Information Behaviour of Online Investors

A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis/project is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Arthur Adamopoulos

20 February 2015
Abstract

Online trading has now become the prevalent form of stock market investing. With a large percentage of investors online, understanding how they gather, use and share information is of major interest to service providers, regulators, researchers and to investors themselves. Previous studies have examined the adoption of online investing, the impact of online stock forums on markets and the information content of stock forums. A relatively limited number of studies have investigated the information seeking practices of online investors. This study sought a deeper understanding of what drives the information behaviour of online investors.

This research reports on a qualitative study that interviewed 26 online investors about their information practices and social networks. The interview transcripts were analysed using a Grounded Theory methodology and the research process was also influenced by aspects of Multi-Grounded Theory. A new Theory of Online Investor Information Behaviour has been developed as a result of the analysis.

The theory introduces the concept of an Investment Persona – a role that an investor takes on – that has a large impact on their information seeking behaviour. Investors may take on multiple Personas simultaneously. A number of distinct Persona types were identified in the study: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler.

The theory also includes a model of the Stock Investing Information Process, which includes the tasks: Idea Generation, Stock Selection, Company Research, Buy, Monitor and Sell. While information practices are incredibly diverse in the early stages of the investment process, the later stages tend to be more homogenous.

A core aspect of the theory is the concept of an Information Lens. Rather than using all information sources and social networks at all times, investors look through an Information Lens, seeing only a small subset of their information world at any particular time. The Information Lens is highly dynamic and is shaped by the current Persona and the task at hand.

The bidirectional relationship between the investor and the information world is also considered. The information environment itself can influence the investor and change their behaviour, by enabling new strategies that were not previously possible, or potentially threatening the investor with information overload. Online technologies can also enhance the investing experience and make it more interesting and exciting.
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Papers Arising from this Thesis


Chapter 1  Introduction

This research is an in-depth study of the information behaviour of a group of online stock market investors. The combined value of all the stock markets in the world is 65 trillion US dollars (WFE 2013). While the majority of those funds are managed by professionals, many millions of individuals all over the world invest in stocks directly, with large sums involved. The advent of the Internet has drastically transformed the stock market industry, with online trading now being the prevalent form of stock market investing. With such a large number of investors online, understanding how they gather, use and share information is of major importance to service providers, public companies, regulators, researchers and to investors themselves.

And yet, little is known about how investors actually use the Internet. While previous studies have examined the adoption of online investing, the impact of online stock forums on markets and the information content of stock forums, relatively few studies have investigated the actual information practices of online investors. This study sought a deeper understanding of how investors use the Internet and how the Internet may impact the investors themselves.

While system usage has been a component of many previous information system studies, the usage itself has often been studied in a relatively simple manner (Barki, Titah & Boffo 2007). To complicate the situation further, the Internet is not a single ‘system’, but a diverse collection of sources and services that are constantly evolving. The perspective of Information Behaviour was therefore taken in this study in order to explore Internet usage in depth. By exploring what drives the information behaviour of online investors, this study not only contributes a deeper understanding of online investor behaviour but also a better understanding of online system usage and new perspectives on information behaviour itself.

This chapter initially presents the motivations for this study. Namely, why online investing is an important context to research and also why the Information Behaviour perspective was crucial to gaining a deeper understanding of Internet usage. Then, the research question being answered by this study is described. A brief outline of the research approach taken in the study is presented and then, finally, the structure of this thesis is outlined.
1.1 Why Online Investing?

Stock market investment is a very large industry, with many millions of individuals and households investing in stocks in many parts of the world. In the USA, over 20% of all households own stocks directly and that figure jumps to almost 50% when managed funds are taken into account (Bucks et al. 2009; ICI 2013). In Hong Kong, 36% of the adult population invest directly in stocks (HKEX 2011). Almost 40% of the adult population of Australia own stocks directly (ASX 2012) and half of those monitor their investments weekly (ASX 2004).

Australia has also seen a dramatic growth in the number of Self-Managed Superannuation Funds (SMSFs), with the number of members recently passing 1 million (Collett 2014). Over 35% of these self-managed funds invest in stocks, making a large population of individual investors that manage their own retirement funds and invest these funds in stocks (ATO 2014).

The Internet has radically transformed the stock market landscape. Whereas previously human stock brokers were the primary conduit between individual investors and the market, online brokers now connect the investor almost directly with the exchange, providing a faster and cheaper service than before. The Internet makes vast amounts of information and trading tools available to every investor - tools that were previously only available to professional traders. It also has enabled investors to gather in electronic communities and discuss stocks directly amongst themselves and share information (Barber & Odean 2001b; Economides 2001).

Online trading has now become the prevalent form of stock market trading. The latest ASX (Australian Securities Exchange) retail investor report found that 80% of Australian investors trade online using an online broker (ASX 2012). Similar rates of uptake of online investing are found in Hong Kong, where 70% of all investors trade online, with 70% of those trading exclusively online (HKEX 2011). Australia’s largest online broker alone, Commonwealth Securities, has over 1 million clients (Webb 2007).

With such a large percentage of investors now online, an understanding of how investors gather, use and share information is important to many stakeholders. Service providers, such as online brokers, need to understand their customer’s needs and behaviours to provide a better service and attract more investors. Publicly listed companies, responsible for keeping their shareholders fully informed, need to understand how their shareholders obtain and use information.
Researchers questioning or surveying online investors about their information activities and social networks need to be aware of all the possible activities that investors may be thinking of when answering the questions. Authorities that are charged with regulating securities markets to ensure that markets remain informed at all times, need a better understanding of the possible information flows in the new online realm and the impact these may have on investor behaviour, to determine if securities laws need to be updated. Investors themselves may also benefit from the knowledge of all the different ways online investors gather information and communicate with others. This knowledge may open their minds to investment approaches and ways of communicating with other investors that they may not have immediately thought of themselves.

Given that stock market investing is a substantial industry that is now predominantly online, there has been relatively little previous research conducted in this field, especially when compared to other online contexts such as online banking or online health. Others have pointed out that “consumer information search for investment decisions have not received much attention” (Lin & Lee 2004) and that “literature on the particular topic of external information search for investment information is scarce” (Loibl & Hira 2009).

The following simple exercise, while by no means a thorough analysis, provides an indication as to how little research has been conducted into the context of online investing in comparison to other online contexts. Using the search engine scholar.google.com, in April 2014, the following basic searches were conducted for academic papers with the following words in their title: ‘online investing’, ‘internet investing’, ‘online banking’, ‘internet banking’, ‘online health’ and ‘internet health’. While the investing searches yielded a total of 280 hits, the banking searches totalled 4,250 and there were 9,200 total hits for health.

Online stock investing is inherently a complex process, involving the gathering of information from a wide range of sources, analysing the information and making investment decisions (O’Connor 2012). A deeper understanding of how investors use online sources and services, and how these may impact the investor, is needed.

For the purpose of this study, online investing is considered to be “the set of activities undertaken by individual investors in connection with the independent management of their investing accounts with online brokers” (Konana & Balasubramanian 2005). This study’s target group is individual stock market investors – individual people that invest their own funds in stocks – either in their own name or via a Self-Managed Superannuation Fund (SMSF).
1.2 Why Information Behaviour?

How people use information systems has been a prominent research question for many years, and yet researchers have recently stressed how little is understood about system usage (Burton-Jones & Gallivan 2007). “Despite being an important construct, IS use is still weakly conceptualized and operationalized as frequency, duration, or variety of system functions used” (Barki, Titah & Boffo 2007). “Researchers must also consider the nature, extent, quality, and appropriateness of the system use” (DeLone & McLean 2003). “We need to better conceptualize system usage so as to include a broader perspective of what users actually do in and around the notion of system use” (Benbasat & Barki 2007). Although the usage construct has been a key element in information systems research for many years, it has not often been studied in depth.

It is only very recently that researchers have proposed broadening the concept of IS Usage. Burton-Jones has proposed that system usage should be investigated by taking three elements into consideration: the System, the User and the Task. He has classified system usage measurements from ‘Very Lean’ to ‘Very Rich’ (see Figure 1-1) (Burton-Jones & Straub 2006). Barki et al propose that in looking at IS Usage, we must consider not only the direct interactions between the individual and the system but also activities that individuals undertake to adapt or modify the task-technology-individual context (Barki, Titah & Boffo 2007).

![Figure 1-1 – Rich and Lean Measures of System Usage - (Burton-Jones & Straub 2006)](image)

Burton-Jones and Straub (2006) found no studies that had explored system usage in a ‘Very Rich’ manner. Yet, this is the reality of how information systems are used in real life: by people to carry out a particular task or solve a specific problem. Real life system usage is complex.
The IT artefact under investigation in this study, the Internet, is a unique type of information system and is especially complex. It is not a single software package created by a single entity but is instead made up of a multitude of individual sources and services and is in a constant state of change and evolution. It exhibits many of the premises proposed by Orlikowski & Iacono – that IT artefacts are not natural but shaped by people, they are often made up of multiple fragmented components, they are adapted and modified by their users and they are constantly changing over time (Orlikowski & Iacono 2001).

Information Behaviour is the study of “how people need, seek, manage, give, and use information in different contexts” (Fisher, Erdelez & McKechnie 2005). It is a key research area in the field of Information Science with a considerable body of knowledge.

By investigating the information practices of actual online investors, this study was able to explore system usage of the IT artefact in the depth and complexity in which it occurs in real life. The study sought to explore the question of how online investors use the Internet, going beyond the questions of who adopts online trading and why. Viewing the data through the perspective of Information Behaviour made this possible.

The context of online investing is multi-disciplinary, spanning not only the fields of Information Systems and Information Science but also Economics, Finance and Law. Although these fields are all somewhat distinct, they all have a common interest when it comes to online investing – information. Utilizing the perspective of Information Behaviour also allowed this study to bring together concepts from all of these disciplines in a coherent manner.

1.3 Research Aim

The aim of this study was to explore, in depth, the information behaviour of online stock market investors. It sought to do this by interviewing actual investors about their actual information practices. The study sought to answer the following research question:

*What drives the information behaviour of online stock market investors?*

Related subsidiary questions were:

*What information behaviours do online stock market investors exhibit?*

*How is investor behaviour influenced by the information environment?*

*What motivates online investors?*
The research questions investigated are inherently of a complex nature. Each online investor has a plethora of information sources available to them, defines their own investing goals and tactics and performs their investing tasks according to their own personal experience and skills. The research did not seek to simplify the complexity away but instead to embrace it and explore the behaviours and contributing factors in all their richness and diversity.

Companies and organizations that provide information and services to online investors are able to improve their services and information sources if they better understand their customers and intended audience. This not only includes stock broking service providers and the stock exchange, but also all of the public companies that provide information to their shareholders. A better understanding of investor behaviour will also assist regulators in drafting legislation in relation to financial markets.

This study also provides a step forward in reaching a deeper understanding of the concept of system usage by exploring it from the perspective of information behaviour.

1.4 Research Approach

The research design and methodology used by this study is described in detail in Chapter 3. In order to investigate the real-life information behaviour of online investors, in all its richness and complexity, twenty-six individual investors were engaged in qualitative interviews using open-ended questions. The transcripts of these interviews were analysed following an inductive and interpretive qualitative approach (Eisenhardt 1989), using a grounded theory methodology (Strauss & Corbin 1998).

The resulting set of coded references produced an initial set of concepts that were analysed (transcripts and memos) and grouped. The grouping resulted in a number of high level concepts and themes. These themes, along with the relationships between them, make up the theory used to answer the research question. This process was highly iterative, with the developing theory evolving through a number of iterations throughout the analysis. The research path followed was also multi-grounded, with the literature being used at various points to compare, contrast and also inform the theory as it evolved (Goldkuhl & Cronholm 2010).
1.5 Structure of the Thesis

Chapter 2 provides a review of the literature that informed this study. Previous studies into online investing span a range of perspectives and disciplines – Information Systems (Adoption and System Usage), Information Science (Information Behaviour), Economics (Behavioural Finance and Efficient Markets), Law and Social Studies (Serious Leisure). The studies from each of these fields are presented, as well as an introduction to the stock market and investing.

Chapter 3 discusses in more detail the research approach taken in this study. It discusses the reasons behind the methods chosen and examines the process by which the data was elicited, analysed and then formulated to arrive at the findings. It describes the research journey and justifies the path taken to generate the theory that answers the research question.

The theory of online investor information behaviour is then presented over three chapters (chapters 4, 5 and 6). Chapter 4 introduces the Information Lenses model and discusses the foundation elements: Investors and the Information World. This includes the characteristics of online investors, what motivates investors to invest online, the information sources and services that are used and the types of social networks investors participate in.

Chapter 5 introduces and explores the model of stock investing information process that was developed during the analysis. Then the concept of an Investment Persona is explored in depth, which is a key component of the Information Lenses model, as individual investors can take on multiple Personas with different information behaviours in each.

Chapter 6 then explores the bidirectional relationship between the investor and the information world - that information behaviour is a “two way street”. How Personas and tasks influence the Information Lens, and therefore information use, is explored. How the information environment itself can influence investors and affect their behaviour is also discussed.

Chapter 7 enfolds the emergent theory with the literature. The theory developed in this study is compared and contrasted with existing theories and concepts. The chapter describes where the theory confirms previous findings and highlights the contributions to knowledge made by the new theory.

Chapter 8 discusses how the theory developed in the study answers the research questions. Implications of the theory in regards to research and industry practice are also discussed, as well as limitations of the study. Finally, potential areas of further research are proposed.
Chapter 2   Literature Review

This chapter provides a review of the literature that informed this study. As highlighted in the introduction, the aim of this study was to explore, in depth, the information behaviour of online stock market investors. This chapter presents the reader with a background of the concepts and theories that informed and influenced the study and the resulting theory that was generated, which ultimately answers the research question: what drives the information behaviour of online stock market investors?

Concepts from the literature informed the study initially in the design of the interview questions. They enabled the researcher to be informed about online investing so as to be able to converse with participants about their activities. During the analysis, theories and models from the literature served as a source of concepts with which to compare and contrast the emerging theory. Finally, the theory developed in this study was enfolded with existing theories from the literature (in chapter 7), highlighting both where the new theory supports previous findings and also where the theory provides contributions to the body of knowledge.

Previous studies into online investing have spanned a wide range of disciplines – Information Systems (Adoption and System Usage), Information Science (Information Behaviour), Economics (Behavioural Finance and Efficient Markets), Law and Social Studies (Serious Leisure). Figure 2-1 provides a pictorial representation of the different fields involved (although presented as a pie chart, the size of each slice does not represent any sort of measurement).

This chapter also serves to bring together the studies from these disparate range of disciplines that all share the same context – online investing – and present them in a cohesive manner. In doing so, it highlights not only existing knowledge but also the gaps in the literature that motivated this study.

Studies from Behavioural Finance provide insights into the human biases that all investors are prone to suffer. Investors have been shown to trade more often once they go online but the reasons for this are not clear. How individual investors cope with potential information overload has had little research. Studies of online forums have focussed on how the forums impact the market but very few studies have investigated how and why investors use these stock forums.
Adoption studies from Information Systems have shown why investors adopt online investing. With a large percentage of investors now online, however, this study sought to go beyond adoption and explore how investors actually use the Internet. Researchers in the field of Information Behaviour have long been studying how people seek and use information in context – to solve problems. By utilising the perspective of Information Behaviour, this study has been able to investigate how investors use the Internet in a very rich manner.

There have been a small number of previous studies investigating the information behaviour of investors and their insights were valuable to this study. None of these studies, however, have provided a single, cohesive theory of online investor information behaviour. This study sought to generate such a theory.
This chapter is structured as follows:

- Investing in Stocks
- Efficient Markets and Behavioural Finance
- Adoption, Diffusion and Beyond
- Investors and Online Social Media
- Information Behaviour Models
- Investor Information Behaviour
- Serious Leisure

This chapter’s primary focus is to review the existing literature specific to online investing. Where appropriate, a brief background is also provided of each discipline, in order for the reader to gain a better understanding of the studies presented, in that discipline, related to online investing.
2.1 Investing in Stocks

This section provides a brief overview of stocks, the stock market and some of the basic mechanics of investing in stocks. A description is also given of some basic measurements and ratios that most investors are typically interested in. The two main approaches to stock selection are described and contrasted: fundamental analysis and charting.

2.1.1 Stocks and the Stock Market

A stock, also known as a share, represents a part ownership of a company. A company issues a limited number of stocks and by buying the stocks, each investor buys part ownership of the business and becomes a shareholder in the company. In return for investing in the company, shareholders share in the profits of the business and can receive dividend payments (ASX 2010b; Investopedia 2014b).

Publicly listed companies are those that have issued stocks to members of the public and are listed on a stock exchange. A stock exchange is a facility that provides a marketplace for shareholders to buy and sell stocks in companies – often referred to as the 'stock market'. In Australia the primary stock exchange is the ASX (Australian Securities eXchange) (ASX 2010b).

There are two ways investors can buy stocks in a company – directly from the company itself when it issues shares, or in the marketplace operated by the stock exchange. When a company first issues shares to the public and lists on the exchange, this is known as a ‘float’ or IPO (Initial Public Offering). At various times, if a company wishes to raise money, they can also issue more shares directly to investors. Most of the time, however, if an investor wishes to buy stocks in a company they will buy them in the marketplace from other investors (ASX 2010b).

Although most stock exchanges are now fully electronic, investors can not directly access the exchange. In order to buy or sell stocks, an investor must use a stock broker. Traditional, full-service, stock brokers are human brokers that provide advice to the investor as well as the transactional service to buy and sell stocks on the exchange. Online brokers provide a transaction only service without any advice, but usually charge much lower brokerage rates (ASX 2010b). While the vast majority of investors in Australia today use an online broker (80%), there is still some demand for full-service brokers (30%), with the overlap showing some investors use both (ASX 2012).
Each company is identified by a ticker symbol (e.g. National Australia Bank = NAB) and this symbol is used when dealing with the broker. Typically, when an online investor decides to purchase stock in a company, they log in to the website of their online broker and enter a trade request. They specify the ticker symbol of the company, the number of stocks and a limit price they are prepared to pay per share (e.g. Buy 100 NAB @ $51.30). The broker website processes the request and then forwards the buy order to the stock exchange computer systems, where it is matched with sell orders from other investors. The purchase occurs if there are current sell orders with offer prices equal to the limit asking price. If the limit price is below the current market price then the order is queued in the system until the market price moves down enough to fill the order or the order expires (CommSec 2014; Sindell 2005).

2.1.2 Basic Company Measurements and Ratios

There are some basic fundamental measurements and ratios that investors generally want to know about a company. All of these are provided by online brokers on their website when an investor looks at the profile of a company they are considering investing in.

Firstly there are basic facts about the company itself such as the industry it operates in and the market capitalization of the company (also called the ‘market cap’). The market capitalization is calculated by multiplying the total number of shares on issue with the current market stock price. The largest companies are often referred to as ‘large cap’ or ‘blue chip’. Medium and smaller sized companies may be referred to as ‘mid cap’ and ‘small cap’ while the smallest companies are known as ‘micro cap’ (Sindell 2005).

The profits of a company are usually known as earnings. The most common earnings measurement is the Earnings Per Share (EPS), which is the total annual profit divided by the number of shares on issue. One commonly used ratio is the Price Earnings (PE) Ratio and this is calculated by dividing the current stock price by the most recent Earnings Per Share. For example, if NAB’s current EPS was $3 and the stock was selling for $54, then the current PE ratio would be 18 [54/3]. The PE ratio is sometimes used as a rough gauge as to how cheap or expensive a company’s share price might be (Sindell 2005).
Companies can pass on part of their profits to shareholders by paying a dividend. A dividend is declared on a per share basis, and a shareholder is paid the dividend amount multiplied by the number of shares they hold. For example, if NAB declared a $1 final dividend and a shareholder held 100 shares, they would be paid $100 in total. In Australia companies usually pay 2 dividends per year.

Another commonly used ratio is the Yield, which is calculated by dividing the most recent annual dividend total by the current market stock price. The yield is expressed as a percentage and is similar in concept to the interest a bank pays on a deposit. For example, if NAB had paid $2 of dividends in the past year and the stock was selling for $54 then the current yield would be 3.7% \(\frac{2}{54}\) (CommSec 2014; Sindell 2005).

### 2.1.3 Fundamental Analysis

A fundamental analysis approach to investment is the mainstream view of stock investing, where companies are analysed and chosen based on their profits (earning) and their dividends. Investors are interested in both historical financials and also in forecasts of future earnings and dividends made by professional analysts. Investment decisions are made based on the industry the company operates in (e.g. banks or mining), the past performance of the company (e.g. long term growth in earnings and dividend payments) and forecasts of potential future earnings.

“The end goal of performing fundamental analysis is to produce a value that an investor can compare with the security's current price, with the aim of figuring out what sort of position to take with that security (underpriced = buy, overpriced = sell)” (Investopedia 2013c). Ideally, the fundamental investor is looking to buy stocks that are priced well below the company’s intrinsic value, both to maximize long term gains and also to provide a ‘margin of safety’, in case of the company running into unforeseen problems (Graham & Buffet 1986).

If, for example, an investor was considering purchasing shares of Apple Corp, they would seek data about Apple’s earnings and dividends, perhaps not only for the current year but also for the past 5 or 10 years. They may look at Apple’s Price Earnings (PE) ratio to consider if the shares are currently expensive or cheap and other financial measurements such as return on equity and perhaps consider the amount of debt or cash the company holds. They may also seek out reports written about Apple by stock broking firms or other analysts for different opinions.
As well as financial numerical data they may also consider more qualitative issues such as the current management of the company, their reputation, past performance and the perceived ability to steer the company into the future. So the question of whether Apple could continue to innovate without Steve Jobs may weigh on the mind of the fundamental investor.

2.1.4 Charting / Technical Analysis

In contrast to the fundamental analysis approach, there is another school of thought that the price pattern of a stock is a true reflection of the total supply and demand of all the market participants. “Using charts, technical analysts seek to identify price patterns and market trends in financial markets and attempt to exploit those patterns… Technical analysts believe that prices trend directionally, i.e., up, down, or sideways… and that investors collectively repeat the behavior of the investors that preceded them” (Investopedia 2013b).

The price history of a stock is drawn on a chart and trend indicators such as moving averages are overlaid on the chart. A moving average is the average of the stock price over a defined number of time periods (e.g. 10 days or 200 days). “The most common applications of moving averages are to identify the trend direction and to determine support and resistance levels” (Investopedia 2013a). A further extension is to use “2 or 3 moving averages of varying lengths… signals are generated when two of the moving averages cross” (ASX 2013). When a shorter term average crosses above a longer term average this is known as a break-out and is often a potential buying signal. More sophisticated technical analysis involves incorporating trading volumes and interpreting chart patterns in more complex ways.

If, for example, a trader was considering purchasing shares of Apple Corp, they might examine the hourly, daily and weekly charts for Apple. They would use moving averages to determine the short and long term price trends. If the 20 day moving average had remained consistently above the 200 day moving average over the past year, this might indicate to the trader that the stock price was in an uptrend and was likely to continue rising and may be worth purchasing.

2.1.5 Summary

This section provided a brief background of stock market investing, including some of the basic measurements and ratios used by most of the investors interviewed in this study. While some investors focus on the fundamental analysis of company financials, others believe in charting – that studying past stock price patterns can predict future price trends.
2.2 Efficient Markets and Behavioural Finance

Economists have long been interested in the behaviour of financial markets and investors, and the role of information has played a key part in economic theories and models. A long held economic theory is the Efficient Market Hypothesis (EMH), which states that security markets are “efficient” because “prices fully reflect all available information” (Fama 1970). Proponents of the EMH argue that because stock prices are always ‘correct’ it is not possible for individuals to beat the market by buying stocks that are under-priced.

Assumptions underlying the EMH are that individual investors always behave rationally and that new information is efficiently aggregated by market participants and immediately reflected in security prices. There is still considerable debate, however, over whether markets are truly efficient, even after thousands of studies over several decades (Lo 2004). The legendary investor, Warren Buffet, has been quoted as stating “I'd be a bum on the street with a tin cup if the markets were always efficient”. This debate was recently highlighted with the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel in 2013 being awarded equally to Eugene Fama (founder of the Efficient Market Hypothesis), Lars Hansen and Robert Shiller (a key developer of the field of Behavioural Finance) (Nobel.org 2013).

Recently, Lo (2004) has proposed an alternative theory called the Adaptive Markets Hypothesis (AMH) that takes an evolutionary perspective and views markets as ecologies. “Intelligent but fallible investors learn from and adapt to changing economic environments - markets are not always efficient, but are usually competitive and adaptive” (Lo 2012). “Prices reflect as much information as dictated by the combination of environmental conditions and the number and nature of ‘species’ in the economy” – species being distinct groups of market participants such as pension funds, retail investors and hedge funds. The efficiency of a particular market will vary, depending on how many participants of each type of species are competing in that market (Lo 2004).

