor 4 – Factor Scores Population Means

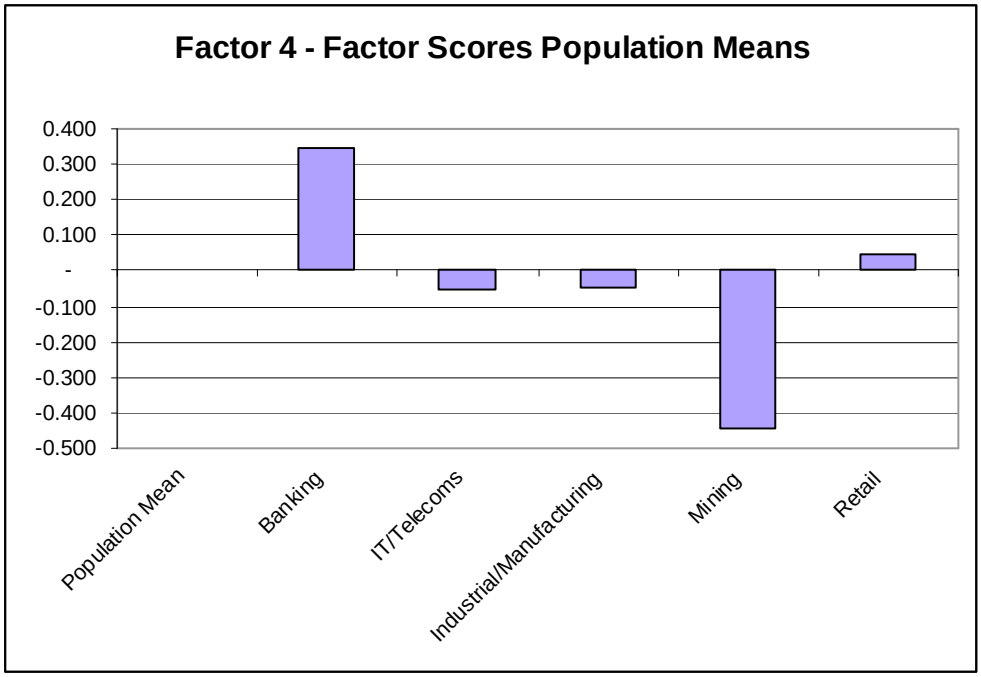


Table 39 - Factor 4 Industry Sector Population Means Groupings

Group 1 –Supporting Factor 4	Group 2 – Not Supporting Factor 4
• Banking • Retail and Other	• Mining • IT / Telecoms • Industrial / Manufacturing

6.3.5 Factor 5 Industry Sector Analysis of Variance Test Results

As a prerequisite for this statistical procedure the test for normality was performed. For Factor 5 it was proven that the factor scores were NOT normally distributed. Hence, a non parametric Kruskal-Wallis ANOVA test was performed (Hanke & Reitsch, 1994). The results from the Kruskal-Wallis One-Way ANOVA test indicated that the five population means are *not* equal. Therefore, all the industry sectors have varying support for Factor 5.

Figure 35 shows the resulting population means for the various industry sectors, indicating their support for Factor 5. The groupings of the various industry sectors with respect to their support for Factor 1 are shown in Table 40.

