Appendix A: Detailed Statistics Related to Findings

Table A1.1 Noncentrality Fit Indices of: Confirmatory Factor analysis of SERVQUAL (Refer Table 6.11)

	Lower 90% Confidence Bound	Point Estimate	Upper 90% Confidence Bound
Population Noncentrality Parameter	0.114	0.148	0.188
Steiger-Lind RMSEA Index	0.238	0.272	0.306
McDonald Noncentrality Index	0.910	0.928	0.944
Population Gamma Index	0.913	0.931	0.945
Adjusted Population Gamma Index	0.569	0.655	0.729

Table A1.2 Single Sample Fit Indices of: Confirmatory Factor analysis of SERVQUAL (Refer Table 6.11)

	Value
Joreskog GFI	0.930
Joreskog AGFI	0.651
Akaike Information Criterion	0.152
Bentler-Bonett Normed Fit Index	0.959
Bentler-Bonett Non-Normed Fit Index	0.881
Bentler Comparative Fit Index	0.960

Table A1.3 Basic Summary Statistics of: Confirmatory Factor analysis of SERVQUAL (Refer Table 6.11)

	Value
Discrepancy Function	0.139
Maximum Residual Cosine	0.000
Maximum Absolute Gradient	0.000
ICSF Criterion	0.000
ICS Criterion	0.000
Degrees of Freedom	2.000
p-level	0.000
RMS Standardized Residual	0.029

Table A2.1 Noncentrality Fit Indices of: Confirmatory Factor Analysis for the reliability dimension (Refer Table 6.12)

	Lower 90% Confidence Bound	Point Estimate	Upper 90% Confidence Bound
Population Noncentrality Parameter	0.148	0.187	0.232
Steiger-Lind RMSEA Index	0.128	0.144	0.160
McDonald Noncentrality Index	0.890	0.910	0.928
Population Gamma Index	0.928	0.941	0.952
Adjusted Population Gamma Index	0.832	0.862	0.890

Table A2.2 Single Sample Fit Indices of: Confirmatory Factor Analysis for the reliability dimension (Refer Table 6.12)

	Value
Joreskog GFI	0.939
Joreskog AGFI	0.857
Akaike Information Criterion	0.210
Bentler-Bonett Normed Fit Index	0.924
Bentler-Bonett Non-Normed Fit Index	0.878
Bentler Comparative Fit Index	0.927

Table A2.3 Basic Summary Statistics of: Confirmatory Factor Analysis for the reliability dimension (Refer Table 6.12)

	Value
Discrepancy Function	0.189
Maximum Residual Cosine	0.000
Maximum Absolute Gradient	0.000
ICSF Criterion	0.000
ICS Criterion	0.000
Degrees of Freedom	9.000
p-level	0.000
RMS Standardized Residual	0.054

Table A3.1 Basic Summary Statistics of: Confirmatory Factor Analysis for the responsiveness dimension (Refer Table 6.13)

	Value
Discrepancy Function	0.000
Maximum Residual Cosine	0.969
Maximum Absolute Gradient	0.000
ICSF Criterion	0.000
ICS Criterion	0.000
Degrees of Freedom	0.000
p-level	
RMS Standardized Residual	0.000

Table A4.1 Noncentrality Fit Indices of: Confirmatory Factor Analysis for the assurance dimension (Refer Table 6.14)

	Lower 90% Confidence Bound	Point Estimate	Upper 90% Confidence Bound
Population Noncentrality Parameter	0.111	0.145	0.185
Steiger-Lind RMSEA Index	0.111	0.127	0.143
McDonald Noncentrality Index	0.911	0.929	0.945
Population Gamma Index	0.941	0.953	0.964
Adjusted Population Gamma Index	0.864	0.892	0.916

Table A4.2 Single Sample Fit Indices of: Confirmatory Factor Analysis for the assurance dimension (Refer Table 6.14)

	Value
Joreskog GFI	0.951
Joreskog AGFI	0.886
Akaike Information Criterion	0.169
Bentler-Bonett Normed Fit Index	0.956
Bentler-Bonett Non-Normed Fit Index	0.930
Bentler Comparative Fit Index	0.958

Table A4.3 Basic Summary Statistics of: Confirmatory Factor Analysis for the assurance dimension (Refer Table 6.14)