Whilst the efficiency of markets was not the focus of this study, an understanding of this history of Economic thinking is helpful in understanding the next topic, Behavioural Finance. The Efficient Market Hypothesis (EMH) has long been a strongly held belief in the field of Economics – that investors always act rationally and prices are always correct. Only recently has the field of Behaviour Finance arisen to question some of these assumptions.
2.2.1 Behavioural Finance

Researchers in the field of Behavioural Finance have shown that investors do not necessarily always behave rationally, pointing to a number of cognitive biases that have been identified by psychologists in human decision-making under uncertainty (Lo 2004; Wärneryd 2001).

Overconfidence is one bias that people commonly exhibit. Psychologists have determined that overconfidence can cause people to overestimate their own abilities, underestimate risks and exaggerate their control over events (Nofsinger 2010). Studies have determined that overconfidence can be bad for investors, making them trade more often and earning lower returns as a result (Barber & Odean 2000, 2001a). Self-attribution can be one contributor to overconfidence – people believing their successes are due to their own skills whereas their failures are caused by bad luck or market forces (Nofsinger 2010).

Another bias is the Illusion of Knowledge – people believing that the accuracy of their forecast of the future improves with more information. “By one account, every on-line investor has access to over three billion pieces of financial data; those who are willing to pay have access to over 280 billion pieces. However, when people are given more information on which to base a forecast or assessment, their confidence in the accuracy of their forecasts tends to increase much more quickly than the accuracy of those forecasts. In fact, at some point, actual predictive skill may decline as information rises, due to information overload” (Barber & Odean 2001b).

Investors are also known to suffer from Confirmation Bias, where new information is given weight according to whether it confirms the investor’s decision. If an investor buys a stock, good news about that stock will be greeted and read carefully, as it confirms the decision the investor made was a good one, whereas bad news may be dismissed (Nofsinger 2010).

The Disposition Effect is another bias observed in investors – “fearing regret and seeking pride causes investors to be predisposed to selling winners too early and riding losers too long” (Nofsinger 2010). People are also known to practice what is termed Mental Accounting – treating different collections of money individually without considering the overall picture. An example would be saving for a holiday in a low interest savings account while at the same time paying a high interest rate on a credit card debt (Nofsinger 2010; Thaler 1999).

Behavioural Finance consists of a large body of knowledge and has identified a range of biases that show investors do not always act rationally and that, at times, market prices do not necessarily fully reflect underlying fundamentals (Barberis & Thaler 2003; Wärneryd 2001).
2.2.2 Behavioural Finance in Online Situations

Behavioural Finance research has continued into the realm of online investors. Researchers have been interested to see what effect the Internet may have on the trading behaviour of investors. There is concern that by being able to place trades immediately and have immediate feedback, investors may gain an exaggerated sense of control. Having access to a vast amount of information on the Internet may make investors overconfident in their ability to pick stocks (Barber & Odean 2001b).

Several studies have shown that when investors changed from phone-based trading to online trading, they traded more actively and less profitably. Choi, Laibson and Metrick (2002) studied the trading records of 100,000 corporate pension plan participants, who were offered a web based platform from 1998. Over the following 2 year period, they found that trading frequency doubled and portfolio turnover increased by 50%. Barber and Odean (2002b) investigated the trading behaviour of investors who switched from phone-based to online trading at a discount brokerage firm. They also found that investors traded more often after going online and their performance suffered as a consequence (Barber & Odean 2002a, 2002b).

Barber and Odean suggest that online investors trade more often because of overconfidence, although their argument is based on inference rather than direct evidence (Barber & Odean 2000). Glaser and Weber (2007) found a more direct link between overconfidence and higher trading. They asked 3000 German online investors to answer a questionnaire designed to measure their level of overconfidence. Checking these against actual trading records, they found that those investors that thought they were above average did actually trade more often. In another study, Barber and Odean found that the most prolific traders were young, single men without children (Barber & Odean 2001a).

The potential impact that the online environment itself may have on investors has also been investigated but to a limited degree. One study surveyed a group of university students about their perceptions of using an online trading system. In their findings they suggest that online technologies may lead investors to exaggerate their capabilities, leading to overconfidence (Looney et al. 2006).
In another study, novice investors (students) participated in a simulated online trading game. They were given limited amounts of time to trade and incomplete information about the stocks they could trade. The findings were that those that traded more often (and therefore made faster decisions) performed more poorly, suggesting that online traders making quick decisions may be at a disadvantage (Richardson, Gregor & Heaney 2004).

Park et al. (2010) conducted an experiment in South Korea with investors using Stock.Naver.com, Korea’s largest stock message board. They subscribed 502 investors to the experiment and presented them with messages about stocks, to which they were asked to rate the message as being positive or negative towards the stock. They found that investors exhibited confirmation bias according to the opinion they already held about the stock. They also demonstrated that “investors with stronger confirmation bias exhibit greater overconfidence. Those investors have higher expectations about their performance, trade more frequently, but obtain lower realized returns” (Park et al. 2014; Park et al. 2010).

A study of Japanese online investors found that those who were employees tended to trade more often, and they preferred higher volatility stocks and used charts to make their own buy and sell decisions. The study claimed that these traits showed online investors to exhibit the traits of overconfident investors (Uchida 2006).

A tentative link has also been made between online trading and risk taking. Zwick (2005) posits that the online investors he interviewed were engaged in a form of edgework – the taking on a risk for the thrill of the risk itself, rather than just for an economic result (in a similar vein to parachuting as a sport). Edgework is described as having similarities to gambling but with a greater level of control and skill involved, instead of just relying on chance. He also put forward the argument that the immediacy and visual appeal of online investing interfaces encourage this form of risk taking behaviour by making the experience more exciting (Zwick 2005; Zwick & Dholakia 2006).

In summary, these studies of online investors have confirmed that they are prone to the same biases that had been previously identified: overconfidence, the illusion of knowledge and confirmation bias. There can be no doubt that investors do trade more often because of the Internet, but overconfidence may not be the only explanation. Lower costs and easier access is a factor that also needs to be taken into account. The online environment may also encourage investors to take more risks. How the Internet might influence investor behaviour – positively and negatively - needs more investigation.
2.2.3 Bounded Rationality and Satisficing

Bounded Rationality is a founding concept in the field of Behavioural Finance. It is used as an argument against the Efficient Market Hypothesis, which assumes investors always behave rationally and make optimal choices (Conlisk 1996; Simon 1982; Tseng 2006).

Bounded Rationality posits that when people are making decisions, their rationality is limited by the information they have, their cognitive ability, and the amount of time they have available. It was proposed by Herbert A. Simon (1955) as an alternative to the concept of rationality as optimization, which views decision-making as the process of finding an optimal solution using all the information available.

Simon argued that because a decision maker often lacks the ability and resources to test all possible solutions and choose the best one, they instead develop simplified measurements and preconceived notions of what an acceptable solution will look like. When a satisfactory solution is found it is adopted, even if it is not the best possible solution. Simon also used the term ‘Satisficing’ to describe this strategy (Marakas 2003; Simon 1982).

More recently, a few studies have studied bounded rationality in the context of online web searching. A study of young people’s use of web sites found evidence of satisficing, with participants reducing the number of sites they visit to a manageable number and terminating a search when they found a ‘good enough’ answer (Agosto 2002). A later study also found evidence of web searchers practicing both these same reduction and termination strategies because of time and effort constraints, despite the fact that they were aware of the potential of missing important information by doing so (Mansourian & Ford 2007).

No studies, however, have looked at online investing from the perspective of bounded rationality. Bounded rationality is also a theory relevant to the study of information overload, which is discussed next.
2.2.4 Information Overload

In a thorough literature review of the field, Eppler and Mengis (2004) found that information overload has been recognised as a problem in a wide range of disciplines: Psychology, Organization Science, Accounting, Marketing and Management Information Systems (MIS).

Researchers have discovered that the decision making performance of an individual improves as more information is made available, but only up to a certain point. If further information is provided beyond this point, the performance of the individual will rapidly decline. Information beyond this point will not be used and information overload will result (Eppler & Mengis 2004).

The Internet has been found to both contribute to information overload, by making vastly more information available to individuals, but also at the same time, it can lessen the problem by making it easier to locate the most useful and relevant information (Edmunds & Morris 2000).

The causes of information overload can be many and varied: the information itself (its quantity, frequency and quality), the person receiving it (skills, experience and motivations), the tasks and processes involved (their complexity and level of routine) and the information technology being used or misused (Eppler & Mengis 2004; Jackson & Farzaneh 2012).

Previous researchers have proposed all forms of measures to counter information overload: from improving training of individuals, use of graphs for visual presentation, standardizing tasks in workplace settings to many forms of information systems such as decision support systems, natural language processing, information filters and intelligent agents. Very few studies, however, have delved into how individuals themselves naturally cope with information overload - especially those from the field of Information Systems (Edmunds & Morris 2000; Eppler & Mengis 2004).

Some studies have shown that people do adopt Herbert Simon’s satisficing strategy when faced with information overload by adopting simplifying strategies or “short cuts” (Paredes 2003). In a study of Finnish environmental activists, Reijo Savolainen found two strategies that were employed by people in an everyday information context: filtering and withdrawing. Filtering involved skipping over certain information items in a stream – such as spam email or news items not of interest. The withdrawal strategy involved limiting the number of information sources used daily. The study did find that many participants did not consider information overload to be a problem, which may have been due to filtering and withdrawing strategies being employed naturally as a way of coping with potential information overload (Savolainen 2007a).
A more recent study of information overload with Facebook found similar findings – users filtered by checking posts of their closest friends first and ignoring those that were not of interest, while they also used withdrawal strategies by hiding or deleting people so they would no longer receive updates about them (Koroleva, Krasnova & Günther 2010).

There have been a small number of studies of Information Overload in the contexts of Finance and Investing. In the field of Accounting there have been studies investigating the impact that company announcements have on investors (Jones & Shoemaker 1994; Miller 2010; Paredes 2003). Although financial market regulators are primarily concerned with ensuring companies disclose information to the market as soon as possible, how much of that information can actually be absorbed by investors is a concern (Paredes 2003). Company financial disclosures have been found to be often difficult to read and “inaccessible” to many unsophisticated investors (Jones & Shoemaker 1994), and longer and more complicated announcements can actually lead to reduced investor activity in a stock (Miller 2010). These studies, however, primarily investigated the market announcements themselves and not actual investors.

Information overload in the context of online investing has received even less attention. In their study of online investor information seeking and regulation, Williamson and Kingsford-Smith (2010) did find that while many of the investors they interviewed were aware of information overload as a potential problem, only a minority were anxious about it. Most investors felt they had adequate strategies for dealing with the problem, including the use of investment software (Williamson 2008, 2010; Williamson & Kingsford-Smith 2010).

They also speculated that information overload may be more of an issue for less experienced investors. Although the strategies of filtering and withdrawing were not mentioned specifically by Williamson and Kingsford-Smith, the quotes they provide in their paper do indeed illustrate both of these strategies being described by their participants (Williamson 2008, 2010; Williamson & Kingsford-Smith 2010).

Information coping strategies identified by Lisa O’Connor in her study of retired investors were primarily related to investors keeping extensive records so they did not have to constantly scan and collect data. Some investors kept collections of books, magazines and other news items, while others created electronic records using spreadsheets to track their various investments (O’Connor 2012).
In summary, although there has been considerable research into information overload from a wide range of disciplines, only a handful of studies have investigated information overload in relation to investing and these have primarily been in regards to company announcements. The very few studies that have reported on investor perceptions of information overload have provided valuable insights, but more needs to be understood of how online investors cope with information overload.

2.2.5 Summary

Despite the Efficient Market Hypothesis claiming markets are always informationally efficient and investors always behave rationally, this may not necessarily be the case. The field of Behavioural Finance has shown that investors, as humans, are prone to all sorts of psychological biases such as overconfidence, self-attribution, illusion of knowledge, confirmation bias and the disposition effect. People have also been known to practice ‘satisficing’ when a complex decision needs to be made with limited information and time, choosing a solution that is ‘good enough’ if not necessarily optimal.

Studies of online investors have shown that not only are online investors prone to these biases but the online environment itself may present new ones. Online investors have been shown to trade more frequently than before going online, resulting in lower returns. The reasons for this are not clear, however. The online environment itself may also encourage investors to gamble. How the Internet might influence investor behaviour – positively and negatively - needs more investigation.

Having access to virtually endless information on the Internet can itself pose the potential threat of information overload to investors. Very few studies, however, have investigated how individual investors actually cope with information overload.
2.3 Adoption, Diffusion and Beyond

The majority of previous studies into online investing, from the field of Information Systems, have been technology adoption studies. This section provides a brief background of the models and theories used in these studies and then presents a summary of the online investing adoption studies and their findings. As this study sought to go beyond adoption and investigate system usage and information behaviour in depth, the theories of ‘Diffusion of Innovations’ and ‘Actor-Network Theory’ are also presented as they were highly informative during the study.

In particular, the concept of re-invention from Diffusion of Innovations - the degree to which an innovation is changed or modified by a user in the process of adoption – was relevant to how investors adapt online sources to their specific needs. From Actor-Network Theory, the concept of a technology being an actor and influencing human actors also rang true when investigating the relationship that investors have with online technologies.

2.3.1 Technology Adoption Models

Factors influencing the adoption of technologies has been a very active area of research in information systems for a long time. The models most commonly used in studies of the adoption of online investing are summarised in Table 2-1, based on table 1 from Venkatesh et al. (2003).

One of the most prominent models in use is the Technology Acceptance Model (TAM) which posits that the two primary factors that will determine the intention to use an information system are ‘perceived usefulness’ and ‘perceived ease of use’ (Davis 1989). There have been many studies that have tested and extended TAM over the years, in many different contexts.

A foundational model drawn from social psychology is the Theory of Reasoned Action (TRA). The two main constructs in TRA are ‘attitude toward behaviour’ and ‘subjective norm’ (social influence) (Fishbein & Ajzen 1975; Venkatesh et al. 2003). The Theory of Planned Behaviour (TPB) extends TRA by adding a third construct: ‘perceived behavioural control’ – the perceived ease or difficulty in performing the behaviour (Ajzen 1991). Taylor and Dodd (1995) expanded TPB by adding constructs to further decompose the three main TPB constructs, called the Decomposed Theory of Planned Behaviour (DTPB) (Taylor & Todd 1995).

Many of the constructs of all the above models were brought together by Venkatesh et al. (2003) who developed the Unified Theory of Acceptance and Use of Technology (UTAUT) (see Figure 2-2) (Venkatesh et al. 2003).
<table>
<thead>
<tr>
<th>Model / Theory</th>
<th>Constructs</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of Reasoned Action (TRA)</td>
<td>Attitude Toward Behaviour</td>
<td>“an individual’s positive or negative feelings about performing the target behaviour”</td>
</tr>
<tr>
<td>Fishbein and Ajzen (1975)</td>
<td>Subjective Norm</td>
<td>“the person’s perception that most people who are important to him think he should or should not perform the behaviour in question”</td>
</tr>
<tr>
<td>Technology Acceptance Model (TAM)</td>
<td>Perceived Usefulness</td>
<td>“degree to which a person believes that using a particular system would enhance his or her job performance”</td>
</tr>
<tr>
<td>Davis (1989)</td>
<td>Perceived Ease of Use</td>
<td>“degree to which a person believes that using a particular system would be free of effort”</td>
</tr>
<tr>
<td>Theory of Planned Behaviour (TPB)</td>
<td>Attitude Toward Behaviour</td>
<td>Adapted from TRA.</td>
</tr>
<tr>
<td>Ajzen (1991)</td>
<td>Subjective Norm</td>
<td>Adapted from TRA.</td>
</tr>
<tr>
<td></td>
<td>Perceived Behavioural Control</td>
<td>“the perceived ease or difficulty of performing the behaviour” - “perceptions of internal and external constraints on behaviour”</td>
</tr>
<tr>
<td>Decomposed Theory of Planned Behaviour (DTPB)</td>
<td>Attitude Toward Behaviour</td>
<td>Decomposed with: Perceived Usefulness, Ease of Use, Compatibility</td>
</tr>
<tr>
<td></td>
<td>Perceived Behavioural Control</td>
<td>Decomposed with: Self Efficacy, Resource Facilitating Conditions, Technology Facilitating Conditions</td>
</tr>
<tr>
<td>Unified Theory of Acceptance and Use of Technology (UTAUT) Venkatesh et al. (2003)</td>
<td>See Figure 2-2</td>
<td>See Figure 2-2</td>
</tr>
</tbody>
</table>

Table 2-1 – Summary of Technology Adoption Models (adapted from Venkatesh et al. 2003)

![Figure 2-2 – Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003)]
All the models of the above theories follow the same structural pattern as the UTAUT model depicted in Figure 2-2. Various factors in each model influence intention to use an information system which is then assumed to lead to actual usage. Although these models were not used directly in this study, the factors identified in the models informed the framing of the interview questions and provided a starting point during the analysis. A background understanding of these models is also useful in understanding the various adoption studies that have been conducted into online investing, discussed in the next sub-section.

### 2.3.2 Adoption of Online Investing

The biggest interest shown by Information Systems researchers into online investing has been looking at the factors behind the adoption of online trading. This section briefly presents these studies and their findings, summarised in Table 2-2.

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Journal/Conference</th>
<th>Model</th>
<th>Constructs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lau, Yen and Chau (2001)</td>
<td>Hong Kong</td>
<td>Journal of Electronic Commerce Research</td>
<td>DTPB + TAM</td>
<td>Attitude, Subjective Norm, Perceived Control, Perceived Usefulness, Perceived Ease of Use</td>
</tr>
<tr>
<td>Li, Lee and Cude (2002)</td>
<td>USA</td>
<td>Assoc for Financial Counseling and Planning Education Journal</td>
<td>Various Factors</td>
<td>Demographics, investment factors, psychological factors, technology factors</td>
</tr>
<tr>
<td>Lee-Partridge and Ho (2003)</td>
<td>Singapore</td>
<td>HICSS 2003</td>
<td>DTPB</td>
<td>Attitude, Subjective Norm, Perceived Control</td>
</tr>
<tr>
<td>Teo, Tan and Peck (2004)</td>
<td>Singapore</td>
<td>Behaviour and Information Technology</td>
<td>Various Factors</td>
<td>Demographics (Gender, Age, Income, Education, Experience), Security, Economics of Costs</td>
</tr>
<tr>
<td>Lee (2009)</td>
<td>Taiwan</td>
<td>Decision Support Systems</td>
<td>TAM + TPB</td>
<td>Usefulness, Ease of Use, Attitude, Trust, Subjective Norm, Perceived Control, Risk</td>
</tr>
<tr>
<td>Ramayah et al. (2009)</td>
<td>Malaysia</td>
<td>Computers in Human Behavior</td>
<td>TRA + TAM</td>
<td>Perceived Usefulness, Perceived Ease of Use, Subjective Norm</td>
</tr>
<tr>
<td>Abroud et al. (2013)</td>
<td>Iran</td>
<td>International Journal of E-Adoption (IJEA)</td>
<td>TRA + TAM</td>
<td>Perceived Ease of Use, Usefulness, Trust, Time Saving, Cost Reduction</td>
</tr>
</tbody>
</table>

Table 2-2 – Online Investing Adoption Studies
While most of these studies employed one of the standard adoption models described in the previous section, some chose their own specific adoption factors to study. All of these studies were conducted using surveys as the research instrument.

In an early study, Loh and Ong (1998) surveyed 84 university students that participated in a competition to trial an online trading platform in Singapore, known as Stocknet. They found that the users were more likely to adopt the new platform if they perceived it to be easy to use and that it added real value compared to traditional brokers. Their primary area of concern was security and privacy (Loh & Ong 1998). In a 2001 survey of Hong Kong investors, it was found that the strongest influences on adoption of online trading were Perceived Usefulness, Perceived Ease of Use and Compatibility with existing systems (Lau, Yen & Chau 2001).

A study of online trading adoption by Seongcheol Kim, in Korea, found that the investors more likely to have adopted online trading were those that were more experienced with investing, investors that were price sensitive (attracted to cheaper brokerage) and investors who traded frequently (Kim 2001). Li, Lee and Cude (2002) analysed the Macromonitor 2001 investment survey of US households and found that those investors that were already trading online or planning to had a higher risk tolerance and tended to be younger, male and with higher incomes (Li, Lee & Cude 2002).

A Singaporean study in 2002 used a Decomposed Theory of Planned Behaviour (DTPB). They found that positive contributing factors to adoption of online trading were social factors and Internet experience. Obstacles to adoption were that online systems were impersonal and concerns about security (Lee-Partridge & Ho 2003). Another study in Singapore by Teo, Tan and Peck (2004) surveyed both online and offline investors. They found the majority of online investors were male, but did not find age or education level to be a major determining factor to adoption. The online investors most valued lower brokerage costs and the ability to trade in foreign markets. They also reported that the online investors said they traded more when they went online (some significantly more) (Teo, Tan & Peck 2004).

A survey of both online and offline investors from Thailand used a decomposed version of TAM. The study found that the most important factors for adoption were ease of use, information quality, security, privacy and the freedom to transact any time and any place (Rotchanakitumnuai 2005, 2006).
A more recent study from Taiwan conducted by Ming-Chi Lee (2009) used a web based survey of online investors and a combination of the TAM and TPB. It found, as in previous studies, that perceived benefit, perceived ease of use and perceived usefulness were all major factors in adopting online trading. The primary concerns shown by investors against adopting online trading were lack of trust and perceived risk.

A Malaysian study in 2007 again tested TPB with online investors and confirmed that attitude, subjective norm and perceived behavioural control have a positive effect on the intention to adopt online trading (Gopi & Ramayah 2007). A further analysis also confirmed that perceived usefulness and perceived ease of use were also contributing factors (Ramayah et al. 2009; Ramayah et al. 2014).

The most recent online trading adoption studies have been from India and Iran, where adoption rates have been reported to be lower than many Western countries. An Indian study in 2013 found that adopters of online trading tended to be the younger and inexperienced investors who were employees or professionals, whereas the non-adopters were older, more experienced and business owners. Adopters valued the convenience of online trading and were not worried about security (Singh, Sandhu & Kundu 2010). The Iranian study, also from 2013, confirmed yet again that perceived usefulness and perceived ease of use are factors that affect adoption. The investors in that study valued the lower costs of online trading but did not consider time saving to be of significance (Abroud et al. 2013; Abroud, Choong & Muthaiyah 2013).

In summary, all of these studies highlight that investors will adopt online trading if they have a positive attitude towards it, others in their social network have adopted it and if they believe that online trading systems will be easy to use and perform the tasks they need to perform easily.

Early adopters tend to be male, younger, highly educated and with higher incomes. Those investors who are more experienced and trade frequently are also more likely to adopt online trading. Online trading systems draw investors by providing them with lower costs and the freedom to transact any time and place. Investors that had not adopted online trading were primarily concerned about security and privacy, in a number of studies. In line with findings from Behavioural Finance studies, investors were also found to trade more frequently once they adopted online trading.
2.3.3 Social-Economic-Psychological (SEP) Model

A more in depth study of what motivates online investors was conducted by Konana and Balasubramanian (2005) in the USA. They interviewed both online investors and managers at online brokerages and then conducted a survey of online investors. They developed a model to explain the motivations of online investors: the Social–Economic–Psychological (SEP) model (see Figure 2-3). This study was particularly interesting as it went beyond the adoption factors explored by other adoption studies and incorporated economic and psychological aspects from the field of Behavioural Finance (Konana & Balasubramanian 2005).

As in other studies, they found that investors were drawn to online investing services for utilitarian gains such as ease of use, lower costs and convenience. They also explored trust as an adoption factor, with trust being influenced not only by the broker themselves but also by institutional safeguards provided by securities regulators (Konana & Balasubramanian 2005).
Of particular interest was the exploration of hedonic gains – those related to “experiential consumption, fun, pleasure and excitement”. Their field interviews suggested that “in parallel with the pursuit of economic returns, investors persisted with online investing because they enjoyed it as a process”. Some of the investors they interviewed practiced ‘mental accounting’ - compartmentalizing their portfolios to reflect different objectives. This was most evident in those investors that had both online brokers and traditional brokers, with the online broker account money being seen as speculative money (Konana & Balasubramanian 2005).