Figure 35 – Factor 5 – Factor Scores Population Means

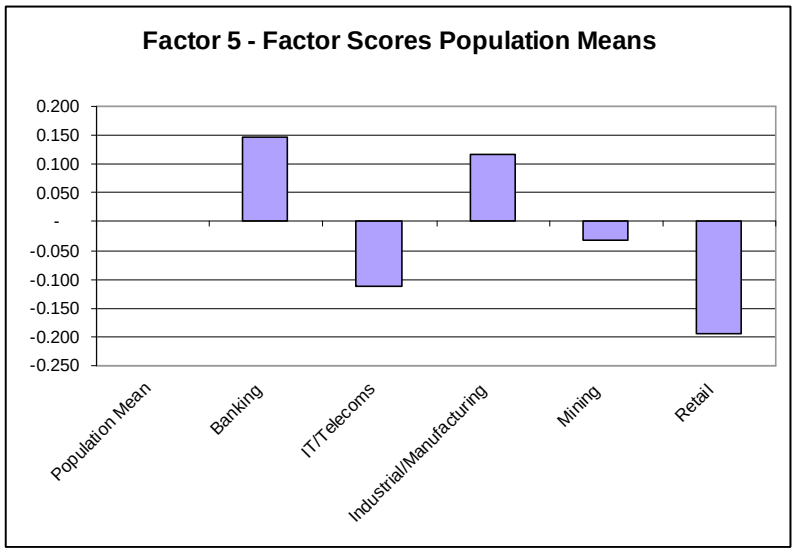


Table 40 - Factor 5 Industry Sector Population Means Groupings

Group 1 –Supporting Factor 5	Group 2 – Not Supporting Factor 5
• Banking • Industrial / Manufacturing	• Retail and Other • IT / Telecoms • Mining

6.3.6 Factor 1-5 Industry Sector Analysis of Variance Summary

The above analysis proved that there was a distinct difference within the various industry sectors and how they related to the five proposed web page categories (factors). Table 41 provides a high-level overview of the various industry sectors and how they relate, according to the means of their respective factor scores to the five proposed web page categories (factors).

Table 41 – Industry Sectors in Relation to Proposed Literal Factors

Factor	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor Name	News 24	The Star	Classifieds	Personals	Business Day
Description	These businesses utilize the web as their primary channel to create awareness in the market and generate revenue, hence establishing a pure on-line presence ("Click and Mortar").	These businesses utilize the web as an additional channel to create awareness in the market, thereby supporting the physical "Brick and Mortar" operation.	These businesses utilize the web to promote awareness for their products and services	These businesses utilize the web to create and maintain relationships with their customers	These businesses utilize the web as an additional channel to convey corporate information
Preferential Industry Sectors	Mining	Retail and Other	IT / Telecoms	Banking	Industrial / Manufacturing

6.4 Cluster Analysis Results

For the purpose of the cluster analysis, the ordinal data were assumed to have an interval level scale. For the purpose of this statistical analysis procedure this assumption is valid (Bendixen & Sandler, 1995).

A *k*-means cluster analysis was performed on the resulting data set. For further investigative purposes, a *k*-means cluster analysis was also performed on the factor analysis scores for the same data set. Figures 36 and 37 show the results for the two *k*-means cluster analyses; on the resulting data set and the factor analysis scores for the same data set, respectively.

With Respect to Figure 36 it is clear that there are no distinct numbers of clusters (above one cluster that represents the entire population) that can account for the majority of the variation. Hence, a smooth decreasing linear trend with respect to the percentage variation has been represented, as the number of clusters increased. Therefore, the *k*-means cluster analysis did not produce any exciting unknown categories within the data set and, for this reason; this investigation was not pursued any further on the raw data set.