	Value
Discrepancy Function	0.148
Maximum Residual Cosine	0.000
Maximum Absolute Gradient	0.000
ICSF Criterion	0.000
ICS Criterion	0.000
Degrees of Freedom	9.000
p-level	0.000
RMS Standardized Residual	0.032

Table A5.1 Noncentrality Fit Indices of: Confirmatory Factor Analysis for the empathy dimension (Refer Table 6.15)

	Lower 90% Confidence Bound	Point Estimate	Upper 90% Confidence Bound
Population Noncentrality Parameter	0.048	0.071	0.101
Steiger-Lind RMSEA Index	0.073	0.089	0.105
McDonald Noncentrality Index	0.950	0.964	0.976
Population Gamma Index	0.967	0.976	0.984
Adjusted Population Gamma Index	0.923	0.945	0.963

Table A5.2 Single Sample Fit Indices of: Confirmatory Factor Analysis for the empathy dimension (Refer Table 6.15)

	Value
Joreskog GFI	0.974
Joreskog AGFI	0.940
Akaike Information Criterion	0.098
Bentler-Bonett Normed Fit Index	0.979
Bentler-Bonett Non-Normed Fit Index	0.968
Bentler Comparative Fit Index	0.981

Table A5.3 Basic Summary Statistics of: Confirmatory Factor Analysis for the empathy dimension (Refer Table 6.15)

	Value
Discrepancy Function	0.078
Maximum Residual Cosine	0.000
Maximum Absolute Gradient	0.000
ICSF Criterion	0.000
ICS Criterion	0.000
Degrees of Freedom	9.000
p-level	0.000
RMS Standardized Residual	0.022

Table A6. Structural Equation – Service Quality leads to Customer Satisfaction.

SEPATH Syntax	Parameter Estimate	Probability Level
(Customer Sat)-->[INTEKOMP]		
(DELTA1)-->[INTEKOMP]		
(DELTA1)-2-(DELTA1)	0.646	0.000
(SQ)-->[RELP]		
(SQ)-3->[RESPO]	1.053	0.000
(SQ)-4->[ASSURP]	1.116	0.000
(SQ)-5->[EMPAP]	1.005	0.000
(EPSILON1)-->[RELP]		
(EPSILON2)-->[RESPO]		
(EPSILON3)-->[ASSURP]		
(EPSILON4)-->[EMPAP]		
(EPSILON1)-6-(EPSILON1)	0.292	0.000
(EPSILON2)-7-(EPSILON2)	0.214	0.000
(EPSILON3)-8-(EPSILON3)	0.116	0.000
(EPSILON4)-9-(EPSILON4)	0.283	0.000
(ZETA1)-->(SQ)		
(ZETA1)-10-(ZETA1)	0.707	0.000
(SQ) -11-> (Customer Sat)	**0.706**	**0.000**

Table A6.1 Noncentrality Fit Indices of: Structural Equation – Service Quality leads to Customer Satisfaction (Refer Table A6)

	Lower 90% Confidence Bound	Point Estimate	Upper 90% Confidence Bound
Population Noncentrality Parameter	0.133	0.170	0.213
Steiger-Lind RMSEA Index	0.163	0.184	0.206
McDonald Noncentrality Index	0.898	0.918	0.935

Population Gamma Index	0.921	0.936	0.949
Adjusted Population Gamma Index	0.763	0.808	0.847

Table A6.2 Single Sample Fit Indices of: Structural Equation – Service Quality leads to Customer Satisfaction (Refer Table A6)

	Value
Joreskog GFI	0.934
Joreskog AGFI	0.803
Akaike Information Criterion	0.184
Bentler-Bonett Normed Fit Index	0.957
Bentler-Bonett Non-Normed Fit Index	0.916
Bentler Comparative Fit Index	0.958

Table A6.3 Basic Summary Statistics of: Structural Equation – Service Quality leads to Customer Satisfaction (Refer Table A6)

	Value
Discrepancy Function	0.167
Maximum Residual Cosine	0.000
Maximum Absolute Gradient	0.000
ICSF Criterion	0.000
ICS Criterion	0.000
Degrees of Freedom	5.000
p-level	0.000
RMS Standardized Residual	0.029

Table A7. Structural Equation: Customer Satisfaction leads to relationship quality.