They also found evidence of social factors influencing the decision to invest online. For example, for some investors ‘embarrassment avoidance’ may be an important social factor – avoiding having to explain their decisions to a human broker and appearing lacking in knowledge or being seen as “small fry” when placing small orders. Investors can also feel social pressure to get involved in online stock investing because all their friends discuss the performance of their stocks and recent trades at parties and they want to be part of the group. Another form of social pressure can be the pursuit of social class membership – “as a means to ‘catch up’ with investors who have achieved certain wealth levels or to ‘make it’ to higher socio-economic classes” (Konana & Balasubramanian 2005).

They also posit that a number of behavioural finance traits may be strengthened by being online, classing these as ‘psychological factors’: overconfidence, self-attribution and illusions of control (Konana & Balasubramanian 2005). These concepts were discussed in section 2.2.1.

In summary, the study by Konana and Balasubramanian (2005) confirmed findings from other studies into adoption factors of online investing - ease of use, lower costs and convenience. It also confirmed findings from previous studies from Behavioural Finance – that online investors may suffer from overconfidence, self-attribution and illusions of control.

Importantly, it introduced potential factors that may motivate online investors not only in adoption but also in their online behaviour – hedonic gains, embarrassment avoidance and pursuit of social class membership. What motivates online investors – both positively and negatively - needs further investigation.
2.3.4 Diffusion of Innovations

Diffusion of Innovations was developed by Everett M. Rogers, and others, over the past 50 years and has been used in a wide variety of fields of research (Rogers 1962, 2003). It is primarily concerned with the process in which an innovation is communicated, over time, among members of a social system. The innovation might be of a physical nature such as a new product or of a conceptual nature such as a new idea or practice (Rogers 2003).

The adoption of an innovation is considered to spread via communication channels from one individual to another. While mass media channels are more efficient at creating awareness of an innovation, interpersonal channels are more effective in persuading an individual to adopt the innovation.

Each individual is said to go through a number of stages in their decision to adopt an innovation: becoming aware of the innovation, forming an attitude towards the innovation, deciding to adopt or reject it, implementing the innovation and finally continuing to use it or deciding to reject it. In trying to understand patterns in the rate of adoption, individuals are classified in relation to how early or late they adopt the innovation: Innovators, Early Adopters, Early Majority, Late Majority and Laggards (Rogers 2003).

Although ignored or dismissed by early diffusion researchers, more recently there has been recognition of the importance of the concept known as re-invention - the degree to which an innovation is changed or modified by a user in the process of adoption and implementation (Rice & Rogers 1980; Rogers 2003). A number of recent studies of re-invention have found that a great deal of re-invention does actually occur for many innovations (Rogers 2003).

Diffusion researchers posit that re-invention is more likely to occur with innovations that are more complex or difficult for adopters to fully understand. Re-invention will also be more likely when the innovation is a general concept or tool with many possible applications (such as a computer or the Internet), or when the innovation has application in solving many different problems (Rogers 2003).
Diffusion researchers have found that a higher degree of re-invention actually leads to a faster rate of adoption and a higher degree of sustainability of an innovation. Re-invention can also be beneficial to adopters of an innovation. Flexibility in the process of adopting an innovation may reduce mistakes and encourage customization to suit local conditions (Rogers 2003). “Artefacts are not only constructed by their designers, they are also reconstructed by their users” (Boczkowski 1999).

Although there have been no distinct diffusion studies of online investing, the theory of diffusion of innovations has provided a valuable viewpoint to inform this study. In particular, the concept of re-invention is an important one to this study as it revolves around how the innovation (i.e. the Internet) is actually adapted and used in the real life context of stock market investing.

### 2.3.5 Actor-Network Theory

Actor-Network Theory was originally developed in the 1980s by sociologists Bruno Latour (1988), Michael Callon (1986) and John Law (1986). More recently it has been used in the field of Information Systems to study technological innovation (Elbanna 2009; Tatnall 2011; Walsham 1997).

Actor-Network Theory proposes a view of the world in which nothing is purely social and nothing is purely technical. Actors, both human and non-human, can be viewed as hybrid entities containing both social and technical elements. Non-human actors (such as computer programs or the Internet for example) are considered in the same way as human actors: existing through the interactions they form with other entities, forming a network. A network can also be hidden inside a ‘black box’, which itself may be an actor within a larger network. Actor-Network Theory is concerned with studying the construction and maintenance of such networks (Tatnall 2011; Tatnall & Gilding 1999).
The creation of an actor-network, also called translation, consists of four major stages: problematization, interessement, enrolment and mobilization. The term ‘translation’ is defined as “the methods by which an actor enrols others” (Callon 1986).

1. **Problematization** – An actor (the initiator) identifies the interests of other actors and defines problems and solutions that will require the initiator to be an indispensable resource in the solution of the problems.

2. **Interessement** – Other actors are convinced that their interests align with those of the initiator. Actors commit to the problematization and an alliance of the actors commences the network.

3. **Enrolment** – This stage involves a set of strategies through which initiators seek to convince other actors to embrace the underlying ideas of the growing actor-network, and to be an active part of the whole project.

4. **Mobilization** – Initiators seek to secure continued support to the underlying ideas from the enrolled actors. With allies mobilized, an actor-network achieves stability (Mähring et al. 2004).

The adoption of an innovation, leading to a stable actor-network, is a consequence of the actions of everyone in the chain of actors. Innovations are adopted only after they have been ‘translated’ into a form that is appropriate to each actor. This may involve adopting only part of an innovation or adopting the innovation for a purpose for which it was not originally intended. The innovation finally adopted is not the innovation in its original form, but a translation of it into a form that is suitable for use by the recipient (Tatnall 2009, 2011).

Although there have been no distinct actor-network theory studies of online investing, the concepts from actor-network theory have provided a valuable viewpoint to inform this study. In particular, the idea of viewing the technology – the Internet – as an actor allowed the study to better understand how the Internet influences investors. The concept of an innovation being translated into a form appropriate to each actor is also important, as each investor translates online resources into a unique form that suits their particular needs.
2.3.6 System Usage

Systems Usage has long been considered as a construct in Information Systems models (Burton-Jones & Straub 2006). One group of researchers found that of all the papers published between 1992 and 2007 in the MISQ and Information Systems Research journals, half involved the measurement or exploration of system usage in some form (Barki, Titah & Boffo 2007).

In a thorough analysis of this literature, Burton-Jones (2005) found four different research domains that involved system usage: IS success, IS acceptance, IS implementation, and IS for decision making (see Figure 2-4) (Burton-Jones 2005).

![Figure 2-4 - Past Conceptions of System Usage (Burton-Jones 2005)](image)

In the IS success domain, researchers have measured usage in order to determine how IT benefits individuals or organizations. In the IS for decision-making domain, researchers typically study IS characteristics that improve user decision making. In the IS acceptance domain (described in more detail in section 2.3.1), researchers study social and cognitive variables that explain the most variance in usage. In the IS implementation domain, researchers seek characteristics of IT implementations that lead to greater use of the final system (Burton-Jones 2005; Burton-Jones & Straub 2006).

Researchers across these fields have generally employed similar usage measures, such as: features used, tasks supported, extent of use, use or non-use, heavy or light use, frequency of use, and duration (see Figure 2-5) (Burton-Jones 2005; Burton-Jones & Straub 2006).
Despite system usage being an element in many such studies, however, it has not been the primary goal of the studies. The majority of the measures of system usage have tended to fall between the ‘Lean’ and ‘Rich’ categories as described in section 1.2. What is needed is consideration of system usage in a ‘Very Rich’ manner, being the “extent to which the user employs the system to carry out the task” (Burton-Jones & Straub 2006).

**2.3.7 Summary**

The majority of Information Systems studies into online investing have been adoption studies. In general these adoption studies have found that investors will adopt online trading if they think it will be easy to use and useful to them, if they have a positive attitude towards it and if others in their social network have adopted it – much in line with numerous previous adoption studies in other contexts. These studies have primarily been interested in finding the factors that lead to people adopting online investing, but not what they do after they have adopted it. As depicted in the UTAUT model shown in Figure 2-2, ‘Usage Behaviour’ is a box in the model that is the endpoint of the theory, and that box is not explored in any more depth.
The more in-depth study by Konana and Balasubramanian (2005) hints that there is much more
to consider with the question of what motivates online investors, not only in their adoption of
online investing but also in their online behaviour (e.g. hedonic gains, embarrassment avoidance
and pursuit of social class membership). Psychological, economic and social factors all need to
be taken into account and require further investigation.

While the various adoption models in these previous studies were not used directly in this study,
they did provide a valuable starting point and perspective during the research. Factors identified
in these studies informed the framing of the interview questions and were also used as an
analytical lens with which to view the data during analysis.

Once a technology has been diffused and has become adopted by a considerable percentage
of the population, the question of how that technology is actually used in practice needs to be
investigated. Despite system usage being an element in many information systems studies, it has
not been the primary goal of these studies and has tended to not be investigated in a ‘very rich’
manner. In the context of this study, there have been no previous studies investigating the
Internet usage of online investors in depth.

As this study sought to go beyond adoption and investigate system usage in depth, the theories of
Diffusion of Innovations and Actor-Network Theory were used to provide further perspectives
with which to view the data during analysis. The concept of re-invention from Diffusion of
Innovations - the degree to which an innovation is changed or modified by a user in the process
of adoption – was found relevant to how investors adapt online sources to their specific needs.

From Actor-Network Theory, the idea of viewing the technology – the Internet – as an actor
allowed the study to better understand how the Internet influences investors. The concept of an
innovation being translated into a form appropriate to each actor is also important, as each
investor translates online resources into a unique form that suits their particular needs.

In summary, the various theories presented in this section were all used in this study, in
combination, to provide a number of different perspectives and lenses with which to view the
data and ultimately provide a deeper and richer understanding of system usage in the context of
online investing.
2.4 Investors and Online Social Media

Previous research into investor use of online social networking platforms has consisted of analysing the postings found on a variety of publicly accessible virtual communities, including stock discussion forums, blogs and more recently micro-blogs such as Twitter. Studies from the field of Behavioural Finance have sought to find links between stock forum postings, investor behaviour and actual price or volume movements in stock markets. Researchers from the field of Information Science have focussed on the form and structure of the postings themselves, seeking to understand the information behaviours of the virtual community and the form and speed of information dissemination and communication. A number of studies have also investigated the social networks of online investors as an integral part of their information seeking behaviours (discussed in section 2.6.3).

2.4.1 Information Content of Stock Forums

A number of studies have examined the information content of postings on stock forums to gain insights into how the members of those virtual communities communicate and how quickly information is disseminated.

In their study of investor postings on four different message boards, Das, Martínez-Jerez and Tufano (2005) found that the majority of the postings were from a small core of members who carried out extended discussions on companies. The discussions were substantial and were a mix of questions, answers, analysis and also opinions. The message boards were also found to quickly disseminate company news and discussions about the news, with postings occurring within minutes of news announcements by the companies, more rapidly than online media services. They also found many rumour postings about mergers and takeovers, but only 2% turned out to actually be true (Das, Martínez-Jerez & Tufano 2005).

One fascinating element of their study was that they sought out and interviewed Glenn, the most prolific poster on the Amazon boards at the time. Although Glenn ran a small chain of jewellery stores, he spent about 30 hours a week on the boards. “He was interested in stocks and in technology, so he gravitated toward tech stocks. He also actively searched the web for news stories about these stocks” (Das, Martínez-Jerez & Tufano 2005). They presented four explanations for his activities:
• **Learning.** Glenn repeatedly emphasized that he wanted to learn. He lived in a small town of 15,000 people and there were not many people he could talk to about investing. “His activity in the Silicon Investor board was equivalent to membership in an investing club. Glenn was keen on learning from people who had more experience than he had”.

• **Complementing Professional Analysts.** Glenn “felt that the professional analysts missed many of the details about firms, and he used the discussion boards to test out his analyses”. He did not believe that the members of the Amazon board had any inside information, but “they did have the time, experience, and inclination to carefully analyse the fundamental data on Amazon”.

• **Interaction with Colleagues.** “The boards provided Glenn with colleagues that he enjoyed”. Although there were close to 1000 posters, Glenn estimated that there was a much smaller number that were relatively active. “Of these he came to know five or six personally, through phone calls or in-person meetings”.

• **Self-Esteem.** “The boards provided Glenn with a venue to engage in enjoyable debate and to earn the respect of others. Glenn called this interaction the ‘entertainment value’ of the boards, the ability to engage others in sustained discussion” (Das, Martínez-Jerez & Tufano 2005).

A survey of 96 investors in Taiwan found that despite the popularity of online social networks, investors still utilized and trusted their personal, offline social networks more than those online when it came to seeking information and advice for investing from family and friends. Younger investors and those more comfortable with technology were the investors more likely to use online media and social networks, together with their personal offline networks (Tan & Tan 2012).

Lisa O'Connor (2013) investigated the information content of postings on three different investment discussion forums over a four year period (2007-2010). Postings were coded as being ‘Hostile’, ‘Collaborative Non-Informational’ and ‘Collaborative Informational’ (those that cited some external information source such as a website or a book). Collaborative posts were further coded in relation to the nature of the posts, such as ‘Neutral’, ‘Humorous’, ‘Responses to Neutral’, ‘Queries’ and ‘Responses to Queries’. She found almost no hostile postings (such as spam and flaming), which was not surprising as all the discussion forums were moderated (O'Connor 2013).
The vast majority of the postings (75%) were information-oriented, being made up of people posting requests for information (queries) and others responding to the requests, with most requests receiving multiple responses that contained opinions, statistical data and also citations to other information sources. The information sources cited were also coded, with a surprising finding that the most quoted information source was actually posts on other discussion forums. She concluded that investor discussion forums constitute rich information environments where participants gather as a virtual community to collaborate and share information. She observed that investor virtual communities are more information rich than other similar communities in health and politics (O'Connor 2013).

These studies show that online forums are rich virtual communities where investors inform, discuss and learn from each other. They also hint that stock forums may provide some investors with access to a virtual community of like-minded individuals that they may otherwise not have access to. These studies are limited, however, in that they have studied only the publicly available forum postings. As alluded to by the interview with Glenn described by Das, Martínez-Jerez and Tufano (2005), there may be more to investor social networks than what is visible on the surface. More needs to be understood of what motivates investors to use online stock forums and how they use them.

### 2.4.2 Impact of Stock Forums on the Stock Market

How investors communicate information with others and possible effects on stock prices (and bubbles in particular) has long been recognised as important in the field of Finance, with earlier studies focussing on how investors communicate stock tips within personal networks (Shiller 2003; Shiller & Pound 1989). This research moved into the online realm once the Internet became widely used by investors. Considerable research has been conducted into the postings on stock forums and blogs from the perspective of Behavioural Finance. Researchers have primarily sought to investigate if such virtual communities have an effect on price and volume movements in stock markets themselves.
Tumarkin and Whitelaw (2001) studied postings on the RagingBull.com discussion forum between 1999 and 2000, which happened to coincide with the very peak of the tech bubble. For stocks in the Internet service sector, they found that days with very high message activity correlated with abnormal returns and higher trading volumes. They could not determine, however, if the message board activity was the cause or the result of abnormal returns to the stock. They concluded that message board activity could not predict returns or trading volumes (Tumarkin & Whitelaw 2001).

An Australian study looked at postings of takeover rumours on the Australian discussion site Hotcopper during the same period (1999 to early 2000). Their analysis found that stocks showed abnormal returns and trading volumes on the day before and the day of the rumour being posted. They concluded that this was consistent with their hypothesis that the market was reacting to the postings of takeover rumours (Clarkson, Joyce & Tutticci 2006).

Another study looking at the link between rumour postings and stock prices collected takeover rumours posted between 2003 and 2008 on the Yahoo! Finance message boards. They also found that takeover rumours on message boards do impact the equity markets in the periods surrounding the postings. They claimed that traders could make significant profits trading on the rumours within a 24 hour period of the postings (Bettman, Hallett & Sault 2011).

Antweiler and Frank (2004) looked to see if the content of messages can be used to predict subsequent stock returns. They studied more than 1.5 million messages posted on Yahoo! Finance and Raging Bull focusing on 45 large companies. They found that “when many messages are posted on a given day, there is a statistically significant negative return on the next day” but the return is economically small so is not usable for trading purposes after allowing for brokerage costs. They also found that message posting activity can predict market volatility and trading volumes for the market overall, but not at the individual stock level (Antweiler & Frank 2004).

A study of the 10 most actively discussed stocks each day on TheLion.com reported that the posters on that site “preferred discussing thinly traded micro-cap stocks with low institutional holdings and low analyst coverage”. The most active daily stocks had a 19.35% abnormal return on that day and on the preceding day, but the returns became negative on following days (Sabherwal, Sarkar & Zhang 2008).
In a later study using the same data, they focussed on only the heavy discussion days where no market news was evident. They again found that the same small stocks had large positive returns on the day before and the day of heavy discussion, but then the price quickly fell back down again in the 2 days following, suggesting a “pump and dump” strategy was evident as manipulators were pumping up the stock price along with heavy online discussion only to dump the stock on following days (Sabherwal, Sarkar & Zhang 2011; Zhang, Swanson & Prombutr 2012).

Blogs have also received attention from researchers, with one study analysing the stock recommendations posted in 106 different blogs on SeekingAlpha.com. It found that “blog recommendations do appear to have an impact on stock prices and trading volumes” but it was claimed that bloggers tend to post about large liquid companies and act out of a genuine desire to spread real information, rather than try to manipulate the market with small companies (Fotak 2008).

Most of these studies have found that higher levels of stock forum postings for a given stock will tend to correlate with higher trading volumes and price volatility in the actual stock in the market. As observed by Tumarkin and Whitelaw (2001), however, it is still unclear whether higher levels of forum postings cause higher trading volumes in the stock or it is simply that the stocks that are being more actively traded due to significant news are more likely to be discussed on forums.

### 2.4.3 Twitter, StockTwits and Sentiment Analysis

Recent attention has turned to micro blogs (such as Twitter), to see if sentiment analysis of tweets can be used to forecast future moves in stock prices, with sentiment analysis (or opinion mining) being “one of the hottest research areas in computer science” at present time (Feldman 2013).

One study collected public tweets from Twitter, classified them according to mood measurements, and found that the mood indicator ‘Calm’ was the strongest predictor of the direction of the stock markets three days later (Bollen & Mao 2011; Bollen, Mao & Zeng 2011). A similar study coded stock related tweets from Twitter into buys and sells. It was found that buy signals were followed by abnormal market returns, but the returns were small and not exploitable (Sprenger & Welpe 2010).
Stocktwits.com, a Twitter based platform dedicated solely to investment related micro-blogging, has also been a source for researchers. One study measured and studied investor sentiment in postings from Stocktwits.com and concluded that this sentiment does “appear to have strong predictive value for future market directions” (Oh & Sheng 2011).

Another Stocktwits.com based study analysed tweets during 2010 looking to automatically identify the ‘expert’ posters, being the posters that achieved the highest success in their tweet buy/sell recommendations when compared to subsequent actual stock prices. They found their system identified the top 20 ‘experts’ who achieved success rates of between 55% and 65%, compared to the expected random rate of 50% (Bar-Haim et al. 2011).

There can be no doubt that stock market professionals are indeed making use of social media feeds such as Twitter, evidenced by the recent mini Flash Crash experienced in the US market in April 2013. US stock markets plunged by 1% in 2 minutes, stemming from an Associated Press tweet reporting that explosions had rocked the White House and that President Obama was injured. The plunge was blamed on high frequency trading software systems that acted on the tweet. The tweet was quickly verified as being fake and the markets rebounded again within 10 minutes (Kwek 2013).

2.4.4 Summary

There is no doubt that social media and online social networks are a very important part of the stock market investing landscape. The social networks themselves have the potential to alter investor behaviour and change the functioning of the market itself. Studies from the field of Economics have shown that there is a connection between online forum activity and market activity, but the direction of the impact is still open to debate.

More in depth studies of the content of stock forums postings paint a richer picture - of investors building collaborative virtual communities where they inform, discuss and learn from each other. Stock forums may provide some investors with access to a virtual community of like-minded individuals that they may otherwise not have access to. More needs to be understood of what motivates investors to use online stock forums and how they use them.

One limitation of these previous studies has been that they have only investigated the publicly visible networks on the social media platforms themselves. There may be more to investor social networks than what is visible on the surface.
2.5 Information Behaviour Models

Information Behaviour has been described as “the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking and information use” (Wilson 1999), and even more broadly as “the study of how people need, seek, give and use information in different contexts, including the workplace and everyday living” (Pettigrew, Fidel & Bruce 2001). For the purpose of this study, the succinct definition of information behaviour provided by Fisher, Erdelez and McKechnie (2005) is used: “how people need, seek, manage, give, and use information in different contexts”.

Information Behaviour has been a popular area of research in the field of Information Science and one of the richest for the creation of theories and models (Bawden & Robinson 2012). Research on information seeking dates back nearly a century. Studies up until the 1960s were primarily on the use of libraries and mass media and of the specialized information needs and uses of academics and professionals such as scientists and engineers. Much of this research was about the information sources and venues of information seeking: books, newspapers, television, universities and conferences. During the 1970s and beyond, research began to shift away from systems and sources, “toward the person as a finder, creator, interpreter and user of information” (Case 2012).

Since 1990 there has been a greatly increased academic interest in the field, with a wider range of research methods employed and a greater number of theories, models and frameworks both adopted and generated (Bawden & Robinson 2012; Fisher & Julien 2009; Pettigrew, Fidel & Bruce 2001). The book titled “Theories of Information Behaviour” by Fisher, Erdelez and McKechnie (2005) alone lists and overviews 71 such theories, models and frameworks.

As earlier studies were primarily on information seeking by academics and professionals, theories and models from these studies tended to focus on the information seeking process, as most information seeking in those contexts is purposeful. As studies expanded to non-work settings, other forms of information seeking have been explored such as incidental and passive information gathering that occurs as part of everyday life.
The act of information seeking, however, needs to be considered within the context in which it occurs. “Information skills and behaviour are usually pragmatic and problem-based; most of the time, people are trying to solve problems, to make sense of the world, and to do things, not to find information for its own sake. Experience has shown that the more context can be brought into the understanding of information behaviour, the more realistic and helpful are the results.” (Bawden & Robinson 2012).

More recent studies, described in this section, have focussed on trying to understand the contextual factors that impact information behaviour. There is, however, no clearly agreed definition of what exactly the term ‘context’ means. Dervin complains that there “is no term more often used, less often defined, and when defined, defined so variously as context” (Case 2012; Dervin 1997). In a thorough review of studies dealing with contextual factors, Christina Courtright (2007) classified context studies into the following groups: rules, resources and culture; social factors; tasks, problems and situations; work domain and human activity (Courtright 2007). In a recent attempt to develop a context framework, Agarwal (2011) has proposed that contexts can be thought of from the following perspectives: personal context (my context), shared context (our context) and context stereotype (their context) (Agarwal 2011; Agarwal, Xu & Poo 2009, 2011).

This section does not attempt to provide a comprehensive and lengthy overview of the entire field of information behaviour but instead presents those theories and models that were found to be the most informative and relevant to this study. Firstly several models of the information seeking process, by Wilson and Ellis, are presented. Going beyond purposeful information seeking, the different modes of information seeking by Bates are presented, highlighting that information is often acquired without intentionally seeking it. The Everyday Life Information Seeking model by Savolainen highlights the ‘big picture’ contextual factors by considering information gathering as part of everyday life. Williamson’s Ecological Theory of Information Behaviour also focusses on incidental information gathering and contextual factors.

Finally the model of Information Horizons by Sonnenwald is presented. This model was found to be the most relevant and informative to this study, as many aspects of this model were consistent with the online investor information behaviour theory that evolved from the analysis of the data.
2.5.1 Information Seeking Process (Wilson and Ellis)

There have been a number of models and frameworks developed that attempt to describe the general process people go through when seeking information. One of the key researchers in the field has been T.D Wilson. One of Wilson’s early models from 1981 is depicted in Figure 2-6, as modified by Wilson in 1999 to include the information seeking steps of Ellis (1989) (Wilson 1981, 1999).

According to Wilson (1999), this model is based on the proposition that an information need arises from a more basic need that can be defined as physiological, cognitive or affective. The context of the basic need could be the person themselves, the demands of their role in work or life, or the environment they operate in (political, economic, technological). During the effort to discover information to satisfy the need, the enquirer is likely to meet with barriers that can impede the search for information, and those barriers will arise from the same set of contexts that define the basic need (Wilson 1999, 2005).