Figure 36 – Results for *k*-means Cluster Analysis on resulting Raw Data Set

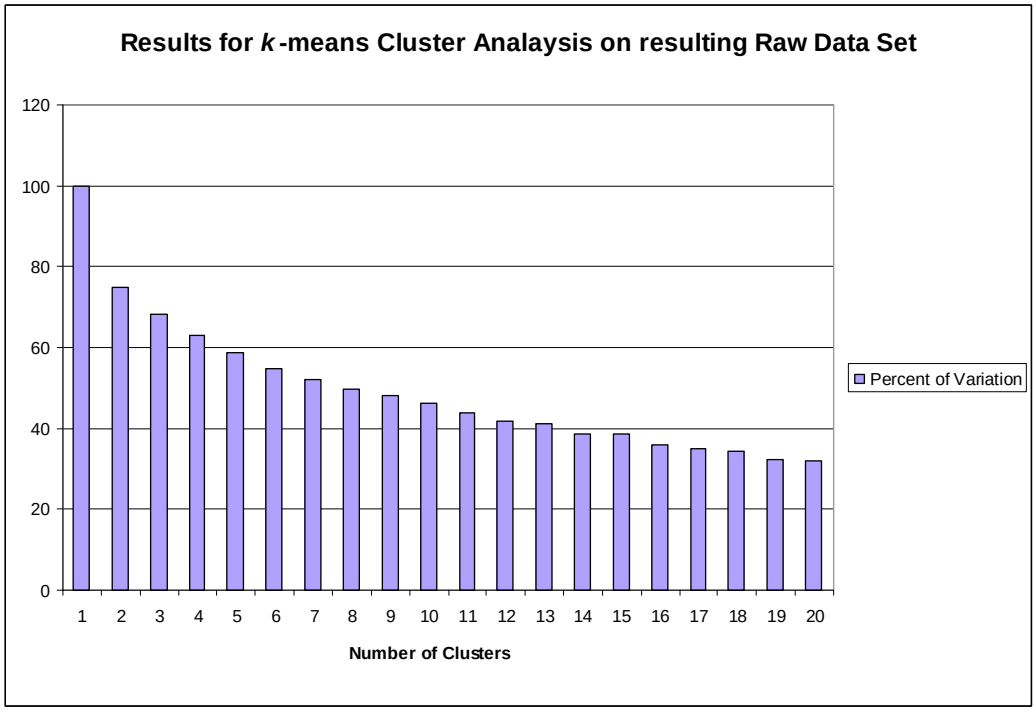
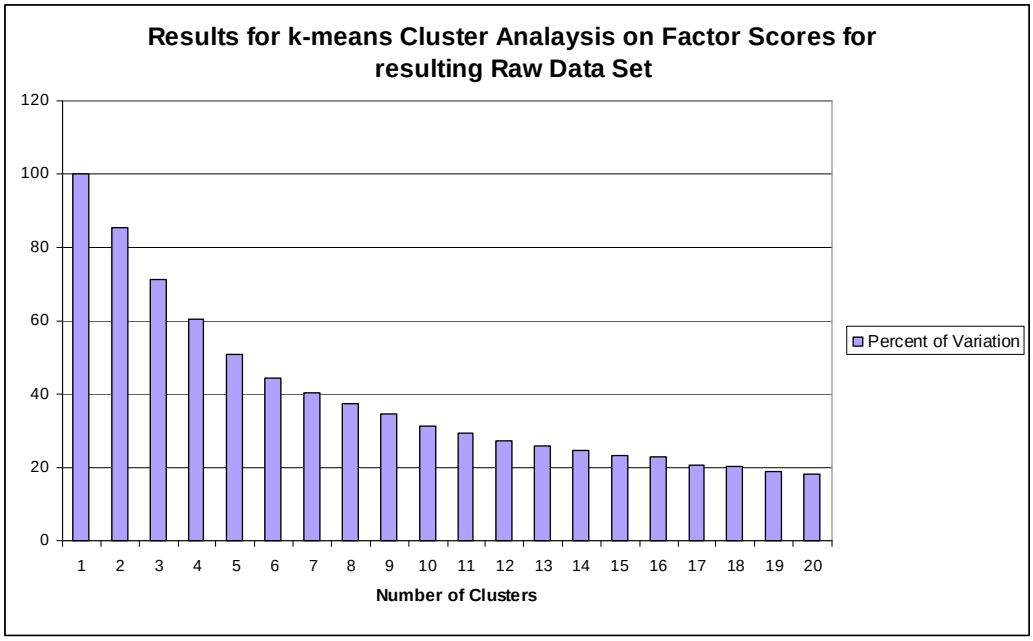


Figure 37 – Results for *k*-means Cluster Analysis on Factor Scores for resulting Raw Data Set



With respect to Figure 37 it is clear that there are no distinct numbers of clusters (above one cluster that is the entire population) that can account for the majority of the variation. Hence, there is an exponentially decreasing trend with respect to the percentage variation been represented as the number of clusters are increased. Therefore, the *k*-means cluster analysis did not produce any exciting unknown categories within the data set and, for this reason; this investigation was not pursued any further, on the factor scores for the raw data set.