SEPATH Syntax	Parameter Estimate	Probability Level
(Cussat)-1->[INTEKOMP]	0.889	0.000
(DELTA1)-->[INTEKOMP]		
(DELTA1)-2-(DELTA1)	0.209	0.000
(Relq)-->[RELQUAL]		
(Relq)-3->[RELCONT]	1.091	0.000
(Relq)-4->[SERVADD]	0.975	0.000
(Relq)-5->[RECOMM]	1.160	0.000
(EPSILON1)-->[RELQUAL]		
(EPSILON2)-->[RELCONT]		
(EPSILON3)-->[SERVADD]		
(EPSILON4)-->[RECOMM]		
(EPSILON1)-6-(EPSILON1)	0.368	0.000
(EPSILON2)-7-(EPSILON2)	0.248	0.000
(EPSILON3)-8-(EPSILON3)	0.400	0.000
(EPSILON4)-9-(EPSILON4)	0.150	0.000
(ZETA1)-->(Relq)		

(ZETA1)-10-(ZETA1)	0.000	
(Cussat)-11->(Relq)	**0.794**	**0.000**

Table A7.1 Noncentrality Fit Indices of: Structural Equation – Customer Satisfaction leads to relationship quality (Refer Table A7)

	Lower 90% Confidence Bound	Point Estimate	Upper 90% Confidence Bound
Population Noncentrality Parameter	0.000	0.012	0.037
Steiger-Lind RMSEA Index	0.010	0.049	0.087
McDonald Noncentrality Index	0.981	0.993	0.999
Population Gamma Index	0.985	0.995	0.999
Adjusted Population Gamma Index	0.955	0.985	0.999

Table A7.2 Single Sample Fit Indices of: Structural Equation – Customer Satisfaction leads to relationship quality (Refer Table A7)

	Value
Joreskog GFI	0.991
Joreskog AGFI	0.974
Akaike Information Criterion	0.057
Bentler-Bonett Normed Fit Index	0.994
Bentler-Bonett Non-Normed Fit Index	0.993
Bentler Comparative Fit Index	0.996

Table A7.3 Basic Summary Statistics of: Structural Equation – Customer Satisfaction leads to relationship quality (Refer Table A7)

	Value
Discrepancy Function	0.021
Maximum Residual Cosine	0.000
Maximum Absolute Gradient	0.000
ICSF Criterion	0.000
ICS Criterion	0.000
Degrees of Freedom	5.000
p-level	0.040
RMS Standardized Residual	0.010

Table A8. Structural Equation: service quality leads to relationship quality.

SEPATH Syntax	Parameter Estimate	Probability Level
(SERVQUAL)-1->[RELP]	0.851	0.000
(SERVQUAL)-2->[RESPO]	0.902	0.000
(SERVQUAL)-3->[ASSURP]	0.938	0.000
(SERVQUAL)-4->[EMPAP]	0.836	0.000
(DELTA1)-->[RELP]		
(DELTA2)-->[RESPO]		

(DELTA3)-->[ASSURP]		
(DELTA4)-->[EMPAP]		
(DELTA1)-5-(DELTA1)	0.275	0.000
(DELTA2)-6-(DELTA2)	0.185	0.000
(DELTA3)-7-(DELTA3)	0.119	0.000
(DELTA4)-8-(DELTA4)	0.300	0.000
(RELQUAL)-->[RELQUAL]		
(RELQUAL)-9->[RELCONT]	1.071	0.000
(RELQUAL)-10->[SERVADD]	0.951	0.000
(RELQUAL)-11->[RECOMM]	1.104	0.000
(EPSILON1)-->[RELQUAL]		
(EPSILON2)-->[RELCONT]		
(EPSILON3)-->[SERVADD]		
(EPSILON4)-->[RECOMM]		
(EPSILON1)-12-(EPSILON1)	0.334	0.000
(EPSILON2)-13-(EPSILON2)	0.236	0.000
(EPSILON3)-14-(EPSILON3)	0.397	0.000
(EPSILON4)-15-(EPSILON4)	0.187	0.000
(ZETA1)-->(RELQUAL)		
(ZETA1)-16-(ZETA1)	0.365	0.000
(SERVQUAL)-17->(RELQUAL)	**0.547**	**0.000**

Table A8.1 Noncentrality Fit Indices of: Structural Equation – service quality leads to relationship quality (Refer Table A8)