Ellis’s model defines a number of distinct activities that may be performed in the process of information seeking. The activities are originally based on studies of various groups of academic researchers, but the model has also been applied in other contexts. The activities do not attempt to represent a set of stages or phases but rather a set of activities that may be performed in any order and also simultaneously (Ellis 1989, 2005):
• **Starting** – activities characteristic of the initial search for information.
• **Chaining** – following chains of citations or other forms of referential connections
• **Browsing** – semi-directed searching in an area of potential interest
• **Differentiating** – using differences between sources as a filter on amount and quality
• **Monitoring** – maintaining awareness of developments in a field by monitoring sources
• **Extracting** – systematically working through a source to locate material of interest

Wilson’s most recent model, the general model of information seeking behaviour, is depicted in Figure 2-7 and incorporates aspects from his earlier models and also ideas and concepts from other models and theories (Bawden & Robinson 2012; Wilson 1997, 1999).

![Figure 2-7 - Wilson's General Model of Information Seeking Behaviour (Wilson 1997)](image)

The basic elements of the earlier framework persist in that the person in context remains as the focus. An information need still arises, but information seeking results due to an activation mechanism, which allows for the fact that not all needs result in information seeking. The intervening variables that impact the information seeking suggest they can be both enablers and well as barriers. The information seeking activities have also been expanded to include passive and ongoing searches, as well as active search (Wilson 1997, 1999, 2005).
2.5.2 Modes of Information Seeking (Bates)

While the above models are most relevant to professional and academic contexts where information seeking is undertaken as part of a work role, as research has extended into non-work contexts, other forms of information seeking have been described. Bates (2002) proposed that information seeking can be classed into four modes, defined by the activity being active or passive and directed or undirected (see Figure 2-8) (Bates 2002).

<table>
<thead>
<tr>
<th></th>
<th>Active</th>
<th>Passive</th>
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</thead>
<tbody>
<tr>
<td>Directed</td>
<td>Searching</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Undirected</td>
<td>Browsing</td>
<td>Being Aware</td>
</tr>
</tbody>
</table>

Figure 2-8 - Modes of Information Seeking by Bates (2002)

Directed Searching represents the type of information seeking addressed by the models presented above – actively seeking information to answer a question or develop understanding of a particular topic. A great deal of information seeking does not necessarily occur in this manner, however. “An enormous part of all we know and learn surely comes to us through passive undirected behaviour, or simply being aware” (Bates 2002). Humans are constantly exposed to information throughout the day and this information is often passively absorbed as it randomly presents itself. Between these two extremes there are also two modes called monitoring and browsing, which are complementary to each other but also opposites.

In monitoring, “we maintain a back-of-the-mind alertness for things that interest us, and for answers to questions we have. We do not feel such a pressing need that we engage in an active effort to gather the information we are interested in; we are content to catch as it goes by. We also may have a question in mind and not act to find an answer but notice when information comes along that is relevant to the question… Browsing is the complementary opposite of monitoring. Here we have no special information need or interest, but actively expose ourselves to possibly novel information” (Bates 2002).
2.5.3 Everyday Life Information Seeking (Savolainen)

Another model with a purposeful focus on non-work domains is the Everyday Life Information Seeking (ELIS) framework developed by Savolainen (1995) – see Figure 2-9.

The ELIS model “provides a holistic framework for social and psychological factors affecting people’s source preferences in everyday contexts” (Savolainen 2005). The model “refers to the acquisition of various informational (both cognitive and expressive) elements which people employ to orient themselves in daily life or to solve problems not directly connected with the performance of occupational tasks” (Savolainen 1995). Aspects of the model are concerned with the set of dispositions individuals bring to information seeking and also with the context in which it occurs. It emphasizes how the effect of an individual’s material, social and cultural capital interacts with “the specific features of the problem situation that generate information seeking” to determine his or her information use choices (O’Connor 2012; Savolainen 1995, 2005).
2.5.4 Ecological Theory of Information Behaviour (Williamson)

The Ecological Theory of Human Information Behaviour was developed by Kirsty Williamson (2005), based on her Ecological Model of Information Seeking and Use (see Figure 2-10), developed from a study focusing on older people and everyday life information seeking (Williamson 1997, 1998, 2005).

This model emphasizes that information is often incidentally acquired rather than purposefully sought. The study found that participants regularly communicated with others in their intimate personal networks (family and friends) and also their wider social networks (clubs, churches and voluntary organisations). In many cases these communications were social in nature, but valuable information would arise during wide ranging conversations without being purposely sought. Institutional sources such as government departments, on the other hand, tended to only be engaged during purposeful information seeking when a known need was being addressed (Williamson 1997, 1998, 2005).
The theory also emphasises that understanding the context of the individual is important in understanding their information behaviour - highlighted by the contextual factors listed around the outside of the model: socio-economic circumstances, personal characteristics, social and cultural values, lifestyles and physical environment (Williamson 1997, 1998, 2005). This perspective was important in a later study, using the model, seeking to understand the user perspective in relation to an online portal with breast cancer information. The outcome of the research was that the portal was built to provide “tailored” information according to the needs of each user (Williamson & Manaszewicz 2002).

2.5.5 Information Horizons (Sonnenwald)

Information Horizons is both a framework and an associated research methodology developed by Diane Sonnenwald (1999, 2005). Information Horizons are defined by three fundamental concepts: Contexts, Situations and Social Networks (see Figure 2-11) (Sonnenwald 1999):

- **Context**
  Sonnenwald defines a Context as “the quintessence of a set (or group) of past, present and future situations”. Examples of contexts include academia, family life, citizenship and clubs. Contexts are multi-dimensional and can be described by a variety of attributes, such as “place, time, goals, tasks, systems, situations, processes, organizations and types of participants”.

- **Situation**
  “Within each context, a flow of situations arise. For example, within the context of academia, teaching a course and attending a committee meeting are two different types of situations”. A situation may be characterized as a set of related activities that occur over time within a particular context. Situations and contexts are not necessarily discrete and may be rapidly inter-leaved. For example, a faculty member may be writing a syllabus (academia context) and receive a phone call from a spouse (family life context).

- **Social Network**
  Social Network refers to communication among individuals including patterns of connection and resonance interaction. Social networks help construct situations and contexts, and are constructed by situations and contexts.
The Information Horizons framework also includes the following five propositions that strive to describe human information behaviour (Sonnenwald 1999, 2005):

1. *Human information behaviour is shaped by and shapes individuals, social networks, situations, and contexts.*
   An information need is defined by the situation, context and social network. In turn, the individual, social network, situation and context helps determine the information resources available to satisfy the need.

2. *Individuals or systems within a particular situation and context, may perceive, reflect and/or evaluate change in others, self, and/or their environment.*
   Information behaviour is constructed amidst a flow of such reflections and/or evaluations and, in particular, those concerning a lack of knowledge.

3. *Within a context and situation is an “information horizon” in which we can act.*
   There is an information horizon in which the individual seeks information, which may consist of a variety of information sources. Information horizons are determined socially and individually and may be different for different contexts, even for the same individual.

4. *Human information behaviour may, ideally, be viewed as collaboration among an individual and information resources.*
   The goals of collaboration, in this sense, are the sharing of meaning and resolution of a lack of knowledge condition.

5. *Information horizons may be conceptualized as densely-populated solution spaces.*
   “In a densely-populated solution space, many solutions are assumed, and the information retrieval problem expands from determining the most efficient path to the best solution, to determining how to make possible solutions visible”.

Figure 2-11 - Information Horizons Model (Sonnenwald 1999)
A research methodology was also developed that involves interviewing participants and asking them to draw a pictorial map of their information horizon when seeking information: all the information sources and people they typically access for a given scenario (Sonnenwald 2005; Sonnenwald, Wildemuth & Harmon 2001).

This concept of information maps was taken further by Savolainen & Kari (2004a, 2004b) in their study of how individuals use the Internet in everyday life. They defined their concept of ‘Information Source Horizons’ as “an imaginary field, which opens before the ‘mind’s eyes’ of the information seeker”. Information sources in this field are positioned so that sources deemed most significant are placed nearest to the onlooker and less significant ones further away (Savolainen 2007b; Savolainen & Kari 2004a, 2004b).

They proposed that information source horizons may be of two types: “first, relatively stable horizons indicating the ways in which people tend to value information sources across situations; and second, dynamic, that is, problem- or situation-specific horizons, sensitive to unique requirements of a task or project at hand” (Savolainen & Kari 2004b).

More recently, the Information Horizons framework has been used, combined with social network theory, in a study of how college students seek and use information in various academic contexts (Tsai 2010a, 2010b, 2012a, 2012b; Tsai & Kim 2012, 2013).

2.5.6 Summary

Information Behaviour is a substantial area of research within the field of Information Science. This section presented the theories and models that were found to be the most informative and influential in this study. These theories and models have provided this study a rich collection of concepts and viewpoints with which to interpret the activities of the online investors interviewed.

Some of the models focus on the information seeking process while others are more focussed on the contextual factors affecting the information seeker. Both perspectives were found to be useful in this study and both have been taken into consideration in the development of the resulting theory. Both the process of seeking information and the contextual factors that impact that process are important.
2.6 Investor Information Behaviour

A relatively few studies have investigated the information practices and behaviours of investors. Earlier studies explored the use of investment information in libraries by students and academics (McKay et al. 1996) and the information practices of professional securities analysts (Baldwin & Rice 1997; Gniewosz 1990; Kuhlthau 1997). These studies mainly focused on the use of libraries and various media and printed sources, such as newspapers, market announcements, annual reports and broker reports. Professional analysts also utilized company visits to gather information directly from companies themselves – an option not feasible for individual investors.

A survey of 96 investors at an investment fair in 1999 found that they still preferred printed sources such as newspapers and annual reports. Although more than 80% of the investors surveyed used the Internet, it was used mainly as a supplementary resource (Mezick 2002). A Swiss survey of investors in 2002 found that 58% did not use the Internet at all in their stock market activities, while 26% used the Internet to seek information but still dealt with a human broker for transactions (Cocca 2002). An analysis of the Macromonitor 2001 consumer financial products survey found that consumers who were more likely to search for investment information on the Internet tended to be the more risk tolerant, younger, higher educated and with higher incomes (Lin & Lee 2004).

While these older studies found investors were not large users of the Internet, this is not surprising given they were conducted in the early days of the Internet. More recently, a small number of studies have investigated the information activities of online investors, and these studies are detailed in the remainder of this section.

2.6.1 Investor Information Characteristics

One of the few studies to report on the actual online information-seeking activities of individual stock market investors was by Kirsty Williamson and Dimity Kingsford-Smith. They conducted a qualitative pilot study in 2004 that involved interviewing 10 Australian investors about how they seek information on the Internet (Kingsford-Smith & Williamson 2004; Williamson 2006). While all of the investors in this study used the Internet in relation to their investing, many sought information and conducted activities both online and offline. They found that the primary online information source investors used was their broker’s website.
They reported that all their investors spoke to others about investing and sought advice from trusted family members, friends or colleagues – with few investors using online forums such as chat rooms. For some investors, there was also a community or hobby aspect to their investing activities – they were part of an investment club or often communicated with others about investing, both online and offline (Kingsford-Smith & Williamson 2004).

The pilot study was followed by a larger research project that involved both a survey of 520 online investors and also a qualitative study, interviewing 26 investors personally. The focus of the project was both from a legal (regulation) perspective and also from an information-seeking perspective (Williamson 2010; Williamson & Kingsford-Smith 2010).

From the qualitative interviews, they found the following key characteristics of information sources that all or almost all the investors valued (Williamson & Kingsford-Smith 2010):

- **Convenience and Ease of Access**
  
  This was seen as important by all participants, with the view being expressed that “it’s much easier to be informed if you’ve got easy access”. This characteristic was seen as explaining why most of the investors in the study saw their online broker website as their key information source.

- **Content**
  
  “All participants considered content important, but there were considerable differences in views about what constituted good content”. Chartists mostly wanted only quantitative data while others wanted advice and were willing to pay for it.

- **Reliability and Accuracy**
  
  “Participants had no doubt about the importance of accuracy and reliability” but some doubted that there could be complete certainty about accuracy or reliability, mentioning that they checked multiple sources.

- **Currency and Timeliness**
  
  “The vast majority of participants thought that currency of information was important” although concepts of what constituted currency varied. “Views were also dependent, to some extent, on the type of trading with which investors were involved. For instance, for short-term or day traders, currency is crucial”.
They found that one important determinant in the choice of key sources of information was whether an investor's approach was 'fundamental' or 'technical', with the latter's key source being their charts and charting services. Fundamental investors, in particular, used a wider variety of sources of information (Williamson 2008).

Participant’s “desire for control over their investments emerged often during the interviews and was an important reason they invested online”. They also found that “it was sometimes difficult to ascertain whether preferred sources of information changed according to the particular investing task, with some participants claiming that their online broker's Website was important at all stages even though they used other sources of information” (Williamson 2008; Williamson & Kingsford-Smith 2010).

A study conducted by Loibl and Hira involved a phone survey of 880 households in the USA, asking them about their use of various information sources for investing. Results were analysed along demographic and psychological factors and five groups of investors were identified based on their information searching habits (Loibl & Hira 2008, 2009, 2011):

- **Balanced Investors** (11%) gather investment information the most often and utilize the highest number of information sources. This group were mostly male, highly educated and had the second highest risk tolerance.

- **Online Investors** (11%) had the strongest focus on the Internet and its services and were similar to the balanced investors group. This group had the highest number of males, college educated investors and had the highest risk tolerance.

- **Moderate Investors** (24%) practiced a broad but less frequent information search strategy, gathering information from the Internet, press, and also financial advisors.

- **Workplace Investors** (24%) practiced a selective workplace-based information strategy and gathered investment information only infrequently. This group had the highest number of females, was the youngest group of investors and also the group with the lowest amount of financial assets in the survey.

- **Reluctant Investors** (30%) practiced a low-information strategy with their major information source being financial advisors. This was the oldest group in the survey with the lowest number of college educated investors but with the most favourable attitude to financial advisors.
Lisa O’Connor (2011) studied a women’s investment club in depth, looking at their information practices. This involved attending their meetings for 6 months and also interviewing 8 of the 16 women. She found that the club members carried out their investing and related information-seeking activities to master some of the various needs of their everyday lives. Participants were classed into three distinct needs-meeting categories (O’Connor 2011):

- **Managers** (30%) viewed the investment club as a convenient way to set aside time to attend to their own financial growth and well-being. Managers joined the club for pragmatic reasons such as ‘to make money’. They tended to be younger women who were still working and may have still had children at home.

- **Hobbyists/Amateurs** (56%) were more likely to view their investing activities as a journey rather than an end in itself (making money) and expressed enjoyment and enthusiasm for their tasks. This enthusiasm for investing also translated directly to their attitudes toward information-seeking for investing. They tended to be older and were more likely to be retired and beyond child-rearing years.

- **Mentors** (14%) viewed their involvement in the club as a means for helping others. Mentors tended to approach their information-seeking as a means for modelling effective behaviours for other members. Like hobbyists, they were more likely to focus on building their skills and doing it the right way. They derived more pleasure from the process than managers, although that pleasure originated from service, rather than from investing and information-seeking activities themselves.

All participants in the study, except one, had used the Internet for investment research, which was surprising given that half the members were over 55. That did not imply wide or effective usage, however. Most of the members depended primarily on a single investment web site (Yahoo! Finance, for example) and consulted it infrequently (O’Connor 2011).

Members tended to have a preference for experiential information, relying heavily on their own observations and experiences, resulting in an investment bias toward consumer-oriented companies. They also showed a strong preference for personal and unmediated sources.

Hobbyists reported spending more time talking to family, friends, and co-workers about investing than any other member type, and this activity was directed beyond information gathering toward building their unique social world (O’Connor 2011).
A further in depth study conducted by Lisa O’Connor investigated the information activities of retired investors (O’Connor 2012). This study involved a small survey of 44 retired investors and then 13 investors participated in the qualitative component, which involved individual interviews and the investors keeping an information journal for 4 weeks (O’Connor 2012). The survey showed that 96% of the male investors used the Internet for investing compared to only 45% of the female investors. Female investors also used fewer and less diverse information sources than the males. Although the Internet was widely adopted by the male investors, surprisingly only 13% reported that they used it for online trading. The primary uses of the Internet were for monitoring the market, scanning financial sites and using search engines.

Based on the analysis of the 13 interviews and information journals in the qualitative phase, participants fell into three categories based on their information intensity use (O’Connor 2012):

- **Information Intensive (45%)**
  Information-intensive investors sought information, on average, five times a week. They also tended to use multiple types of information and multiple sources. This group was predominately male, with five male investors and only one female investor.

- **Moderate Information Use (30%)**
  “Unlike information-intensive investors, moderate-information-use investors relied on rich and diverse personal networks for much of their information”. Although they did use other information sources, they were used at a much lower frequency and were less diverse. This group sought information, on average, 2 times a week. Two males and two female investors fell into this category.

- **Low Information Use (25%)**
  Low-information-intensive investors sought information less than once per week. This group was exclusively female and these investors relied primarily on one or two interpersonal sources – mostly brokers but also family and colleagues. None of these three women used the Internet for investment research.

The information-intensive investors fell into two camps in relation to how they used technology. One group used tools and systems as a way of controlling their information flows to a manageable level, in order to avoid information overload. They tended to create personal collections of data, both in physical printed forms (e.g. collections of books and periodicals) and also electronic forms (e.g. spreadsheets) (O’Connor 2012).
The other group organised their information seeking around their routine. “Their information fields were richly imbedded with sources accessed through convenient technologies such as the Internet, television, and radio”. These investors saw technology as making them better and more efficient investors. “For them, early access to information was key to successful investing” (O’Connor 2012).

The clearest predictor of information-intensive behaviour was found to be the investor’s attitude toward investing itself. “Participants who approached investing as serious leisure were understandably more likely to devote time and energy in developing their information fields for investing” (O’Connor 2012). Serious leisure is discussed in section 2.7.

As in the study by Loibl and Hira (2009), this study found that “female investors sought information for investing much less often and used fewer sources of information than did their male counterparts”. Information-intensive investors also often exhibited a disposition toward independence, a trait also noted by Williamson (2008) (O’Connor 2012).

In summary, investors value information if it has the content that is important to them and if it is reliable, accurate and convenient to access. In a number of the studies, investors have expressed a desire to be in control of their investments. Some investors have been found to be very active and use many information sources while others use very few. The reasons for this are not clear, but the active investors are more likely to be men, highly educated and more risk tolerant. Several classifications of investors according to their information intensity have been offered. A few of these studies have also found that for some investors, investing is more than just a financial activity – it is considered to be a hobby or even a career – a serious leisure activity.

2.6.2 Information Sources

The general trend evident in these studies is that investor’s preferred information sources have gradually changed from printed to online sources as the Internet has become more prevalent over time. The variety of information sources used and valued by investors, as reported in previous studies, is briefly presented in this section.

In their pilot study, Kingsford-Smith & Williamson (2004) found that all of the investors interviewed used their brokers’ website very frequently for information seeking and that this source was very important to them.
Other frequently used online sources were company websites and other general financial websites. The investors also used offline sources such as newspapers and journals, as well as reports from brokers and analysts (Kingsford-Smith & Williamson 2004).

In their larger study, the survey of 520 investors provided more detailed statistics in relation to information sources being used. They found the following online information sources were used every day or very frequently (Williamson 2008; Williamson & Kingsford-Smith 2010):

- Online Broker Website (79% of participants)
- Data and Charting Services (53%)
- General Information Portals (45%)
- Emails from Brokers (40%)
- Company Investor Relations Websites (30%)

More traditional offline information sources and media were also still widely popular, with the following being used frequently (Williamson & Kingsford-Smith 2010):

- Newspapers and Journals (79%)
- Radio and TV (55%)
- Broker and Analyst Reports (52%)

The qualitative study also found that search engines, most commonly Google, were used by the large majority of participants to search for investment information and several investors also mentioned subscribing to investment newsletters (Williamson & Kingsford-Smith 2010).

In their telephone survey, Loibl and Hira (2008, 2009) asked participants of their use of a specific range of online and offline information sources. They obtained the following usage scores rated out of 5, with 1=’never’ and 5=’very often’ (Loibl & Hira 2008):

- Internet Search (2.38)
- Market Watch Websites (1.95)
- Email Newsletters (1.90)
- Investment Software (2.09)
- Internet Trading (1.78)
• Newspapers and Magazines (2.69)
• Television (1.59)
• Radio (1.56)

In her study of retired investors, Lisa O’Connor surveyed 44 investors and asked them what types of information they valued. The following average ratings of each information type were reported, with a score out of 5 for importance (O’Connor 2012):

• Historical performance (4.07)
• Analyst opinion (4.05)
• Stock price (3.93)
• Company financials (3.90)
• Personal knowledge of and experience with a company (3.88)
• Stock, bond and mutual fund guide ratings (3.81)
• Broker opinion (3.12)
• Industry financial ratios (3.12)
• Measures of volatility (3.10)
• Social and environmental behaviour of companies (2.74)

In summary, investors have been shown to use a wide range of information sources, with the website of their stock broker the most prominent. The general trend over time has been for investors to prefer online sources over printed sources. Although these studies show the types of information sources investors prefer, what is not known is how they use these sources and at what stage of the investing process they are used.

### 2.6.3 Personal Social Networks

Despite having access to virtually unlimited information online, these previous studies have found personal social networks are still a major part of the investing landscape. This is in keeping with findings from earlier information behaviour studies. Inter-personal sources of information are very important to people when seeking information.
In their pilot study, Kingsford-Smith and Williamson (2004) reported that all their participants “talked with others who were also investors - ranging from family members, through flat mates to friends and work colleagues. A few investors described how they trusted and respected the investment prowess of members of their family” while some discussed investing with their children. “Several other participants reported discussing investing with work colleagues whom they had discovered shared the interest” (Kingsford-Smith & Williamson 2004).

The social inter-communication was varied, ranging from “casual conversations to regular semi-formal meetings in pubs and coffee shops, to more formal discussion groups with a common interest in investing, and on to investor clubs in which members contributed to a common fund to learn from making actual investments”. Very few of the investors in their study reported using online chat rooms, however (Kingsford-Smith & Williamson 2004).

Their larger study supported most of these findings from the pilot study. Few of the 520 investors surveyed reported using online forums such as chat rooms. However, 10% did say they used chat rooms every day, indicating a small but active subset of investors that use stock forums. Only one participant in the qualitative study reported ever using online stock forums (Williamson & Kingsford-Smith 2010).

The one surprise finding from the survey was the lower than expected numbers of investors reporting interpersonal sources of information. In the qualitative study, however, they found that almost all of the investors interviewed did, in fact, talk with others who were also investors – family members, friends and work colleagues. One interesting form of social network reported from this study was one participant who belonged to several investment groups that used Yahoo email groups to share stock investment ideas (Williamson & Kingsford-Smith 2010).

In their telephone survey, Loibl and Hira (2008, 2009) also asked participants about their interpersonal information sources. They obtained the following usage scores rated out of 5, with 1=’never’ and 5=’very often’ (Loibl & Hira 2008):

- Financial Advisor (2.76)
- Friends or Colleagues (2.32)
- Classes or Workshops (1.68)
- Investment Clubs (1.25)
The study of a women’s investment club conducted by Lisa O’Connor (2011) was inherently a study of a personal social network, being the investment club itself. The club consisted of 16 members who made regular contributions to the club fund and met monthly to discuss how to invest the money in stocks. As discussed in section 2.6.1, O’Connor classified the members according to their information needs: managers, hobbyists/amateurs and mentors. The hobbyists, in particular, reported spending more time talking to family, friends, and co-workers about investing than any other member type, and this activity was directed beyond information gathering toward building their unique social world. There were therefore multiple personal networks involved – the personal social network of the investment club itself and also the personal networks of each member, involving family and friends (O’Connor 2011).

In her study of retired investors, Lisa O’Connor (2012) once again found considerable evidence of personal social networks being part of investor’s information worlds. This was particular the case with the information-intensive investors. Three of them belonged to investment clubs and they all often reported talking to friends and family about investing. One investor “stated that he had become the go-to-guy with his friends and family on investment matters. He was considering starting his own blog” (O’Connor 2012).

Investors in the moderate-information-use category were specifically classed into that category because of their use of personal social networks as their primary information source. One “had maintained a complex network of professional connections even beyond his retirement. He relied primarily on his direct knowledge of the field and a network of informants constructed over the course of his career to build a substantial knowledge base about his industry” (O’Connor 2012).

A female investor in this category “constructed her knowledge base geographically. She had a high interest in local companies and talked with friends, family and colleagues frequently about them. She tended to choose companies whose products were familiar to her, that she used and liked”. Even most of the low-information-use investors were heavily reliant on interpersonal sources for their information needs – being brokers, family and colleagues (O’Connor 2012).

