

THE USE OF MOBILE PHONES IN CONSUMER PANEL RESEARCH

by

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ABSTRACT

A consumer research panel is a representative collection of individuals whose consumption habits are continually monitored by a marketing research company. It is designed to study the behaviour rather than the attitudes of consumers in the fast-moving consumer goods (FMCG) sector. The analysed and interpreted reports help the retailer and manufacturing clients to better understand their markets and the changing dynamics within markets which are largely overseen by retail studies.

It is shown that consumer research panels have a very high per panellist cost due to the nature of the data collection methodologies currently used being either very labour-intensive with the in-home interviewer visits, or due to the cost of the technology needed when using an in-home audit terminal to scan the barcode of items.

The ubiquitous use of the mobile phone begs the question whether this technology, already in the hands of people, could be used as a data collection device. In 2007, Robert Adelmann demonstrated that it is possible to recognise linear barcodes using a mobile phone equipped with a camera and a barcode recognition algorithm.

Three requirements are set for a mobile phone to be used as a data collection device in a consumer panel and are indicated by various studies researching each, focused on Gauteng, South Africa. The technology is shown to be quick and accurate enough to be used in everyday barcode scanning albeit not very prevalent among the responding sample. The data communication infrastructure needed to communicate the audited data was found to be 100% present although few of the respondents displayed their interest in joining a research panel based on mobile phones.

It is, therefore, recommended that a phone-based consumer panel be used to supplement existing consumer panels to extend in hard-to-reach demographics like the upper-LSM households, and that the privacy and usage concerns raised by the respondents be addressed. It is also recommended that similar studies be conducted in developed economies where required mobile phone technology could be more prevalent.

Key words: consumer research panel, mobile phone data collection, consumer research, FMCG.

OPSOMMING

Verbruikerspaneelnavorsing is 'n navorsingsmetode waarvolgens die navorsingsmaatskappy 'n verteenwoordigende groep individuele verbruiksgewoontes op 'n gereelde basis monitor. Dié navorsingsmetode word gebruik om die gedrag eerder as die persepsie of houding van verbruikers in die vinnige-omset-verbruiksartikel-sektor te bestudeer. Die geanaliseerde data en geïnterpreteerde inligting dien as riglyne vir die kettingwinkels en vervaardigers om markte en die veranderende dinamiek binne hul markte beter te verstaan. Hierdie tendense word gewoonlik misgekyk deur net verkoper-gebaseerde studies te bestudeer.

Daar word aangetoon dat verbruikerspaneelnavorsing 'n baie hoë per-paneellid-koste het as gevolg van die manier waarop die data ingevorder word. Die data-invorderingsproses is baie arbeidsintensief as gevolg van die huis-besoeke deur die veldwerkers, en die koste van data-invorderingstoerusting is baie hoog in die geval waar die huishouding self die inkopies opneem met 'n strepiekode-data-opnemer.

Die algemene gebruik van die selfoon bring die vraag na vore of dié tegnologie, wat alreeds 'n onontbeerlike toestel in die hand van 'n verbruiker geword het, gebruik kan word as 'n data-opnemer. In 2007 het Robert Adelman gedemonstreer hoe dit moontlik is om 'n selfoon, wat met 'n kamera toegerus is, saam met die gepaste sagteware te gebruik om 'n lineêre strepiekode te herken.

Drie vereistes word geïdentifiseer om 'n selfoon effektief te kan gebruik as 'n data-opnemer en word gedemonstreer deur verskeie studies, en fokus uiteindelik op die mark in Gauteng, Suid-Afrika. Die tegnologie word gedemonstreer as vinnig en akkuraat genoeg om gebruik te word, al is dit nie baie teenwoordig in die steekproef nie. Die data-kommunikasie-infrastruktuur wat benodig word, is 100% dekkend, maar baie min van die respondente toon belangstelling om aan 'n selfoon-gebaseerde verbruikerspaneel deel te neem.

Dit word dus aanbeveel dat 'n selfoon-gebaseerde data-invorderingsmetode slegs gebruik moet word om 'n bestaande verbruikerspaneel aan te vul in die moeilik-bereikbare demografiese groepe soos die hoër-inkomstegroepe, en dat die privaatheid en bruikbaarheidsvrese van so 'n metode aangespreek moet word. Dit

word ook aanbeveel dat soortgelyke studies gedoen moet word in meer ontwikkelende ekonomieë waar die vereiste tegnologie meer algemeen aangetref word.

Trefwoorde: Verbruikersnavorsingspaneel, selfoon-data-insameling, verbruikersnavorsing, VBVG.

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ABBREVIATIONS

2.5G – is a stepping stone between 2G and 3G cellular wireless technologies.

2G – second-generation wireless telephone technology introduced data services for mobile phones.

3G – third generation wireless telephone technology is a family of standards for mobile telecommunications defined by international telecommunication. It allows simultaneous use of speech and data services and higher data rates.

3GPP – third generation partnership project is a collaboration between groups of telecommunications associations, to make a globally applicable third generation (3G) mobile phone system specification within the scope of the International Mobile Telecommunications-2000 project of the International Telecommunication Union.

AMPS – All Media and Products Study

API – Application Programming Interface is an interface in computer science that defines the ways by which an application program may request services from libraries and/or operating systems.

CATI – Computer Assisted Telephone Interviewing is a telephone surveying technique in which the interviewer follows a script provided by a software application.

EAN – Electronic Article Number (originally European Article Number) is a one-dimensional barcode symbology to encode GTINs.

FMCG – Fast-moving consumer goods are the products that are sold quickly at relatively low cost.

GetJar – Directory and download service of mobile Java games and applications by independent developers. The GetJar service provides statistics of handsets used for all downloads on the site.

GPRS – General Packet Radio Service is a packet oriented mobile data service available to users of the 2G cellular communication systems.

GS1 – GS1 is an international not-for-profit association dedicated to the development and implementation of global standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across multiple sectors.

GSM – Global System for Mobile communications.

GTIN – Global Trade Item Number is an identifier for trade items developed by GS1.

Homescan – Homescan is a service provided by The Nielsen Company where members scan the barcodes on all their purchases with a special barcode reader.

LSM – Living Standards Measure is a research tool developed by SAARF to divide the population into 15 groups based on a demographic profile of 29 variables. In this text, the AMPS 2004 LSM descriptors were used.

MyScan – is an impulse panel measurement service provided by The Nielsen Company which aims to track impulse food purchasing which would not be recorded by traditional home-based panel measurement services such as Homescan.

SAARF – South African Advertising Research Foundation

UPC – Universal Product Code (UPC) is a one-dimensional barcode symbology to encode GTINs.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

A consumer research panel is a representative collection of individuals whose consumption habits are continually monitored by a marketing research company. The data from the consumer research panels are used to answer the What?-type questions (Birn, 2000:233) for manufacturers and retailers. The participating individuals are referred to as panellists.

In a panel that monitors the consumption of fast-moving consumer goods (FMCG), the panellists are required to regularly and continuously record the purchase and consumption details of goods. To promote participation in the research it is imperative to simplify the process for panellists. Technology in the form of barcode scanning terminals is used to assist in capturing of the data by the panellists.

As stated by Birn (2000:233), the accuracy of the measurements down to brands or brand sizes is largely determined by the size of the sample. All aspects kept equal, the single most important factor for accuracy is therefore the size of the panel. Due to large panel sizes required and the cost of technology to assist the panellists, the consumer panels are very expensive to set up and maintain (McDaniel & Gates, 1998:57).

Mobile phones have become ubiquitous, even in developing countries. According to the latest Millennium Development Goals Report (United Nations, 2009:51), a penetration rate of 39% can be observed. Recent technological advances in the use of mobile phones and its ability to recognise barcodes (Adelmann, 2007) has led to the question whether panellists can use their own phones to record consumption data needed for consumer panel research.

1.2 PROBLEM STATEMENT

Consumer panels are very expensive to start up and in order to maintain it, in large part is due to incremental per panellist cost which scales with the size of the panel. The largest per panellist cost comes from the device used or labour incurred when collecting the data from a consumer research panel. It would be to the benefit of a market research company to significantly lower the per panellist cost incurred during data collection by exploring existing technologies already in the hands of consumers, like the ubiquitous mobile phone.

1.3 OBJECTIVES

1.3.1 Primary objective

The main objective of this study was to research the feasibility of using a person's own mobile phone as the data collection device in consumer research panels.

1.3.2 Secondary objectives

The secondary objectives were to:

- Assess the technological maturity of using a mobile phone for data collection in consumer panel research;
- Determine the readiness of the technological environment and infrastructure needed to use a mobile phone for data collection; and to
- Determine the panellists' willingness to participate and ability to use a mobile phone for data collection.

1.4 RESEARCH METHODOLOGY

The research comprised a literature study to describe the panel research requirements and current theoretical technology frameworks needed for a mobile phone to be used as a data collection device. Several empirical studies conducted by The Nielsen Company were used to assess the research objectives which were finally focused on a limited target location within Gauteng, South Africa.

1.5 DEMARCATION OF THE STUDY

The study focused on consumer research panels based in the fast-moving consumer goods sector of marketing research. The study also focused on the data collection methodologies within the data acquisition phase of panel research. The study ultimately culminated in an application within Gauteng, South Africa.

1.6 LAYOUT OF THE STUDY

Chapter 1 focused on introducing the concept of consumer research panels and formulates the problem statement and research objectives.

Chapter 2 comprised a literature study of consumer research panels, the data collection methodologies and its characteristics.

Chapter 3 describes the research methodologies of the various studies conducted for the research objectives.

Chapter 4 reports the results of the empirical studies.

Chapter 5, the final chapter, reports on conclusions from the literature study and the study's results and ends with recommendations and areas for future research.

CHAPTER 2

LITERATURE STUDY

2.1 INTRODUCTION

In this chapter, the market research concept of a consumer panel is introduced as a platform designed to study the behaviour rather than the attitudes of consumers in the fast-moving consumer goods (FMCG) sector (Kent, 1993:151).

The lifecycle of a panellist in a consumer panel is studied to show what kind of data is collected and how it is collected. Attention is given to highlighting the differences in current data collection methodologies and identifying the requirements for a data collection device. A comparison is made to highlight the advantages and disadvantages of current data methodologies further indicated by a financial comparison.

The mobile phone is reviewed as a potential replacement of the current data collection devices, evaluating it on the requirements identified from current data collection methodologies and devices used. The adaptations to current data collection methodologies are evaluated leading up to the final requirements for using a mobile phone for data collection in consumer panels. The requirements are used to dictate the research objectives of the quantitative studies.

2.2 WHAT IS A CONSUMER PANEL?

A consumer research panel is a representative collection of individuals who are recruited to take part in a continuous research study. These individuals' consumption habits are continually monitored by the marketing research company. The data from the consumer research panels are used to answer the What?-type questions (Birn, 2000:233) for consumer goods manufacturers and retailers like:

- Who are you?
- What do you buy?

- Where do you buy?
- How much?
- Price?
- When?
- What else could you have bought?
- Where else could you have bought it?

In a panel that monitors the consumption of fast-moving consumer goods, the panellists are required to regularly and continuously record the purchase and consumption details of goods. The recorded details would include aspects such as (Avasarikar & Chordiya, 2007:4-5):

- Particulars of the item purchased;
- Number of units purchased;
- Price paid; and
- Location of purchase.

The way in which the data is captured is usually dictated by the research environment. The most popular instruments are diaries and electronic devices (Kent, 1993:153). Diaries require the panellist to manually record the purchase details after each shopping trip. Electronic devices equipped with barcode scanners have largely replaced diaries in most first-world countries as indicated by the charts in Appendix G which shows a geographical map of the diary and home scanner panels of Nielsen in 2009. The use of electronic devices eliminates most of the errors associated with manual capturing of data.

The collected consumer data is then periodically quantified, aggregated and statistically expanded to represent a population or a subset thereof. Due to the continuous nature of the research panel, trends and data shifts can be analysed and interpreted. The analysed and interpreted reports help the retailer and manufacturing clients to better understand their markets and the changing dynamic within markets which is largely overseen by retail studies (Jones & Slater, 2003:49).

As stated by Birn (2000:233), the accuracy of the measurements down to brands or brand sizes is largely determined by the size of the sample. All aspects kept equal,

the single most important factor for accuracy is therefore the size of the panel. Due to large panel sizes required and the cost of technology to assist the panellists, the consumer panels are very expensive to set up and maintain (McDaniel & Gates, 1998:57). The size of the panel, and therefore its representativeness, depends on the availability of funds and the coverage of geographical area (Avasarikar & Chordiya, 2007). Although statisticians might argue the ideal size of a consumer panel, in practice it is often dictated by the abovementioned factors.

To motivate and remind panellists to regularly record their purchases, a reward system is usually set in place (Kent, 1993:152). Several implementations of such reward systems exist, including the accumulation of points which can then be redeemed in the form of a gift from a gift catalogue.

One of the ongoing tasks in consumer panel research is to ensure that the panel always remains demographically and geographically balanced. If no panel members ever retire from the consumer panel, the panel would increasingly represent an older demography (Kent, 1993:152). To maintain the balance, it is therefore necessary to continuously retire panel members and recruit new ones.

From this section the main stages in the panellist lifecycle can be identified as:

- Recruitment;
- Data collection;
- Panel management; and
- Termination.

In the following section, each of these stages will be discussed in more detail.

2.3 THE PANELLIST LIFECYCLE

2.3.1 Recruitment

The goal of recruitment is to get a representative sample of the required population in the panel and to keep the maximum recruited members reporting over time (Birn, 2000:234). In order to achieve these goals, panel members are recruited from

various sources. The most popular recruitment sources are:

- Mail;
- Telephone (CATI); and
- Internet / e-mail.

The sources are usually dictated by the availability of the recruitment medium and the demographic needed. In places with high internet penetration, almost all recruitment is done on-line. More traditional recruitment techniques like computer assisted telephone interviews (CATI) or mail can be used in places with lower internet penetration or when a lower living standard measurement (LSM) demography is targeted. One of the advantages of electronic recruitment is that the recruitment survey is delivered instantaneously and responses and feedback are quick and are much cheaper than mail surveys (Baker, 2007:178).

During the recruitment process, potential candidates are demographically screened. The reporting task and incentive program is well explained; this is done to minimise the panel drop-out and maximise continuity in the panel (Birn, 2000:235).

Once recruited, some panel members experience an element of self-consciousness in their purchasing behaviour that might upset their personal bias (Blankenship *et al.*, 1998:134). Market research firms therefore further screen the panel members' data for several months or reporting periods before actively using the newly recruited members' data.

Market research companies often benefit from partnerships with Internet companies for its on-line recruitment needs (Postoaca, 2006:17). A good example of this can be seen from the press release of a strategic alliance between The Nielsen Company and Facebook (Anon., 2009n). On-line recruitment from social networks greatly enhances the effectiveness of the recruitment campaigns because the needed demographic groups can be targeted.

2.3.2 Data collection

2.3.2.1 What kind of data is collected?

The data collected from the panel members is entirely dictated by the function of the consumer panel. In a consumer panel dedicated to the research of consumer goods, the core data collected is (Avasarikar & Chordiya, 2007):

2.3.2.1.1 *Particulars of item purchased*

Most consumer goods items are identified by a GS1 standard barcode. Once the item is identified by the barcode, all other particulars of the item can be determined by an item master database. To ensure accurate data, the barcode is usually scanned by an electronic barcode scanner.

2.3.2.1.2 *Number of units purchased*

The number of items purchased determines the volume of items purchased. This is usually manually recorded but depending on the recording methodology can be negated if each item is recorded individually.

2.3.2.1.3 *Price paid*

The price of each item can be recorded manually or can be inferred from retail audit data if the research firm in question has the capability of doing retail audit.

2.3.2.1.4 *Location of the purchase*

The location of the purchase is recorded manually but the level of detail recorded is determined by the function of the consumer panel. In some cases, only the retail chain or outlet type is recorded but in other cases, the level of detail could go as far as identifying the particular store where the item was purchased.

2.3.2.1.5 *When the purchase was made*

The date of purchase is recorded either manually or inferred by the electronic scanning device if the items are recorded electronically.

2.3.2.1.6 *Surveys*

Some consumer panels sell the capacity for manufacturers to record consumer opinions; this is usually done by requiring the panel members to complete surveys. The surveys might be electronically available on the electronic recording device or mailed separately.

2.3.2.2 How is the data collected?

Different methodologies exist in the way that data is acquired from the panel members and is critical both to the quality of the data and to the complexity and scale of the task (Birn, 2000:238). These methodologies are usually dictated by the nature of the research and the characteristics of the research environment. The main distinction between the different methodologies lie in the way the data is collected from the participating panellist. The two main distinctions are diary or bin manual data collection and in-home electronic scanner methodologies. Further special cases also exist in the form of cash slip collection and impulse purchase collections.