	Lower 90% Confidence Bound	Point Estimate	Upper 90% Confidence Bound
Population Noncentrality Parameter	0.157	0.218	0.294
Steiger-Lind RMSEA Index	0.091	0.107	0.124
McDonald Noncentrality Index	0.863	0.896	0.924
Population Gamma Index	0.931	0.948	0.962
Adjusted Population Gamma Index	0.870	0.901	0.928

Table A8.2 Single Sample Fit Indices of: Structural Equation – service quality leads to relationship quality (Refer Table A8)

	Value
Joreskog GFI	0.940
Joreskog AGFI	0.887
Akaike Information Criterion	0.310
Bentler-Bonett Normed Fit Index	0.963
Bentler-Bonett Non-Normed Fit Index	0.953
Bentler Comparative Fit Index	0.968

Table A8.3 Basic Summary Statistics of: Structural Equation – service quality leads to relationship quality (Refer Table A8)

	Value
Discrepancy Function	0.248
Maximum Residual Cosine	0.000
Maximum Absolute Gradient	0.000
ICSF Criterion	0.000
ICS Criterion	0.000
Degrees of Freedom	19.000
p-level	0.000
RMS Standardised Residual	0.042

Appendix B: Paper delivered at Nett Effects: The Worldwide Internet Conference and Exhibition – February 1999 – London, UK

The Internet and the changing role of market research

by Peet Venter and Meyer Prinsloo

The paper addresses the important role that the Internet plays in a changing market research environment. It uses case histories as a backdrop to analysing the problems and advantages associated with Internet based research. It also identifies possible means of overcoming problems and utilising advantages.

1. Introduction

Internet based research is very experimental in nature due to the rapid development of the Internet. Because of this rapid growth, theory has been slow to catch up. As Harris (1997) points out, marketing activities on the Internet can largely be regarded as 'practice without theory'. This paper will attempt to propose some practical solutions for Internet based research. It represents the view of the commercial research buyer/ user, and has both a South African and global focus.

2. The changing nature of marketing

Probably the single most significant change affecting the nature of marketing has been changes in information technology, with the Internet at the forefront as a catalyst for change. Some of the significant areas of change where the Internet plays a role are discussed below.

- The traditional marketing paradigm of interaction between a physical seller and a physical buyer is no longer valid. This enables the elimination of intermediaries like wholesalers and retailers. As Brännback (1997) points out, the focus in a virtual market is on information about the product rather than the product itself or geographical positioning.
- Customer data abounds and marketers are now able to know more about their customers than ever before.
- Consumers are empowered and able to access or find information on their own, and to make more informed choices. This puts the consumer in a stronger bargaining position relative to the seller.
- It reduces the barriers of entry to the market dramatically. For instance, where the investment in trading space and the purchasing of physical product have traditionally been barriers to entry, these have been eliminated. The result is a proliferation in competition and choice

How are marketers, and specifically market researchers, responding to these challenges?

3. The Internet and the changing role of market research

The dominant theme emerging from marketing in the knowledge era is relationship marketing. The utopia of relationship marketing is a personal relationship with every single customer. The customer database is a primary tool in accomplishing this. It rests on the principle that proactive identification and fulfilling of individual customer needs will build a relationship and raise the "lifetime value" of customers. Marketing on the Internet is regarded as a particular opportunity in this regard (Carnelley 1997).

In light of the above, it is hardly surprising that the role of market research in the organisation is seen to be changing too. Also, it would seem that traditional market research, which relies on sampling and survey data to represent a population may not always be the ideal model for gathering information in a relationship marketing paradigm. Some of the changes in market research are as follows (Schmidt 1993; Seggev 1995; Van Vuuren & Maree-Koen 1997):

- market researchers are more and more required to provide pragmatic and action oriented business solutions;
- a professional market research service is required, using better trained and more business oriented staff;
- market researchers are required to come up with more innovative research approaches; and
- market researchers are increasingly expected to justify their existence in 'return on market research investment' terms.

In short, market research is more and more seen as a professional service and less as mere execution of the market research process. This paper will analyse the role that the Internet can play in this changing role of market research. However, as a starting point, some definitions have to be clarified. That will be followed by three case histories of Internet based research projects as a backdrop to the discussion.