In summary, personal social networks are still an important source of information for investors, despite having access to the Internet. Many investors often discuss investing with people in their personal networks - friends and family. For some investors their personal social network is their primary source of information. Some investors are also involved in more structured networks such as investment clubs and a small but active segment of investors use online stock forums.
2.6.4 Summary

This section presented the small number of studies that have investigated the information behaviour of investors. Investors value information that has the content that is important to them and if it is reliable, accurate and convenient to access. Several of the studies also found investors had a desire to be in control of their investments. Some investors are very active and use many information sources while others use very few. The active investors are more likely to be men, highly educated and more risk tolerant. For some investors, investing is more than just a financial activity – it is considered to be a hobby or even a career – a serious leisure activity.

Investors have been shown to use a wide range of information sources, with the website of their stock broker the most prominent. Despite the Internet providing virtually unlimited information, personal social networks are still an important source of information for investors. Many investors often discuss investing with people in their personal networks - friends and family. For some investors their personal social network is their primary source of information. Some investors are also involved in more structured networks such as investment clubs and a small but active segment of investors use online stock forums.

These few studies have provided valuable insights into investor information behaviour but more investigation is needed. Although these studies have investigated the types of information sources investors prefer, there is no indication how they use these sources and at what stage of the investing process they are used. It has been shown that some investors are highly active users of information and others are not, but how investor characteristics and their investment goals influence their information behaviour has not been investigated. More investigation is also needed into the different types of personal social networks that may exist, both online and offline.
2.7 Serious Leisure

The Serious Leisure Perspective was pioneered and developed by Robert Stebbins (1982), to provide a framework for exploring people’s activities in their free time, as opposed to paid or unpaid work activities (Stebbins 2009b). Stebbins defines serious leisure as “the steady pursuit of an amateur, hobbyist, or career volunteer activity that captivates its participants with its complexity and many challenges. It is profound, long-lasting, and invariably based on substantial skill, knowledge, or experience, if not on a combination of these three. It also requires perseverance to a greater or lesser degree”. It can give people the sense that they are pursuing a career, similar to those pursued in high-level occupations, but without remuneration (Stebbins 2001).

Career volunteers use their valuable skills, knowledge and experience to help, in an altruistic way, people, organisations or other causes they are passionate about, such as the environment. Amateurs are people involved in activities in art, science, sport and entertainment that have professional counterparts. Hobbyists are similar to amateurs but are involved in activities that do not reach a professional level, but this line can sometimes be hazy (e.g. online gaming). Hobbyists are further classified into five categories: collectors, makers and tinkerers, activity participants (e.g. fishing), players of non-professional sports and games and enthusiasts of liberal arts hobbies. The same individual may be involved in multiple forms of serious leisure at the same time, such as an amateur sports player that also volunteers to be president of the sports club (Stebbins 2001, 2007).

One of the defining qualities of a serious leisure activity is that significant effort is required to acquire the knowledge, skills and experience necessary, and that perseverance is required at various times. Many significant benefits and rewards to the individual have been identified, which can include: self-actualization, personal enrichment, self-expression, feelings of accomplishment, lasting physical products of the activity, self-gratification, renewal of self and financial return. There are also social rewards, such as meeting like-minded people and making new friends, contributing to the development of the group and having a sense of being helpful and needed (Stebbins 2001, 2007).
The relationship between serious leisure and work is a complex one, with some serious leisure participants becoming so involved in their “career” that it evolves into a work role, and vice versa. The link between serious leisure and retirement is also recognised, with many people replacing their working career with a serious leisure career once they enter retirement (Stebbins 2001, 2009b).

2.7.1 Serious Leisure and Information Behaviour

The extension of the Serious Leisure perspective into the field of Information Science was pioneered by Jenna Hartel. In 2003 she pointed out that, historically, Information Behaviour studies were heavily biased towards scholarly and professional domains, and she called for more research into information practices within leisure pursuits. She proposed that the Serious Leisure perspective could conceptually assist such studies (Hartel 2003, 2010a; Stebbins 2007, 2009a). Hartel used the Serious Leisure perspective in her exploration of the information activities of hobbyist gourmet cooks. She found that their information activities went well beyond collecting recipes and cook books. Gourmet cooking and associated information activities were integrated into their lifestyle. They had friendships with other cooks and ate out to experience new foods. They expressed their culinary expertise by teaching and helping family and friends and were avid readers of cooking literature and media to continually update their knowledge, with the Internet being a major information source (Hartel 2006, 2010b, 2011).

A growing interest into the role of information in serious leisure activities followed, especially within the online realm. The Internet not only creates new possibilities for leisure participants to express themselves and communicate with others about their hobby, but also provides researchers data sources not previously available (Stebbins 2010).

A study of food bloggers found they were just as interested in the information production aspect (writing and attracting a reading audience) of the activity as they were in the actual food information content of their blogs (Cox & Blake 2011). Several researchers have delved into the information practices of quilt makers, particular their use of online virtual communities to both share and preserve knowledge of the craft (Fulton 2009; MacDowell et al. 2011; Sikarskie 2011).
Studies of serious travellers and backpackers found that online sources were not only used before travel for planning purposes but also during travel to keep family and friends updated and even after the travel to discuss and relive the experiences (Chang 2009; Ho, Lin & Chen 2012). How amateur photographers use online virtual communities has also been investigated (Cox, Clough & Marlow 2008; Spurgin 2009). Several forms of hobby collecting have been investigated, including coin collectors and their online information activities (Case 2009, 2010) and a fascinating study by Lee and Trace (2009) of the information activities of the members of Duckplanet.com – a website dedicated to the collecting of rubber ducks.

2.7.2 Serious Leisure and Investing

Investing has only very recently been studied as a serious leisure activity. Although Williamson and Kingsford-Smith (2004, 2010) did not directly identify online investing with the serious leisure perspective, they did find evidence that some of the investors in both of their studies did consider investing to be a hobby and a leisure activity – something they enjoyed doing. This trend was stronger in the earlier study than the later one (Williamson & Kingsford-Smith 2010).

“One thing we observed very strongly, is the extent to which many investors see investing as a leisure activity. Online investing allows them much more freedom in the degree to which they can do this at leisure, if they have Internet connection at home” (Kingsford-Smith & Williamson 2004). They also identified that some of the investors may see online investing as a form of gambling, particularly the younger male investors (Williamson & Kingsford-Smith 2010).

The only researcher, to date, to use the serious leisure perspective in studying the information behaviour of stock market investors has been Lisa O’Connor (2011, 2012). In her study of a woman’s investment club, she found that some, but not all, of the club members were involved in serious leisure. The investors classed as ‘managers’ were primarily using the club as a way of setting aside time to attend to their financial well-being, and did not exhibit the level of interest in the activity that could be considered to be serious leisure (O’Connor 2011).

The hobbyists and mentors, on the other hand, were identified by O’Connor as fitting the characteristics of serious leisure as described by Stebbins and outlined above. Whereas managers viewed investing as “analogous to household chores or health maintenance”, hobbyists expressed real joy and enthusiasm for their tasks (O’Connor 2011).
“For some of the women, investing seemed to have rejuvenated their self-perception as developing rather than static individuals... This enthusiasm for investing translated directly to hobbyists’ attitudes toward information-seeking for investing. In contrast to managers, they were much less likely to assign strict time limits to their activities. More typically they described their information seeking as an enjoyable aspect of their avocation” (O’Connor 2011).

Mentors were identified by O’Connor as being consistent with Stebbins’ classification of volunteers – “viewing their involvement in the club as a means for helping others”. Mentors tended to approach their information-seeking as a “means for modelling effective behaviours for other members”, particularly the younger women in the club. They derived pleasure from the process, “although that pleasure originated from service, rather than from investing and information-seeking activities themselves” (O’Connor 2011).

In her later study of retired investors, Lisa O’Connor (2012) found further evidence that the investors she interviewed were occupied in serious leisure. This was particularly the case with the information-intensive participants, who “exhibited the vocational zeal that focuses on the acquisition of special knowledge, skill, and training. Besides the extensive time commitments evidenced by their record-keeping and scanning activities, these participants also radiated energy and enthusiasm about investing during their interviews” (O’Connor 2012).

Investors in the moderate-information-use category were also identified as exhibiting some features of serious leisure. “They developed strong informal social worlds by talking about investing with people in their social networks” and “sought opportunities to develop the special skill required for serious leisure activities by attending classes and reading some materials”. These investors also “conveyed a sense of pleasure in their activities, though it was less pronounced than it was with information-intensive investors” (O’Connor 2012).

### 2.7.3 Summary

Serious Leisure is a perspective that people pursue careers in their leisure life that are just as important to them as their working career. There have been a growing number of studies using the serious leisure perspective to study the information behaviour of various hobby activities. To date, the only researcher to use the serious leisure perspective to study the information behaviour of investors has been Lisa O’Connor (2011, 2012). While these two studies have provided valuable insights, there is much more that can be learnt about online investing as a serious leisure activity and how it may influence investor motivations and information behaviour.
2.8 Chapter Summary

This chapter presented a review of the literature that informed this study. Previous studies of online investing have spanned a wide range of disciplines, but they all share one common interest – information.

Behavioural Finance tells us that investors are prone to various human biases and they may take shortcuts in decision making if they have limited time or data. Studies show that online investors trade more often but the reasons for this are not clear. How individual investors cope with potential information overload has had little investigation.

Social networks are important to investors and online stock forums have existed from the very beginning of the Internet. Studies of online forums have primarily been from Finance and have focussed on how forums impact the market. A relatively few studies have looked at the information content of stock forums and what motivates stock forum users, but questions remain.

Studies from Information Systems have primarily looked at factors that lead to the adoption of online investing. With a large percentage of investors having now adopted online investing, however, we must move beyond the question of adoption to the question of usage. How do investors actually use the Internet? No previous studies have explored Internet usage, in the context of online investing, in depth.

Information behaviour is a substantial area of research in the field of Information Science. The theories and models from this field have been evolving towards the perspective of information seeking in context – how people seek and use information in a particular context to solve particular problems. By utilising perspectives from the field of Information Behaviour, this study has been able to investigate how investors use the Internet in a very rich manner.

There have been very few studies investigating the information behaviour of investors and these have provided valuable insights. None of these studies, however, has provided a single, cohesive theory of online investor information behaviour. This study sought to generate such a theory and was therefore exploratory in nature.

The next chapter outlines the research approach taken to generate this theory and answer the research questions. It will discuss the reasons behind the methods chosen and how the data was gathered, analysed and how, ultimately, the theory evolved from the data.
Chapter 3  Research Design and Methodology

This chapter outlines the methodological approach taken in this study. It provides detailed discussion of the activities done and the sequence in which they were performed, in order to emphasize the rigour and validity of the research. This chapter provides justification for the research approach used in this study. It discusses the reasons behind the methods chosen and examines the process by which the data was elicited, analysed and then formulated to arrive at the findings. Ultimately, this chapter describes the research journey and justifies the path taken to generate the theory that answers the research question.

As highlighted in chapter 2, previous studies into online investing have spanned a wide range of disciplines – Information Systems (Adoption and System Usage), Information Science (Information Behaviour), Economics (Behavioural Finance and Efficient Markets), Law and Social Studies (Serious Leisure). While each field has made contributions to understanding adoption factors, the behaviour of investors and market impacts, the overall picture of online investors is fragmented.

How investors use the Internet to seek and use information is not clearly understood. The aim of this study was to explore, in depth, the information behaviour of online stock market investors. There have been a small number of previous studies investigating the information behaviour of investors and these have provided valuable insights. None of these studies, however, has provided a single, cohesive theory of online investor information behaviour. This study sought to develop such a theory.

This study was therefore exploratory in nature. The aim of qualitative research is “to achieve a deeper understanding of a phenomenon” (Kvale 1989), to “explore substantive areas about which little is known” and “obtain intricate details about phenomena” (Strauss & Corbin 1998). Therefore a qualitative research approach was chosen as the most appropriate to achieve the goals of the study. Section 3.2 outlines the reasons behind this choice, as well as the research plan used for this study.

The research methodology used in this study was Grounded Theory (Strauss & Corbin 1998). A Grounded Theory is “inductively derived from the study of the phenomenon it represents. That is, it is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon” (Strauss & Corbin 1998).
The research path followed was also Multi-Grounded, with the literature being used at various points to compare, contrast and also inform the theory as it evolved (Goldkuhl & Cronholm 2010). Section 3.3 elaborates on the Grounded Theory methodology used in this study.

In order to investigate the real-life information behaviour of online investors, in all its richness and complexity, twenty-six individual investors were engaged in qualitative interviews using semi-structured questions. Descriptions of the participants recruited for this study and how the data was collected are provided in section 3.4. This includes a discussion on the sample size and theoretical sampling.

Analysis of the interview transcripts resulted in an initial set of coded references, which in turn produced an initial set of concepts. These were further analysed (using both transcripts and memos) and grouped. The grouping resulted in a number of high level concepts and themes. These themes, along with the relationships between them, make up the theory used to answer the research question. This process was highly iterative, with the developing theory evolving through a number of iterations throughout the analysis. Section 3.5 describes the analysis process used in this study in more detail.

This study has ensured that the theory developed reliably represents the concepts found in the data by following a rigorous research plan. This included constant evaluation and comparison of the evolving theory against the data itself and the literature. Section 3.6 discusses these issues of reliability and validity.

### 3.1 Research Questions

This study sought to answer the following research question (introduced in Chapter 1):

*What drives the information behaviour of online stock market investors?*

Related subsidiary questions were:

*What information behaviours do online stock market investors exhibit?*

*How is investor behaviour influenced by the information environment?*

*What motivates online investors?*
3.2 Research Design

As eloquently described by Yin (2009), “a research design is a logical plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about those questions”.

This section provides an understanding of the research plan. A high-level conceptual research model is discussed, showing the key elements and methods that were employed in this study to get from here to there.

3.2.1 Research Perspective

Three philosophical research perspectives are described by Myers (2009), based on previous work by Orlikowski and Baroudi (1991), and Chua (1986): positivist, interpretive and critical. The same three perspectives are described by Williamson and Johanson (2013) but are called research paradigms. Positivist researchers generally assume that reality is objectively given and can be described by measurable properties, which are independent of the researcher and his or her instruments. Positivist studies generally attempt to test theory in an attempt to increase the predictive understanding of phenomena (Myers 2009; Williamson & Johanson 2013).

Interpretive researchers, on the other hand, assume that our knowledge of reality is gained only through social constructions such as language, shared meanings and instruments. Interpretive research focuses on the complexity of human sense making as the situation emerges. It attempts to understand phenomena through the meanings that people assign to them (Myers 2009; Walsham 1995). The interpretive approach is now well established in the field of Information Systems research (Walsham 2006) and also widely used in studies in the field of Information Science (Williamson & Johanson 2013).

Critical researchers assume that social reality is historically constituted and that it is produced and reproduced by people. Although people can consciously act to change their social and economic circumstances, critical researchers recognise that their ability to do so is constrained by various forms of social, cultural and political domination. The main task in critical research is one of social critique, bringing to light the supposedly restrictive and alienating conditions of the status quo (Myers 2009; Williamson & Johanson 2013).
The nature of the research question should determine the research perspective and methodology employed to answer it (Creswell 2009). The research question of this study was to explore and understand the information behaviours of online investors. The goal of the research was to generate theory, not to test existing theories. It sought to explore the complexity of information behaviour within the given context of online investing, without any specific cultural or political agenda in mind. Therefore, this study took an interpretive research perspective as being the most appropriate to answer the research question. It is embedded in the branch of interpretivist research known as Grounded Theory and builds upon Glaser, BG and Strauss (1967), Strauss and Corbin (1998), Eisenhardt (1989) and Goldkuhl and Cronholm (2003).

The interpretive research undertaken in this study was guided by seven principles for interpretive field studies described by Klein and Myers (1999). These principles include:

   This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. The methodology employed in this study, Grounded Theory, is inherently iterative in nature, constantly exploring and comparing concepts at both low and high levels of abstraction.

   This principle requires critical reflection of the wider social and historical context of the area being investigated. In the case of online investors, what investors say at a particular point in time must be considered in the wider context of the state of financial markets at that time and the constantly changing relationships with online technologies.

   This principle requires critical reflection on how the data was obtained through the interaction between the researchers and the participants. The researcher needs to be aware of their own potential biases when conducting interviews and also understand how his/her own perceptions and understanding changes because of the research itself.

   The concepts that are revealed through the interpretation of the data in detail should be abstracted to a higher theoretical level. The goal of developing theory is to not only investigate and describe the phenomenon under investigation but to find meaning that may potentially be applicable in other circumstances.

This principle requires the researcher to be sensitive to possible contradictions between the theoretical preconceptions guiding the research design and the actual findings of the research. A major principle of Grounded Theory is that the theory emerges from the data and is not influenced by preconceptions based on previous theories. Chapter 7 provides a comparison and contrast between the theory developed by this study and existing theories from the literature.


This requires sensitivity to possible differences in interpretations among the participants. By interviewing a wide range of online investors, each providing their own experiences, this study obtained many different interpretations of the online investing activity.


This requires sensitivity to possible biases or distortions in the transcripts collected from interviewees. As it was not possible to verify statements made by participants with other sources such as trading records, the interview questions were designed to not be confronting to the interviewees so they would feel comfortable to answer openly and truthfully (e.g. no financial questions were asked).

Through analytical generalisation, the theory developed is not only grounded in the data but also compared and contrasted with existing theories to strengthen the potential applicability of the theory to a wider range of contexts (Yin 2003).

### 3.2.2 Qualitative Research

At the broadest level, qualitative research is “any type of research that produces findings not arrived at by statistical procedures or other means of quantification. A nonmathematical process of interpretation, carried out for the purpose of discovering concepts and relationships in raw data and then organizing these into a theoretical explanatory scheme” (Strauss & Corbin 1998). All qualitative research methodologies, to some extent, share these same basic elements, but may differ in specific outcomes being sought or the procedures used.
The major activities that are common to qualitative research methodologies include data collection, procedures to interpret the data and analytical procedures. Data collection may come from interviews, observations, documents, records, films etc. Procedures to interpret and organize (code) the data can include: conceptualizing and reducing the data into categories, elaborating categories in terms of properties and dimensions and relating the categories with prepositional statements. Analytical procedures may include non-statistical sampling, writing notes or memos and written and verbal reports of results (Strauss & Corbin 1998).

Reasons for doing qualitative research include (a) the nature of the research question – understanding the meaning or experience of persons, (b) exploring substantive areas about which little is known and (c) obtaining intricate details about phenomena (feelings, thought processes and emotions) that are difficult to extract with other methods (Strauss & Corbin 1998).

As there has been very limited previous research into the information behaviour of online investors there were no existing theories to test. The research question of this study sought to investigate the actual information behaviours of people in a specific context (online investing), which requires asking actual online investors what it is that they do. The research question also sought to delve deeper into the behaviours themselves and investigate what factors influence the behaviours. The goal was to build a theory that captures and gives insight into the behaviours and influencing factors. A qualitative research approach was therefore chosen as being the most appropriate to answer the research question.

### 3.2.3 Research Plan

In order to increase the validity and reliability of the outcomes of this research a research plan was developed. The research plan used in this study was based on a research plan described by Bruno (2011). The plan is originally based on the research process described by Eisenhardt in *Building Theories from Case Study Research* (1989). Eisenhardt’s steps have been further augmented with conceptual components from Grounded Theory – open coding, axial coding and selective coding (Strauss & Corbin 1998). Elements of multi-grounded theory have also been incorporated, particularly in relation to the use of existing literature (Goldkuhl & Cronholm 2003). The plan also highlights points where iterative loops occur in the research process. Figure 3-1 presents the plan pictorially and the rest of this section expands on the steps.
The research plan includes the following steps:

1) **Getting Started.**
   
   An initial research question needs to be defined (at least in broad terms). Without an initial focus the research may become overwhelmed by the data. Identification of possible constructs can also be useful, provided it is recognised they are tentative, as the constructs will evolve as the data is analysed. The research findings may also yield serendipitous results that may lead to refocusing the research question.

2) **Selecting cases.**
   
   The population from which participants will be drawn from is defined. This helps reduce extraneous variation and defines limits for generalising the findings. Eisenhardt promotes “theoretical sampling”, also described by Strauss and Corbin (1998). Cases are chosen for the possible contribution to the developing theory, rather than based on statistical sampling. This is further discussed in Section 3.4.3.
Crafting Instruments and protocols.
This step involves defining the mechanism for gathering data. This study has performed interviews that include a set of open research questions that have generated a large volume of qualitative data. This is discussed in more detail in Section 3.4.1.

Entering the field.
This stage involves not only the gathering of data but also performing coding and initial analysis of the data in an iterative process. These three activities overlap to a large degree. Transcription and analysis can occur as data is gathered for each case study. This stage can also include notes made by the researcher at the time of data collection.

Analysing data
Analysing the data is an important part of bridging the gap between the data collected and the findings of the research. The Grounded Theory concept of Open Coding is used at this stage to explore the concepts that are being discussed by the participants.

Analysing Within-Case Data
Analysis begins with analysing the data within each case by going into the details of the case and looking for concepts. These form the basis of a potential theory.

Analysing Cross-Case Data
Cross case analysis looks for similarities and differences between cases, to flesh out the potential concepts with more depth and variation.

Shaping hypotheses
From the within case analysis, and various cross-case analysis tactics and overall impressions, tentative themes, concepts, and possible relationships between concepts begin to emerge. In shaping the hypotheses, a highly iterative process is used to compare systematically the emergent theory with the evidence in each interview. The central idea is that researchers constantly compare theory and data – iterating toward a theory which closely fits the data. Axial Coding involves adding depth and variation to the concepts in the emerging theory so the concepts are relevant to all the cases being analysed.

According to Multi-Grounded Theory (Goldkuhl & Cronholm 2010), the emergent theory should not only be compared and contrasted with the data but also with other theories and concepts from the literature throughout this iterative process.
7) **Building Theory**

As the hypothesis develops it evolves into a theory. Selective Coding from Grounded Theory involves selecting one major theme from the concepts as the focus of the theory. This provides a cohesiveness to the theory so that all the concepts fit together in a meaningful way and also ensures the theory fits with all of the cases that have been investigated.

8) **Enfolding Literature**

An essential part of theory building is to compare the emergent concepts and theory to those found in the current literature. This requires reviewing similar theories that support or contradict the emergent theory of this research and postulate why it supports or contradicts it. This enhances the internal validity, generalisability and the theoretical level of the theory built. Enfolding the literature is crucial, because the number of interviews performed is of a limited number. “Bringing the literature into the writing not only demonstrates scholarliness but also allows for extending, validating and refining knowledge in the field” (Strauss & Corbin 1998).

9) **Reaching Closure** involves deciding when to stop adding interviews and when to stop iterating between theory and data in the generation of theory. Usually this is at the point of theoretical saturation, when new cases do not add to the emerging theory, but pragmatic considerations such as time and money may also dictate when this occurs.

The iterative loops (shown in Figure 3-1) are key elements to the research plan and are shown using dotted ellipses. The figure shows three iterative loops (a), (b) and (c). The first iteration (a) occurs during data collection, where interviews are conducted, transcribed, and then analysed (using open coding). The emerging concepts guide subsequent interview questions and also the selection of subsequent cases. The second iteration (b) is performed after a number of iterations of the first iterative loop (a) have been performed. During this iteration the hypotheses starts to develop and is deepened (using axial coding). The third iteration (c) involves further shaping of the hypothesis towards theory generation (using selective coding). The plan therefore allows for multiple iterative cycles (a), (b) and (c), which include steps 4 through to 7, to be performed, based on the findings and perceived theoretical saturation between the various iteration boundaries. Grounding of the theory with the literature occurs during iterative cycles (b) and (c), as well as near the end of the process (step 8) (Goldkuhl & Cronholm 2003).


3.3 Methodology

Myers (2009) describes four research methods appropriate for qualitative research in business: action research, ethnography, case studies and grounded theory. Action research involves the researcher not only seeking to understand organizational cultures and processes but also to collaborate with the participants to action changes and study the effect of those changes (Myers 2009). As this study sought to understand information behaviours of online investors but not to change them, action research was considered to not be an appropriate methodology.

Creswell (2009) states that the ethnographic researcher studies a cultural group in a natural setting during a prolonged period of time by collecting, primarily, observational data. It was considered that an ethnographic study of online investing would have been difficult to achieve as the activity is not one that is practiced in a confined place or time. Each individual investor does their investing in their own place and time. While some investing tasks may be distinct and regular (e.g. daily checking of a watch list), other tasks may happen at unexpected moments or be incorporated into other everyday activities (e.g. reading the newspaper).