2.3.2.2.1 *Manual diary / bin*

The core attribute of this data collection methodology is that the panel member is not equipped by any electronic apparatus to capture the data himself. All the data is therefore manually written down by the panel member and is only electronically captured by the market research company or its auditors. Various derivatives of this data collection methodology exist. Diaries are filled in usually by the housewife after each shopping trip in which all the details about each item and the shopping trip are captured. The diary can either be mailed to the marketing research company or it can be captured by an auditor visiting the household on a regular basis, also known as in-home interviewer checks (Birn, 2000:240). Another variation of this methodology is

for an auditor to visit the household and to audit the trash also known as the dustbin audit (Birn, 2000:240).

The in-home interviewer checks have become the norm for manual diary / bin consumer panels (Kent, 1993:153), and because the electronic data capturing lies with the market research company this data collection methodology is characterized by high labour costs. It is therefore not viable in areas where labour is expensive as indicated in the United Kingdom and the rest of Europe in the late 1990s (Birn 2000:240). The level of literacy and low technology infrastructure required by this technology makes it ideal for developing economies around the world. Due to the manual capturing of data this methodology is very error prone and a lot of effort usually goes into data checks and verification.

The in-home interviewer is responsible for scanning all the items for each of his households since the previous visit to the household. The barcode scanning terminal therefore needs to be robust and have the capability of storing a lot of data before it is uploaded to a central server.

2.3.2.2.2 *Electronic in-home scanning*

Since the introduction of the barcode, it was possible to electronically record an item by scanning its unique item number, sometimes referred to as the EAN (electronic article number). Since then, the electronic devices for scanning barcodes and capturing purchase data have become extremely affordable (Birn, 2000:241), in that it was now possible to equip every household in a panel with its own electronic data capturing device capable of scanning barcodes and transmitting the data to the market research company. The in-home scanning methodology accounts for more than 80% of The Nielsen Company's consumer panel services (Appendix G). In the electronic in-home scanning scenario, each household is equipped with a barcode scanning terminal. The panel member is required to scan all purchased items and then complete some details about each purchase. After all items are scanned and entered, the data is uploaded electronically and received by the market research company (Kent, 1993:153).

Due to the fact that each household needs to be equipped with a barcode scanning

terminal and the fact that all data is captured electronically and sent to the market research company, this data collection methodology is characterized by high capital start-up costs, but low labour costs. The electronic nature of this methodology has the benefit of very little errors being made in the capturing of data.

Seeing that the household only enters its own purchases and has the ability to regularly upload the data to the central server, the barcode scanning terminal used in in-home scanning does not need to have a lot of memory and does not need to be very robust.

2.3.2.2.3 *Cash slip*

In some special cases it is possible to collect all the necessary purchase data from the cash slip alone as can be seen from Appendix H (Marom, 2008). The Nielsen Company's consumer panel in Israel is entirely based on the panel members collecting and mailing the cash slips of all their purchases on a regular basis. On close inspection of the cash slip in Appendix H, it can be seen that all the information needed is printed on the cash slip, including the barcode for each item purchased. This methodology however, relies solely on the co-operation of the retailers to print this information on the cash slips as described by the local data acquisition manager in Israel, Julia Nilov-Alush (2009).

The methodology is very cheap to implement, seeing that the cash slips cost very little to mail and can be electronically scanned. Errors in data capturing is very limited and can easily be double-checked at data entry.

2.3.2.2.4 *Impulse purchases*

All the previously described data collection methodologies have one area which they do not cover; that is, impulse purchases. Impulse purchases and consumption are described as those purchases and consumption done outside of the home. According to Desai (2002), "Impulse purchases are another area that is hard to research through conventional methods alone." It is particularly difficult to determine what is consumed outside the home and the details thereof. For instance, the can of Coke bought from the vending machine at work, or the cup of coffee purchased at the

news stand on the way to the nearest train station.

In 2006 to 2007, The Nielsen Company rolled out a method to research exactly this (Deflandre, 2009); it was called MyScan, and consisted of a small keyring barcode scanner and booklet of barcodes. Whenever a panel member would buy an item for impulse consumption, he would scan the barcode of the item, and a few other barcodes from the booklet to describe the details of the purchase. The keyring barcode scanner would then be connected to a personal computer and the data uploaded via a website. According to Deflandre (2009), the reason for the discontinuance of this data collection methodology was due to the high cost of implementation and relatively low revenue for such a specialised product.

2.3.2.3 A financial comparison of data collection methods

Appendices C and D show a financial model created to highlight some of the financial differences between the data collection methodologies. The model highlights three important financial differences between the two predominant data collection methodologies: in-home scanner and diary / bin using in-home interviewer visits.

2.3.2.3.1 *Start-up costs*

The first observation from the model is that the start-up cost of an in-home data collection methodology is much higher than that of a diary / bin methodology. This is mainly due to the fact that each household needs to be equipped with a barcode scanning terminal. Although, in full operation, the manual panel will quickly catch up this cost in labour, it lacks the high initial start-up costs of the in-home scanner methodology.

2.3.2.3.2 *Labour versus asset costs*

The second observation is that, although the manual panel costs less to start-up, it quickly accumulates to roughly the same cost, the difference being that most of the cost is due to the high labour cost that is translated into high operational costs. Because the cost of manual panels is mainly due to labour, it is still very profitable in places with low labour costs, especially in hard to reach rural areas with low

technology penetration. From the graph in Appendix D, it can be seen that in this scenario there is very little cost advantage between the two main data collection methodologies.

2.3.2.3.3 *Translated savings from discounted barcode terminals*

The third observation highlights the savings that would be had if the barcode terminals are discounted. In this scenario comparison (A versus B) it is shown that a 20% discount in the price of a barcode scanner only translates to an 8% and 1% discount in total cost of the in-home and manual data collection methodologies respectively. This is very significant, in that this is usually the first place where cost savings are to be searched for by a non-experienced observer when trying to cost-optimize the data acquisition in consumer panels.

2.3.2.4 Characteristic comparison of data collection methods

In looking at the data collection discussion this far, it is easy to compile the characteristics of the different data collection methodologies.

Table 2.1: Characteristic comparison of data collection methodologies

	In-home scanner	Diary / bin with in-home interviewer visits	Cash slip
Quality of data	Data is captured directly on the audit device with very little manual interventions. Very Good	Data is first captured on paper by the panel member and then by the interviewer, therefore introducing extra room for error. Good	Cash slips are digitally processed, captured and manually checked. Very Good
Audit frequency and delay	Data is sent to a central server immediately after capture without any delay. Very Fast	Panellists are audited monthly or fortnightly therefore introducing a long delay. Very Slow	Panellists send in their cash slips weekly or fortnightly introducing a delay. Slow
Expected technology literacy	The panellist needs to capture all the data himself and the infrastructure to submit the data. High	The panellist needs to write down some details about the purchases which can easily be copied from supplied materials. Low	The panellist is only expected to collect the cash slips from the retailers, place it in a supplied envelope and mail it. None

Table 2.1 (continued)

Cost of barcode terminal	The barcode terminal is very basic, does not need a lot of memory and does not need to be very robust. Low	The barcode terminal is used for multiple households in varying conditions. High	No barcode terminal is used. None
Panel start-up cost	Each household is supplied with a barcode terminal. Very High	Interviewers and audit materials are needed. High	The household is only supplied with empty postage-paid envelopes. Very Low
Labour cost	No interviewers are used, labour is limited to panel management and support. Low	Interviewers need to visit the households on a regular basis. Very High	No interviewers and no helpdesk support. Very Low
Impulse purchase coverage	The barcode terminal, although portable, is really not meant to be carried around. No	No way to audit impulse purchases. No	If cash slips are provided with impulse purchases it is possible. Possible
Dependent on retailer co-operation	Data capturing is done in-home, so no retailer co-operation is needed. No	Audits are done by in-home interviewers. No	Total dependence on the retailers printing all the needed information on the cash slips. Yes

2.3.3 Panel management

In managing a consumer panel, several tasks can be identified:

2.3.3.1 Helpdesk support

Due to the level of competency needed in in-home scanning panels, it is necessary to provide technical assistance to the panel members. This can vary from technical difficulties with the barcode scanning terminal or with the phone connection that is needed for the data communication. This communication channel is also used to update the panel member with his loyalty points status and reminders in the case that the panel member becomes unresponsive. The panel member can use the helpdesk to request panel termination or update demographic data.

2.3.3.2 Loyalty compensation

To improve panellist cooperation, panellists are compensated for their participation. It

is not normal to pay panellists directly; rather, they should be compensated by surprise gifts, prizes, competitions and accumulate points that reward regular participation. It is important to make the panellist feel as a member of a team and that his input is used to improve the products and services of retailers and manufacturers (Kent, 1993:152). A very effective way to accomplish this is by keeping the panellist informed using a newsletter to communicate developments and success stories.

2.3.3.3 Demographic data updates

It is normal for a participating household to change demographically, and it is necessary to keep this information up-to-date to ensure the household represents the correct segment in the population. The panellist should be given the ability to quickly and easily update his demographic information either by using an on-line service, by phoning the helpdesk or completing an update-questionnaire attached to the newsletter.

2.3.3.4 Panel balancing

The population that is represented by the panel is ever changing and with that the panel should also be changing (Kent, 1993:152). To balance the panel, it is often necessary to terminate some households and recruit new ones; this is called panel turnover and should always be kept to a minimum to ensure data continuity (Birn, 2000:238).

2.3.4 Termination

Panellist termination is the last step in the panel member lifetime. In order to keep the panel balanced, it is often necessary to terminate some panel members and recruit new ones. Some panel members might choose to no longer be part of the research panel and therefore willingly terminate; others might be terminated because they fail to report or fail to perform some of the necessary tasks (Kent, 1993:153). It is always useful to ask the panel members to complete an exit survey on termination and thereby improving the panel membership experience and to ensure that these dropouts are not behaviourally different and thereby affecting the total panel results (Birn, 2000:238).

2.4 REQUIREMENTS FOR A DATA COLLECTION DEVICE

In Section 2.3.2, the data collection methodologies were discussed as well as the role of the data collection device in those methodologies. Hence, the requirements of the data collection device can now be identified.

2.4.1 Scan item barcodes

To assure the accurate capturing of product identification, it is absolutely imperative that the data collection device has the ability to scan the product barcode (Birn, 2000:241). The accurate capture of the item barcode together with an item master database, maintained by the marketing research company, will ensure the correct item identification (Ruff & Kirsche, 2005:297). To assure the effective identification, the data collection device needs to scan item barcodes in various shapes and sizes as printed on the various surfaces. Special care also needs to be taken to ensure the successful scanning in various lighting conditions that the panel member might find himself in when scanning the barcodes.

2.4.2 Capturing of purchase information

Some details about the purchase need to be captured. It is usually only short numbers like the quantity of items purchased, the price paid or a selection from a list of stores where the item was purchased (Avasarikar & Chordiya, 2007:4-5). Seeing that text entry will not be required, the capture of this information can be done from a simple numerical keypad; a full keyboard is not necessary.

2.4.3 Data communication

After the data is captured by the panel member it needs to be electronically communicated to the market research company where it will be validated and processed (Birn, 2000:241). Today, many data communication methods are used; the choice is usually dictated by the availability of the infrastructure and the cost of using the medium in question. The ability to transmit data is not only a requirement from the device but is also dependent on the existence of the necessary

infrastructure to make this communication possible. It is therefore as important that a good communication infrastructure exists as it is for the device to be able to use such an infrastructure.

2.5 MOBILE PHONE DATA COLLECTION

In Section 2.4 the requirements for a data collection device were identified. This section evaluates whether a mobile phone meets these requirements.

2.5.1 The definition of an item barcode

GS1 is the global organisation responsible for the design and implementation of the global standards for marking trade items (Anon., 2009e). It is the requirement of GS1 that fixed measure trade items in an open supply chain, as is the case with fast-moving consumer goods, be marked with a unique Global Trade Item Number (GTIN) in a bar code symbol of the EAN/UPC family. (Anon., 2009d:21-22). This is the linear stripe barcode found on consumer goods. It should be noted however that the GS1 organisation is planning to add more code symbols to the marking of fixed measure trade items by adding the GS1 Databar Symbologies in 2014 (Anon., 2009c:1).

2.5.2 Mobile phone barcode scanning

In 2007, Robert Adelman demonstrated that it is possible to recognise linear barcodes of the EAN/UPC family using a mobile phone equipped with a camera and a barcode recognition algorithm. Adelman imposed a further restriction by adding that it is a functional requirement of the recognition algorithm that the phone should have auto focus or a macro mode (the ability to focus close to the camera lens). Camera phones without auto focus are configured by the factory to focus on infinity (Chandler, 2009) and therefore need the addition of a macro lens to focus on an item barcode (Adelman, 2007). A further restriction observed by Adelman (2007) is the exposure of the necessary application programming interface (API) by the mobile phone operating system. This is necessary for the barcode recognition algorithm to get access to the pictures taken with the phone camera.

To summarise, through the research of Robert Adelman, it is possible for a mobile

phone to recognise a barcode if the following requirements are met:

- It is equipped with an internal camera.
- It has the ability to auto-focus or is equipped with a macro lens.
- The operating system exposes access to the camera via an application programming interface (API).

If these requirements are met, it is possible for a barcode recognition algorithm to recognise a barcode using a mobile phone; therefore, the first requirement for a mobile phone to be used for data collection device is met.

Several successful implementations of linear barcode scanning have been done; one such implementation is called ShopSavvy, and by installing the software, it gives the consumer the ability to compare prices of the item that was scanned from several competing internet outlets (Anon., 2009k). In a report on the use of ShopSavvy (Anon., 2009j) it is shown that during its first five months in operation in the United States they have gained 1 million+ users and had 2.8 million+ downloads of their barcode scanning application. Alexander Muse, co-founder of Big in Japan and owner of the ShopSavvy service, however, mentions that grocery data has been a challenge for them and mentions that 25% of their ShopSavvy users have scanned over a million grocery items with limited success over the past year (Cian, 2009).

2.5.3 Capturing of purchase information

The data captured by panel members is needed to add detail about the item purchased, like the price and quantity, and where the item was purchased. The former is done by entering a number from the keypad and the latter is done by selecting an outlet or banner from a predetermined list. As indicated by Loudon (2009), data collection projects with mobile phones have become abundant and very effective. It is further indicated how quickly and easy the text messaging culture has taken off, and how a mobile phone can successfully be used for capturing data or entering text (Ehrlich, 2005). This indicates how quickly and easy data can be captured using a mobile phone and therefore fulfills the second requirement for a mobile phone to be used as a data capturing device in consumer panels.

2.5.4 Data communication

To ensure data communication on a mobile phone, it is necessary that both the handset and the communication infrastructure support a means for the data to be transmitted. GSM (Global System for Mobile communications) has become the most popular standard for mobile phones around the world and makes up more than 80% of all connections worldwide (Anon., 2009g). In 2000, the GSM specification was amended and added the facility to carry data as well as voice on GSM networks (3GPP, 2009a). This meant the addition of GPRS (General Packet Radio Service) which would soon be followed with faster data communication standards such as EDGE (Enhanced Data rates for Global Evolution) and 3G (3rd generation networks).

2.5.4.1 Mobile phone data communication

It is hard to find up to date per country penetration data for mobile phones that support GPRS or better. According to Verclas (2008), 80% of mobile phones globally are 2G (second generation) or 2.5G GSM phones and will improve as 3G technology becomes cheaper. This means that 80% of mobile phones at least support the GPRS protocol which, on a GSM network, is the most basic requirement for data communication.

2.5.4.2 Data communication infrastructure

According to the Global mobile Suppliers Association (GSA), the GSM/EDGE network is available in 181 countries around the world (Anon., 2009f) and provides data communication facilities for 850 million users (Anon., 2009b).

From this, it can be concluded that most mobile phones in use today have both the capability and infrastructure to transfer data, therefore completing the third and final requirement for a mobile phone to be used as a data collection device.

2.6 THE USE OF MOBILE PHONES FOR DATA COLLECTION IN CONSUMER PANELS

In this section, the practical implications of using a mobile phone for data collection in consumer panels will be studied. The lifecycle of the panellist will be used, and the impact of using the mobile phone will be studied for each step.

2.6.1 Recruitment

When relying on a panel member to use his own mobile phone for data collection, a few extra requirements are introduced on top of the current, already strict, requirements in the recruitment process:

- The panel member must have a compatible phone, specifically, a phone that is equipped with a camera, autofocus lens and the ability to run the required audit software.
- For the phone to send the captured audit data back to the research company's central server, the panel member must have the required data communication infrastructure available at his normal place of residence.
- It is particularly important to ensure the main shopper always has the ability to capture the shopping items after a shopping trip. The compatible phone must therefore be the property of the main shopper in the household. This requirement is not observed with the in-home scanner methodology because the audit terminal is shared by all the household members.

Birn (2000:235) observes that recruitment rates of panel research are very low and depends on the difficulty of the task and the value of the incentive offered. With the addition of the abovementioned requirements, it could be imagined that the successful recruitment rates will be much lower and therefore also more expensive. The successful recruitment rates should, however, improve over time as the required technology becomes more pervasive.