4. Defining Internet based research

It appears as if there are two different definitions at work in the arena of online research. Firstly, there is what can be described as Internet

research. This refers to instances where the online population is used as a sampling frame. Quite often the results from these surveys are then used to make inferences about the nature of the online population, or even to the general population. This approach has deservedly drawn criticism, since no single sampling frame for Internet users exist. In addition, the Internet population is skewed towards certain demographic groups.

The focus of this paper is on Internet based research, as the authors refer to it. This refers to the methodology where the Internet is used as a research vehicle.

There are essentially three Internet based research models. These are briefly discussed below.

i. A World Wide Web based model, where a questionnaire is hosted on a web site/ server. It allows fairly complex interactivity, help facilities and skip procedures. Respondents are lured to the site by e-mail, by focused media (such as snail mail or telephone) or by unfocused media such as radio or television (which does not allow probability sampling).

Advantages:

- High level of interactivity.
- Control can be more efficient since it is possible to integrate control procedures with the server architecture. The server can for example verify certain user characteristics or identification codes interactively while the respondent logs onto the questionnaire.
- The questionnaire can be adjusted on the spur of the moment.
- The session variables of the respondents completion of the questionnaire can be monitored very closely, for instance the time spent on a specific question.
- Data is immediately available, for example for pilot analysis.
- Respondents do not need an e-mail box (for instance universities and Internet cafés).

Disadvantages:

- Respondent pays for the telephone connection (local charges in UK and South Africa).

- Respondents need an Internet Browser.
- Time spent to complete the questionnaire is reliant on the quality of the connection to the Internet.

ii. An e-mail based model, where the full questionnaire is e-mailed to the respondent. This model has varying levels of interactivity – for example from mailing a Microsoft word document to mailing a fully interactive executable file.

Advantages

- Respondent only pays for the connection time necessary to download the e-mail message.
- Respondent needs only access to e-mail.

Disadvantages:

- Control is restricted to what can be included in the e-mail message.
- Questionnaire can not be altered or deleted on the mail server.
- Data is only available for analysis after mail has been sent back.
- The response mechanism is relatively technically complex.

iii. A hybrid model, which is a combination of the above mentioned models, so that the respondent chooses which model to support. For instance, inviting potential respondents to either complete the questionnaire on a web page or to reply to the e-mail questionnaire.

5. Internet based research case histories

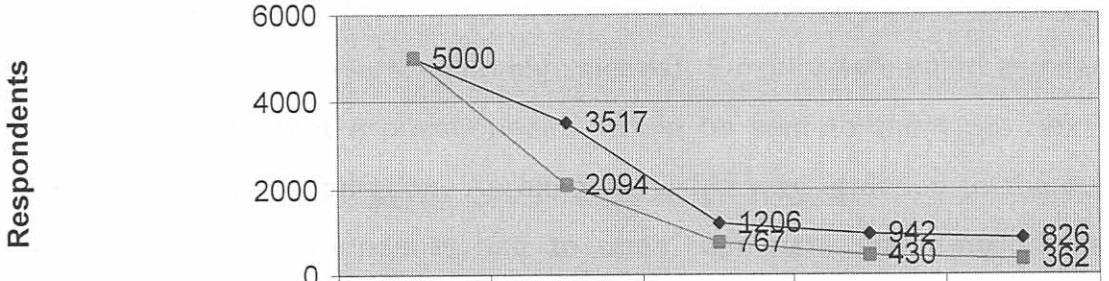
Case 1

An Internet Service provider performed a customer satisfaction, retention and segmentation study during the period September to November 1998. Two probability samples of 5 000 e-mail addresses each where drawn from the Internet Service Provider database. An e-mail invite to a web-based questionnaire was mailed out on the first of October 1998 at 10:00. One sample was promised 100 double movie tickets for the first 100 completed questionnaires submitted and mouse-pads for the next 200 responses. No incentive was offered to the other sample.

In this study the Internet Service Provider database information was used to validate respondents as subscribers and make sure they complete only one questionnaire. Postal codes were used to weigh the sample back into the subscriber population.

The response patterns over time were almost identical, with similar drop-off rates occurring for both samples. However, the response volume for the incentive group was 9% higher than for the non-incentivised group (see figure 1). From the 5000 invites, approximately 70% of the incentivised group followed the link to the web page, compared to 42% of the non-incentivised group. Of the Web page visitors, 34% and 37% respectively started with the questionnaire. Of those starting, 78% and 56% respectively proceeded to the middle of the questionnaire, and of these 88% and 84% respectivly submitted a questionnaire.