According to Yin (2003), the case study method is “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. Myers (2009) similarly states that “case study research uses empirical evidence from real people in contemporary real-life organizations … a defining feature of case study research is its focus on asking ‘how’ and ‘why’ questions”. Myers, however, also points out that “a ‘case study’ in business is almost always synonymous with a study of some business aspect of an organization” (Myers 2009). This study sought to understand the information behaviour of individual online investors. As such, there was no organisation per se that could be studied as a single case study.

Grounded theory is “theory that was derived from data, systematically gathered and analysed through the research process (Strauss & Corbin 1998). The researcher begins with an area of study and allows the theory to emerge from the data. This study sought to not only understand the information behaviours of online investors but also the factors that affect those behaviours. This study sought to generate theory rather than test theory. Grounded Theory was therefore chosen as the methodology most appropriate to answer the research question.
3.3.1 Grounded Theory

A grounded theory denotes a set of well-developed categories (e.g. themes, concepts) that are systematically inter-related through statements of relationship to form a theoretical framework that explains some relevant social, psychological, educational or other phenomenon. The statements of relationship explain who, what, when, where, why, how and with what consequences an event occurs. A theory usually is more than a set of findings; it offers an explanation about phenomena and may have predictive powers (Strauss & Corbin 1998).

“Grounded theory begins at the level of observation and concludes at the conceptual level. Thus, concepts or variables are created by observation of the data. Data is gathered within a reflective framework where a broad research question is raised. Interviews are conducted, the data or recorded statements from the interviews are analysed, and a second set of interviews is conducted. After that, further analysis occurs with reflection and the formulation of provisional hypotheses. In summary, grounded research enters the fieldwork phase of a project without hypotheses. The researcher describes what is happening, and provides explanation for why events occurred” (McMurray, Pace & Scott 2004).

Grounded theory was originally developed by Glaser and Strauss (1967) and has become widely used not only in social research but other fields including Information Systems. Over the years, grounded theory has developed into two variants, one favoured by Glaser and the other by Strauss, with public disagreements between the two originators (Glaser 1992). More recently, other authors have contributed their own evolved perspectives on the use of grounded theory, including Cathy Urquhart (2013), Kathy Charmaz, Janice Morse and Phyllis Stern (Morse et al. 2009).

All the grounded theory variants, however, share the same major common elements and the goal of generating a theory that is grounded in the data being studied. This study conducted grounded theory as described by Strauss and Corbin (1998) but also drew inspiration from the concept of multi-grounded theory (Goldkuhl & Cronholm 2003), which is elaborated on in Section 3.3.4.

The primary analysis method of grounded theory involves the coding of the data into concepts and themes that eventually lead to the development of a theory. Strauss and Corbin (1998) promote three different forms of coding: open coding, axial coding and selective coding.
Open coding aims to “uncover, name and develop concepts”. The text is ‘opened up’ to “expose the thoughts, ideas and meanings contained therein”. “Broadly speaking, during open coding, data are broken down into discrete parts, closely examined and compared for similarities and differences. Events, happenings, objects and actions/interactions that are found to be conceptually similar in nature or related in meaning are grouped under more abstract concepts termed ‘categories’ ” (Strauss & Corbin 1998). “In later analytic steps, such as axial and selective coding, data are reassembled through statements about the nature of relationships among the various categories and their subcategories. These statements of relationship are commonly referred to as a ‘hypothesis’ ” (Strauss & Corbin 1998).

Axial coding is seen as coming after open coding, but in practice both types of coding occur at the same time in multiple iterations. “The purpose of axial coding is to begin the process of reassembling data that were fractured during open coding. In axial coding, categories are related to their subcategories to form more precise and complete explanations about phenomena” (Strauss & Corbin 1998). Procedurally, axial coding is the act of relating categories to subcategories along the lines of their properties and dimensions. It looks at how categories crosscut and link.

Once the major categories are integrated to form a larger theoretical scheme, the research findings start to take the form of theory. “Selective coding is the process of integrating and refining categories. “Concepts that reach the status of a category are abstractions; they represent the stories of many persons or groups reduced into several highly conceptual terms. They should have a relevance for, and be applicable to, all cases in the study” (Strauss & Corbin 1998).

The first step in selective coding is deciding on a central category. “The central category represents the main theme of the research… all the products of analysis condensed into a few words to explain ‘what this research is all about’ ” (Strauss & Corbin 1998). The other categories and themes are integrated around the central category to form a cohesive theory.

Figure 3-2 shows a pictorial view of how the grounded theory research process enables large amounts of raw data to be transformed and broken up into concepts, refined into themes and then reconstructed into categories and ultimately a theory (Bruno 2011).
3.3.2 Memos

An integral part of the grounded theory methodology is the writing of memos, or very specialized types of written records. Memos can contain the products of analysis or directions for the analyst. They are meant to be analytical and conceptual rather than descriptive (Strauss & Corbin 1998).

Memos can take the form of code notes, which contain the actual products of the three types of coding (open, axial and selective), theoretical notes, which may summarize the analysis or record the analyst’s thoughts and ideas about theoretical sampling and other issues or simply be operational notes recording directions and reminders for the analyst (Strauss & Corbin 1998).
Memos grow and evolve during different stages of the analysis. They remain important documents because they record the progress, thoughts, feelings and directions of the research and researcher. At the end, it is impossible for the analyst to reconstruct the details of the research without memos (Strauss & Corbin 1998).

During the open coding stage, early memos contain impressions, thoughts and directions to oneself. Early notes include categories, the concepts that point to categories and some properties and dimensions. Memos during axial coding relate categories and continue developing them in terms of their properties and dimensions. The analyst can record his/her thoughts of where the analysis is going. During selective coding theoretical and operational notes pertain to filling in categories and refining the theory (Strauss & Corbin 1998).

### 3.3.3 Use of Existing Knowledge and Literature

According to Suddaby (2006), a common misconception of grounded theory is that it requires a researcher to enter the field without any prior knowledge. “There are several variants of this myth, each based on the false premise that the researcher is a blank sheet devoid of experience or knowledge. Leaving aside the question of whether it is even possible to disregard one’s prior knowledge and experience, the idea that reasonable research can be conducted without a clear research question and absent theory simply defies logic” (Suddaby 2006).

“There is a difference between an open mind and an empty head” (Strauss & Corbin 1998). The issue is not whether to use existing knowledge but how it is used. Existing researcher knowledge is not simply put aside but instead acknowledged and understood. “The real danger of prior knowledge in grounded theory is not that it will contaminate a researcher’s perspective, but rather that it will force the researcher into testing hypotheses, either overtly or unconsciously, rather than directly observing” (Suddaby 2006).

Both Eisenhardt (1989) and Strauss and Corbin (1998) promote the use of existing literature at each stage of the research process. This is reflected in the research plan presented for this study in section 3.2.3. Existing literature can be used at the beginning to identify a research gap and inform the research question, provided the researcher recognises constructs from the literature are only tentative. The literature can also assist in defining the interview questions before the data collection begins. The questions, however, must be kept broad and open to allow respondents the freedom to answer without being led.
During analysis, the literature can stimulate questions to be asked by the analyst and concepts derived from the literature can provide a source for making comparisons with concepts arising out of the data. Once the theory has been developed, the literature can be used to confirm findings, but also, findings can be used to illustrate where the literature is incorrect, is overly simplistic or only partially explains phenomena. Bringing the literature into the writing not only demonstrates scholarliness but also allows for extending, validating and refining knowledge in the field (Strauss & Corbin 1998).

3.3.4 Multi-Grounded Theory

Goldkuhl and Cronholm (2003, 2010) have more recently proposed an extended version of grounded theory that they call multi-grounded theory. In multi-grounded theory, the theory that is developed is grounded using three grounding processes: theoretical, empirical and internal (see Figure 3-3). Although most, if not all, of the elements of multi-grounded theory can be found in earlier grounded theory literature, multi-grounded theory makes a stronger case for the explicit grounding of the theory than is made previously.

![Multi-grounded theory grounding sources](Goldkuhl & Cronholm 2010)

Figure 3-3 - Multi-grounded theory grounding sources (Goldkuhl & Cronholm 2010)
A theory is empirically grounded in that the theory is grounded in the concepts that have arisen from the analysis of the data, just as in traditional grounded theory. Theoretical grounding means that the theory is compared to external theories from the literature to contrast similarities and differences.

Strauss and Corbin (1998) similarly propose the concept of ‘enfolding the literature’ which is comparing the developed theory to the existing literature. Multi-grounded theory, however, goes one step further and makes this process explicit not only at the end of the theory development process but also during the analysis and development of the theory, in an iterative fashion (Goldkuhl & Cronholm 2010).

Internal grounding of the theory involves a systematic investigation of the conceptual structure of the evolving theory, where consistency and congruency are checked. A focused part of the theory (one or several concepts and possible relations) is assessed in relation to other parts of the evolving theory – the theory itself is used for grounding (Goldkuhl & Cronholm 2010). Strauss and Corbin (1998) similarly propose that the theory be validated by comparing the theory to the original data to ensure it has explanatory powers for all cases. Multi-grounded theory, again, makes this process more explicit and relevant throughout the analysis process.

According to Multi-grounded theory, it is also important to be continuously reflective on the research interest of the study. “It is fully acceptable to let the research questions evolve through the empirical and theoretical work” (Goldkuhl & Cronholm 2010).

The research path taken by this study has identified strongly with many of the aspects of multi-grounded theory. At a number of stages during the analysis, concepts arose from the data that needed to be further explored by the researchers before further analysis could proceed. It was necessary to investigate the literature to find theories that partially explained what was being seen in the data. This then led to the discovery of theories and research fields not previously known to the researchers, which further informed the analysis to lead to a deeper understanding of the concepts arising from the data.
3.4 Data Collection

A range of data collection techniques are available in regards to qualitative research: interviews, participant observation and using documents (Myers 2009; Williamson & Johanson 2013). This study sought to understand the information behaviour of individual online stock market investors. Investors gather information from many different sources and mediums.

The use of documents was determined to be not possible as there are no records or documents available that relate to the information gathering activities of individual investors. It may have been possible to obtain web server logs of an online broker or investment related website, but that data would have been an aggregate of all investors in general and would have only been relevant to that site alone. It would not have captured the very important behaviour of data gathering across multiple sources and media.

Direct participant observation may have been a possible source of data, but similarly was determined to be difficult to achieve and would have resulted in limited data. Each individual investor does their investing in multiple places and times. While some investing tasks may be regular and potentially observable (e.g. daily checking of prices and news items on a broker website), others can occur at random, unexpected moments (e.g. getting an idea while watching a television program). It may have been possible to observe investors perform some of their online activities, but that would have only captured part of the whole picture and potentially have missed very important pieces of the puzzle. During the interviews, some investors did show the researcher specific use of websites or software packages.

Interviews allowed for open ended questions to be asked and for the participant to describe, in detail, the process they followed and how they gathered and used data from all information sources. As each investor is different, the questions could be varied somewhat to delve deeper into the specific behaviour of each investor and capture richer data about their activities. Interviews with individual investors were therefore chosen as the best data collection method to meet the aims of the research question for this study.


3.4.1 Semi-Structured Interviews

Interviews are one of the most important data gathering techniques for qualitative research. They are the technique of choice in most qualitative research methods and allow the gathering of rich data from people in various roles and situations (Myers 2009). Interviews are widely used in the fields of Information Science and Information Systems (Williamson & Johanson 2013). It has been said that qualitative interviews are like night goggles, “permitting us to see that which is not ordinarily on view and examine that which is looked at but seldom seen” (Rubin & Rubin 2005).

The interviews for this study were conducted face-to-face, 23 in person and 3 over the Internet using Skype (audio only), with most interviews lasting approximately one hour. The researcher followed the ethics requirements as approved by the relevant ethics committee, obtaining informed consent from the participants to record the interview.

The questions were semi-structured but many questions were left open ended so participants could expand what they thought was important. This also allowed the interviewer to follow up on interesting comments made by participants with further questions. The interview questions generally asked each investor to describe the process they went through in identifying, researching, buying and selling shares in companies. The questions tried to delve into not only what information sources they used but also what they did with the information once it was obtained and how the information was used to make decisions at each step of the process. The questions also tried to solicit what impacts the Internet itself had on the investment process and also if and how investors communicated with others as part of their investment process.

Interviews were recorded and then the primary researcher transcribed all the interviews himself. This allowed for the researcher to become immediately immersed in the data as the transcription process allows the researcher to relive the conversation and stimulates analytical thinking about what the interviewees were saying.

An example of the interview questions used in this study is found in Appendix B. The questions themselves evolved during the research process, as the theory developed and new concepts were uncovered from the data. The interview questions presented were the most recent.
3.4.2 Participant Recruitment

A total of 26 investors were interviewed for this study, with 28 actual interviews being conducted. The first 2 participants were interviewed a second time later in the study to enable them to answer questions related to concepts that arose during the analysis, that were not in the original set of interview questions. All the investors interviewed were individual investors investing their own funds on their own account or for their self-managed superannuation fund (SMSF), which was the population the study sought to investigate.

Investors were recruited for the study from a variety of sources. Some were known personally to the researcher and some were referred by others, in a snowball fashion. Investors were also recruited from those answering general requests for participants that were posted to online stock forums and also sent to mailing lists.

As much as practically possible, the goal was to interview as wide a range of investors as possible, in order to explore the range of information behaviours and online activities that are important to investors.

Five of the investors interviewed were female and 21 were male. Although females were somewhat under-represented in the sample, it was not unexpected as previous research has found that women, in general, are usually less active investors than men (Loibl & Hira 2009, 2011; O'Connor 2012) and this study specifically sought investors from the more active end of the activity spectrum. A similar ratio of females to males (20% to 80%) was also observed in the survey of online investors conducted by Williamson and Kingsford-Smith (2010). This was not considered to be an issue as the women that were interviewed included chartists and high risk takers and did not show any major differences in information behaviour compared to the men in the sample when compared across all other factors.

Table 3-1 shows the range of age groups of the investors interviewed, with a good spread of ages represented. More than half the investors interviewed were over 40 years of age, which is representative of the age groups that tend to be share owners. The retail share ownership study conducted by the Australian Securities Exchange (ASX) in 2010 shows that direct share ownership tends to increase with age, with 17% of 18-24 year olds owning shares, but more than 50% of those aged over 45 owning shares (ASX 2010a).
A good range of investing experience levels was also achieved, with the years of investing experience ranging from beginners with less than 1 year of trading to veterans with over 30 years of experience (see Table 3-2).

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>6</td>
</tr>
<tr>
<td>30-39</td>
<td>5</td>
</tr>
<tr>
<td>40-49</td>
<td>3</td>
</tr>
<tr>
<td>50-59</td>
<td>5</td>
</tr>
<tr>
<td>60+</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 3-1 – Participant Age Groups

Most of the interviewees could be considered relatively active investors, making 10 to 20 trades per year. Although not at the high end of the spectrum, they could still be considered more active than most, when compared to the ASX share ownership study (2010a) which found that 70% of investors traded less than 6 times per year. Four of the investors interviewed were very active day traders, trading daily and making more than a thousand trades per year.

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>4</td>
</tr>
<tr>
<td>5-9</td>
<td>3</td>
</tr>
<tr>
<td>10-14</td>
<td>7</td>
</tr>
<tr>
<td>15-19</td>
<td>6</td>
</tr>
<tr>
<td>20-24</td>
<td>2</td>
</tr>
<tr>
<td>25-29</td>
<td>2</td>
</tr>
<tr>
<td>30+</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3-2 – Participant Years of Investing Experience
3.4.3 Theoretical Sampling and Saturation

Theoretical sampling is “data gathering driven by concepts derived from the evolving theory and based on the concept of ‘making comparisons’, whose purpose is to go to places, people or events that will maximize opportunities to discover variations among concepts and to densify categories in terms of their properties and dimensions” (Strauss & Corbin 1998). Marshall (1996) also describes such sampling as judgemental or purposeful sampling. “It may be advantageous to study a broad range of subjects (maximum variation sample), outliers (deviant sample), subjects who have specific experiences or subjects with special expertise (key informant sample)” (Marshall 1996).

Rather than being predetermined before beginning the research, the sampling evolves during the research process. The aim of theoretical sampling is to choose cases in order to maximize opportunities to make comparisons, in order to determine how a category varies in terms of its properties and dimensions. Sampling and analysis occur in an iterative process, with the analysis guiding the data collection (Strauss & Corbin 1998).

Theoretical sampling occurs in all stages of the analysis process, but with a different purpose at each stage. During open coding, the aim is to discover, name and categorize phenomena according to their properties and dimensions. Therefore the aim of data gathering at this stage is to keep the collection process open to all possibilities. Early cases should be chosen in order to generate the widest range of data to provide the greatest opportunity for discovery (Strauss & Corbin 1998). As data collection and analysis progresses and the theory starts to take shape, the researcher is looking for cases that demonstrate dimensional range or variation of a concept and the relationships among concepts. At the final selective coding stage, cases are chosen that will maximize opportunities for comparative analysis with the theory that has evolved (Strauss & Corbin 1998).

The first 10 interviews of this study sought to interview as wide a range of investors as possible to discover as many concepts as possible. This was achieved, with the first set of interviews including investors representing all investing approaches (fundamentals, charts, word-of-mouth and professional advice) as well as combinations. A reasonably wide range of experience levels and age groups was also achieved in this first sample, however, it was recognised that there was a lack of young and inexperienced investors up to that point.
The next 10 interviews sought to further explore the evolving hypothesis, focussing on exploring the idea generation and company research tasks of the investment process. These tasks had been identified as the most varied between investors in terms of information behaviour and also the tasks on which investors spent most of their time and effort. The study also sought out younger investors and those with less experience, as well as several more highly active day traders, in order to provide cases at the extremes of the spectrum of the evolving concepts in the theory to strengthen and deepen the analysis.

“A question that always arises is how long a researcher must continue to sample”. The general rule when building theory is to gather data until each category is saturated (Strauss & Corbin 1998). This means until:

- no new or relevant data seem to emerge regarding a category
- the category is well developed in terms of its properties and dimensions
- the relationships among categories are well established and validated.
- the analysis has accounted for much of the possible variability.

In reality, however, if one looks long and hard enough, there is always something new. Saturation is more a matter of reaching the point where collecting new data seems counterproductive (Strauss & Corbin 1998).

After the first 20 interviews, the remaining interviews that were conducted primarily confirmed and strengthened the evolving theory but did not provide any major new insights. It was considered at this point that saturation had been reached.

### 3.4.4 Sample Size

In a quantitative study, the aim is usually to test a hypothesis or theory on a given population. If it is not practical or efficient to test the entire population, then a sample of the population is used. The size of the sample is determined by the optimum number necessary to enable the findings of the study to be generalized to the whole population (Williamson & Johanson 2013). In a grounded theory study, however, the goal is to generate a theory in order to understand complex phenomena. Being able to statistically generalise the findings to the entire population is not a primary goal of such a study (Marshall 1996).
“An appropriate sample size for a qualitative study is one that adequately answers the research question” (Marshall 1996). Saturation, as described in the previous section, is the primary determinant of when to end data collection. Even so, it is worth comparing the sample size of this study (26 respondents) to guidance in the literature provided by experienced researchers and other similar studies.

Although most grounded theory texts do not suggest any specific sample size, Creswell (1998) recommends between 20 and 30 participants and Charmaz (2006) suggests that “25 participants are adequate for smaller projects”. Mason (2010) conducted an analysis of qualitative PhD studies and found that for grounded theory studies, the median sample size was 30. This study, with 26 participants, falls comfortably within these recommendations and is also a similar sample size to many other grounded theory PhD studies.

A small sample size is often characteristic of qualitative research that involves in-depth interview data. The data in this study required continual analysis, with multiple iterations. The small sample size enabled the emergent theory to be more manageable in the researcher’s mind during all stages of the research (Crouch & McKenzie 2006; Sandelowski 1986).

The relationship between sample size and theoretical saturation is rarely discussed in the literature. During a health related study in West Africa that involved interviews with 60 women, Guest, Bunce and Johnson (2006) maintained records of the generation of codes and concepts during the interview and analysis process. They found that 75% of all codes were generated from the analysis of the first 6 interviews. They also determined that they had effectively reached saturation after 12 interviews, as the remaining 48 interviews generated very few new codes (Guest, Bunce & Johnson 2006).

Sandelowski (1995) concludes that, ultimately, “an adequate sample size in qualitative research is one that permits – by virtue of not being too large – the deep, case-oriented analysis that is the hallmark of all qualitative inquiry, and that results in – by virtue of not being too small – a new and richly textured understanding of experience”.

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3.5 Research Analysis

The method of data analysis used in this study was Grounded Theory (Strauss & Corbin 1998). This section details the fundamental principles of Grounded Theory and the processes used in this study in performing the analysis. It also provides a short description of the software tool used in this study (Nvivo). Lastly, a reflective description is given of the actual research journey taken in this study during the analysis process.

3.5.1 Grounded Theory Fundamentals

Two key theoretical concepts that are fundamental to grounded theory analysis are those of objectivity and sensitivity. Objectivity means maintaining an objective stance when analysing the data. “In qualitative research, objectivity does not mean controlling the variables. Rather, it means openness, a willingness to listen and to “give voice” to respondents” (Strauss & Corbin 1998). Methods that assist with this goal are to think comparatively, obtain multiple viewpoints by interviewing multiple people and being aware of one’s own assumptions and checking them against the incoming data.

“Having sensitivity means having insight into, and being able to give meaning to, the events and happenings in data. It means being able to see beneath the obvious to discover the new” (Strauss & Corbin 1998). Existing researcher knowledge is not simply put aside but instead acknowledged and understood so as to better uncover the concepts in the data. “There is a difference between an open mind and an empty head” (Strauss & Corbin 1998). Personal experience can increase sensitivity by giving a comparative base for understanding.

The basic operations in grounded theory analysis are those of asking questions and making comparisons. By constantly asking questions of the data and constantly comparing at every level, the analyst can obtain a grasp on the meaning of events or happenings that might seem otherwise obscure. It allows the analyst to move more quickly from the level of description to one of abstraction. Researchers are forced to examine their basic assumptions, biases and perspectives and compare them to the data. This can force a closer examination of the evolving theory, sometimes resulting in the qualification or altering of the initial framework. Analysts are more likely to discover both variation and general patterns (Strauss & Corbin 1998).
Strauss and Corbin (1998) promote many forms of questioning. These include:

- Spatial questions: how much space, where, open or closed.
- Technological questions
- Informational questions: who knows who, what etc.
- Questions about rules, cultural values or morals and standard.

The constant making of comparisons is a key technique in grounded theory (Strauss & Corbin 1998). These can include:

- **Cross-case comparisons.** Each case is compared to other cases at the property or dimensional level for similarities and differences and is grouped or placed into a category. During the analysis there were constant comparisons made of each investor with others on many dimensions, including investment approach, information sources used, experience, motivations etc.

- **Theoretical comparisons.** This can involve comparing an incident to something else at a conceptual level looking for similarities and differences in properties and dimensions. The theoretical comparator may be derived from the literature or from experience, and may be similar or very different. For example, during the analysis the relationship that investors have with information was compared to the relationship that humans have with water, resulting in the concepts of an information filter and tap.

- **The Flip-Flop Technique involves taking a concept and turning it ‘inside out’ or ‘upside down’ to obtain a different perspective on the event, object or action.** Looking at opposites or extremes may bring out significant properties. As an example, the analysis considered the theoretical case of an investor that chooses not to invest directly in stocks but uses a managed fund instead and explored the reasoning behind this choice.

- **Waving the Red Flag.** “One of the indicators of bias intruding is the face value acceptance of the words or explanations given by respondents or the complete rejection of these without questioning what is being said. Whenever we hear the terms ‘always’ and ‘never’, these should wave a red flag in our minds” (Strauss & Corbin 1998).
3.5.2 The Coding Process

The key task of analysis in grounded theory is one of coding data into concepts, categories and themes. A concept is a labelled phenomenon (Strauss & Corbin 1998). Elements in the data are broken down into discrete incidents, ideas, events and acts and are given a name. The name may be one placed on the objects by the analyst, or the name may be taken from the words of the respondents themselves, known as *in-vivo* codes (Glaser & Strauss 1967).

The analysis began with what is known as ‘Microscopic Examination of Data’, which is “the detailed line-by-line analysis necessary at the beginning of a study to generate initial categories (with their concepts and themes) and to suggest relationships among categories; a combination of open and axial coding’ (Strauss & Corbin 1998). The initial interviews were analysed line-by-line and any concepts of interest were identified and coded. This initial, open coding, step provided a base set of concepts.