Because the mobile phone is already the property of the prospective panel member, it would therefore not be necessary to send an audit kit (barcode scanning terminal, phone modem, charging station and operating manual) to the panel member. Rather,

a download link will be sent to the mobile phone which will allow the panel member to install the audit software. Eliminating the logistical costs and risks associated with using a supplied barcode scanning terminal is a big benefit to a research company, not to mention the capital that would be spent on purchasing the terminals and the depreciation annually as indicated on the financial model in Appendix C.

2.6.2 Data collection

Data collection will be done with the mobile phone already in possession of the panel member and automatically communicated back to the central server. To ensure the loyal participation of the panel member to the research panel, it should be a priority to make the audit process as little intrusive as possible. Therefore, a few design considerations should be observed.

- The audit procedure should be quick and effortless by making the barcode recognition algorithm as efficient as possible, not only performing well in low light, but also with irregular surfaces and various package shapes.
- In order to speed up the audit process, as little manual inputs should be done as possible.
- The audit software should not interfere with the workings of the mobile phone by draining the battery or intruding with received phone calls.
- The panel member should be assured that all his personal details will be kept confidential.
- The panel member should be assured that he will be compensated for all the data communication expenses incurred with the use of the audit software.

One of the benefits of using the mobile phone as a data collection device is that people usually carry their mobile phones with them, therefore it could also be used to capture impulse purchases that are notoriously hard to observe as described in section 2.4.2.4.

2.6.3 Panel management

All the panel management tasks will remain the same. Panellists would still need helpdesk support if they have queries surrounding the use of the audit application or

technical difficulties. As a motivational tool for contributing to the panel, loyalty incentives would need to remain intact. Panellists would still need to update their demographic changes and panel balancing will still occur as the demographic groups within the panel become under or over representative.

2.6.4 Termination

Ending the participation from the research panel would be a very simple task. A phone call or a function in the audit software would inform the research company that the panel member no longer wants to take part in the research panel. There would be no logistical costs or risk of losing or damage to the barcode terminal. Termination will then eventually lead back to recruitment to compensate for an under representative demographic, thereby completing the panellist lifecycle.

2.7 CHARACTERISTICS OF DATA COLLECTION METHODOLOGIES – REVISITED

The table below revisits the characteristic review of the two most popular data collection methodologies and compares it to a mobile phone data collection methodology. It should be noted, that in all categories the Mobile Phone data collection methodology is either equal or better performing than the two current data collection methodologies.

Table 2.2: Characteristic comparison of data collection methodologies – revisited

	In-home scanner	Diary / bin with in-home interviewer visits	Mobile phone
Quality of data	Data is captured directly on the audit device with very little manual interventions. Very Good	Data is first captured on paper by the panel member and then by the interviewer, therefore introducing extra room for error. Good	Same as in-home scanner, as there should functionally be no difference in what is captured Very Good
Audit frequency and delay	Data is sent to a central server immediately after capture without any delay. Very Fast	Panellists are audited monthly or fortnightly therefore introducing a long delay. Very Slow	Same as in-home scanner Very Fast

Table 2.2 (continued)

Expected technology literacy	The panellist needs to capture all the data himself and the infrastructure to submit the data. High	The panellist needs to write down some details about the purchases which can easily be copied from supplied materials. Low	It could be argued that the familiarity of a person with his own mobile phone could improve the learning curve Low
Cost of barcode terminal	The barcode terminal is very basic, does not need a lot of memory and does not need to be very robust. Low	The barcode terminal is used for multiple households in varying conditions. High	Panel member's own phone being used, therefore no cost. None
Panel startup cost	Each household is supplied with a barcode terminal. Very High	Interviewers and audit materials are needed. High	After the infrastructure is in place, there is no per panellist start-up cost. None
Labour cost	No interviewers are used, labour is limited to panel management and support. Low	Interviewers need to visit the households on a regular basis. Very High	Same as in-home scanner, limited to panel management and helpdesk support Low
Impulse purchase coverage	The barcode terminal, although portable is really not meant to be carried around. No	No way to audit impulse purchases. No	It could be assumed that a person usually carries his phone with him and in that case can very well audit impulse purchases. Yes
Dependent on retailer co-operation	Data capturing is done in-home, so no retailer co-operation is needed. No	Audits are done by in-home interviewers. No	Data capturing is done independent of retailers No

2.8 SUMMARY

In this chapter, the concept of a consumer research panel was introduced as a method to study the behaviour of consumers. The lifecycle of a panellist was found to consist of four steps:

- Recruitment;
- Data collection;
- Panel management; and
- Termination.

Attention was given to data collection and identifying the current data collection methodologies, the most popular of which are:

- Manual diary / bin; and
- Electronic in-home scanning.

Both of these methodologies are shown to be prohibitively expensive to operate because of the expenses related to either the labour or the data collection devices. Further shortcomings in each of the methodologies were pointed out and in order to find a more affordable and effective solution to data collection, the data capture devices were studied, identifying the core requirements:

- Barcode scanning;
- Manual data capturing; and
- Data communication.

The mobile phone was then studied as a possible replacement for a data collection device and found to be theoretically capable of being used if the above requirements are observed in practice. It therefore dictates the research objectives to indicate that:

- The technology of using a mobile phone as a barcode recognition device is mature enough to be used in an everyday audit scenario.
- The necessary prevalence of said technology and the infrastructure needed to do the required data communication while still observing the required representative demographics are needed in a research panel.
- What the people's willingness is to embrace the methodology in practice.

Finally, this chapter provided the literature study on consumer panels and specifically data collection. The next chapter discusses the research methodology used in the empirical research.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

In this chapter, the research methodology for each of the three research objectives is specified. All the studies were conducted by The Nielsen Company. Nielsen is the world's #1 market research firm and monitors consumer habits in the retail and media arenas around the globe on behalf of its customers, which include leading retailers and makers of consumer packaged goods. Active in more than 100 countries, the company's major business segments include retail measurement services (ScanTrack), household consumer panels (Nielsen Homescan), and media measurement giant Nielsen Media Research (Anon., 2009). External sources were consulted for the technology prevalence and data communication coverage.

3.2 RESEARCH METHODOLOGY

3.2.1 Secondary study – assessing the technology maturity of scanning barcode with a mobile phone

To assess the technology maturity of using a mobile phone to scan a barcode, two studies were consulted. Both these studies were conducted by The Nielsen Company to determine the technology prevalence and maturity.

3.2.1.1 Technology pilot in Israel – 2007

The study was conducted by Julia Nilov-Alush (2009) in Israel for The Nielsen Company. Some 85 panel members from the consumer panel were interviewed and 38 household agreed to participate in the study. None of these panellists had any experience scanning barcodes with a mobile phone before; they were all part of the cash-slip-based methodology. Nielsen provided the mobile phones to the panellist and covered all data expenses. Panellists could use the mobile phone at 35% discount on voice calls and sms's. The panellists were also further incentivised with

extra loyalty points on their current panel membership. The panellists were asked to enter the quantity and promotion of all consumer goods purchased. Price was required only when not shopping at a list of favourite shops. Additionally, ten panellists were asked to record all fresh fruit and vegetable purchases. The mobile phone provided was a Nokia 6680 equipped with a swivel-attached macro lens. The study was done from 20 February 2007 until 3 June 2007.

Table3.1: Technology pilot in Israel – characteristics of the study

Item	Category	Frequency	Percentage
Language	Hebrew	24	63%
	Russian	14	37%
Demographics	Middle-aged singles 35-64	2	5%
	Older singles 65+	3	8%
	Middle-aged couples (the oldest is 35-64)	5	13%
	Older couples 65+	2	5%
	Families with grown-ups (youngest child aged 18-30)	2	5%
	Families with teenagers (youngest child aged 13-17)	6	15%
	Families with kindergarteners (youngest child aged 6-12)	4	10%
	Families with kindergarteners (youngest child aged 3-5)	7	18%
	Families with babies (youngest child 0-2)	6	15%
	Young singles, couple-singles or couples without kids	2	5%

3.2.1.2 Barcode recognition assessment study – 2009

The study was conducted by Koos van Staden for The Nielsen Company. The study consisted of two parts: the first was to establish how many of the most popular camera phones from the popular manufacturers could scan a barcode. Because this study is relevant to the second research objective, it will form part of the next section. The second part of the study was used to determine the technology maturity of the phones and software provided by several vendors. The study was conducted among seven employees of The Nielsen Company; each was given one of nine phones installed with barcode recognition software from seven different vendors along with a

set of instructions and questionnaires (Appendix E). Each person was equipped with a stopwatch and was to find ten barcoded items and scan the barcodes in various light conditions with the software from the various software vendors. The person would write down the results and impressions of each test. The test was conducted between 29 November 2008 and 30 March 2009, during which a total of 128 test results were received.

The characteristics of the study are indicated in Table 3.2, which shows the tests were evenly distributed among seven people without any prior barcode scanning experience with a mobile phone. The manufacturers were over represented by Nokia at 86% of the tests. Most of the tests (64%) were done on two particular Nokia phone models, being the N79 and N96 at 31% and 33% respectively. Only seven of the tests were done with a macro lens, which supports a strategy where the use of macro lenses is not encouraged. The tests were well spread among different types of light, surface shape, surface type, surface condition and barcode condition. The number of items scanned in a test was concentrated between 5 and 15 items.

Table3.2: Barcode recognition assessment study – characteristics of the study

Item	Category	Frequency	Percentage
Auditors	Amanda	8	6%
	Annelie	16	12%
	Benny	17	13%
	Desiree	27	21%
	Koos	31	24%
	Max	18	14%
	Ria	12	9%
Manufacturers	Apple	6	5%
	HTC	12	9%
	Nokia	111	86%
Phones	Apple iPhone	6	5%
	HTC Touch Diamond	7	5%
	HTC Tytn II	5	4%
	Nokia 6120	1	1%
	Nokia E71	6	5%
	Nokia N73	14	11%
	Nokia N79	40	31%
	Nokia N95	8	6%
	Nokia N96	42	33%

Table3.3 (continued)

Software vendor	3G Vision	45	35%
	Barcorama	2	2%
	Neoreader	4	3%
	QuickMark	33	26%
	Symlink	9	7%
	UPCode	35	27%
	Zxing	1	1%
Macro lens used	No	122	95%
	Yes	7	5%
Type of light	Fluorescent	64	50%
	Incandescent (normal bulb)	14	11%
	None (Ambient Sunlight)	32	25%
	Power saver	19	15%
Surface shape	Flat surfaces	31	24%
	Random surfaces	70	54%
	Rounded surfaces	28	22%
Surface type	Dry / normal surfaces	56	43%
	Random surfaces	53	41%
	Wet / frozen surfaces	20	16%
Surface condition	Dull / matt	18	14%
	Random surfaces	97	75%
	Shiny / gloss	14	11%
Barcode condition	Bad	1	1%
	Good	19	15%
	Random	37	29%
	Very Good	72	56%
Number of items	less than 5	21	16%
	5 and less than 10	60	47%
	10 and less than 15	34	26%
	15 and less than 20	7	5%
	more than 20	7	5%

3.2.2 Secondary study – assessing the prevalence of the required phones as well as the needed communication infrastructure

To assess the prevalence of the required phones and the need infrastructure for data communication, one study and two external sources were consulted.

3.2.2.1 Barcode recognition assessment study – 2009

The study was conducted by Koos van Staden for the Nielsen Company in February 2009. Using the statistical data from an internet source called GetJar.com, the top 2 to 3 most popular camera equipped phones (Table 3.3) from the large manufacturers were selected. The barcode recognition software from seven different vendors was then installed on the phones to determine if the phone has the ability to scan barcodes using the software available at that stage.

Table 3.4: Barcode recognition assessment study – phones used in the study

Manufacturer	Model
Apple	iPhone
Nokia	6120 classic E71 N73 N79 N95 N96
HTC	Touch Diamond Tytn II
Motorola	RAZR2 V9
Samsung	E250 D900i
Sony-Ericsson	K850i W910i W760i

Table 3.4 shows the characteristics of the study, comparing it to market share data retrieved from GetJar.com to indicate the representativeness of the sample. The small size of the sample means it is not 100% representative.

Table 3.5: Barcode recognition assessment study – characteristics of the study

Item	Category	Frequency	Percentage	Market Share (GetJar)	
				Global	South Africa
Phone manufacturers	Apple	1	7%	0.1%	0.0%
	Nokia	6	40%	48.9%	50.8%
	HTC	2	13%	0.4%	0.2%
	Motorola	1	7%	2.3%	4.9%
	Samsung	2	13%	7.8%	12.1%
	Sony-Ericsson	4	27%	16.6%	17.4%

3.2.2.2 Phone prevalence – source: GetJAR

GetJAR (www.getjar.com) is a website where software developers post mobile phone applications that can then be downloaded free of charge by mobile phone users. GetJAR gathers the details of the phones used when downloading the software and makes this statistical data freely available for download (Anon., 2009o), broken down in geographical location and phone manufacturer / model. The statistical data is a good representation of internet capable mobile phones. Only results for South Africa are presented.

3.2.2.3 Data communication infrastructure

The study will focus on the data communication infrastructure available in South Africa, more specifically Gauteng. All the mobile phone providers in South Africa make use of the infrastructure of two companies (MTN and Vodacom). The mobile phone coverage maps of these two companies are presented.

3.2.3 Assessing the prevalence of the required technology and willingness to participate in a mobile phone-based research panel

This study was conducted in South Africa by The Nielsen Company under the supervision of the Consumer Panel Services Operations Assistant, Amanda Hapgood-Strickland, in September 2009.

The study was performed among 168 people in Gauteng, conducted by several field auditors. None of these respondents had any experience scanning barcodes with a mobile phone before. The respondents were not incentivised for their participation to the study. Each field auditor was given the audit materials in Appendix B and equipped with one of three mobile phones (Nokia N73, N79 and a N96) on which barcode recognition software were installed. Instructions were added, showing the auditors how to operate the mobile phone and demonstrate the barcode scanning abilities (Appendix B).

The auditors were asked to visit their allocated panel members selected from the upper LSM groups in their respective territories. They were also asked to supplement

the study by interviewing some of their friends and family. Arriving at the premises of the respondent, the auditor was asked to demonstrate the barcode scanning capabilities of the mobile phone thereafter observing the panel member trying it out for himself and afterwards asking some questions from the research material presented in Appendix B.

The demographic information of each panel member was maintained by The Nielsen Company from the questionnaire in Appendix F. The demographic information of each household was linked using the panel member identification number on the questionnaire in Appendix B.

The characteristics of the study are shown in Table 3.5. Observe a 50:50 split in panel members and friends / family. Also of note is that the study was only conducted among upper-LSM households, as indicated by the spread in household LSMs. The study was well presented geographically in Gauteng, with the exception of five respondents which were outside the border.

Table3.6: Panel member interviews – characteristics of the study

Item	Category	Frequency	Percentage
Interview type	Friends / family	86	51%
	Panel member	82	49%
LSM (Panel members only)	LSM 4	1	1%
	LSM 5	4	5%
	LSM 6	1	1%
	LSM 7 H	3	4%
	LSM 8 L	2	2%
	LSM 8 H	12	15%
	LSM 9 L	5	6%
	LSM 9 H	12	15%
	LSM 10 H	12	15%
	n/a	30	37%

Table 3.7 (continued)

Town (Panel members only)	BENONI	1	1%
	CARLETONVILLE	2	2%
	FOCHVILLE	4	5%
	JOHANNESBURG	10	12%
	KRUGERSDORP	7	9%
	MEYERTON	1	1%
	MIDVAAL	1	1%
	MODIMOLLE	2	2%
	PRETORIA	8	10%
	RANDFONTEIN	5	6%
	RANDVAAL	2	2%
	ROODEPOORT	6	7%
	RUSTENBURG	1	1%
	SANDTON, JOHANNESBURG	1	1%
	SASOLBURG	4	5%
	VANDEBBIJLPARK	12	15%
	VEREENIGING	8	10%
WESTONARIA	7	9%	
Urban / Rural (Panel members only)	Rural	1	1%
	Urban	81	99%
Household members (Panel members only)	1	9	11%
	2	35	43%
	3	26	32%
	4	8	10%
	5	3	4%
	6	1	1%

3.3 SUMMARY

In this chapter, the research methodology for each of the three research objectives was specified. Two of these studies were performed by The Nielsen Company, to demonstrate the technology maturity and technology prevalence globally. External sources were used to demonstrate to some part the technology prevalence and the data communication coverage and were localized to South Africa. The last study was performed by The Nielsen Company to assess the practicality of implementing a mobile phone-based audit methodology in Gauteng, South Africa, thereby culminating the previous studies, but focusing it on a specific geography and demography. Table 3.6 indicates the number of observations dedicated to each research objective.