It is not common to find any additional unknown clusters arising out of distinctly categorized population groups.

CHAPTER 7

CONCLUSIONS

"New businesses have sprung up on the Internet without a physical presence (that is virtual stores). Some existing organizations have moved from a bricks-and-mortar format to a clicks-and-mortar format, whilst others have adopted a more conservative approach and have both a physical and virtual presence." (Singh, 2004)

The Internet and e-commerce has revolutionized the way business is done and will continue to do so. This not only includes the use of the web as a new advertising channel, acting as a service provider to the physical "brick and mortar" operation, for it is now establishing itself as a new marketplace, driving a pure "click and mortar" enterprise. Along with interactivity and personalized, customizable customer relationships, the web promises to take consumer experience to the next level, leaving no area untouched and driving the purchasing cycle down to a couple of clicks.

With all the development within the Internet space, the value proposition for the customer has increased whilst, at the same time, the cost structures for the respective businesses have decreased, allowing for a homogeneous environment that is truly beneficial to the entire value chain. This change in the pricing equilibrium can be attributed to lower transaction costs,

cheaper search costs, customizable interfaces, increased transparency, increased reach (globalization) and advanced, autonomous interactivity.

The results from this research have been very promising, in that they have indicated that enormous development has taken place in the web and e-commerce environment across most industry sectors. The following provides a high level summary of the data analysis results for each of the research propositions:

Research Proposition 1: South African corporate websites operate mainly within the Business-to-Consumer domain, was not supported.

The results have proven that the business-to-business marketing domain is the prevalent model within the South African web space and e-commerce environment. This is particularly prevalent in the IT/Telecoms, Banking, Mining and Industrial / Manufacturing industry sectors. Within the IT/Telecoms and Banking industry sectors it is proven that these web pages operate within both business-to-business and business-to-consumer marketing domains. As expected, the Retail and Other industry sector predominantly operates within the business-to-consumer marketing domains. However, as previously mentioned, only within the IT / Telecoms industry sector is consumer-to-consumer interaction allowed for on the web pages, possibly because of their advanced knowledge and understanding of the technology to implement such functionality on their web pages.

Research Proposition 2: South African corporate websites predominantly have a promotional presence, was only partially supported.

These results have also proven that South African web pages are mainly used to promote their corporate presence. This is particularly prevalent in the Mining, Banking and Industrial / Manufacturing industry sectors. However, within the IT/Telecoms, Retail and Other and Banking industry sectors, these industry sectors have also shown a very strong promotional presence. These industry sectors also have a conversational presence, allowing for consumers to provide product and/or service feedback. Again, only within the IT/Telecoms, Banking and Retail and Other industry sectors is there an indication of a transactional presence. Since these industry sectors are supporting both a corporate and a promotional presence, this could be expected, as these companies would want their on-line customers to complete their transactions whilst they are on-line.

Research Proposition 3: South African corporate websites utilise their websites predominantly as a communication and promotional cost elimination model, was not supported.

The results from this study have also proven that South African web pages, across all industry sectors, are used mainly according to an advertising support model. However, this is particularly defined within the IT/Telecoms industry sector, where companies often do not have a physical establishment and exist only within the space of the Internet. For this reason their advertising is holistically contained within the same realm, hence, when viewed in this perspective this form of on-line advertising can be seen as a cost elimination model.

Research Proposition 4: South African corporate websites predominantly promote product and/or service awareness and interest, was supported.

The results from this study have also proven that South African web pages are used mainly to promote an awareness and interest focus on the stage of the consumer's adoption process,

particularly in the IT/Telecoms, Banking, Retail and Other and Mining industry sectors. Within the IT / Telecoms industry sector these web pages allow for consumers to interact with other consumers on their web pages and serve their desire to find out more about a product or service. Again, only within the IT/Telecoms, Retail and Other and Banking industry sectors is there an indication that these web pages support the action/adoption stage of the consumer's adoption process by allowing for on-line transactions to take place. These industry sectors were also the only sectors to indicate their support for the retention of the consumer's adoption process by providing follow-up services to on-line customers.