Figure 1: Sample Attrition

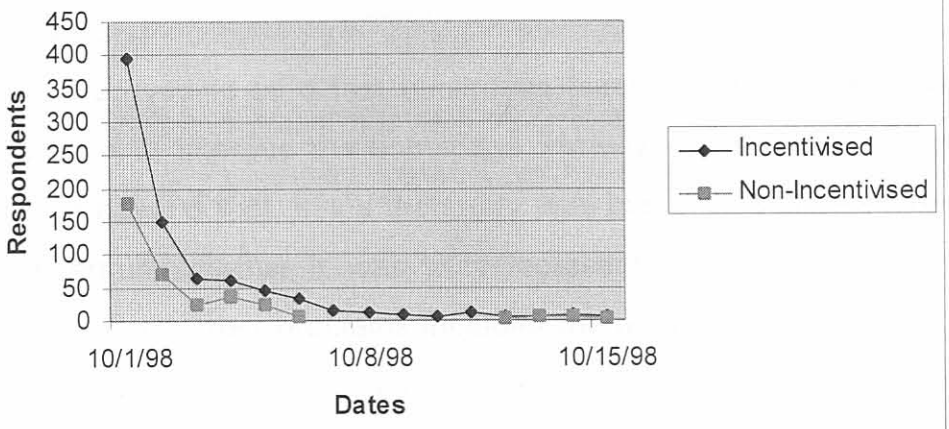


	Invite:	Web:	Begin:	Middle:	End:
Incentivised	5000	3517	1206	942	826
Non-Incentivised	5000	2094	767	430	362

Response Stage

In addition, 66% of responses were generated within the first 48 hours after launch of the questionnaire for both samples (see figure 2). Detailed records were kept as to what time was spent on the questionnaire, and when questionnaires were completed. Most questionnaires were submitted after office hours. It is interesting to note that the incentivised sample took less time to complete the questionnaire than the non-incentivised sample.

Figure 2: Response by Date



Case 2

Although strictly not Internet based, the following example does serve to highlight some important points. Telkom conducted an internal customer satisfaction survey for a large division in the company. 980 users of this division's services were randomly selected. E-mail was sent to the sample to warn them that a questionnaire would be sent to them the next day and to solicit co-operation. An executable file was attached to the survey e-mail, which respondents had to open, complete and e-mail back by automated process. The e-mail announced the incentives, and provided instructions to completing and submitting questionnaires.

An incentive in the form of a small prize was offered to the first 30 respondents. The survey drew a response rate of 20.1%, compared to

14% the previous year (no incentive). The completion time of the project from questionnaire launch to data analysis was 10 working days.

Case 3

Intekom launched an Internet based questionnaire to evaluate the their home site. The questionnaire was launched on 25 September 1998 and removed end of day 6 October 1998 (12 days). Small incentives were offered to 30 randomly drawn respondents. A banner on the home page was used to lure on-line users into the questionnaire. Out of 33678 page hits in this period, 1127 clicked through to the banner (3.3%). Of these, 370 (33% of click through, 1.1% of page hits) submitted completed questionnaires.

The method proved to be a fast qualitative feedback method that was in this case used to improve the homepage. However, the results were not extrapolated beyond that, since the study was based on self-selection and it was uncertain whether it was truly representative of the home page visitor population. Other problems included the high drop-off rate, and the fact that raw data was captured in text labels and not numeric labels. This practice complicated the data analysis and wasted time.

In the case of the Intekom home page regular users can request to customise the home page according to their personal needs/interests. It is possible to obtain more meaningful results by drawing a sample out of the customisation database and offer the questionnaire only to a probability sample through a banner link. This sample can then be extrapolated to cover the customised users, the type of users that seek for relationship type interaction from the content/service provider.

6. Addressing the problems of Internet based research

The most often cited problem of Internet research is the lack of a sampling frame and representation. However, the organisation's market segmentation should drive the decision here. In other words, is the segment targeted by the market research ready for Internet based research? Table 1 demonstrates that South African business decision-makers (especially those in large companies) seem to be ready for Internet

based research. Perhaps the most interesting statistic is the fact that 70% of business decision-makers in large organisations prefer e-mail to other means of communication. Another application being implemented by Telkom, is the market research evaluation network, where both internal clients and external vendors are targeted by e-mail to provide structured feedback on research projects.