Table3.8: Summary – observations per study

Study	Objectives		
	Technology maturity	Prevalence and infrastructure	People's acceptance
Israel pilot	1	***	***
Barcode test	2	1	***
GetJar source	***	1	***
Mobile coverage maps	***	1	***
Questionnaire – South Africa	1	2	7
Global	3	2	
South Africa only	1	3	7
Total	4	5	7

Finally, this chapter provided the research methodology for each of the three research objectives. The next chapter presents the results of the empirical studies divided into the three research objectives.

CHAPTER 4: RESEARCH RESULTS

4.1 INTRODUCTION

In this chapter, the results of five studies are presented. These results address the three research objectives of the study.

4.2 RESULTS

4.2.1 Secondary study – assessing the technology maturity of scanning barcodes with a mobile phone

4.2.1.1 *Technology pilot in Israel – 2007*

The study held in 2007 concluded that, by using the Nokia 6680 mobile phones it took the panel member roughly one minute to scan one item. The results are indicated in the table below.

Table4.1: Technology pilot in Israel – time to scan 20 items

Statistics	Minutes
Average time to scan 20 items	24.68
Median time to scan 20 item	20.00

4.2.1.2 Barcode recognition assessment study – 2009

The barcode recognition assessment study ending in March 2009, concluded an average scan time of 15 seconds per item for all software tested. Furthermore, the study also concluded that 93% of items' barcodes could successfully be recognised by the test phones. The best in class performances are also indicated in Table 4.2 as an average of eight seconds for the software provided by Symlink and a 95% successful recognition rate by the software from 3G Vision.

Table4.2: Barcode recognition assessment study – scanning times/ success rates

Statistic	All vendors		Best in class	
	Per item scan time (mm:ss)	Success rate (%)	Symlink	3G Vision
			Per item scan time (mm:ss)	Success rate (%)
Sample size	127	127	8	44
Average	00:15	93%	00:07	95%
Standard deviation	00:12	15%	00:01	10%
Confidence level	95%	95%	95%	95%
Confidence interval - Lower limit	00:13	91%	00:05	92%
Confidence interval - Upper limit	00:17	96%	00:08	98%

4.2.2 Secondary study – assessing the prevalence of the required phones as well as the needed communication infrastructure

4.2.2.1 Barcode recognition assessment study – 2009

The results from the study, indicated in Table 4.3, conclude that 9 out of the 15 phones in the test were able to scan a barcode, which translates to a 60% success rate. If the sample is representative of all phones, it implies that 60% of all phones have the capability of scanning a barcode.

Table 4.3: Barcode recognition assessment study – results

Manufacturer	Model	Scan success
Apple	iPhone	Yes
Nokia	6120 classic	Yes
	E71	Yes
	N73	Yes
	N79	Yes
	N95	Yes
	N96	Yes
HTC	Touch Diamond	Yes
	Tytn II	Yes
Motorola	RAZR2 V9	No
Samsung	E250	No
	D900i	No
Sony-Ericsson	K850i	No
	W910i	No
	W760i	No

4.2.2.2 Phone prevalence – source: GetJAR

The results from GetJar.com for September 2009, indicated in Table 4.4, show that 46% of the phones representing 70% of the South African market could scan a barcode, therefore representing 65% of the total internet capable phone market in South Africa. This percentage corresponds well with the barcode recognition assessment study (60%) and is 2% below the global capability of 67% of phones capable of scanning a barcode. To represent the total population in South Africa, two things must be considered. According to ITWeb Cellular (Anon., 2008), the mobile phone penetration in South Africa is 83% and 80% of all phones are internet capable (Verclas, 2009). To get the GetJar results as a percentage of the population rather than the internet capable phone using market, it would therefore have to be multiplied by 66% (83% x 80%), then giving a population adjusted barcode scanning phone penetration of 43%.

If the study is correct, it implies that 43% of the South African population will have a mobile phone capable of scanning a barcode.

Table 4.4: Barcode scanning phones South Africa and global (GetJar)

Result	South Africa	Global
Phone models	97	157
Total market share	70%	70%
Barcode scanning capable	46%	47%
Percentage of total market	65%	67%
Percentage of total population	43%	

4.2.2.3 Data communication infrastructure

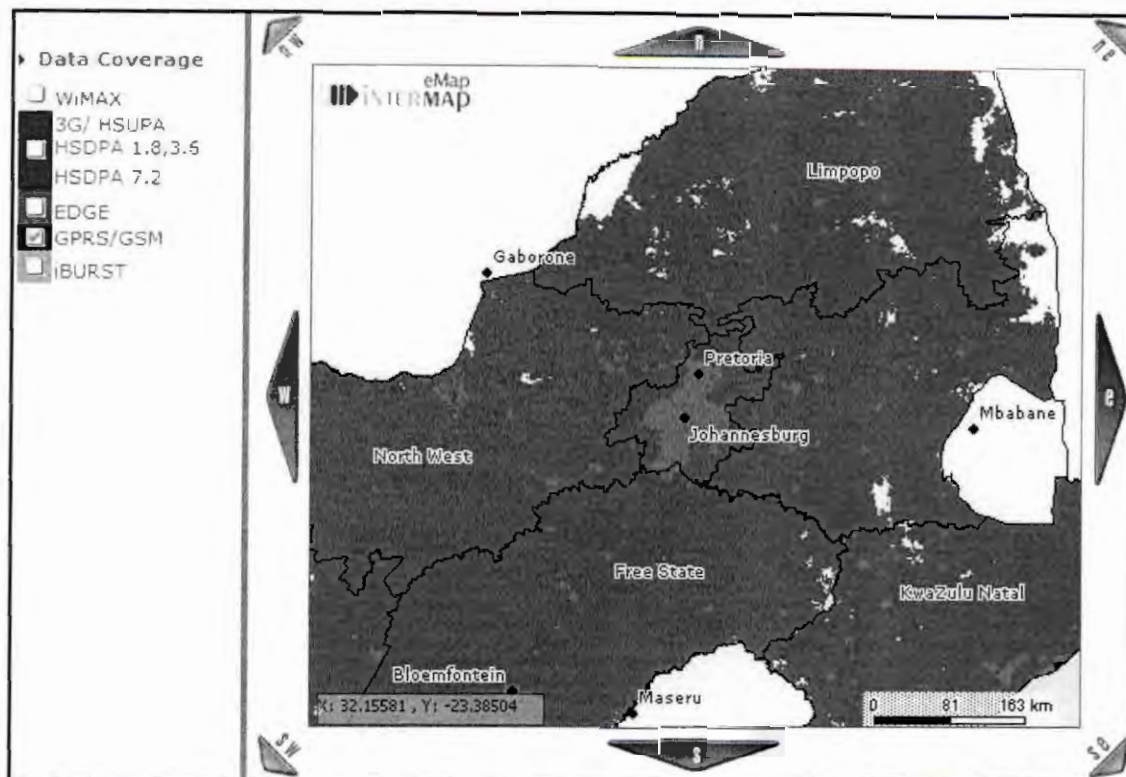
The MTN website provides the coverage map as indicated in Chart 4.1, showing a 100% GPRS data coverage for Gauteng. In Chart 4.2, this is similarly indicated by Vodacom at 100% GPRS data coverage for Gauteng.

Chart 4.1: MTN data coverage map



Source: (Anon., 2009h)

Chart 4.2: Vodacom data coverage map



Source: (Anon., 2009m)

4.2.3 Assessing the prevalence of the required technology and willingness to participate in a mobile phone-based research panel

The results of the interviews with panel members and family / friends are split into three sections. Thereafter the results of two subgroups are presented, the participation details of those who are willing to participate and the concerns of those who do not want to participate in a mobile phone-based research panel.

4.2.3.1 Observations about reception and phones – all respondents

All the interviews received where a data coverage observation was made, established that a mobile data connection infrastructure was available, three non-completes were received and ignored. Therefore, 100% data coverage was observed of which 86% was a high speed 3G connection. In 29% of the cases, the phone model was not observed, which concludes that the observational method used is not sufficient and an electronic observational method would be advised in the future. This

of course has an impact that 12% of the phones could not be classified as being able to scan a barcode or not. Some 39% of the phones observed were found to be barcode scanning capable; this is slightly less than the percentages from GetJar (43%). The phone manufacturers represented in the study, agree well with the percentages given by GetJar in Table 3.4.

Table 4.5: Data coverage and phone details – all respondents

Item	Category	Frequency	Percentage
Data coverage	3G	144	86%
	No 3G	21	13%
	n/a	3	2%
Phone model known	Known	120	71%
	Unkown	48	29%
Compatible phone	Yes	66	39%
	No	82	49%
	Undetermined	20	12%
Phone brand	LG	10	6%
	Motorola	9	5%
	Nokia	95	57%
	Samsung	36	21%
	Sony	2	1%
	Vodafone	11	7%
	n/a	5	3%

4.2.3.2 Participation and participation details

Of all the respondents interviewed, 81% were observed at being comfortable to scan item barcodes using the mobile phone but only 25% expressed their willingness to participate in a mobile phone-based research panel. Only 16% of respondents observed the security advantage of in-home self auditing, but were far outweighed by the 84% that disagreed and felt comfortable being audited by an interviewer on a regular basis. Only 10% of respondents perceived any benefit from value added services that could be presented by a shopping list and budget planner based on the audits made. Very little respondents had any interest in impulse (7%) and holiday (6%) participation. Only 10% of the respondents presented their interest in participating in a research panel without receiving compensation.

Table 4.6: Panel participation and details – all respondents

Item	Category	Frequency	Percentage
Person comfortable	Yes, Very	24	14%
	Yes	112	67%
	No	19	11%
	Not at all	12	7%
	n/a	1	1%
Willingness to participate	Yes, Very	1	1%
	Yes	41	24%
	No	107	64%
	Not at all	17	10%
	n/a	2	1%
Security advantage	Strongly Agree	1	1%
	Agree	26	15%
	Disagree	127	76%
	Strongly Disagree	14	8%
Value added services	Yes, Very	0	0%
	Yes	17	10%
	No	138	82%
	Not at all	12	7%
	n/a	1	1%
Impulse participation	Yes, Very	0	0%
	Yes	12	7%
	No	135	80%
	Not at all	21	13%
Holiday participation	Yes, Very	0	0%
	Yes	10	6%
	No	129	77%
	Not at all	29	17%
Without compensation	Yes, Very	0	0%
	Yes	16	10%
	No	123	73%
	Not at all	29	17%

4.2.3.3 Concerns

As much as 77% of all the respondents ranked the fear that someone would get hold of their personal information as their greatest concern when using their mobile phone to audit their consumer items. This concern was followed by a fear of a high phone

bill (74%), fear that the audit application would drain the mobile phone battery (61%) and finally the fear that they would miss an important phone call while busy using the audit application.

Table 4.7: Concerns – all respondents

Item	Category	Frequency	Percentage
Information privacy	1 (greatest concern)	129	77%
	2	22	13%
	4	0	0%
	3	5	3%
	5 (least concern)	4	2%
	n/a	8	5%
High phone bill	1 (greatest concern)	125	74%
	2	33	20%
	3	1	1%
	4	2	1%
	5 (least concern)	0	0%
	n/a	7	4%
Battery drain	1 (greatest concern)	102	61%
	2	4	2%
	3	53	32%
	4	4	2%
	5 (least concern)	2	1%
	n/a	3	2%
Miss phone call	1 (greatest concern)	93	55%
	2	5	3%
	3	2	1%
	4	56	33%
	5 (least concern)	6	4%
	n/a	6	4%

4.2.3.4 Participation details – accepted subgroup

Among the participants that expressed their interest in joining a mobile phone-based research panel, 59% agreed that they saw a security benefit from doing the audits themselves rather than an interviewer visiting the household – much higher than the total respondent group (15%). The benefit observed from extra services such as on-line shopping lists and budget calculators were perceived to be higher in this subgroup at 24% versus 10% in the total group. Likewise, the impulse and holiday

participation interest was much higher at 26% and 21% respectively from 7% and 6% in the total group. A markedly high increase (three times) in the participation without compensation was observed at 31% versus the 10% observed from all the respondents.

Table 4.8: Participation details – accepted subgroup

Item	Category	Frequency	Percentage
Security	Strongly Agree	1	2%
	Agree	24	57%
	Disagree	17	40%
	Strongly Disagree	0	0%
Value added services	Yes, Very	0	0%
	Yes	10	24%
	No	32	76%
	Not at all	0	0%
Impulse participation	Yes, Very	0	0%
	Yes	11	26%
	No	30	71%
	Not at all	1	2%
Holiday participation	Yes, Very	0	0%
	Yes	9	21%
	No	31	74%
	Not at all	2	5%
Without compensation	Yes, Very	0	0%
	Yes	13	31%
	No	27	64%
	Not at all	2	5%

4.2.3.4 Concerns – rejected subgroup

The concerns of the total group was mirrored in the subgroup not interested in participating in a mobile phone-based research panel albeit a little more exclaimed at an average of 5% higher than the total respondent group.

Table 4.9: Concerns – rejected subgroup

Item	Category	Frequency	Percentage
Information privacy	1 (greatest concern)	99	79%
	2	15	12%
	3	2	2%
	4	0	0%
	5 (least concern)	3	2%
	n/a	7	6%
High phone bill	1 (greatest concern)	97	77%
	2	21	17%
	3	0	0%
	4	1	1%
	5 (least concern)	0	0%
	n/a	7	6%
Battery drain	1 (greatest concern)	84	67%
	2	1	1%
	3	35	28%
	4	3	2%
	5 (least concern)	1	1%
	n/a	2	2%
Miss phone call	1 (greatest concern)	78	62%
	2	4	3%
	3	1	1%
	4	35	28%
	5 (least concern)	3	2%
	n/a	5	4%

4.3 SUMMARY

In this chapter, the results of five studies were presented and divided into the three research objectives. A summary of the results is presented in Table 4.10.

Table 4.10: Results summary

Research objective	Study / result	Global	South Africa	Gauteng
Assessing the technology maturity of scanning barcode with a mobile phone	Technology pilot in Israel - 2007 Average scan time per item	1 min.		
	Barcode recognition assessment study - 2009 Average scan time per item	15 sec.		
	Success rate	93%		
Assessing the prevalence of the required phones as well as the needed communication infrastructure	Barcode recognition assessment study - 2009 Barcode scanning prevalence	60%		
	Phone prevalence – Source: GetJAR Barcode scanning prevalence (population adjusted)		43%	
	Data communication infrastructure MTN data coverage			100%
	Vodacom data coverage			100%
Assessing the prevalence of the required technology and willingness to participate in a mobile phone-based research panel	Panel member interviews - 2009 Data coverage			100%
	Barcode scanning prevalence			39%
	Respondent's ability to scan barcodes			81%
	Willingness to participate in mobile panel			25%

Finally, this chapter provided the results of the empirical studies that address the three research objectives of the study. The next chapter discusses the conclusions and presents the recommendations based on the results and literature review.

CHAPTER 5:

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In this chapter, the conclusions are drawn based on the literature study from Chapter 2 and the quantitative results in Chapter 3, and recommendations are made. This chapter finally identifies areas for future research.

5.2 CONCLUSIONS

5.2.1 Assessing the technology maturity of scanning a barcode with a mobile phone

The large improvement in scanning times indicated in the quantitative studies from an average of 1 minute per item to 15 seconds per item, shows how the technology has matured in a year and a half. The successful use of barcode scanning technology is also indicated by products such as ShopSavvy which was shown to have gained 1 million+ users and had 2.8 million+ downloads of their barcode scanning application during their first five months of operation in the United States (Anon., 2009j). The robustness of the software as indicated by the 93% success rate in various conditions as well as the ease with which respondents were able to quickly and efficiently use it to scan barcodes, further backs up the conclusion that the barcode scanning technology has reached a level of maturity required to use a mobile phone as a data collection device in consumer research panels.

5.2.2 Assessing the prevalence of the required phones as well as the needed communication infrastructure

The prevalence of phones capable of scanning barcodes is a requirement that will always need to be assessed regionally. From the quantitative studies the prevalence of a barcode scanning-capable mobile phone were found to be 43% by GetJar and 39% as observed by the respondents in the South African environment among the

upper-LSM households in the study.

The requirement of the compatible mobile phone will place an extra requirement on the already low recruitment success rate of consumer panels and will have to be considered when setting up the recruitment budget for a mobile phone-based research panel. In first-world economies with higher compatible phone penetration, this could have less of an effect and will improve over time as people replace their existing phones with newer generation ones.

The data communication infrastructure, presented theoretically by the predominant mobile phone infrastructure providers were shown to cover 100% of Gauteng and was backed up by the 100% coverage shown in the quantitative study. Therefore, the data communication infrastructure in Gauteng was found not be a limiting factor to the deployment of a mobile phone-based consumer research panel.

5.2.3 Assessing the prevalence of the required technology and willingness to participate in a mobile phone-based research panel

The prevalence of the required technology was concluded in the previous section and is not repeated here. It should be mentioned that the method of identifying the mobile phone model used in this research was found not to be efficient and should be reconsidered for any further research where a mobile phone model is to be identified.