Research Proposition 5: South African corporate websites are predominantly used as communication and promotional tools, supporting the physical operations of the business or corporation, was only partially supported.

The results from this study have also proven that South African web pages, across all industry sectors, are used mainly as on-line communication channels. However, again for all industry sectors, there was also data to support that these industry sectors use their web pages as a service provider, supporting the physical operations of the business or corporation; however, the results were not as convincing as those supporting the usage of their web pages as an on-line communication channel. Within the IT/Telecoms and Retail and Other industry sectors it was also shown that these industry sectors are the only sectors that provided some sort of on-line search engine.

Research Proposition 6: South African Websites use mainly Consumer – Message interactivity, was supported.

The results from this study have also proven that South African web pages, across all industry sectors, are used mainly to promote on-line consumer – message interaction/s. Within the Industrial / Manufacturing, Banking, IT / Telecoms and Retail and Other industry sectors it was shown that these industry sectors also support consumer – marketer interaction/s allowing for consumers to provide product and/or service feedback to the respective companies and marketing departments. Only within the IT / Telecoms industry sector do these web pages allow for on-line consumers to interact with other on-line consumers (consumer – consumer interaction), to find out more about specific product/s and/or service/s.

The results of this study indicated distinct differences within and between the various industry sectors and how they relate to the five proposed web page categories (factors). An interesting insight is that the associations, as elicited from the factor scores were different from the expected market perceptions. The industrial / manufacturing industry sector can appropriately relate to the "Business Day" classification, as the banking, IT / Telecoms and the retail and other industry sectors can appropriately relate to the "Personals", "Classifieds" and "The Star" classifications respectively. However, another interesting insight is that the mining industry sector was shown to relate to the "News 24" classification. This could be an anomaly of this study or it could indicate that the mining industry sector is moving into a more aggressive on-line marketing strategy.

The e-commerce domain offers enormous potential and competitive advantage for both traditional and 'dot.com' companies. However, the net effect is a combination of how geared a particular value chain is to manage the increased complexities of managing a 'virtual' customer and delivering on the promises made by its on-line marketing strategies. Ultimately it will depend on the consumers and their cumulative adoption of the Internet as a purchasing channel.

CHAPTER 8

FUTURE RESEARCH

"The advent of the Internet has provided more opportunities and applications for advertisers and marketers in their strategy development because of its advantageous properties such as interactivity, low setup costs, global coverage, and so forth." (Cho & Cheon, 2005)

There is still an enormous amount of research that remains to be done to better understand the influence of the Internet and the e-commerce environment on marketing in general, and advertising in particular.

Replicating this study with a more representative sample would be an important step: not only could the sample size be increased, but the research could also be focused around particular attributes of this research report. This could include focussing on the level of interactivity of a particular web page, which would determine the extent which certain web pages allow their customers to manage their on-line experience, ultimately impacting on purchasing decisions. In addition to this, the research could focus on the on-line transactional functionality of South African web pages. This research could try and ascertain which products and/or services are seen to be purchasable over the Internet, *versus* which industry sectors use on-line transactional facilities.

This study could also be extended to other countries. This would be a particularly useful exercise, as not only would a new population be studied but, more importantly, this would allow for a benchmarking exercise to be done. This would then clearly show where South Africa is currently positioned with respect to their Internet and e-commerce environment. This exercise would also indicate whether a lead or lag in the development of an e-commerce environment existed between the various countries: ultimately, any lag would give foresight into where the e-commerce environment would be heading and allow marketers to pro-actively react to the required change.

This research could also be extended, to study the implications of the different population groups relating to the various gender, age, culture and race groups within South Africa. This research could produce an interesting insight for marketers regarding how they could approach segmented marketing strategies and campaigns and how their respective web pages could be designed and built around these unique distinctions.