“In the course of doing analysis, an analyst might derive dozens of concepts. Eventually, the analyst realizes that certain concepts can be grouped under a more abstract higher order concept, based on its ability to explain what is going on” (Strauss & Corbin 1998). Categories are concepts, derived from data, that stand for phenomena. Once a category is identified, the analyst can begin to develop it in terms of its specific properties and dimensions. Whereas properties are the general or specific characteristics or attributes of a category, dimensions represent the location of a property along a continuum or range (Strauss & Corbin 1998).

The purpose of axial coding is to begin the process of reassembling data that were fractured during open coding. In axial coding, categories are related to their subcategories to form more precise and complete explanations about phenomena (Strauss & Corbin 1998). The basic tasks of axial coding include (Strauss 1987):

- Laying out the properties of a category and their dimensions, a task that begins during open coding.
- Identifying the variety of conditions, actions/interactions and consequences associated with a phenomenon.
- Relating a category to its subcategories through statements denoting how they are related to each other.
- Looking for cues in the data that denote how major categories might relate to each other.
Strauss and Corbin (1998) also promote the idea of the ‘paradigm’ as a way of exploring more complex relationships between concepts and categories. Combining structure with process helps to get at some of the complexity that is so much part of life. Actions and interactions occur within a set of conditions or situational context. Action/interaction can also bring about changes in the context, thus becoming part of the conditions framing the next action/interaction sequence (Strauss & Corbin 1998). The basic components of the paradigm are:

- **Conditions** - a conceptual way of grouping answers to the questions why, where, how come and when. These together form the structure, or set of circumstances, in which phenomena are embedded.

- **Actions/interactions** - strategic or routine responses made by individuals or groups to issues, problems, happenings or events that arise under those conditions. Actions/interactions define the process.

- **Consequences** - the outcomes of actions/interactions. Consequences are represented by questions as to what happens as a result of those actions/interactions.

### 3.5.3 Selective Coding and the Central Category

It is not until the major categories are finally integrated to form a larger theoretical scheme that the research findings take the form of theory. Selective coding is the process of integrating and refining categories. Concepts that reach the status of a category are abstractions; they represent the stories of many persons reduced into several highly conceptual terms. They should have a relevance for, and be applicable to, all cases in the study (Strauss & Corbin 1998).

The first step in integration is deciding on a central category. The central category represents the main theme of the research - all the products of analysis condensed into a few words to explain ‘what this research is all about’. The category chosen must be central in that all other categories can be related to it, it must appear frequently in the data and the name for the central category should be sufficiently abstract that it can be used to do research in other substantive areas (Strauss & Corbin 1998).
As the central category is refined analytically through integration with other concepts, the theory grows in depth and explanatory power. The theory should be able to explain variation as well as the main point made by the data. A number of activities are involved in integrating the categories and refining the theory (Strauss & Corbin 1998). These include:

- **Reviewing the Scheme for Internal Consistency and Logic**
  To check for consistency and logical development, the analyst can stand back and ask what he or she thinks the properties are and then go back and see how much of this has been built into the scheme.

- **Filling in Poorly Developed Categories**
  Checking that all the properties and dimensions of a category have been identified, thereby building in variation and giving a category precision and increasing the explanatory power of the theory. Filling in can be done through review of memos, the raw data or by looking for further cases for data collection using theoretical sampling.

- **Building in Variation**
  There may be outlying cases that are at either extreme of a concept’s dimensions. Discovering these outliers and building explanations into the theory for them increases its generalizability and explanatory power.

Although this study had a number of interrelated themes evolving during the analysis and theory development, the concept of the Information Lens was found to be the one key concept that tied all the others together in a cohesive way.

### 3.5.4 Qualitative Research Tool

A software tool was used to aid in the handling of the vast amount of rich data gathered from the investor interviews. The tool used was NVivo (versions 9 and 10), which is developed by QSR International. Although primarily used by researchers, it is also widely used by forensic scientists, psychologists, tourism managers, sociologists and consultants (QSR 2013).

Computer software can assist in the analytical process of a qualitative analysis method, such as grounded theory, because of its capacity to store, sort, match, and link data. It can provide invaluable assistance to the researcher in answering the research questions from the data, without losing access to the source data (Bazeley 2007).
Simply using a software tool, however, does not ensure rigour in qualitative research. It is the grounded theory methodology used in this study that is the key part of rigour and validity in producing good theory. The tool, however, does allow the analysis of the data collected to be done in a more organised, systematic way and provides more opportunities to engage with the data, concepts and themes developed. “The searching tools in NVivo allow the researcher to interrogate her or his data at a particular level. This can, in turn, improve the rigour of the analysis process by validating (or not) some of the researcher's own impressions of the data” (Welsh 2002).

The tool itself does not replace immersion in the data, reflection and analysis by the researcher. It simply facilitates organising and sifting the data to enable the researcher to perform the inductive analysis more easily, using the research interpretation of the data. “The intellectual work of actually conceptualizing can only be done by the brain of the researcher. The computer may be able to assist, but there is a risk of becoming so concerned with the technical aspects that this interferes with the ‘artistic’ aspects” (Webb 1999).

Ultimately, the NVivo software tool can be said to have assisted the analysis in this study in the same way that Microsoft Word assisted the writing of this thesis document.

### 3.5.5 The Research Journey

This research has been a journey. This section seeks to describe the journey and how the theory developed evolved and was informed by both the data itself and theory from the literature, in an iterative fashion. It started out with a rather broad research question: how do online investors use the Internet?

From the beginning, it was the words *how* and *use* that were the most intriguing part of that question. Many previous studies involving system usage treated usage in a rather simplistic manner, such as amount of time spent using a system or the number of features used (see section 2.3.6). Research into online investing itself was primarily focussed on adoption – looking at factors related to whether investors had gone online or not – only looking at ‘use’ as a yes or no issue (see section 2.3.2). Some research had delved into why investors were using the Internet but very few had investigated how they were using it (section 2.3.3). At this stage, very few of the information seeking studies of online investors, described in section 2.6, had been published.
After analysis of the first set of interviews, the most striking concepts that appeared were those revolving around the very different approaches each investor took in identifying which stocks were potential investments. As well as the expected ‘chartist’ and ‘fundamentalist’, it was also found that some investors relied almost solely on ‘word of mouth’ to identify stocks to buy while others took an ‘idea’ approach, starting with an idea from outside the investment world and investigating the industry and companies that operated in that industry. It was realised that each of these approaches had a profound impact on how these investors used online services themselves.

At this point the data gathering and analysis was paused and the literature was again consulted to see if theories already existed that observed or explained these phenomenon. This led the researcher to investigate theories from the fields of information search, information seeking and human information interaction. The concept of ‘contextual information seeking’ resonated strongly with what was being observed in the data (see sections 2.5.1 to 2.5.4).

Conducting further interviews and analysis expanded the concept of ‘use’ by focussing on the context of that usage. For the online investors interviewed, that context was found to revolve around three distinct groups of factors: the investor themselves, the goals they were trying to achieve and the specific tasks they were performing. It was around this point that some investors described how they had both a short term trading system and also a long term investment portfolio. The realisation was made that the same investor can have totally different portfolios at the same time, performing completely different information seeking tasks in each of the different contexts. Therefore the concept of context was not a fixed one for each investor – investors themselves could operate in different contexts simultaneously. It also became apparent that although some investors operated alone, others operated within a social network of other investors, exchanging ideas and information.

Again the literature was consulted to see if such behaviour had been previously observed by others. This led to investigating the theory of Information Horizons (see section 2.5.5). Theories from the fields of Communication Theory and Information Foraging were also examined but ultimately not found to be highly relevant to the theory as it evolved.
Further interviews and data analysis sought to further explore the factors that make up the ‘context’ investors are working in and what implications that has on their information behaviour. At this point it became apparent that one of the implications involved avoidance of information overload (see section 2.2.4). The more experienced investors had not only evolved their investment practice to be more efficient, but also had evolved their information seeking behaviour to only seek sufficient information as required to make a decision. By choosing to invest in a particular fashion, the investors by default limit the information they need to look for.

Although the concept of investing being a hobby was in the back of the researcher’s mind and part of the interview questions from the beginning, the perspective of Serious Leisure (see section 2.7) was not discovered until later during the analysis process. The connection was made serendipitously via reading papers on information seeking. The studies linking serious leisure with investing (see section 2.7.2) had not yet been published at that point in time.

This journey is an example of the process described by Multi-Grounded theory, where the literature is used throughout the analysis process, to ground the theory both in the data and in the literature. It is also an example of the researcher being continuously reflective on the research interest of the study and allowing the research question to evolve (Goldkuhl & Cronholm 2010).

3.6 Issues of Reliability and Validity

Strategies for ensuring rigour in a qualitative study must be built into the research process (Morse et al. 2002). Validity must be considered at all stages of the research process, including design consideration, generation of data, analysis and in presenting the results (Whittemore, Chase & Mandle 2001). These strategies include: investigator responsiveness, methodological coherence, theoretical sampling and sampling adequacy, an active analytic stance, and saturation (Morse et al. 2002).

Investigator responsiveness involves the researcher’s creativity, sensitivity and flexibility. The investigator must remain open, use sensitivity, creativity and insight throughout the study (Morse et al. 2002). A good qualitative reduction of data to concept “grabs the essence of a phenomenon; it does not flood us with detail” (Sandelowski 1993). Throughout the analysis, the researcher ensured he was open to new concepts arising from the data. As an example, during an interview with a day trader, a passing comment was made about their long term holdings.
The sudden realisation by the researcher that the investor was actually conducting two drastically different forms of investing was a surprise and immediately recognised as important to the developing theory. This immediately led to follow up questions being asked in the interview.

Methodological coherence is ensuring congruence between the research question and the method. As the research unfolds, the research question may have to be modified or the research method altered to fit the needs of the data (Morse et al. 2002). While the research method was not altered during the course of this study, the research question did evolve as new concepts arose and the theory developed. Consulting the literature at multiple stages both grounded the theory with the literature and also influenced evolution of the research question – leading to Information Behaviour (see section 2.5) becoming central to this study.

Participants chosen for the study need to best represent the research topic being investigated. This is to ensure efficient and effective saturation of categories. Sampling adequacy, evidenced by saturation, means that sufficient data to account for all aspects of the phenomenon have been obtained (Morse et al. 2002). As described in section 3.4.2, the study sought to interview as wide a range of investors as possible, in order to explore the range of information behaviours and online activities. The study reached saturation after approximately 20 interviews, as previously described in more detail in section 3.4.3.

Throughout the study, validation of the products of analysis is a crucial part of theory building - comparing products of analyses against actual data, making modifications or additions as necessary and then further validating the theory against incoming data (Morse et al. 2002; Strauss & Corbin 1998). This study followed a highly iterative research plan that involved constant comparison at every stage of the analysis, as outlined in section 3.2.3. Constant comparison is a key element of the Grounded Theory methodology (section 3.3.1) and also Multi-Grounded Theory (section 3.3.4) followed in this study.

Theory development should involve moving from a micro perspective of the data to a macro conceptual and theoretical understanding. The theory that develops should be both an outcome of the research process and also a template for comparison and further development of the theory. “Valid theories are well developed and informed, they are comprehensive, logical, parsimonious, and consistent” (Morse et al. 2002). The theory developed by this study did evolve from a micro perspective to a theoretical understanding. Initial detailed analysis of investor activities led to many individual concepts.
These were grouped and these groupings became higher level concepts: the investor, the information world, investment tasks and investment portfolio. Relationships between these higher level concepts were also recognised and these formed part of the theory. Finding the right name for an investment portfolio – Investment Persona (section 5.2) – led to a further, higher level of theoretical understanding of the relationships between the concepts.

By following a rigorous research plan that included constant evaluation and comparison of the evolving theory against the data itself and the literature, this study has ensured that the theory developed reliably represents the concepts found in the data and that the theory makes a solid contribution to the understanding of the information behaviour of online investors.

3.6.1 Identifying researcher bias

The primary researcher that conducted this study is himself an online stock market investor. This was both an asset and also a potential liability during the research process. It assisted the research in that when conducting interviews related to an activity such as investing, it was important for the researcher to be able to converse intelligently with the interviewees. It was also important during the analysis that the primary researcher was able to fully understand the discussions of the investors interviewed, which at times became quite technical.

At the same time, the researcher must also be aware of potential biases when entering the field to collect data and also when analysing the data collected. If the researcher makes assumptions about investing based on their own personal experience, they may interpret a different meaning to the data to that intended by the participant.

The background of the researcher was an online investor with 15 years of experience in the market, with primarily a value investing and fundamentals approach to investing. The investment knowledge developed by the researcher over those 15 years proved invaluable in conversing with and understanding the wide range of investors interviewed, including day traders. Being a fundamentals investor, the researcher did not put much value in following charts when beginning this research, but was very aware of this potential bias and did not allow it to affect either the interviews or the analysis, especially when dealing with investors that are primarily chartists.
In fact, through the process of conducting this study, he has not only gained a greater appreciation for the potential value of charts but also for the value of systematic trading plans that technical traders tend to use. The study has also opened the researcher’s mind up to various methods of generating investing ideas that he had not personally considered previously. This study has not only been a research journey but also a learning journey for the researcher.

3.7 Chapter Summary

This chapter outlined the methodological approach taken in this study. It provided detailed discussion of the activities done and the sequence in which they were performed, in order to emphasize the rigour and validity of the research. This chapter provided justification for the research approach used in this study – grounded theory. It discussed the reasons behind the methods chosen and examined the process by which the data was elicited, analysed and then formulated to arrive at the findings. Ultimately, this chapter described the research journey and justified the path taken to generate the theory that answers the research question.

This study sought to explore the information behaviour of online stock market investors in depth. To do so, an interpretive, qualitative study was conducted that involved interviewing 26 stock market investors. The interviews were transcribed and analysed using a Grounded Theory methodology. Concepts and themes arose from the data and further analysis of these concepts and their interrelationships led to the development of a theory of online investor information behaviour.

For ease of readability, the theory of online investor information behaviour, developed in this study, is presented over three chapters (chapters 4, 5 and 6). Chapter 4 introduces the Information Lenses model and briefly describes it. It then discusses the foundation elements of the model: Investors and the Information World. Chapter 5 focusses on the central elements of the model: the Stock Investing Information Process and Investment Personas. Finally Chapter 6 explores the bidirectional relationship between the investor and the information world.
Chapter 4  Information Lenses:
Investors and the Information World

As described in the previous chapter, this study sought to explore the information behaviour of online stock market investors in depth. To do so, a qualitative study was conducted that involved interviewing 26 stock market investors about their online and offline information activities. The interviews were transcribed and analysed using a Grounded Theory methodology. Concepts and themes arose from the data and further analysis of these concepts and their interrelationships led to the development of a theory of online investor information behaviour.

For ease of readability, the theory of online investor information behaviour is presented over the next three chapters (chapters 4, 5 and 6). This chapter introduces the Information Lenses model and briefly describes it. The rest of this chapter then discusses, in depth, the foundation elements of the model: Investors and the Information World. The findings from the data related to these concepts are presented in detail, along with quotes from participants that help to further illustrate the concepts.

Chapter 5 continues the exploration of the Information Lenses model by focussing on the central elements of the model: the Stock Investing Information Process and Investment Personas.

Chapter 6 then explores the bidirectional relationship between the investor and the information world - that information behaviour is a “two way street”. How Personas and tasks influence the Information Lens, and therefore information use, is explored. The information environment itself, however, can also influence investors and affect their information behaviour. These influences and their potential effects are discussed in chapter 6.

The remainder of chapter 4 introduces the Information Lenses model and then each section, in turn, explores the characteristics of online investors that influence information behaviour, what motivates investors to invest online, the online and offline information sources and services that are used and the types of social networks they participate in.
4.1 Theory of Online Investor Information Behaviour

Figure 4-1 – Information Lenses Model
The model that developed from the analysis is presented in Figure 4-1 and has been given the name Information Lenses. The model is made up of the major concepts and themes that arose from the analysis of the data and their interrelationships. Each element is briefly introduced here and then expanded on over the following three chapters. A copy of Figure 4-1 is also provided in Appendix E for the reader to tear out and refer to while reading this thesis.

4.1.1 The Investor

As the investment behaviour is being conducted by the investor, characteristics of the investor themselves would naturally influence that information behaviour. The concepts that arose during the analysis in relation to investor characteristics were grouped into four main categories: personal profile, skills, experiences and motivations.

The concepts of personal profile, skills and experiences are elaborated on in section 4.2 and online investor motivations are explored in section 4.3.

4.1.2 Information World

The Information World represents all the possible information sources, services and social networks available to the investor. It not only includes all online information sources but also offline sources such as mass media (newspapers, magazines and television). It also includes social networks of other investors, where the social networks may be conducted online or offline.

The information sources and services most commonly used by the investors in this study, and the forms of social networks they participate in, are explored in section 4.4.

4.1.3 Investment Persona

An Investment Persona is a role an investor takes on in trading a particular stock portfolio. It is most influenced by the goal of the portfolio, the investment approach taken to achieve the goal, the time frames involved and the market sector(s) of the stocks involved. An individual investor can have multiple Investment Personas and their information behaviour may be different for each of those personas. Investment Personas are discussed in depth in section 5.2.
4.1.4 Information Lens

An Information Lens represents the set of information entities (sources, services and social networks) that an investor draws upon or communicates with at any particular point in time. It is, by necessity, a subset of the total information world available, as no single individual is capable of knowing, gathering and processing all available information, and not all available information is relevant or useful to investing.

The investor does not necessarily use all of the sources and services known to them at all times. Rather, they look through an Information Lens, seeing only a small subset of the information world at a time. The Information Lens is highly dynamic – it will be constantly changing depending on the context of the activity being conducted.

When working in different personas, the shape of the relevant information lenses may be considerably different. The information lens used when dealing with a long term investor persona can be very different to that of a trader persona. As the investor switches between personas, they also switch between information lenses.

The two most influential contextual elements that shape the information lens are the make-up of the persona itself and also the task being undertaken at the time. These contextual elements and their influence on information lens are discussed in detail in section 6.1.

4.1.5 Stock Investing Information Process

The information sources, services and social networks being utilized by investors at any particular time are also highly influenced by the specific task that is being performed at that time, even for an individual investor.

The investment processes as described by all the investors in the study were synthesized into a unified general stock investing information process. The concepts were grouped into distinct stages: idea generation, stock selection, company research, buy, monitor holdings and sell. The stock investing information process model is described and covered in depth in section 5.1.
4.2 Investor Characteristics

The individual characteristics of investors themselves would naturally influence their online investing information behaviour, as it is the investor that is doing the information seeking, gathering and sharing. This section explores the investor characteristics that were found to have an influence on information behaviour, looking at not only basic demographics such as age and gender, but also the investor’s skills and past experiences. The motivations for investing online are explored in section 4.3.

The demographic profiles of the investors interviewed for this study have been previously described in section 3.4.2 – Participant Recruitment.

4.2.1 Personal Profile

The attributes related to the personal profile of the investor are those attributes specific to the investor as a person. These include attributes such as the age and gender of the investor, the amount of time they have available for investing and their attitude to risk.

Age

The investors interviewed for this study were from a wide range of age groups (see Table 3-1). Even so, age was found to only have a minor influence on information behaviour.

The stereotype of young investors being technologically savvy high risk takers while older, retired investors being conservative and technology averse, did not bear out in this study. Indeed, the most active day trader who was also the most prolific stock forum poster was over 60 years old, while one of the most conservative investors interviewed was less than 30 years old.
The younger investors in the study were more likely to search out information from multiple online information sources and more likely to be using online stock forums and social media. But for each of these generalisations, there were also exceptions.

**Attitude to Risk**

A wide range of attitudes to risk was evident with the investors in the study, from those who considered themselves very conservative to those who viewed themselves as high risk takers.

“And it really depends on your own personality and your propensity for risk and risk aversion, and also your state of life. You know, as you get older you tend to get more conservative - or maybe you don't. Again it's a personality thing.”

“I’m ultra conservative, which means that I stick very much to recognised, current blue chip type shares … they'd be in the top 50.”

“And my personality profile is high risk. But it's also high reward. And it's taken me a little while to come to that realisation. And investing in the stock market is a lot about confidence and understanding your own personality as well as understanding the stock market itself.”

“Yes - so it's a risk. My thought was, it's not like I've got a wife and kids, so what am I going to do with the money, it's going to be in a term deposit earning 5 or 6 percent a year, if I'm lucky. So I may as well use this money. If I lose I lose, if I win, I win.”

The investor’s risk attitude can influence their information behaviour both directly and indirectly. In a direct way, investors who are looking for high returns and are comfortable with high risk, are generally seeking to invest in the riskier end of the market – small and emerging companies. These types of stocks will generally require more information gathering and more checking and validation of data. These investors are also more likely to search for rumours and tips on stock forums and social networks.

The more conservative investors stick to large, blue chip companies and therefore have lower information effort required as information and analysis is more readily available for those large companies.
“The high risk I would do a bit more research, and I would be a bit more anxious to check their performance - so I maybe check those every couple of hours quickly on my phone. So yeah I guess I was a bit more worried about those shares, being higher risk, so more research and more checking.”

Indirectly, the investors seeking higher returns with higher risk are drawn to certain investing and trading styles, such as day trading, charting and systematic trading to control the risk. These styles of investing, in turn, influence their information behaviour, as the style of investment they take on has specific information gathering requirements inherent within it.

**Time Availability**

Time (or lack of it) was an issue that arose often during the interviews. Those investors that were working full time (19 of 26), had limited time to conduct their investing activities, and this had a major impact on the amount of information they could gather and process.

“Because I have limited time - you know the time frame I have to spend on this is limited. So when you're trying to scrunch something in when you get home, or on a weekend somewhere, you haven't really got time to sit and browse through.”

“And that's because I do have a full time job. If I was at home - if I was retired - I would trade more, definitely. In fact, I think that's something I will do when I finish full time employment.”

The most commonly reported reason for not using online stock forums was a lack of time, in addition to issues of trust.

“I just don't have the time. By the time I've gone through the information I've got, there's not enough hours in the day.”

“I didn't trust it entirely, and I didn't really have the time to sit there and filter through it all.”

For those investors who were retired (5 of 26) or partly retired (2 of 26), the issue of time availability was mixed. While some spent considerable time on their investing and trading, others reported spending even less time than when they were working.
“I probably stopped putting in a lot of effort after I retired. Once I had more time to do it, I started doing it less and less. Because before you retire you’re not sure how much you need in your retirement. Once I retired and found out how I would handle it, I said I’ve got too much to do and I don’t really need more money, so that necessity dropped off.”

One retiree was actually a very active day trader, having made stock market trading his full time occupation in retirement.

Gender

As described in section 3.4.2, the study interviewed 21 males and 5 females. Although there were considerably less females than males, gender was not found to be a major influence on information behaviour, at least within the participants in this study. The typical stereotype of women being more conservative investors than men did not bear out. The women in the study included chartists and fundamentalists, high risk takers and ultra conservatives, strict system followers and word of mouth investment styles, high and low levels of activity and both working and retired investors.

4.2.2 Skills

The skills and knowledge that each individual investor possesses was also found to be a major influence on their investing and information behaviour. The concepts that arose in the analysis around the theme of skills were grouped into three categories: investment skills, IT skills and domain knowledge.

Investment Skills

The level of investment skill each investor possessed was, not unexpectedly, dependent on how long the investor had been involved in stock market investing. Those with many years of investment experience had developed their investing skills over many years and were not only more proficient at it but also more efficient. The actual form of skills varied widely, however, with some of the experienced investors being highly knowledgeable in charting and systematic trading, while other experienced investors knew very little about charting but had considerable knowledge in analysing companies and reading financials.
The financial skill sets an investor had from other aspects of their life also influenced their personal stock investing and information behaviour. Those investors who were professionally trained in finance or accounting (5 of 26) were more likely to study the fundamentals of a company as they were more capable of reading and understanding financial reports.

“Because my job for the past few years has been in finance, I know how to read annual reports and I know exactly the information I want, so I go straight to the information.”

**IT Skills**

All 26 of the investors in the study were sufficiently IT literate that they had no problem using their online broker website, searching for information using Google and using and accessing other online sources and services such as email, online newspapers and stock forums where they were used. In this regard, there was no observation in the study of a low level of IT skills being an impedance to general online investing.

Where IT skills were found to have an influence on online investing activities and information behaviour was in the more IT intensive investing activities of charting and systematic day trading. Charting involves the use of specialised charting software packages. Although the packages can be used simply at a basic level, five of the investors described creating their own charting indicators within the software systems via programming (all having IT backgrounds). Systematic trading involves developing a system that involves complex computations and testing the system out on historical data using back testing software packages. The software packages involved are rather complicated and often require some programming skills, so the IT skills of those conducting this type of investing need to be at a higher level than the average investor.