The willingness of the respondents to participate in a mobile phone-based research panel, as assessed by the quantitative study, was found to be 25%, which is very low, but not uncommon for successful recruitment rates in consumer panels which can be between 30% and 60% (Birn, 2000:235). It is, however, positive to see that the respondents that showed interest in participating in a mobile phone-based consumer research panel, were quick to realise the security benefit offered by this methodology above the in-home interviewer visit. The value of services on offer like an on-line shopping list and budget analysis tools also piqued the interest of several interested respondents at 26% and 21% for impulse and holiday purchases respectively. This interest could aid in giving some insights into the very hard to research aspects of consumer behaviour.

The willingness to participate can be greatly improved by analysing the concerns of the subgroup that did not want to participate in a mobile phone-based research panel. Respondents expressed their fears at invasion of privacy through the access of personal details on the mobile phone, followed by fears of a high phone bill, the phone battery draining quickly and missing an important phone call while using the audit application.

The final conclusion is that, even with an upper-LSM biased sample of respondents, the low prevalence of mobile phones capable of scanning barcodes, together with the unwillingness of the respondents to participate, it would be very hard and expensive to recruit a demographically balanced research panel exclusively driven by mobile phones already in the possession of potential recruits in Gauteng, South Africa.

5.3 RECOMMENDATIONS

From the conclusions in the previous section, it is clear that two areas will have to be addressed: the low technology prevalence and the unwillingness of people to participate in a mobile phone-based consumer research panel. In the following section, it is shown how a solution could be devised working around these shortcomings and also addressing some of these shortcomings.

5.3.1 Supplement existing methodologies

In the previous section, it was found that it would be hard and expensive to set up a demographically balanced consumer panel **exclusively** using mobile phones, but research showed some interest from upper-LSM households. Upper-LSM households in South Africa are already a very hard demography to recruit, a mobile phone-based research methodology could be used to **supplement** the current in-home interviewer data collection methodologies and in doing so, leveraging the upper-LSM bias and exploiting the observed security advantage of mobile phone audits versus in-home interviewer visits.

5.3.2 Increasing the perceived value

One way to improve the participation and recruitment efficiency is by increasing the perceived value of the incentives offered (Birn, 2000:235). In practice, this could be done by:

- Adding value added services like comparative shopping, which compares prices of items scanned and providing the user with more information on the item scanned like allergens and calorific value; and
- Providing a maintenance / insurance plan for the panel member's mobile phone in case of a broken, lost or stolen phone.

5.3.3 Address concerns

In studying the results from respondents, it was seen that some concerns could have been to blame for the unwillingness to participate in a mobile phone-based consumer research panel. Each of these concerns can be addressed by:

- Assuring information privacy by providing a manufacturer endorsed software certificate;
- Assuring the compensation for all data communication expenses by agreements made directly with the service providers whereby the research company is billed directly for all data communication costs incurred on the phone by the panellist and audit software;
- Minimising the battery usage during the use of the audit software and assuring the phone longevity with a phone maintenance plan provided by the research company; and
- Assuring there will be no interference with the normal operations of the phone by providing a manufacturer endorsed software certificate.

5.4 AREAS FOR FUTURE RESEARCH

5.4.1 Other geographic areas

This study concentrated on a sample based in Gauteng, South Africa – a developing

economy. Developed economies present higher mobile phone penetration and higher required technology prevalence. It would therefore benefit a market research company to conduct similar studies in developed economies to determine if and when a demographically balanced consumer research panel based on mobile phones is viable.

5.4.2 Optimising the recruitment rate by simplifying the audit task

The main driver for this study was to determine if a cheaper data collection methodology (the mobile phone) is viable. This was brought on because of the high cost percentage of the data collection activity in the operations of a consumer panel. Another high cost activity currently in consumer panel research is the loyalty compensation demanded by panel members from the perceived scale of the audit task in terms of time and complexity. It could therefore be argued, that if the time and scale of the task can be lowered, so can the needed compensation be lowered. Other data collection methodologies can be investigated, like using the loyalty cards from large retail chains to retrieve the panel member details during retail audits or the use of new technology like near field communication that could revolutionise the way electronic payments are made during consumer purchases (Near Field Communication World, 2009i).

5.5 SUMMARY

In this chapter, the conclusions were stated based on the literature study from Chapter 2 and the quantitative results in Chapter 3. Recommendations were made followed by a description of areas for future research.

The final conclusion is that, even with an upper-LSM biased sample of respondents, the low prevalence of mobile phones capable of scanning barcodes, together with the unwillingness of the respondents to participate, it would be very hard and expensive to recruit a demographically balanced research panel exclusively driven by mobile phones already in the possession of potential recruits in Gauteng, South Africa.

Recommendations were made to supplement existing methodologies rather than using mobile phones exclusively as a data collection methodology. The perceived

value of panel membership could be increased by offering additional services that could include comparative shopping and maintenance plans on mobile phones used by the panel members. The concerns identified from the respondents should be addressed to lower the perceived risks from unwilling participants.

Areas for further research were given to include other geographies with higher mobile phone penetration and higher technology penetration. Another way to reduce the costs of a consumer research panel could also be researched by optimising the recruitment rate in simplifying the audit task.

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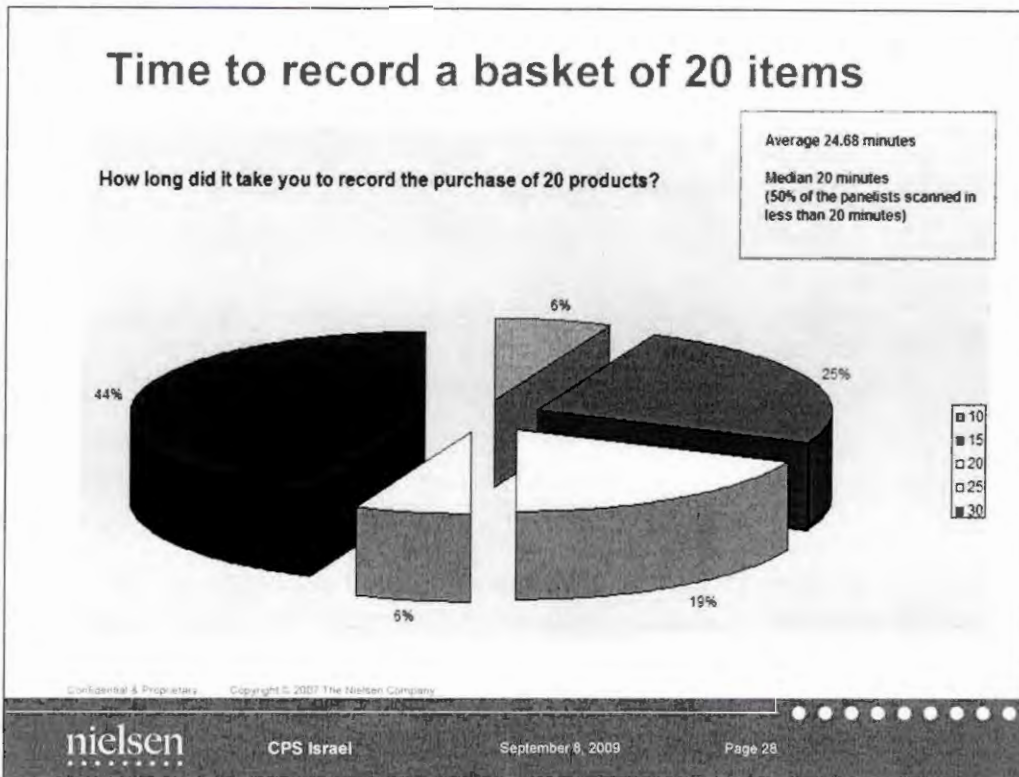


Figure A.1: Time to record a basket of 20 items

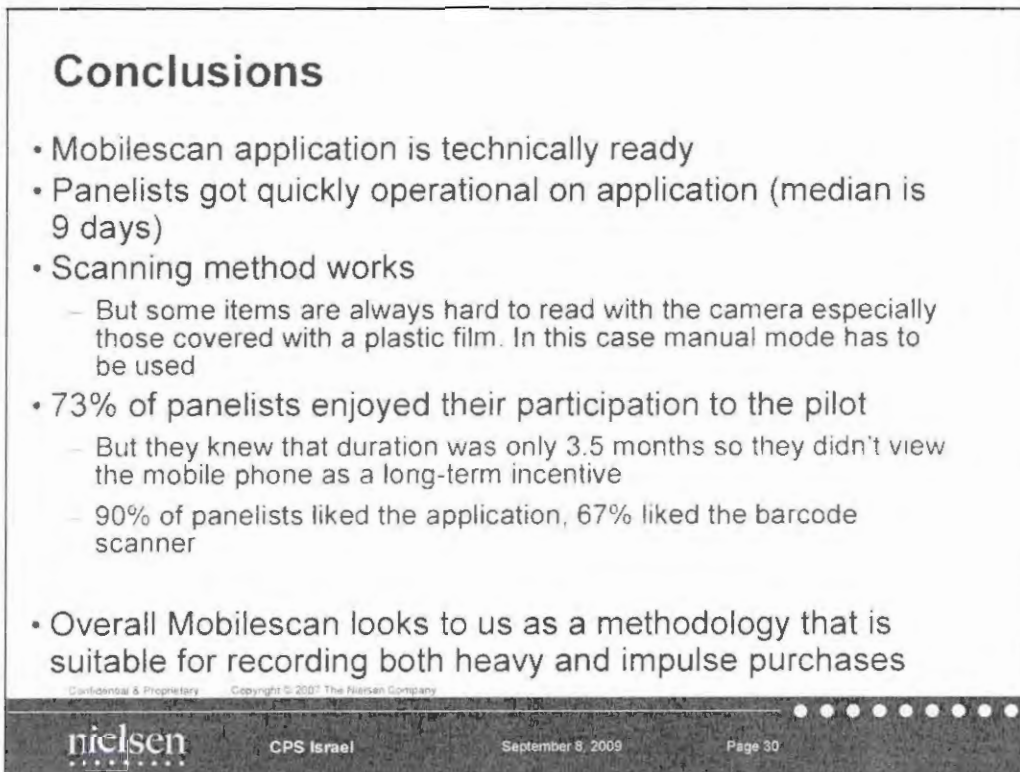


Figure A.2: Conclusions

APPENDIX B.1: Questionnaire

The use of mobile phones in Consumer Panel Research

The goal of this study is to determine if it will be feasible to conduct consumer panel research with the use of the panelist's own mobile phone. In order to determine this, the auditor will demonstrate a sample mobile phone with the capability of doing mobile phone audits and ask the panelist to try it for himself. After the demo, the panelist will be asked a few questions to determine whether he/she feels comfortable with such an audit methodology.

Please follow the steps carefully when conducting the interview.

1. Complete the following details when entering the home




1.1. Auditor Name

1.1. Panelist ID (please read from your barcode scanner)

1.2. Date and Time

yyyy/mm/dd	hh24	mi
------------	------	----

1.3. Please check your provided sample phone for 3G availability

No Reception		
Reception - No 3G		
Reception - 3G		

1.4. Fill in the details of each phone

	Make	Model	Data Plan		Contract <i>(mark with an X)</i>	Pay-as-you-go
			Yes <i>(mark with an X)</i>	No		
(main shopper)						
2						
3						
4						
5						
6						
7						
8						
9						
10						

2. Demonstrate the audit application on the sample phone.
1. Do all operations while facing the phone towards the panelist
 2. Open the audit application on the sample phone
 3. Scan a few items lying around in the kitchen
 4. Ask the person to try it out on his own.

3 Complete the following questions concerning the audit application / phone

3.1. Observation: Did the person seem comfortable scanning the items?

Yes, very	Yes	No	Not at all
-----------	-----	----	------------

3.2. Would you participate in a panel if this was the normal procedure you had to follow after each shopping trip instead of the current auditor visit?

(It should take a well trained hand about 6 seconds per item. Therefore it should take about 1 minute for 10 items)

Yes, very interested	Yes	No	Not at all
----------------------	-----	----	------------

3.3. Would you agree that this method of auditing is more secure than an auditor visiting for South-African households?

Strongly Agree	Agree	Disagree	Strongly disagree
----------------	-------	----------	-------------------

3.4. Would you find it useful if you could access your shopping (you scanned) from a secure on-line web page? (This could be helpful in determining a budget and shopping list)

Yes, very	Yes	No	Not at all
-----------	-----	----	------------

3.5. Would you scan out of home / impulse purchases? (like a Coke from the corner café)

Yes, very interested	Yes	No	Not at all
----------------------	-----	----	------------

3.6. Would you scan your shopping when you are on holiday as well?

Yes, very interested	Yes	No	Not at all
----------------------	-----	----	------------

3.7. Would you enter such a research panel without any compensation?

Yes, very interested	Yes	No	Not at all
----------------------	-----	----	------------

3.8. What is your greatest concern when using your mobile phone applications? (please rank with a number next to each item 1-greatest concern -> 5-least concern)

I'm afraid someone accesses my personal details.	
A high telephone bill	
My battery will drain quickly	
I will miss an important phone call / SMS	
I am totally comfortable using applications	

Thank you for participating in this survey.

APPENDIX B.2: Questionnaire – demo instructions

The use of mobile phones in Consumer Panel Research

Demo Instruction sheet

N96

1. Switch on, by pressing and holding button located at top right edge
2. Wait for phone to load
3. Press large square button once
4. Wait for application to load
5. Focus on barcode until scan success (with sound)
6. Show screen to panelist (indicate price/quantity)
7. Click "Options"
8. Scroll down to "Scan". Press large square button => go to step #6 and repeat.
9. To Exit, click "Exit" and switch off phone by pressing and holding button located at top right edge.

N79

1. Ensure Camera slide is open.
2. Switch on, by pressing and holding button located at top right edge
3. Wait for phone to load
4. Press small square button in middle of phone once
5. Press small square button to confirm "Read 1D code"
6. Focus on barcode until scan success (screen will change)
7. Show screen to panelist (indicate price/quantity)
8. Click "Back"
9. Go to step #5 and repeat.
10. To Exit, click "Exit" and switch off phone by pressing and holding button located at top right edge.

N73

1. Ensure camera slide is open.
2. Switch on, by pressing and holding button located at top edge
3. Camera will open, click "ok" and "exit"
4. Press small square button in middle of phone once
5. Focus on barcode until scan success (with sound)
6. Show screen to panelist (indicate price/quantity)
7. Click "X" to cancel
8. Go to step #5 and repeat.
9. To Exit, switch off phone by pressing and holding button located at top edge.