The issue of security is, and will always remain, a critical success factor for an on-line e-commerce environment (Singh, 2004). For this reason, research into this particular field could produce some very useful results that marketers and designers of web pagers could use to ensure that their on-line e-commerce environment is protected and that the consumers' perception of their on-line transactional security is satisfied.

Interactivity is obviously a critical success factor for any on-line marketing and e-commerce environment. However, the measurement thereof becomes important. Research has indicated that there are three ways by which interactivity on the Internet can be measured (Cho & Cheon, 2004):

- Marketer-controlled interactivity, which is obtained through content analysis;
- Consumers' perceived interactivity, measured through user surveys;
- Consumers' behavioural interactivity – measured though computer log file analysis.

To date, these three forms of interactivity measurement have not been compared, so this research could provide very valuable insight into the interactivity construct by looking at the interrelations between the different measures of interactivity.

The research arena of on-line consumer behaviour also holds unlimited potential: understanding of the on-line consumers' psyche, and the way in which they manage their motivation, perception, personality, attitude and emotions, will allow for the interactivity of web pages and on-line marketing strategies to be designed around these behavioural models (Smith & Rupp, 2003). Hence, further research in this area would also be beneficial to the South African e-commerce environment.

Finally, because the conclusions of this research report are time-dependent, what is clear is that any research on the applications and theoretical implications of this relatively new technology that is the Internet, will lag behind the ever changing and developing arena of this technology. Therefore, this research needs to be managed in an ongoing fashion. Consequently, regular tracking and longitudinal studies are required.

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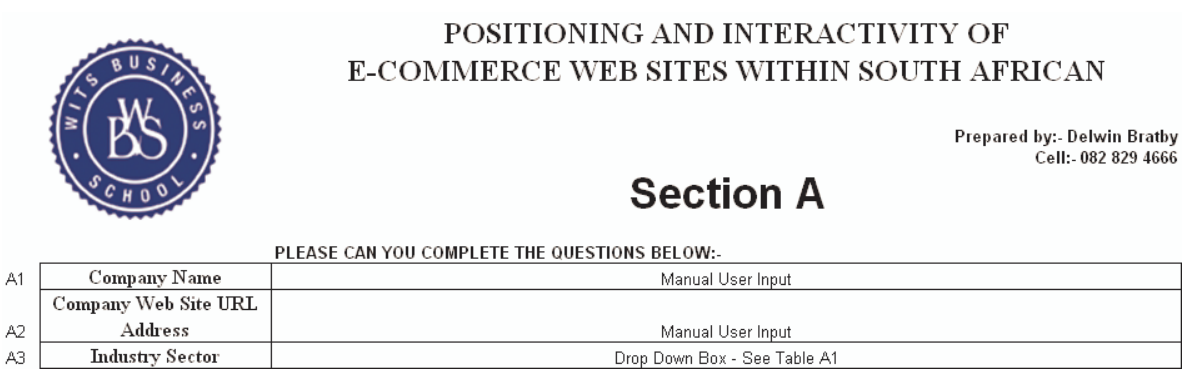
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APPENDICES

"The marketing mix is experiencing a fundamental transformation, and the catalyst is Internet commerce." (Gordon & Lima-Turner, 1997)