Table 1: Internet usage in South African business market segments

	Home office	Small business	Medium business	Large business
Internet usage	7%	38%	39%	60%
Use Internet at work	-	13%	13%	21%
Prefer e-mail	-	44%	45%	70%
Use e-mail daily	-	16%	17%	44%
Use Internet at home	-	13%	27%	33%

Source: BMI-T (1997), SA Business Survey (1997)

Internet users are notoriously jealous of their privacy, and can react extremely negatively to unsolicited contact. This may mean that the organisation would either have to obtain commercial, vetted e-mail address lists, or would have to obtain this consent. In South Africa, list brokers are only now getting into the business of obtaining e-mail addresses in addition to other contact details for commercial databases. Panels for specific market segments may be another way of solving this problem. In all cases, it is important to ensure that research initiatives conform to legislation and research codes of conduct.

Response rates for online research is typically lower than for face-to-face or for telephonic research, and is more in line with those for mail surveys. The obvious solution is to use incentives, since it increases responses significantly. Incentives seem to play a particular role in luring respondents to the questionnaire, and again in getting respondents to persevere to the end of the questionnaire, as Case 1 has shown. However, using incentives also create problems. Respondents may for instance try to submit more than one response. Also, since access may be shared, the actual respondent may not be the targeted respondent. Currently, ISPs and companies hosting mail servers are the only entities in a position to

control of these problems, since they control all e-mail addresses and aliases from their databases.

Technical problems may arise. Incompatibilities between various software versions or systems may create complications. Hays (1998) warns that technical problems that may arise when sending questionnaires to networked environments, for instance due to security measures. In addition, technical problems with completing and submitting the questionnaire may arise. Experience has taught that, on the design side, different versions of browsers and e-mail packages should be taken into account. Thorough pilot testing and online 'torture testing' is required to make sure that potential technical problems are solved before questionnaire launch. In addition, clear instructions should be provided to respondents at every opportunity.

Another concern is the high attrition rate of responses. Between steps in the response process, and even during questionnaire completion, sample attrition is high (see figure 1 and 2). Even the number of drop-offs in the beginning and middle of samples is a concern. This necessitates the quest innovative means of ensuring respondent attention and click-through to next steps in the process.

7. Advantages of Internet based research

It is a very flexible research tool, with the ability to build random exposure to different questionnaires, automatic routing, visual aids and other stimuli into the questionnaire. This is particularly relevant since research is evolving into issues of complex design such as discrete choice modelling and conjoint value analysis. This complicates the data collection process. For instance, a discrete choice methodology was used in a recent demand research survey In South Africa. With 6 of the 11 official languages being used, the methodology (using face-to-face interviews) dictated a sample of 1200, exposed to 90 different versions of the questionnaire. This would have been much easier to handle electronically.

It is a lot quicker than conventional methods, since it eliminates the "fieldwork bottleneck" to a large degree. For example, experience has

shown that the bulk of respondents to e-mail surveys respond within 48 hours of being invited to respond to the questionnaire, while a typical research project can be completed within 10 working days. This means that much more time can be spent on planning the survey properly and analysing the data and turning it into knowledge.

Fieldwork in on-line research is much less costly than other methods. For example, in South Africa, a telephone interview can cost anything between $10 and $30 (including data processing), depending on the questionnaire size. Online, this variable cost virtually disappears. In fact, dial-up users actually bear the cost of the response!

A great advantage is the fact that interviewer error, bias and data capturing errors can be eliminated to a large degree. In South Africa this is not a trivial issue, since crime problems are having the effect of households refusing to co-operate with interviewers, having inaccessible properties and unlisted telephone numbers. This creates quality control problems and raises the probability of interviewer error.

Feedback is immediate. Pilot testing can be completed in a very short time frame. In addition, the database of responses can be updated as completed questionnaires are returned, and analysed whenever top line results are required. In fact, judging from case histories, good top line results may be drawn about 48 hours from questionnaire launch.

It is a very convenient research tool for the respondent. As the cases have shown, respondents complete questionnaires at times that no sane interviewer would contact them telephonically or in person. In addition it removes all geographical boundaries and international time differences.

In summary, table 2 presents a summary of advantages of various research data collection tools.