APPENDIX C: Financial model

	Home Scanner A Scenario	Home Scanner B Scenario	Manual Panel A Scenario	Manual Panel B Scenario	Mobile Phone Scenario
Panel Details					
Panel Size	1000	1000	1000	1000	1000
Auditor:Household Ratio	n/a	n/a	0.02	0.02	n/a
Barcode Terminal Value	R 2,000	R 1 600	R 15,000	R 12 000	n/a
Data Communication (Megabyte per panellist per year)	12	12	12	12	12
Data Communication Cost (per Megabyte)	R 1	R 1	R 1	R 1	R 2
% Barcode Terminals Lost (per year)	10%	10%	5%	5%	n/a
Period of depreciation (years)	5	5	5	5	n/a
Auditor Salary (per year)	n/a	n/a	R 18,000	R 18,000	n/a
Travel Cost (per panellist visit)	n/a	n/a	R 19	R 19	n/a
Auditor Visits (per panellist per year)	n/a	n/a	21	21	n/a
% Termination (per year)	10%	10%	10%	10%	n/a
Package & Posting	R 100	R 100	n/a	n/a	n/a
Incentive Cost (per panellist per year)	R 500	R 500	R 300	R 300	R 500
Recruitment					
Recruitment Campaign	R 5,000	R 5,000	R 5,000	R 5,000	R 5,000
Barcode Terminal - Package & Postage	R 100,000	R 100,000	n/a	n/a	n/a
Recruitment Subtotal	R 105,000	R 105,000	R 5,000	R 5,000	R 5,000
Data Collection					
Barcode Terminal Depreciation	R 400,000	R 320,000	R 60,000	R 48,000	n/a
Lost Barcode Terminals	R 200,000	R 160,000	R 15,000	R 12,000	n/a
Data Communication	R 12,000	R 12,000	R 12,000	R 12,000	R 24,000
Auditor Salaries	n/a	n/a	R 360,000	R 360,000	n/a
Auditor Travel Expenses	n/a	n/a	R 399,000	R 399,000	n/a
Data Collection Subtotal	R 612,000	R 492,000	R 846,000	R 831,000	R 24,000
Panel Management					
Incentives	R 500,000	R 500,000	R 300,000	R 300,000	R 500,000
Helpdesk Support	R 300,000	R 300,000	n/a	n/a	R 300,000
Panel Management Subtotal	R 800,000	R 800,000	R 300,000	R 300,000	R 800,000
Termination					
Barcode Terminal - Package & Postage	R 10,000	R 10,000	n/a	n/a	n/a
Termination Subtotal	R 10,000	R 10,000	R 0	R 0	R 0
Total Expenses	R 1,527,000	R 1,407,000	R 1,151,000	R 1,136,000	R 829,000
Total Initial Capital	R 2,000,000	R 1,600,000	R 300,000	R 240,000	R 0

Percent saving with 20% barcode terminal discount

7.86%

1.30%

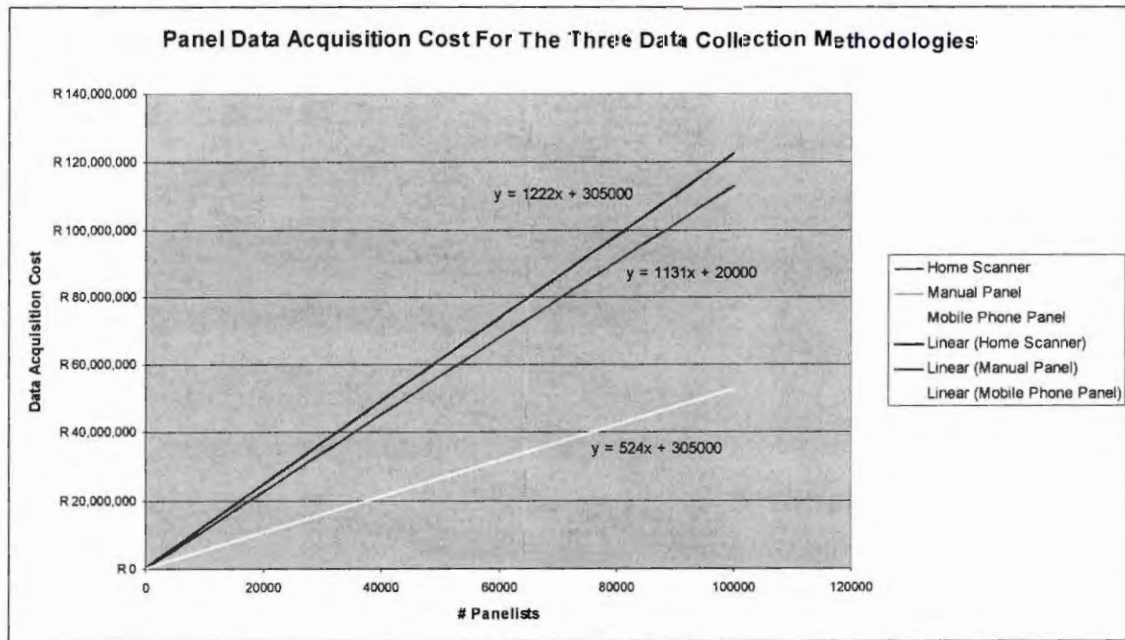
Percentage savings from home scanner to Mobilescan at 1000 panellists

45.71%

Percentage savings from manual to Mobilescan at 1000 panellists

27.98%

APPENDIX D: Incremental cost per panellist



APPENDIX E.1: Technology maturity study

Mobile Phone Barcode Scanning Test Sheet

Details

Auditor Name: _____
 Date: _____
 Phone # (read from label):
 Application Name: _____

Conditions

Macro Lens: On Off
 Type of Light:

Flourescent	Incandescent (normal bulb)
Power Saver	None (Ambient Sunlight)

 Barcode Surface Shape:

Random Surfaces	Rounded Surfaces	Flat Surfaces
-----------------	------------------	---------------

 Barcode Surface Type:

Random Surfaces	Dry / Normal Surfaces
Wet / Frozen Surfaces	

 Barcode Surface Condition:

Random Surfaces	Dull / Matt	Shiny / Gloss
-----------------	-------------	---------------

 Barcode Condition:

Random	Very Good	Good	Bad
Very Bad			

Test Results

Number of Items in test run:
 Number successfully scanned:
 Time for successful scans:

Your impressions

Did the application provide assistance in finding the barcode?

Yes	No
-----	----

 Did you have to trigger the scan?

Yes	No
-----	----

What was your impressions of the application? _____

What was your impressions of the phone? _____

Do you think this is a feaseble solution for auditing your own shopping?

Yes	No
-----	----

APPENDIX E.2: Technology maturity study – instructions

Mobile Phone Barcode Scanning Test Instructions

Welcome to the mobile phone barcode scanning test. In this test we would like to determine whether it would be feasible to use a mobile phone as an auditing device to scan barcodes. We would like to evaluate a variety of phones and software applications to accomplish that.

In your test package you would have received a mobile phone with a number sticker and macro lens attached. Also included are a light meter, stopwatch and several test sheets.

Please follow the instructions below on how to perform the test and fill out the test sheets.

If the phone is also marked with a **red sticker**, please perform all test **with and without the macro lens** by swiveling the lens to or away from the camera.

Step 1:	Please fill in all your details and that of the phone in the 'Details' section of the test sheet. Using the phone, decide on the application that you will be testing and write down the name of the application
Step 2:	Gather all the items that you would like to use for the test on a surface where you can easily reach the items.
Step 3:	Use the light meter provided, and measure the light conditions. Write down the number displayed on the test sheet. Describe the type of light used in the environment that you are in.
Step 4:	Fill in the number of items in your test and describe the items in your test. Please vary the type of tests that you do, for instance, do one test with random shaped objects, one with only rounded surfaces like canned food and one with items from your fridge.
Step 5:	Perform the test. Try to scan each item, <u>take your time</u> and see whether the phone recognises the barcode, group all the recognised items on one side. Once you are finished with all the items, write down the number of successful scans.
Step 6:	Speed test. Only use all the items that were successfully recognised. (Try to have a minimum of 10 items) Start the supplied stopwatch and run through all the recognised items. Write down the time it took to recognise these items.
Step 7:	Write down your impressions. At the question ' Did the application provide assistance in finding the barcode? ', it implies that there are some aiming mechanism that helps you center the barcode on the screen of the cell phone when trying to scan. At the question ' Did you have to trigger the scan? ' it asks whether you had to click a button to recognise the barcode. Please answer the rest of the questions as honestly as possible.

Homepanel Questionnaire 2009 / 2010
 Thank you for taking care in completing this questionnaire accurately and in our writing, making only a black pen.
 HOUSEHOLD ID: _____
 TRANSACTORY NUMBER: _____

1 Household Information

1.1 Is this a new household?
 Yes No

1.2 Are any household members involved in the following industries?
 Construction 0
 Electricity, Gas and Water Sanitary 1
 Manufacturing 2
 Mining and Quarrying 3
 Services / Government / Personal / Business 4
 Transport / Storage and Communications 5
 Agriculture 6
 Creche / Nursery School 7
 Home Industry 8
 Marketing Industry 9
 Own Store / Spaza Shop 10
 Stop Interview 11
 Unemployed but receiving a government grant of UIF 12
 Unemployed 13
 Note: If any person in the household is involved in any of the following industries: Creche, nursery school, home industry, marketing industry, own spaza or store, the interview should be stopped. You have to answer this question.

1.3 Are you the person who is mainly responsible for the food, grocery and toiletry purchases of your household?
 Yes 1 Go to question 1.4
 No 0 Go to question 1.5
 Note: You have to do the interview with the main purchaser or the person partly responsible for shopping. You are not allowed to interview a child for any reason. Make an appointment to see the correct person.

1.5 Are you partly responsible for the food, grocery and toiletry purchases of your household?
 Yes 1 Go to question 1.6
 No 0 Stop the interview
 Note: You can only be mainly or partly responsible for the purchases. not both. You have to answer this question.

1.6 By observation only. To which population group does the respondent belong?
 White 0
 Coloured 1
 African / Indian 2
 Asian / Black 3
 Note: In mixed marriages, please state the population of the main purchaser. You have to answer this question.

1.7 Is this house / flat / dwelling owned or rented?
 Rented 0
 Owned 1
 Note: You can only rent or own, not both. If you pay for your dwelling it is rented no matter if you pay to another family member. You have to answer this question.

1.8 How many males live in this house?
 Note: There should only be ages here for the number of male persons living in this dwelling.

17	5
16	4
13 - 15	3
7 - 12	2
4 - 6	1
0 - 3	0
18 - 20	6
21 - 24	7
25 - 29	8
30 - 34	9
35 - 39	10
40 - 44	11
45 - 49	12
50 - 54	13
60 - 64	14
65 - 69	15
70+	16

1.9 Are there any males in the following age groups?

17	5
16	4
13 - 15	3
7 - 12	2
4 - 6	1
0 - 3	0
18 - 20	6
21 - 24	7
25 - 29	8
30 - 34	9
35 - 39	10
40 - 44	11
45 - 49	12
50 - 54	13
60 - 64	14
65 - 69	15
70+	16

1.10 How many females live in this house?
 Note: There should only be ages here for the number of female persons living in this dwelling.

17	5
16	4
13 - 15	3
7 - 12	2
4 - 6	1
0 - 3	0
18 - 20	6
21 - 24	7
25 - 29	8
30 - 34	9
35 - 39	10
40 - 44	11
45 - 49	12
50 - 54	13
60 - 64	14
65 - 69	15
70+	16

1.11 Are there any females in the following age groups?

17	5
16	4
13 - 15	3
7 - 12	2
4 - 6	1
0 - 3	0
18 - 20	6
21 - 24	7
25 - 29	8
30 - 34	9
35 - 39	10
40 - 44	11
45 - 49	12
50 - 54	13
60 - 64	14
65 - 69	15
70+	16

1.12 How many females live in this house?
 Note: There should only be ages here for the number of female persons living in this dwelling.

17	5
16	4
13 - 15	3
7 - 12	2
4 - 6	1
0 - 3	0
18 - 20	6
21 - 24	7
25 - 29	8
30 - 34	9
35 - 39	10
40 - 44	11
45 - 49	12
50 - 54	13
60 - 64	14
65 - 69	15
70+	16

1.13 Is this dwelling the place where the main purchaser spends at least four nights per week?
 Yes 1
 No 0
 Note: We can not have a house on the panel with the main purchaser away for work more than a month for the year.

1.14 How long has your household lived at this residence?

Less than 6 months	0
6 months to under 1 year	1
1 year to under 2 years	2
2 years to under 5 years	3
5 years or more	4

1.15 What is the respondent's name and surname (write in clear capital letters)?

 Note: Please complete with correct spelling and clear to read the correct name and surname of the respondent.

1 15 Please indicate in which province this household resides?

1	Gauteng
2	Northern Province
3	Mpumalanga
4	North West
5	KwaZulu-Natal
6	Free State
7	Northern Cape
8	Eastern Cape
9	Western Cape

Note: Please ask to look on a piece of mail delivered to the house for the correct address info if nothing is available please go to the nearest Post Office and get a Postal Code book (it is for free) and confirm every input of the address questions

1 17 By observation only: Is this a rural dwelling? (Note the answer to this question is always No in the Western Cape)

Yes	1
No	0

1 18 Is this a rural household in Gauteng?

Yes	1
No	0

1 19 What is the physical address: Street (in capital letters, look on a piece of mail delivered to the house)

1 20 What is the physical address: Suburb (in capital letters, look on a piece of mail delivered to the house)

1 21 What is the physical address: Town / city (in capital letters, look on a piece of mail delivered to the house)

1 22 What is the physical address: Municipal district (in capital letters, as per your electrical bill)

1 23 What is your postal address: PO Box (in capital letters, look on a piece of mail delivered to the house)

1 24 What is your postal address: Suburb (in capital letters, look on a piece of mail delivered to the house)

1 25 What is your postal address: Town / city (in capital letters, look on a piece of mail delivered to the house)

1 26 What is your postal code

Note: It have to be 4 digits

--	--	--	--	--

1 27 Do you have a home telephone / landline (excluding cellular phone)

Yes	1
No	0

Note: This is a Telkom telephone line, pre-paid or account based

1 28 What is your home telephone / landline number

1 29 What is your work telephone number

1 30 What is your cellular phone numbers

Note: Please confirm that every number have 10 digits. You have to get a contact number for every household

2. Media usage

2 1 Please indicate if the household reads any of the following

Yes	1
No	0

Note: You may choose more than one block. It is not important if the respondent bought the paper or magazine, as long as they have read some of it.

Daily newspapers	1
Weekly newspapers	1
Magazines	1
	0

2 2 Evaluate a typical day's television viewing. How many hours per day, on average, does your household watch television?

Note: You may choose only one block as per the respondent's viewing habits

Less than 1 hour	1
1 hour to under 1 1/2 hours	2
1 1/2 hours to under 2 hours	3
2 hours to under 2 1/2 hours	4
2 1/5 to under 3 hours	5
3 hours to under 3 1/2 hours	6
	7
	8
	9
	10
	11

2 3 Evaluate a typical day's radio listening. How many hours per day, on average, does your household listen to the radio?

Note: You may choose only one block as per the respondent's listening habits

Less than 1 hour	1
1 hour to under 1 1/2 hours	2
1 1/2 hours to under 2 hours	3
2 hours to under 2 1/2 hours	4
2 1/5 to under 3 hours	5
3 hours to under 3 1/2 hours	6
	7
	8
	9
	10
	11