Appendix A – Section A and B of the On-line Questionnaire

Figure 38 – Section A of the proposed on-line Questionnaire



POSITIONING AND INTERACTIVITY OF
E-COMMERCE WEB SITES WITHIN SOUTH AFRICAN

Prepared by:- Delwin Bratby
Cell:- 082 829 4666

Section A

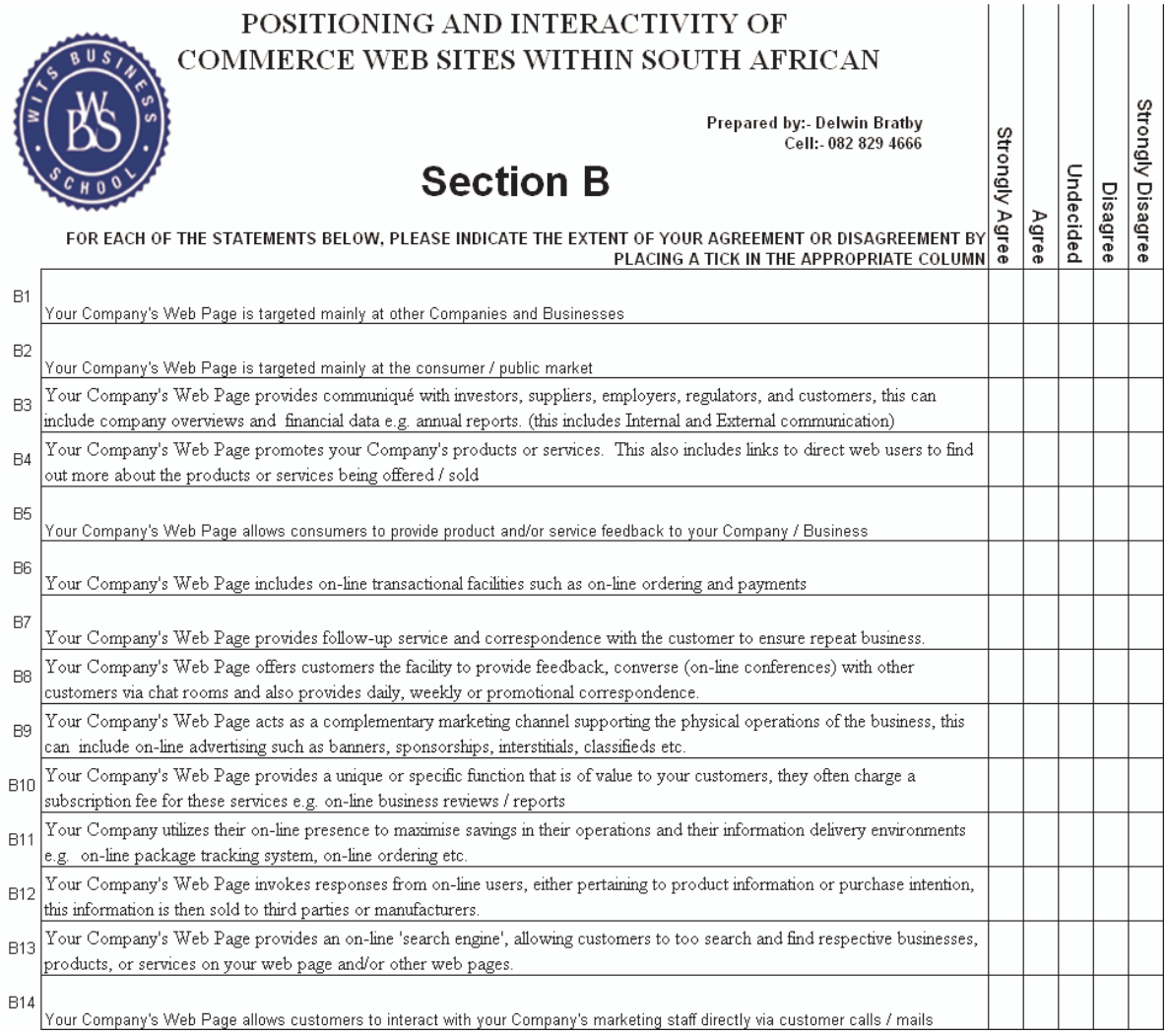
PLEASE CAN YOU COMPLETE THE QUESTIONS BELOW:-

A1	Company Name	Manual User Input
A2	Company Web Site URL Address	Manual User Input
A3	Industry Sector	Drop Down Box - See Table A1

Table 42 – Drop down box with respect to Section A of the proposed on-line Questionnaire