Table 2 Comparison of various research methodologies

Attribute:	Mail	Telephone	Face to face	Internet
Turnaround time	>3 months	6-8 weeks	8-12 weeks	10-14 days
Convenient time	Yes	No	No	Yes

Flexibility	Limited	Limited	High – visual and verbal	High – visual and verbal
Response rate	5-10%	33% hit rate, 90% response rate	Unknown hit rate, 85% response rate	10-20%
Approximate variable cost per response	$25-$50	$10-$30	$30-$50	0
Population	Mail address owners	Telephone users	Geographical restrictions	Internet users

8. Conclusions and recommendations

One of the causes of criticism of Internet research seems to be a result of organisations either trying to reap the benefits of Internet based research prematurely or simply trying to 'get on the bandwagon'. It has to be stressed that Internet research may in fact require a considerable 'ramp-up' in terms of preparation before the benefits can be reaped.

Internet based research should be used subject to the rigors of the research process. In other words, the research process should drive the decision whether Internet based research (compared to the advantages and disadvantages of other media) is a proper medium to use, and not vice versa.

While experimenting with Internet based research, it may be a good idea to validate findings by running parallel control groups outside of the Internet using conventional research media. That will give an indication whether findings from the Internet based sample can be extrapolated.

In instances where the full sample drawn can not be reached via Internet based research, hybrid survey methods like telephone and Internet may present a practical solution to make a survey more affordable and comprehensive.

It is suggested that all questionnaires should contain standard demographic/ corpographic or behavioural questions that can be linked back to the organisation's market segments. This will assist in validating the survey data with known population figures.

Care should be taken to apply the right tool to the right kind of research. For instance, Web site guest books, Web boards and newsgroups can offer quick, valuable qualitative market intelligence but cannot be 'sold' as focus groups (Harris 1997).

Eliminating the variable cost of data collection combined with the ease of administering large samples create the danger that the online population may become over-researched, creating further attrition in response rates. Therefore, sampling plays a vital role even in Internet based research. In addition, certain guarantees could be made to panels or market segments that they will only be contacted by the organisation in question a maximum of say 4 times a year.

In Internet based research, design is a critical issue. Case histories have shown that design has to take place with the data processing in mind. In addition, design has to facilitate the flow of the questionnaire, and care needs to be taken to provide ample instructions. It is useful to give the respondent an indication of progress with the questionnaire. Graphics and open questions should be used sparingly to facilitate speed.

In conclusion it has to be said that Internet based research is an ideal tool to support the changing role of market research, provided that it is done responsibly. Not only is it able to deliver market research results timely, but it also enables more focus on planning the research and analysing results than on execution of the process. In this way, it enables market research to add more value to the business.

9. Future pointers

Research on the Internet is remarkably easy to conduct, with software providing a lot of the required functionality. The temptation may justifiably exist for organisations to take online research in-house. In addition, organisations that are not researchers (such as ISPs) may start to encroach on the terrain of the market research vendor. What is the effect of this going to be on the industry?

When and how will the flexibility of Computer Aided Personal Interviewing (CAPI) and Computer Aided Telephone Interviewing (CATI) tools be

combined with Internet based research tools to get the "best of both worlds"?

Tools already exist to process qualitative questions by means of advanced content analysis (often requiring analyst intervention to complete). This may represent a significant opportunity to conduct automated qualitative research via the Internet.

Currently ISPs have the best contact data to reach the Internet user. The search for a single sampling frame may require the co-operation of all ISPs, commercial list brokers and market research vendors.

From the above discussion it is clear that the Internet provides an exciting additional tool that can provide organisations with relatively cheap data on fast turnaround times. However, organisations that want to use it should not be seduced by the 'smoke and mirrors' of generating sheer numbers very quickly, but should utilise the Internet in enhancing their long term research strategy. In this way, the organisation will be able to obtain the benefits of Internet research, while retaining the value of conventional research processes. What can we as researchers do?

- Experiment and document, help build out the theory of Internet based research.
- Never substitute quality for quantity. Just because high numbers of responses can be generated is no reason to do it.
- Use the Internet as a convenient and cost effective way to survey execution in conjunction with conventional methods. The Internet widens the options that may be offered to potential respondents.
- Select the sample frame independently from the survey method used wherever possible. This is a problem not restricted to Internet based research, for instance using telephone directories to select samples representing the general population.

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