3. Dwelling, amenities and appliances, lifestyle

<p>3.1 Please indicate the type of dwelling you live in?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>House</td><td align="right">0</td></tr> <tr><td>Cluster house (don't pay a levy)</td><td align="right">1</td></tr> <tr><td>Town house (pay a levy)</td><td align="right">2</td></tr> <tr><td>Flat</td><td align="right">3</td></tr> <tr><td>Traditional hut</td><td align="right">4</td></tr> <tr><td>Room in backyard</td><td align="right">5</td></tr> <tr><td>Squatter hut / shack</td><td align="right">6</td></tr> <tr><td>Other (specify)</td><td></td></tr> </table> <p><i>Note: Please mark only one</i></p>	House	0	Cluster house (don't pay a levy)	1	Town house (pay a levy)	2	Flat	3	Traditional hut	4	Room in backyard	5	Squatter hut / shack	6	Other (specify)		<p>3.2 How many rooms does your dwelling consist of (living rooms and bedrooms, excluding kitchens, toilets and bathrooms)?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>One room</td><td align="right">0</td></tr> <tr><td>Two rooms</td><td align="right">1</td></tr> <tr><td>Three rooms</td><td align="right">2</td></tr> <tr><td>Four rooms</td><td align="right">3</td></tr> <tr><td>Five rooms and more</td><td align="right">4</td></tr> </table> <p><i>Note: Please mark only one</i></p>	One room	0	Two rooms	1	Three rooms	2	Four rooms	3	Five rooms and more	4														
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Four rooms	3																																								
Five rooms and more	4																																								
<p>3.3 What is the household's main water supply?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Piped (tap) water in the dwelling</td><td align="right">0</td></tr> <tr><td>Piped water (tap) water on the site, yard</td><td align="right">1</td></tr> <tr><td>Public tap</td><td align="right">2</td></tr> <tr><td>Water-carrier / tanker</td><td align="right">3</td></tr> <tr><td>Borehole / rain-water tank / well</td><td align="right">4</td></tr> <tr><td>Dam / river / stream / spring</td><td align="right">5</td></tr> <tr><td>Other source (specify)</td><td></td></tr> </table> <p><i>Note: Please mark only one</i></p>	Piped (tap) water in the dwelling	0	Piped water (tap) water on the site, yard	1	Public tap	2	Water-carrier / tanker	3	Borehole / rain-water tank / well	4	Dam / river / stream / spring	5	Other source (specify)		<p>3.4 Does your household have hot running water from a geyser?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Yes</td><td align="right">1</td></tr> <tr><td>No</td><td align="right">0</td></tr> </table> <p><i>Note: Please mark only one</i> <i>You can not have hot running water if your main water supply is from the dam / river, stream / water carrier / tanker / public tap / borehole / rainwater or well</i></p>	Yes	1	No	0																						
Piped (tap) water in the dwelling	0																																								
Piped water (tap) water on the site, yard	1																																								
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Other source (specify)																																									
Yes	1																																								
No	0																																								
<p>3.5 What type of toilet facilities does your household have?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>No toilet facilities</td><td align="right">0</td></tr> <tr><td>Non flush toilet at dwelling</td><td align="right">1</td></tr> <tr><td>Flush toilet - inside house</td><td align="right">2</td></tr> <tr><td>Flush toilet - outside house</td><td align="right">3</td></tr> <tr><td>Communal portable flush toilet</td><td align="right">4</td></tr> <tr><td>Communal non flush toilet</td><td align="right">5</td></tr> </table> <p><i>Note: Please mark only one</i></p>	No toilet facilities	0	Non flush toilet at dwelling	1	Flush toilet - inside house	2	Flush toilet - outside house	3	Communal portable flush toilet	4	Communal non flush toilet	5	<p>3.6 What type of body washing facilities does your household have?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Shower only</td><td align="right">0</td></tr> <tr><td>Bath only</td><td align="right">1</td></tr> <tr><td>Shower and bath</td><td align="right">2</td></tr> <tr><td>Portable bath / basin</td><td align="right">3</td></tr> </table> <p><i>Note: Please mark only one</i></p>	Shower only	0	Bath only	1	Shower and bath	2	Portable bath / basin	3																				
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Portable bath / basin	3																																								
<p>3.7 From what source does our household get electrical power?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>No electrical power</td><td align="right">0</td></tr> <tr><td>Direct from municipality/local authority or Eskom</td><td align="right">1</td></tr> <tr><td>Generator</td><td align="right">2</td></tr> <tr><td>Solar Cell</td><td align="right">3</td></tr> </table> <p><i>Note: Please mark only one</i></p>	No electrical power	0	Direct from municipality/local authority or Eskom	1	Generator	2	Solar Cell	3	<p>3.8 Is the electrical power in your home currently connected?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Yes</td><td align="right">1</td></tr> <tr><td>No</td><td align="right">0</td></tr> </table> <p><i>Note: Please mark only one</i></p>	Yes	1	No	0																												
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<p>3.9 Does your household have an electric kettle?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Yes</td><td align="right">1</td></tr> <tr><td>No</td><td align="right">0</td></tr> </table> <p><i>Note: Please mark only one</i></p>	Yes	1	No	0	<p>3.10 Does your household have any...</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Dogs</td><td align="right">1</td></tr> <tr><td>Cats</td><td align="right">0</td></tr> </table> <p><i>Note: You may mark more than one</i></p>	Dogs	1	Cats	0																																
Yes	1																																								
No	0																																								
Dogs	1																																								
Cats	0																																								
<p>3.11 How many Cellular phones are there in your household? Please indicate cell phones that are owned, rented or used by any person in your household, including your own, excluding any domestic or household helper's</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>None</td><td align="right">0</td><td>If none, go to question 3.17</td></tr> <tr><td>One</td><td align="right">1</td><td></td></tr> <tr><td>Two</td><td align="right">2</td><td></td></tr> <tr><td>Three or more</td><td align="right">3</td><td></td></tr> </table> <p><i>Note: It should be a cell phone handset with a activated sim card</i></p>	None	0	If none, go to question 3.17	One	1		Two	2		Three or more	3		<p>3.12 How many of the cell phones in your household have a monthly contract?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>None</td><td align="right">0</td></tr> <tr><td>One</td><td align="right">1</td></tr> <tr><td>Two</td><td align="right">2</td></tr> <tr><td>Three or more</td><td align="right">3</td></tr> </table> <p><i>Note: Please mark only one</i> <i>It should be a cell phone handset with an activated sim card</i></p>	None	0	One	1	Two	2	Three or more	3																				
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<p>3.13 Are your own calls on cell phone contract or pre-paid?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Contract</td><td align="right">1</td></tr> <tr><td>Pre-paid</td><td align="right">0</td></tr> </table> <p><i>Note: You may mark more than one but not nothing</i></p>	Contract	1	Pre-paid	0	<p>3.14 Is your own cell phone private or company maintained?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Private</td><td align="right">1</td></tr> <tr><td>Company</td><td align="right">0</td></tr> </table> <p><i>Note: You may mark more than one but not nothing</i></p>	Private	1	Company	0																																
Contract	1																																								
Pre-paid	0																																								
Private	1																																								
Company	0																																								
<p>3.15 How many cellular phones in your household are pay as you go?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>None</td><td align="right">0</td></tr> <tr><td>One</td><td align="right">1</td></tr> <tr><td>Two</td><td align="right">2</td></tr> <tr><td>Three or more</td><td align="right">3</td></tr> </table> <p><i>Note: Please only mark one answer</i></p>	None	0	One	1	Two	2	Three or more	3	<p>3.16 How many cellular phones in your house are company phones?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>None</td><td align="right">0</td></tr> <tr><td>One</td><td align="right">1</td></tr> <tr><td>Two</td><td align="right">2</td></tr> <tr><td>Three or more</td><td align="right">3</td></tr> </table> <p><i>Note: Please only mark one answer</i></p>	None	0	One	1	Two	2	Three or more	3																								
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<p>3.17 Apart from cellular phones, where do members of this household mainly use any kind of telephone? If you have a landline in your home, please mark in your home</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>In your home</td><td align="right">0</td></tr> <tr><td>At a nearby neighbor</td><td align="right">1</td></tr> <tr><td>At a nearby public phone</td><td align="right">2</td></tr> <tr><td>At another nearby location</td><td align="right">3</td></tr> <tr><td>No access to telephone</td><td align="right">4</td></tr> </table> <p><i>Note: You may mark only one but not nothing</i></p>		In your home	0	At a nearby neighbor	1	At a nearby public phone	2	At another nearby location	3	No access to telephone	4																														
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<p>3.18 What type of energy or fuel do you use for cooking?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Direct from municipality</td><td align="right">0</td></tr> <tr><td>Generator</td><td align="right">1</td></tr> <tr><td>Solar Cell</td><td align="right">2</td></tr> <tr><td>Gas</td><td align="right">3</td></tr> <tr><td>Paraffin</td><td align="right">4</td></tr> <tr><td>Candles</td><td align="right">5</td></tr> <tr><td>Wood</td><td align="right">6</td></tr> <tr><td>Coal</td><td align="right">7</td></tr> <tr><td>Animal dung</td><td align="right">8</td></tr> <tr><td>Other, specify</td><td></td></tr> </table> <p><i>Note: Please select the most frequently used</i> <i>You may mark only one but not nothing</i></p>	Direct from municipality	0	Generator	1	Solar Cell	2	Gas	3	Paraffin	4	Candles	5	Wood	6	Coal	7	Animal dung	8	Other, specify		<p>3.19 What type of energy or fuel do you use for heating?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Direct from municipality</td><td align="right">0</td></tr> <tr><td>Generator</td><td align="right">1</td></tr> <tr><td>Solar Cell</td><td align="right">2</td></tr> <tr><td>Gas</td><td align="right">3</td></tr> <tr><td>Paraffin</td><td align="right">4</td></tr> <tr><td>Candles</td><td align="right">5</td></tr> <tr><td>Wood</td><td align="right">6</td></tr> <tr><td>Coal</td><td align="right">7</td></tr> <tr><td>Animal dung</td><td align="right">8</td></tr> <tr><td>Other, specify</td><td></td></tr> </table> <p><i>Note: Please select the most frequently used</i> <i>You may mark only one but not nothing</i></p>	Direct from municipality	0	Generator	1	Solar Cell	2	Gas	3	Paraffin	4	Candles	5	Wood	6	Coal	7	Animal dung	8	Other, specify	
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<p>3.20 What type of energy or fuel do you use for lighting?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Direct from municipality</td><td align="right">0</td></tr> <tr><td>Generator</td><td align="right">1</td></tr> <tr><td>Solar Cell</td><td align="right">2</td></tr> <tr><td>Gas</td><td align="right">3</td></tr> <tr><td>Paraffin</td><td align="right">4</td></tr> <tr><td>Candles</td><td align="right">5</td></tr> <tr><td>Wood</td><td align="right">6</td></tr> <tr><td>Coal</td><td align="right">7</td></tr> <tr><td>Animal dung</td><td align="right">8</td></tr> <tr><td>Other, specify</td><td></td></tr> </table> <p><i>Note: Please select the most frequently used</i> <i>You may mark only one but not nothing</i></p>	Direct from municipality	0	Generator	1	Solar Cell	2	Gas	3	Paraffin	4	Candles	5	Wood	6	Coal	7	Animal dung	8	Other, specify																						
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<p>3.21 Does your household employ a domestic servant or household helper or gardener</p> <table border="1"> <tr><td>No servant or household helper</td><td>0</td></tr> <tr><td>Live-in servant/ household helper</td><td>1</td></tr> <tr><td>Non live-in servant/household helper</td><td>2</td></tr> </table> <p>If no, go to question 3.23</p>	No servant or household helper	0	Live-in servant/ household helper	1	Non live-in servant/household helper	2	<p>3.22 How many domestic workers or household helpers are there working for your household?</p> <table border="1"> <tr><td>One</td><td>1</td></tr> <tr><td>Two</td><td>2</td></tr> <tr><td>Three or more</td><td>3</td></tr> </table>	One	1	Two	2	Three or more	3																																																				
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<p>3.23 Does your household have a built in kitchen sink?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table> <p>Note: This is a unit bolted or built and can not be removed with ease</p>	Yes	1	No	0	<p>3.24 Does your household ever purchase dishwashing liquid?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table>	Yes	1	No	0																																																								
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<p>3.25 What dishwashing facilities does your household most often use?</p> <table border="1"> <tr><td>Automatic dishwasher</td><td>0</td></tr> <tr><td>Fitted basin</td><td>1</td></tr> <tr><td>Portable plastic/metal basin</td><td>2</td></tr> <tr><td>Built in kitchen sink</td><td>3</td></tr> <tr><td>Other, specify</td><td></td></tr> </table> <p>Note: If Automatic dishwasher is chosen, make sure to mark it on Q 3.28</p>	Automatic dishwasher	0	Fitted basin	1	Portable plastic/metal basin	2	Built in kitchen sink	3	Other, specify		<p>3.27 How many motorcars, station wagons, bakkies and minibuses/kombis, including any company cars, are there in your household in running order? Please do not include motorbikes, scooters and trucks.</p> <table border="1"> <tr><td>None</td><td>0</td></tr> <tr><td>One</td><td>1</td></tr> <tr><td>Two</td><td>2</td></tr> <tr><td>Three or more</td><td>3</td></tr> </table>	None	0	One	1	Two	2	Three or more	3																																														
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<p>3.26 Does your household own, run or drive a motor vehicle?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table>		Yes	1	No	0																																																												
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<p>3.28 Please indicate which of these items, if any, are presently in a working order in your household. (use show card 1)</p> <table border="1"> <tr><td>Electrical stove</td><td>0</td><td>Video cassette recorder</td><td>16</td></tr> <tr><td>Coal stove</td><td>1</td><td>DSTV decoder</td><td>17</td></tr> <tr><td>Gas cooker</td><td>2</td><td>MNET decoder</td><td>18</td></tr> <tr><td>Electric hot plate</td><td>3</td><td>HiFi / music centre</td><td>19</td></tr> <tr><td>Paraffin stove</td><td>4</td><td>Camera still of movie</td><td>20</td></tr> <tr><td>Microwave oven</td><td>5</td><td>Audio cassette player (Only tape)</td><td>21</td></tr> <tr><td>Gas stove with oven</td><td>6</td><td>Portable radio</td><td>22</td></tr> <tr><td>Refrigerator/ combined fridge /freezer</td><td>7</td><td>Car radio</td><td>23</td></tr> <tr><td>Free standing deep freezer</td><td>8</td><td>Compact disc player</td><td>24</td></tr> <tr><td>Floor polisher / Vacuum cleaner</td><td>9</td><td>Personal computer/ Lap top in home</td><td>25</td></tr> <tr><td>Dishwasher</td><td>10</td><td>DVD player</td><td>26</td></tr> <tr><td>Washing machine</td><td>11</td><td>Power tools</td><td>27</td></tr> <tr><td>Tumble dryer</td><td>12</td><td>Lawn mower electric or petrol</td><td>28</td></tr> <tr><td>Electric sewing machine</td><td>13</td><td>Home theatre system</td><td>29</td></tr> <tr><td>Manual sewing machine</td><td>14</td><td>Coffee maker (using instant coffee)</td><td>30</td></tr> <tr><td>Television set</td><td>15</td><td></td><td></td></tr> </table> <p>Note: Take your time to allow the respondent to look on the show card to confirm. This is very important to be 100% accurate. If the appliance does not belong to the respondent, but to another person living in the house, or living away from the house and the respondent or any person in the house is making use of that item, please include it on the list.</p>		Electrical stove	0	Video cassette recorder	16	Coal stove	1	DSTV decoder	17	Gas cooker	2	MNET decoder	18	Electric hot plate	3	HiFi / music centre	19	Paraffin stove	4	Camera still of movie	20	Microwave oven	5	Audio cassette player (Only tape)	21	Gas stove with oven	6	Portable radio	22	Refrigerator/ combined fridge /freezer	7	Car radio	23	Free standing deep freezer	8	Compact disc player	24	Floor polisher / Vacuum cleaner	9	Personal computer/ Lap top in home	25	Dishwasher	10	DVD player	26	Washing machine	11	Power tools	27	Tumble dryer	12	Lawn mower electric or petrol	28	Electric sewing machine	13	Home theatre system	29	Manual sewing machine	14	Coffee maker (using instant coffee)	30	Television set	15		
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<p>3.29 Are there any television sets in working order in your household? It may belong to any person or company</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table> <p>If no, go to question 3.34</p>	Yes	1	No	0	<p>3.30 What power source does your best television set use?</p> <table border="1"> <tr><td>Battery</td><td>0</td></tr> <tr><td>Mains</td><td>1</td></tr> </table>	Battery	0	Mains	1																																																								
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<p>3.31 Is your best television black and white or color?</p> <table border="1"> <tr><td>Black and white</td><td>0</td></tr> <tr><td>Color</td><td>1</td></tr> </table>	Black and white	0	Color	1	<p>3.32 Does your household pay a subscription for any of the following television services. Either a M-Net or Multichoice DStv (Digital Satellite TV)?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table>	Yes	1	No	0																																																								
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<p>3.34 Excluding radios in cars and other vehicles, how many radios in working order are there in your household?</p> <table border="1"> <tr><td>None</td><td>0</td></tr> <tr><td>One</td><td>1</td></tr> <tr><td>Two or more</td><td>2</td></tr> </table>	None	0	One	1	Two or more	2	<p>3.35 Does your household subscribe to the Internet?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table>	Yes	1	No	0																																																						
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<p>3.36 If anyone in your household has a computer, does it have a CD-ROM drive?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table> <p>Note: It can be rented personally owned or company computers</p>	Yes	1	No	0	<p>3.37 Does your household make use of a home security service?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table>	Yes	1	No	0																																																								
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<p>3.38 Which method does your household use most often to do laundry?</p> <table border="1"> <tr><td>Automatic front-loader</td><td>0</td></tr> <tr><td>Automatic top loader</td><td>1</td></tr> <tr><td>Semi-automatic / Twin tub</td><td>2</td></tr> <tr><td>Commercial laundry</td><td>3</td></tr> <tr><td>By hand at home</td><td>4</td></tr> <tr><td>By hand away from home</td><td>5</td></tr> </table> <p>Note: make sure it is also marked on Q3.28</p>	Automatic front-loader	0	Automatic top loader	1	Semi-automatic / Twin tub	2	Commercial laundry	3	By hand at home	4	By hand away from home	5	<p>3.39 What cooking facility does your household most often use? Use show card nr 2</p> <table border="1"> <tr><td>Electric stove</td><td>0</td></tr> <tr><td>Electric hot plate</td><td>1</td></tr> <tr><td>Microwave oven</td><td>2</td></tr> <tr><td>Gas stove with oven</td><td>3</td></tr> <tr><td>Coal stove</td><td>4</td></tr> <tr><td>Paraffin stove (primus)</td><td>5</td></tr> <tr><td>Gas cooker</td><td>6</td></tr> <tr><td>Open fire</td><td>7</td></tr> <tr><td>Other (specify)</td><td></td></tr> </table>	Electric stove	0	Electric hot plate	1	Microwave oven	2	Gas stove with oven	3	Coal stove	4	Paraffin stove (primus)	5	Gas cooker	6	Open fire	7	Other (specify)																																			
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<p>3.40 Are you a Clicks Club Card Member?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table> <p>If no, go to question 3.42</p>	Yes	1	No	0	<p>3.42 Do you do Bulk or Non-Bulk shopping (Bulk is when you purchase lots of items with long time lapses before you buy big again like monthly or quarterly, Non-Bulk is when you shop regularly buying smaller amounts at a time, like daily or weekly)</p> <table border="1"> <tr><td>Non-bulk</td><td>0</td></tr> <tr><td>Bulk</td><td>1</td></tr> </table> <p>go to question 3.44</p>	Non-bulk	0	Bulk	1																																																								
Yes	1																																																																
No	0																																																																
Non-bulk	0																																																																
Bulk	1																																																																
<p>3.41 What Clicks Club Card Member Status Card do you have?</p> <table border="1"> <tr><td>Blue</td><td>1</td></tr> <tr><td>Gold</td><td>2</td></tr> </table>	Blue	1	Gold	2																																																													
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Gold	2																																																																

3.43 At which retail outlets do you do your fill-up shopping for food, grocery and toiletry, purchases (excluding daily purchases such as bread and milk)? (Use show card nr 4)

(answer only for households doing bulk shopping)