Table A1
Industry Sector Proposed Groupings
Banking
Business Support Services (HR, Consulting, PR, etc.)
Food/Hospitality Services
Industrial/Manufacturing
IT/Telecoms
Logistics/Transportation
Medical/Pharmaceutical
Mining
Other
Retail

Figure 39 – Section B of the On-line Questionnaire



POSITIONING AND INTERACTIVITY OF COMMERCE WEB SITES WITHIN SOUTH AFRICAN

Prepared by:- Delwin Bratby
Cell:- 082 829 4666

Section B

FOR EACH OF THE STATEMENTS BELOW, PLEASE INDICATE THE EXTENT OF YOUR AGREEMENT OR DISAGREEMENT BY PLACING A TICK IN THE APPROPRIATE COLUMN

		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
B1	Your Company's Web Page is targeted mainly at other Companies and Businesses					
B2	Your Company's Web Page is targeted mainly at the consumer / public market					
B3	Your Company's Web Page provides communiqué with investors, suppliers, employers, regulators, and customers, this can include company overviews and financial data e.g. annual reports. (this includes Internal and External communication)					
B4	Your Company's Web Page promotes your Company's products or services. This also includes links to direct web users to find out more about the products or services being offered / sold					
B5	Your Company's Web Page allows consumers to provide product and/or service feedback to your Company / Business					
B6	Your Company's Web Page includes on-line transactional facilities such as on-line ordering and payments					
B7	Your Company's Web Page provides follow-up service and correspondence with the customer to ensure repeat business.					
B8	Your Company's Web Page offers customers the facility to provide feedback, converse (on-line conferences) with other customers via chat rooms and also provides daily, weekly or promotional correspondence.					
B9	Your Company's Web Page acts as a complementary marketing channel supporting the physical operations of the business, this can include on-line advertising such as banners, sponsorships, interstitials, classifieds etc.					
B10	Your Company's Web Page provides a unique or specific function that is of value to your customers, they often charge a subscription fee for these services e.g. on-line business reviews / reports					
B11	Your Company utilizes their on-line presence to maximise savings in their operations and their information delivery environments e.g. on-line package tracking system, on-line ordering etc.					
B12	Your Company's Web Page invokes responses from on-line users, either pertaining to product information or purchase intention, this information is then sold to third parties or manufacturers.					
B13	Your Company's Web Page provides an on-line 'search engine', allowing customers to too search and find respective businesses, products, or services on your web page and/or other web pages.					
B14	Your Company's Web Page allows customers to interact with your Company's marketing staff directly via customer calls / mails					

Appendix B – Consistency Matrix

Table 43 – Consistency Matrix for proposed questionnaire relating to stated problems and respective sub-problems

Research Problem statement	*Research Sub Problems*	*Research Propositions*	Literature sources	Data Sources	Method of analysis
POSITIONING AND INTERACTIVITY OF E-COMMERCE WEB SITES WITHIN SOUTH AFRICA	Determine what the dominant e-commerce internet domain is	***Research Proposition 1: South African corporate web sites operate mainly within the Business to Consumer domain.***	Kotler (2003).	Questionnaire	Anova Analysis, Factor Analysis plus Cluster Analysis
	Determine what the dominant e-commerce web page typologies / classifications is	***Research Proposition 2: South African corporate web sites only have a promotional presence.***	Wagonfeld and Deighton (2002),	Questionnaire	Anova Analysis, Factor Analysis plus Cluster Analysis
		Research Proposition 3: South African corporate web sites utilise their web sites purely as a cost elimination model.	Wagonfeld and Deighton (2002),		
		Research Proposition 4: South African corporate web sites only promote product and/or service awareness and interest.	Wagonfeld and Deighton (2002),		
		Research Proposition 5: South African corporate web sites are only used as Service Providers, supporting the physical operations of the business or corporation.	Wagonfeld and Deighton (2002),		
	Determine what the level of interactivity is used within South African web pages	***Research Proposition 6: South African Web Sites use mainly Consumer – Message interactivity***	Cho and Cheon (2005),	Questionnaire	Anova Analysis, Factor Analysis plus Cluster Analysis