Shoprite/Checkers	0
Shoprite Usave	1
Hyperama	2
Pick 'n Pay Supermarkets	3
Pick 'n Pay Mini Market	4
Pick 'n Pay Family	5
Pick 'n Pay Hypermarkets	6
Multi Save	7
OK Foods & Sentra	8
Spar / Kwikspar / SuperSpar	9
Score Supermarkets	10
Friendly Grocer (IGA)	11
Foodies	12
Rite Value	13
8 Till Late	14
7 Eleven	15
Supper Value	16
Shield	17
Discom	18
Clicks	19
Dis-Chem	20
Woolworths Jet Mart	21
PEP	22
Game	23
Dion	24
Macro	25
Trade Center	26
Jumbo	27
Metro	28
Boxer	29
Shell	30
Sasol	31
Caltex	32
Total	33
Engen	34
BP	35
Local / Neighborhood Supermarket	36
Township Supermarket	37
Internet / Online Shopping	38
Green Grocer	39
Take Away	40
Garage Forecourt	41
Cafe	42
Sweet Shop	43
Chemist / Pharmacy	44
Spaza / Kiosk	45
Direct Selling Agent / Mail Order	46
Butchery	47
Bakery	48
Department Store	49
Beauty Salon	50
Hairdresser	51
Wholesaler	52
Any other outlet	53

3.44 At which retail outlets do you do your Bulk or non-bulk shopping for food, grocery and toiletry, purchases (excluding daily purchases such as bread and milk)? (Use show card nr 4)

(answer for all households)

Shoprite/Checkers	0
Shoprite Usave	1
Hyperama	2
Pick 'n Pay Supermarkets	3
Pick 'n Pay Mini Market	4
Pick 'n Pay Family	5
Pick 'n Pay Hypermarkets	6
Multi Save	7
OK Foods & Sentra	8
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Spaza / Kiosk	45
Direct Selling Agent / Mail Order	46
Butchery	47
Bakery	48
Department Store	49
Beauty Salon	50
Hairdresser	51
Wholesaler	52
Any other outlet	53

4. Household member information

4.1 Please tell me the name by which the main purchaser would prefer to be known by? (Use capital letters)

4.2 Please give me the birth date of the main purchaser yyyy/mm/dd

4.3 Please tell me into which age group the main purchaser falls in completed years?

0-6	0
7-12	1
13-15	2
16	3
17	4
18-20	5
21-24	6
25-29	7
30-34	8
35-39	9
40-44	10
45-49	11
50-54	12
55-59	13
60-64	14
65-69	15
70+	16

4.4 Is the main purchaser male or female?

Male	0
Female	1

4.5 Does the main purchaser work for pay, profit or family gain? This answer should be yes for formal work for salary, wages and informal work such as services rendered and selling thing that were made, and for work on a farm or land whether for a wage or as part of household's farming activities

Yes	1
No	0

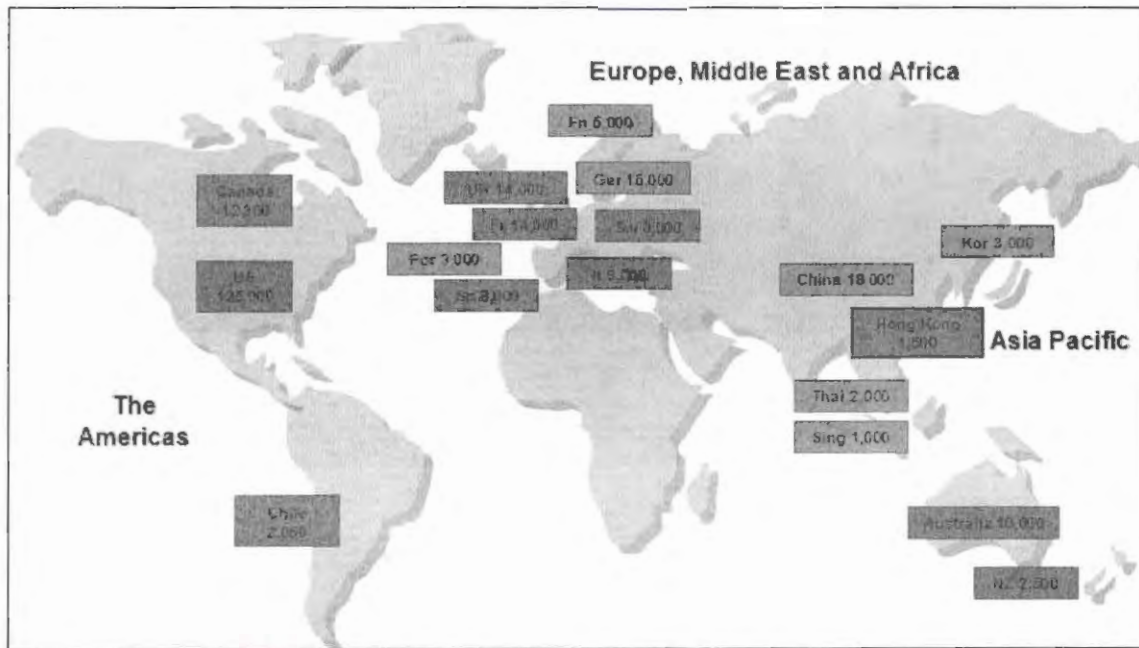
4.6 does the main purchase carry this activity out fulltime or part-time?

Fulltime	0
Part-time	1

<p>4.7 Please indicate which description best fits the main purchaser?</p> <table border="1"> <tr><td>Unemployed and looking for work</td><td>0</td></tr> <tr><td>Unemployed, not looking for work, but will accept work</td><td>1</td></tr> <tr><td>Housewife / home-maker</td><td>2</td></tr> <tr><td>Scholar / full-time student</td><td>3</td></tr> <tr><td>Pensioner / retired person</td><td>4</td></tr> <tr><td>Disabled Person</td><td>5</td></tr> <tr><td>Not wishing to work</td><td>6</td></tr> <tr><td>None of the above</td><td>7</td></tr> </table>	Unemployed and looking for work	0	Unemployed, not looking for work, but will accept work	1	Housewife / home-maker	2	Scholar / full-time student	3	Pensioner / retired person	4	Disabled Person	5	Not wishing to work	6	None of the above	7	<p>4.8 Could you please state your marital status?</p> <table border="1"> <tr><td>Never married</td><td>0</td></tr> <tr><td>Married: Civil / Religious</td><td>1</td></tr> <tr><td>Married: Traditional / Customs</td><td>2</td></tr> <tr><td>Living together (with partner)</td><td>3</td></tr> <tr><td>Widower / Widow</td><td>4</td></tr> <tr><td>Divorced / Separated</td><td>5</td></tr> </table>	Never married	0	Married: Civil / Religious	1	Married: Traditional / Customs	2	Living together (with partner)	3	Widower / Widow	4	Divorced / Separated	5																																																																
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<p>4.9 Could you please state your level of education?</p> <table border="1"> <tr><td>No schooling</td><td>0</td></tr> <tr><td>Some primary schooling</td><td>1</td></tr> <tr><td>Primary schooling completed</td><td>2</td></tr> <tr><td>Some high schooling</td><td>3</td></tr> <tr><td>Matriculated</td><td>4</td></tr> <tr><td>Artisan certificate completed</td><td>5</td></tr> <tr><td>Technician diploma / degree completed</td><td>6</td></tr> <tr><td>Other post-metric: professional</td><td>7</td></tr> <tr><td>Other post-metric: Technical</td><td>8</td></tr> <tr><td>Other post-metric: Secretarial</td><td>9</td></tr> <tr><td>Other post-metric: some university</td><td>10</td></tr> <tr><td>Other (specify)</td><td></td></tr> </table>	No schooling	0	Some primary schooling	1	Primary schooling completed	2	Some high schooling	3	Matriculated	4	Artisan certificate completed	5	Technician diploma / degree completed	6	Other post-metric: professional	7	Other post-metric: Technical	8	Other post-metric: Secretarial	9	Other post-metric: some university	10	Other (specify)		<p>4.10 Could you please tell me what language you usually speak at home?</p> <table border="1"> <tr><td>Afrikaans</td><td>0</td></tr> <tr><td>English</td><td>1</td></tr> <tr><td>Other European / Asian</td><td>2</td></tr> <tr><td>Indian</td><td>3</td></tr> <tr><td>Zulu</td><td>4</td></tr> <tr><td>Xhosa</td><td>5</td></tr> <tr><td>Northern Sotho</td><td>6</td></tr> <tr><td>Southern Sotho</td><td>7</td></tr> <tr><td>Tswana</td><td>8</td></tr> <tr><td>Tsonga</td><td>9</td></tr> <tr><td>Venda</td><td>10</td></tr> <tr><td>Ndebele</td><td>11</td></tr> <tr><td>Swazi</td><td>12</td></tr> <tr><td>Other African</td><td>13</td></tr> </table>	Afrikaans	0	English	1	Other European / Asian	2	Indian	3	Zulu	4	Xhosa	5	Northern Sotho	6	Southern Sotho	7	Tswana	8	Tsonga	9	Venda	10	Ndebele	11	Swazi	12	Other African	13																																								
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<p>4.11 Please indicate your religion, denomination or belief?</p> <table border="1"> <tr><td>Christian</td><td>1</td></tr> <tr><td>African Christian</td><td>2</td></tr> <tr><td>Muslim</td><td>3</td></tr> <tr><td>Jewish</td><td>4</td></tr> <tr><td>Hindu</td><td>5</td></tr> <tr><td>Other (specify)</td><td></td></tr> </table>		Christian	1	African Christian	2	Muslim	3	Jewish	4	Hindu	5	Other (specify)																																																																																	
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<p>5.1 We are not focusing on each person's income, but rather the household's income. Think of the past year and the money each person in the house received. Please indicate the total household income category per month, before tax or any other deductions was made. Please use show card</p> <table border="1"> <tr><td>R1 - R99</td><td>0</td></tr> <tr><td>R100 - R199</td><td>1</td></tr> <tr><td>R200 - R299</td><td>2</td></tr> <tr><td>R300 - R399</td><td>3</td></tr> <tr><td>R400 - 499</td><td>4</td></tr> <tr><td>R500 - R599</td><td>5</td></tr> <tr><td>R600 - R699</td><td>6</td></tr> <tr><td>R700 - R799</td><td>7</td></tr> <tr><td>R800 - R899</td><td>8</td></tr> <tr><td>R900 - R999</td><td>9</td></tr> <tr><td>R1000 - R1099</td><td>10</td></tr> <tr><td>R1100 - R1199</td><td>11</td></tr> <tr><td>R1200 - R1399</td><td>12</td></tr> <tr><td>R1400 - R1599</td><td>13</td></tr> <tr><td>R1600 - R1999</td><td>14</td></tr> <tr><td>R2000 - R2499</td><td>15</td></tr> <tr><td>R2500 - R2999</td><td>16</td></tr> <tr><td>R3000 - R3999</td><td>17</td></tr> <tr><td>R4000 - R4999</td><td>18</td></tr> <tr><td>R5000 - R5999</td><td>19</td></tr> <tr><td>R6000 - R6999</td><td>20</td></tr> <tr><td>R7000 - R7999</td><td>21</td></tr> <tr><td>R8000 - R8999</td><td>22</td></tr> <tr><td>R9000 - R9999</td><td>23</td></tr> <tr><td>R10 000 - R10 999</td><td>24</td></tr> <tr><td>R11 000 - R11 999</td><td>25</td></tr> <tr><td>R12 000 - R13 999</td><td>26</td></tr> <tr><td>R14 000 - R15 999</td><td>27</td></tr> <tr><td>R16 000 - R17 999</td><td>28</td></tr> <tr><td>R18 000+</td><td>29</td></tr> <tr><td>Not applicable</td><td>30</td></tr> </table>	R1 - R99	0	R100 - R199	1	R200 - R299	2	R300 - R399	3	R400 - 499	4	R500 - R599	5	R600 - R699	6	R700 - R799	7	R800 - R899	8	R900 - R999	9	R1000 - R1099	10	R1100 - R1199	11	R1200 - R1399	12	R1400 - R1599	13	R1600 - R1999	14	R2000 - R2499	15	R2500 - R2999	16	R3000 - R3999	17	R4000 - R4999	18	R5000 - R5999	19	R6000 - R6999	20	R7000 - R7999	21	R8000 - R8999	22	R9000 - R9999	23	R10 000 - R10 999	24	R11 000 - R11 999	25	R12 000 - R13 999	26	R14 000 - R15 999	27	R16 000 - R17 999	28	R18 000+	29	Not applicable	30	<p>5.2 If the house did answer 5.1, please copy that answer here again. If the household did not answer 5.1, please estimate the household's income group</p> <p>R _____</p> <p>5.3 Please indicate if your household has or makes use of any of the following financial services (use show card nr7)</p> <table border="1"> <tr><td>Checkque account</td><td>0</td></tr> <tr><td>Savings account (ordinary bank or special bank) Transmission ac</td><td>1</td></tr> <tr><td>Investments / subscriptions shares or paid up shares</td><td>2</td></tr> <tr><td>credit card</td><td>3</td></tr> <tr><td>Petrol or garage card</td><td>4</td></tr> <tr><td>Automatic teller machine care (ATM)</td><td>5</td></tr> <tr><td>Personal loan or overdraft</td><td>6</td></tr> </table> <p>5.4 Has your household bought any durable item (e.g. appliances of furniture on credit during the past twelve months?</p> <p>Yes <input type="checkbox"/> 1</p> <p>No <input type="checkbox"/> 0</p> <p>5.5 Please indicate if the household has any of the following policies or plans that one can take out with an insurance company?</p> <table border="1"> <tr><td>Whole life policy (pays out when you die)</td><td>0</td></tr> <tr><td>Endowment, savings or investment</td><td>1</td></tr> <tr><td>Retirement annuity for personal retirement plan</td><td>2</td></tr> <tr><td>Pension (usually deducted by employer)</td><td>3</td></tr> <tr><td>Funeral insurance (to cover cost of funeral)</td><td>4</td></tr> <tr><td>Medical insurance (not medical aid, insurance)</td><td>5</td></tr> <tr><td>Short-term insurance (on your house, car e.g.)</td><td>6</td></tr> <tr><td>None of the above</td><td>7</td></tr> </table> <p>5.6 Does your household have an investment in a mutual fund or unit trust?</p> <p>Yes <input type="checkbox"/> 1</p> <p>No <input type="checkbox"/> 0</p>	Checkque account	0	Savings account (ordinary bank or special bank) Transmission ac	1	Investments / subscriptions shares or paid up shares	2	credit card	3	Petrol or garage card	4	Automatic teller machine care (ATM)	5	Personal loan or overdraft	6	Whole life policy (pays out when you die)	0	Endowment, savings or investment	1	Retirement annuity for personal retirement plan	2	Pension (usually deducted by employer)	3	Funeral insurance (to cover cost of funeral)	4	Medical insurance (not medical aid, insurance)	5	Short-term insurance (on your house, car e.g.)	6	None of the above	7
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<p>5.7 Did your household invest on the stock exchange in the past twelve months?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table>	Yes	1	No	0	<p>5.8 Is the household a member of a medical aid scheme (e.g. through a family member or employer)?</p> <table border="1"> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>0</td></tr> </table>	Yes	1	No	0																																																																																				
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<p>6.1 During the year, taking in account your contribution and availability, and the usability of your data, we would like to give you a gift as a token of our appreciation. Would you like to be part of the 6 or 12 month gift scheme?</p> <table border="1"> <tr><td>6 months</td><td>1</td><td>We choose what you get</td></tr> <tr><td>12 months</td><td>0</td><td>You choose what you get from a list provided</td></tr> </table>	6 months	1	We choose what you get	12 months	0	You choose what you get from a list provided	<p>6.2 What is this households GPS Points</p> <table border="1"> <thead> <tr> <th colspan="3">SOUTH</th> <th colspan="3">EAST</th> </tr> <tr> <th>SD</th> <th>SM</th> <th>SS</th> <th>ED</th> <th>EM</th> <th>ES</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	SOUTH			EAST			SD	SM	SS	ED	EM	ES																																																																										
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Thank you for your valuable time.

APPENDIX G: Nielsen consumer panels worldwide – 2009



Map of in-home scanner consumer panels 2009



Map of diary/bin consumer panels 2009

APPENDIX H: Cash slip from a retailer in Israel

זולפה
מחסני מזון למרצד /

רח הנוסע 12 אטרוד 08-8528818
520022732 פ.ח.

707 פה אטרוד (367)
טוסק מורשה 0520022732

לחשבור	תאור	קוד
18.99	חולצה אלגנט	*6073081289
13.99	פאחחחון ילדים	*7028002694
12.99	קנקב ים גבר	*6073054665
-3.00	מבצע	
28.90	2.89 X 10 ליחידה	3060009
-4.00	קפה 1 קג	מבצע
67.87	לחשבור	
5.00	תע. זכוי מיחוש	
	136707006958 תעודה חסי	
53.00	מזומן	
0.02	טיגול אגודות	
0.15	ט ד ר	

סה"כ פריטים 13

* * * * *

17/07/07 12:07 59920 10300 16ט
קופאי/ח : סיגלית
אטיאם
תודה בקנייתם אצלנו

Note the highlighted bar codes