“Well this is the back testing software we use... And the beauty of the software is that you can bring in a system which covers all the aspects of the plan including portfolio management, entry, exit, money management and risk management. And each one of these particular blocks has a series of scripts that defines the rules of the system and you run it over a period of time.”

“When it comes to my system, I wrote the scripts. But there are some inbuilt ones as well, and there are also standard sort of things like trailing stops.”
**Domain Knowledge**

Another set of skills that investors develop or draw upon from other aspects of their life is their knowledge about particular industries or technologies. Each investor has their own knowledge base and skills from other parts of their life that they draw upon when it comes to investing, and that influences the companies they might invest in. Investors can also develop such domain knowledge through investing, becoming more knowledgeable about mining, for instance, through investing in mining companies.

“At the start I was buying only shares of business that I understood very well. Steel I understood very well, because I was working in that business. So I was buying steel. I was buying software services, because I understood software services very well. Especially out-source software service companies. I understood that business very well, so I bought that.”

“Let's just take one of the large banks. So how did one become aware of that stock? Well, historically, it's pretty hard not to. Secondly, having worked in that industry for the best part of 20 odd years, one has a degree of industry knowledge about it. So you have a natural affinity, I suppose, towards that sector.”

**4.2.3 Investment Experience**

Each investor has a different past investing experience and that experience influences the form of investing they undertake at the present time and therefore their current information behaviour. Investors in the study often described their stock investment experience as a journey of learning, but each journey was different.

“In this context it's very much a learning experience there is obviously a degree of knowledge base that one has acquired but continues to try and build upon. But it's very much a learning experience. And you learn by making mistakes and occasionally you learn from making good decisions and successful decisions.”

The investing style and information behaviour is influenced both by what stage of the learning journey the investor is currently at and also the past experiences that have shaped the investor’s views, knowledge and skills.
Learning Journey

Those that were at the beginning of the journey tended to describe their investing as a fractured process with limited information gathering and low confidence.

“We are still kind of in a learning phase about it, so our research doesn't go much beyond that really, and it's a bit on gut feeling just seeing how we can kind of watch and predict the markets.”

The paths taken by investors in the early stages of their journey were quite varied. Four of the investors described beginning by doing practice or ‘paper’ trading before committing actual money to the stock market, while others jumped right in, either starting off slowly with one or two companies, or starting off very actively.

“In the beginning I was doing lots and lots of paper trading. And that was a phenomenal learning curve. I highly recommend people doing that before they actually invest any money. And that was so much enjoyment in the beginning, even when I did start to invest money I kept that going.”

“That's why I practiced before investing money. To see what it was like, without money. And I realised trading is like a full time job.”

All the investors described their investing and trading evolving over time. The evolution was in many cases due to the investor themselves learning and understanding more about trading and investing and broadening their horizons.

“Yeah, it evolved over time. There was no-one to lead me. I learnt all these things out for myself because when I started I knew no-one who traded in shares, so I thought I'd give it a go. I've made a lot of money, I've lost a lot of money, I've made it back again, and these are all phases - it in part reflects the market. But it more probably reflects the maturing of the way that I approach my trading. So before I followed the pack and over time I've understood more how the economy works.”

While most of the investor’s journeys remained within stocks, six of the investors broadened their investing beyond the stock market to derivative markets such as options, warrants, futures and even foreign exchange.
“I traded the stock market for a year or so - well a year intensively and then, sort of, on a part time basis for about 3 years, and then I got more focussed into options and then forex [foreign exchange] and then futures. And now I'm basically a futures trader but I use CFDs [Contracts For Difference].”

Past Success/Failures

The learning journey for many was also shaped by successes and failures along the way. Three investors reported having been ‘burnt’ early on, especially during the dot-com boom period, and how that changed their approach to becoming more conservative.

“Well, originally I learnt about trading through a course that taught me about basic technical analysis and the examples were given with the stock market. And it was in the time of the dotcom boom and all the shares were going up and people making a lot of money on the market and, you know, I was caught up in all of that. I made some money and I lost a lot of money. Then I realised that if I was going to become a trader, I'd have to work a lot harder at educating myself. Through the education process I started to realise that the markets I was in were actually inherently more risky than the markets I trade now.”

“When I started off, the average hold time that I had on a stock was 3 days. I make the distinction between a trader and an investor. So when I started off I was definitely a trader and now I'm leaning more towards investment. I might only execute 12 to 15 trades a year.”

While others reported starting off very conservatively and slowly, but then becoming more active and adventurous in later years as they gained more knowledge and became more confident.

“Before that I looked at - dabbled - as everyone did when they got some Telstra shares and so forth and had no idea what I was doing. And then at that point I decided to start paper trading and really look into it till I could learn it in whatever spare time I had. And then about 7 years ago I started seriously as a share trader - again on weekends - so you could call me a weekend share trader I guess.”
4.2.4 Summary

The individual characteristics of investors themselves influence their investing and therefore their information behaviour. These characteristics include the investor’s personal profile, the skills they possess and their investment experience.

The attributes related to personal profile that arose in this study included their age, gender, the amount of time they have available for investing and their attitude to risk. Age was found to only have a minor influence on information behaviour. Likewise, gender was not found to be a major influence either. Time (or lack of it) was an issue that arose often during the interviews. Those investors who were working had limited time to spend on investing and this limited their information gathering efforts.

A wide range of risk attitudes was evident with the investors in the study, from very conservative to high risk takers. Higher risk takers are generally seeking to invest in riskier stocks and these stocks generally require more information gathering and more checking and validation of data. Conservative investors stick to large, blue chip companies and therefore have lower information effort requirements.

The more experienced investors had developed their investing skills and were more proficient and efficient at both investing and information gathering. Investors who were professionally trained in finance or accounting were more likely to study the fundamentals of a company. In relation to IT skills, all of the investors in the study were sufficiently IT literate to conduct basic online investing activities. IT skills had a larger influence in the more IT intensive investing activities of charting and systematic day trading. Investors also drew upon their domain knowledge of industries or technologies that they may already have had from other aspects of their life, and this influenced their investing behaviour.

Each investor has a different past investing experience and that experience influences the form of investing they undertake. Investors in the study often described their stock investment experience as a journey of learning. Those that were at the beginning of the journey tended to describe their investing as a fractured process whereas experienced investors had worked out what investing worked for them and the information they required.

The learning journey was also shaped by successes and failures along the way. Some investors were burnt early on and became more conservative, while others started off conservatively and then became more active and adventurous in later years.
4.3 Online Stock Investor
Motivations

What motivates an investor to invest in or trade stocks online, as an individual, when they have the option of investing the same money in a managed fund and allowing professionals to invest the money in the stock market for them? This was one of the questions asked of the investors in this study and this section explores the responses and their relevance to information behaviour.

Although a stereotype assumption might be that all online investors are only motivated by greed – to make money – the real picture is far more complex.

4.3.1 Make Money / Generate Income

Obviously any investor undertaking any sort of investment activity will be interested in the financial outcome, so yes, all the investors in the study were looking to make money. Some of the investors (8 of 26) were looking to use stocks to ‘make money’ in the sense of generating profits from trading, while others (6 of 26) were primarily investing to generate an income from the dividends. Approximately half (12 of 26) were doing both at the same time.

“I want to be able to make 100% per year on my money - at least <laughs>... It’s doable.”

“Because at the age I am, that's my source of income actually. Because theoretically I'm retired. That's where I get my income from - that I live off.”

“Mainly money. My aim is to make money to buy a house.”
It was also mentioned that fund managers in general have a hard time beating the market, so they, as an individual investor, have just as much chance of beating the market as a professional.

“Alan Kohler was interviewing one of the large industry super fund managers in Australia, and he mentioned it’s going to be a bad year for super returns. And the response was ‘well, we knew it was going to happen’. And Alan Kohler rightly asked, ‘if you knew it was going to happen, why didn’t you do something about it?’… So, the way my mind processed that, was well, if we’ve got a fund manager, who’s got a research team and all the advisors that money can pay for, if their response is shrug the shoulders, it’s no better than mine.”

The issue of fees was also mentioned by half of the investors. They perceive that by investing as an individual, they avoid paying fees to investment managers, which will result in higher profits in the long run.

“And the reason I have a self-managed fund is because of fees and the reason I don't have shareholdings in managed funds is because of fees. I mean all you're doing is paying the salaries of the managers. It's possible to prove that mathematically. The proportion that they have to outperform the market to get the equivalent return of the market is quite high.”

4.3.2 Self Determination / Control

Money, however, was not the only motivation discussed. There was a strong theme that investors want to be in control of their own destiny. This was mentioned by almost two thirds of the investors in the study (16 of 26). They preferred to make their own decisions rather than entrust those decisions to professionals.

“If you are going to spend the time and effort monitoring the fund, you may as well spend the same time and effort monitoring your share portfolio. If it's in a fund they make the choice - if it's my portfolio I make the choice. The time and effort required is the same, and at least I get the opportunity to buy shares that my fund may not.”
“I think I can do better than managed funds. I hate managed funds. I like to be in control of my destiny.”

“Because if you put it into a fund, you don't really know what they are doing. You've just got a dollar figure in a fund. If I had my money in a fund, and I don't really know all of the risks and options and god knows what they are doing in there, and suddenly I see this company drops, I don't know if that's affecting me or not - I don't know what's affecting me or not. I rather that if I make a mistake, it's my mistake.”

Similar sentiments were also made by some (8 of 26) when discussing making their own direct investing decisions verses taking advice from a professional such as a stock broker.

“Because I feel now, having had the experience - having experienced having a broker - having experienced working with a broker or investment advisor, I think that actually you're better off learning the ropes yourself and doing it yourself.”

“So we don't have an advisor - so if we make a mistake we wear it.”

A few investors (4 of 26) mentioned that being able to trade online and having instant access to the broker website gave them a sense of being in control of their investments.

“With being online I feel much more involved and in control. Because I can just jump online at any time. I can sell them at this price and buy them at this price, and click the box for any time within 30 days, if it hits that price it will automatically buy them for me.”
4.3.3 Intellectual Challenge

Investing in the stock market was also seen by some investors (11 of 26) as an intellectual challenge that went beyond the simple goal of making money. They not only enjoyed the activity in terms of competition – beating the market – but also as a test of applying their own set of logic to a chaotic market and succeeding.

“I think I am competitive, yes. It is intellectually stimulating and I am more a brain person anyway than an athlete, so from that perspective I love that kind of intellectual challenge. I can't find enough sudokus to get the same out of it.”

“I really enjoy the mental challenge of it. My interpretation is that it's probably the same with a lot of people, even if they wouldn't admit it, there's a lot of flashing lights and numbers and it's like a big game.”

“It's an interesting pursuit trying to find sense out of all the chaos.”

The challenge was not always against others or the market but sometimes it was seen as a personal challenge - beating the market by a certain degree or beating their own past performance.

“For me it's the challenge. Because I always monitor my percentage return overall - and what I've done that year. It's a bit like maybe a computer game, although I've never played computer games. It's like a challenge - a challenge to set yourself - and something you want to win at I guess. But it's really winning with yourself - you're only competing with yourself.”

One investor said they started investing just to prove to themselves that they could succeed at investing in stocks.

“Initially I started off just to prove - it was an ego thing. Yes, I could use the money but it was an ego thing. And I just wanted to prove that I could do it.”
4.3.4 Serious Leisure - Hobby

To over half the investors in the study (14 of 26), online stock investing was more than just a financial activity. They described it as an interest or hobby. An activity that they enjoy doing but that also has a financial aspect to it as well. They used words such as ‘fun’ and ‘interesting’, which few would use to describe other online financial activities such as online banking.

“It's fun. It's a good way to make money. It's a pure... to me it represents freedom. Because if I can get to a point where I am completely just me and the market, or the market and I...”

“It's an interest, yes. I enjoy it, I very much enjoy it. And I think it's a good source of money.”

“It's more than just a means to an end. There is an inherent interest in the market and what's going on. Not to try and outguess the market, not trying to be smarter than, because I don't think one could, I certainly could never be, especially when you're such a small player. But yeah, I have an interest in trying to build wealth for my family and I.”

A few investors (3 of 26) also described being interested in the market even at times when they were not invested in stocks. In some cases it was purely out of interest and in others it was continuing to monitor the market looking for opportunities to buy back in.

“In fact, I have monitored the market more when I have not been actively buying and selling, than when I was actually buying and selling. I don't know why. Maybe I've got more time now than I had. Maybe the share market is being much more unpredictable on this downward slope that it has been on. And again, that makes you anxious, and when you're anxious you want information.”

A few (4 of 26) also mentioned that the online aspect of stock investing increased the appeal of it as a hobby.

“Yes, I would say the Internet has increased my interest in it as a hobby. Very, very much so. Because you have that instant access to information.”
4.3.5 Serious Leisure – Retirement Career

Stock investing was also seen by some (10 of 26) of the investors as an activity or career that could be continued during retirement. This theme seemed to be stronger with those that were still working, stating plans to actively manage their stock portfolios once they retired. Online trading was seen as an avenue to keeping the brain active during retirement.

“Say I had retired, and I had the time, and because it's online, I would do more. I would make that my vocation. I would make that my interest. That would be my 9 to 5 job. And that's what I'm planning for. The last 25 years has been my learning to head towards that. I've got to do something in retirement. So I have to start thinking about those kind of things, and that is what I will do. So I'm building up my portfolio so I can do that.”

“I guess the best way to answer that is, when I retire, will I continue to manage my super fund? And I'd say I would. So I'd say yeah, it probably would be a hobby for me as well.”

“If I was at home - if I was retired - or it was a pastime, I would trade more, definitely. In fact, I think that's something I will do when I finish full time employment.”

For those investors that were actually retired the picture was more mixed. Although all the retired investors were very involved in managing their stock investments, it was seen as just one of many activities they did in retirement. One did treat it as their ‘job’, spending considerable time and effort trading the market daily.

“It is very much also a hobby and an interest. That is in part due to the fact that I am partially immobilised… I can keep my mind ticking over on a worthwhile financial exploit. That plays a big role for me.”
4.3.6 Summary

Although a stereotype assumption might be that all online investors are only motivated by greed – to make money – the real picture is far more complex. Obviously any investor undertaking any sort of investment activity will be interested in the financial outcome. Some of the investors were looking to use stocks to ‘make money’ in the sense of generating profits from trading, while others were primarily investing to generate an income from the dividends. They thought they had just as much chance of beating the market as the professionals, and by investing as an individual they avoided paying fees to investment managers.

There was also a strong theme that investors want to be in control of their own destiny. They preferred to make their own decisions rather than entrust those decisions to professionals.

Investing in the stock market was also seen by some investors as an intellectual challenge that went beyond the simple goal of making money. They not only enjoyed the activity in terms of competition – beating the market – but also as a test of applying their own set of logic to a chaotic market and succeeding.

To over half the investors in the study, online stock investing was more than just a financial activity. They described it as an interest or hobby. An activity that they enjoyed doing but that also has a financial aspect to it as well. For some, the online aspect of stock investing increased the appeal of it as a hobby.

Stock investing was also seen by some of the investors as an activity or career that could be continued during retirement. Online trading was seen as an avenue to keeping the brain active during retirement. This theme seemed to be stronger with those that were still working. While the stock market was still important to those that had retired as it provided them a source of income, some had other interests in life as well. One retired investor did treat it as their ‘job’, spending considerable time and effort trading the market daily.
4.4 Information World

This section categorises and briefly describes the range of information sources, services and social networks that the investors in this study reported using in their investing activities. Services specifically related to social networking, such as stock forums, are discussed in section 4.4.4.

The investors interviewed in this study use an extremely wide ranging and diverse set of online information sources and services. This is in contrast to other financial activities such as online banking, which may only involve a single website.

Although online sources are in wide use, there is still also considerable use made of traditional offline sources and services, including print and mass media (e.g. newspapers and television).

Three of the investors used a traditional human stock broker, at least for part of their investments, and considered their services valuable despite also having an online broker.

4.4.1 Online Information Sources and Services

This section briefly describes the range of online sources and services that were discussed by the investors in this study.
Online Broker Website

All 26 of the investors interviewed in this study reported using an online broker. As well as providing the ability to buy and sell stocks, all online brokers provide a host of financial data related to stocks, company announcements, watch-lists, as well as basic forms of charts, earnings forecasts and broker reports.

“I typically don't look at the chart on my broking service because I have my own charts with my own indicators. But if I'm in a hurry I might have a look at it just to see what is happening. And I would go into the announcements, and I would see for the last 3 months, what's been happening? ... I could go to the ASX website or the company’s website to get that information, but I would use my broking service because it's all in one spot. It saves me time.”

Online Stock Investment Newsletter

The majority (22 of 26) of the investors in the study read or have read stock investment newsletters, such as Huntley’s Your Money Weekly or The Eureka Report. The newsletters usually contain profiles of companies and are often accompanied by buy or sell recommendations, but also often contain general market and financial commentary. All such newsletters are now primarily distributed electronically, either through email or viewable on a password protected website.

“To help me with the fundamentals I use information services so I subscribe to a newsletter - Huntleys. And I get weekly reports and two emails a day about shares from Huntleys. And I find them very good. I think their commentaries on the share market are very good and very responsible and they focus on fundamentals.”

“I'll tell you who is not a bad read - Marcus Padley. Because, even though he works for an investment house, he has his own personal opinions, and a lot of those resonate quite well with me.”
Not all of the investors that read the newsletters were current subscribers however. Only seven (of 26) were paid subscribers to a newsletter at the time of the interview. Another five had previously held subscriptions in the past, while the remainder had accessed newsletters at some point by taking up limited periods of free subscriptions or obtaining copies from friends or family members.

“I have subscribed when, you know, you can get 4 free issues of Huntleys. And then you do that and then you get your husband to do it the next time. Then probably you use your son the next time.”

**Broker Report**

Part of the service traditional full service stock brokers provide to their clients is regular newsletters that include analyst reports on companies and buy or sell recommendations. Some of the investors (8 of 26) reported using such broker reports in their investing process. While only three of the investors were current clients of a broker, the other five received copies of the reports from family members or friends, or were still on the broker’s mailing list even though they no longer transacted with the broker.

“The broker does have a weekly market wrap, which I get online. And they have a daily thing too which I don't read. It's on their website but they send an email reminder. And apart from having a general economic thing, they have a review of companies.”

“Actually I swap with some friends. I send them this weekly market wrap and they send me the Eureka Report by Alan Kohler and the Huntleys newsletter.”

**Online Newspaper**

All of the investors interviewed reported reading newspapers in general and the financial sections of newspapers online. This is not surprising as many newspapers have been gradually moving online over the years. Just over half (14 of 26) investors still read physical newspapers but also looked up things online. Many (20 of 26) reported reading overseas newspapers online, mainly to get financial news from the US or Europe.
“And I just had a quick look at my home page this morning, and I’ve got things as diverse as the New York Times and the Age business pages. Isn’t that interesting? I find I look at the Age business pages quite a lot.”

Blogs

A minority (6 of 26) of the investors reported reading blogs of some form. While two investors regularly read the same blogs, investors generally came across blog postings while using Google to search for news items about a company or industry.

“Well you know, you put in <Company Name> and next thing you know you’re on someone’s own personal blog.”

“I’m constantly keeping an eye on a couple of blogs in Australia. I look at Steve Keen. He looks at everything as a glass half empty rather than a glass half full. I look at someone else who is 'glass half full’.”

Search Engines (Google)

Google is a major investment tool used by all of the investors in this study. All of the investors use Google as a company research tool to search out information about a company. They may come across news items, broker reports, other articles written about the company or perhaps even a blog that might be discussing the company. It is also used by a few investors (6 of 26) in more diverse ways such as to do background checks on company directors and to confirm rumours that might have been heard.

“Yeah – I use Google quite regularly. When I hear news or something I might type it in and see if something comes up on another website. When I’m bored, I just do it...Companies, directors, if there's a court case, anything - I mean who knows what someone has put on there.”

Some (9 of 26) use it as a discovery tool to investigate and learn about a new industry, to discover the companies operating in an industry and find the company web sites.

“So from that idea you might look up the company name. And then you use the Internet - whack it into Google. And this is where the Internet comes into it. So you look at - you might go to the company website, you might go to the profile, you might look for newspaper articles that highlight the company.”
Two of the investors even reported using a service called Google Alerts, which will regularly and automatically email them new articles or writings in relation to a company code or company name.

“So I’ll type in my share code, and set a Google Alert for that in the news. And then whatever stories come in, anywhere around the world, Google does all the hard work, and they just deliver an email to me.”

Stock Exchange Website

Although all 26 investors had visited the website of the Australian Securities Exchange (ASX), only about a third (8 of 26) used it frequently, mainly to check company announcements. One investor also mentioned using the ASX most traded stocks list.

“One particular share that I made a considerable amount of money on, was found by looking on the ASX most daily traded stocks. So on the ASX website, there is a list of the biggest volume for shares that have traded the most volume for the day.”

Company Website

While all the investors in the study reported visiting a company’s website at some stage, the use of company websites varied depending on the type of company being investigated. Some investors (5 of 26) stated that when they were investing in large “blue chip” companies, they didn’t feel the need to look at the company’s website because they got all the information they needed from their broker’s website or from analysts’ reports.

“Maybe on two occasions I might have gone into a company website when there seemed to be some real hiccup in the market and I thought what’s going on with that company. But most of that information, I can get through my packages.”

In contrast, all investors that talked about investing in smaller, speculative companies reported visiting the company’s website as part of their research into the company. Smaller companies tend to have less detailed data available about them at the broker websites and are less likely to be covered by brokers so research reports are not available.

“If it was a company that was not readily available, I would go and do a lot more research. I would look at the charts first and then go to the company website and ask what is pushing the price up?”
“The upside with the Internet has been that every company has got their annual reports online, they've got their careers online. So I look at the careers of the company website as well. To get an understanding of where they're hiring, what are the kind of skills they are hiring. Does that tie into what they are trying to say in terms of their growth potential?”

Other Investment Websites and Services

A wide variety of other finance related websites were also mentioned. These ranged from financial services such as Bloomberg, financial commentary sites such as www.itulip.com, websites that provide price data downloads for charting packages to websites that explain advanced charting methods. Each investor seemed to have a unique collection of websites that they frequented.

4.4.2 Offline Information Sources

Despite the vast array of information sources available online, traditional offline information sources are still widely used by the investors in the study, although they serve a different purpose to the online sources. Newspapers, as well as radio and television, are primarily used for obtaining general business news and commentary – for getting the background economic picture. They can also be the source of investment ideas - hearing of new companies or industries – which are then researched further using the Internet.

Newspapers and Magazines

While all 26 of the investors in the study reported reading newspapers daily, the delivery channels used varied. Almost half (12 of 26) only read online newspapers while the rest (14 of 26) read both paper and online newspapers. For all of the investors, reading the newspaper is a regular daily activity and reading the financial news just happens to be part of that, alongside general news and sport.
“It's a consequence of just reading the newspaper. The general day-to-day news is generally quite boring. I mean Gillard and Rudd, so all the interesting stuff is all around ideas. So you flip past the politics etc. and then you go 'so and so has got this idea - isn't that a great idea'?”

A smaller number (8 of 26) read more financially oriented newspapers such as the Australian Financial Review, but even then they tended to be looking for general finance background rather than for stock specific news.

“I read the Fin Review on the weekend. I read the business section of The Australian every day. So I use that information to determine what I should be getting into. Looking at certain sectors of the market. Whether it's banking and finance, whether I want to go into resources.”

A third of the investors (9 of 26) mentioned the issue of timeliness of information in newspapers, expressing the view that by the time the information has reached the newspaper it has already been factored into the share price by the market.

“With the Age, with any information, I always feel it's too late. Isn't it? It's all too late really. But, you're just looking basically all the time at past performance, and you can see the projections into the future. But, by the time it gets to a public level – in the Age or on a website - all the insiders have known about it already.”

A minority (4 of 26) of investors reported reading business and finance magazines, and again, with the intent of looking at background trends and markets rather than for stock specific news.

“I usually subscribe to the BRW - Business Review Weekly - for 1 year... Just to have a bit of an idea of what they are doing, like the new energy or new industries. So from the bigger view - which industry I'm interested in.”

“Every now and again, in the newsagents, I look at those share investment magazines. Very rarely buy them, but I have a quick flick while I'm in the newsagent. I don't really buy them because, and again with the Age, with any information, I always feel it's too late. Isn't it? It's all too late really.”
Television and Radio

Television and radio were also mentioned by just over half of the investors (14 of 26) as an information channel, but as with newspapers and magazines, primarily for general background information rather than stock specific data.

“Because I'm at home a lot now and I'm quite addicted to the ABC radio, 774. And they have a lot of discussion on the share market... Every Saturday morning they have property discussion, they have share market discussion and we have listened to that every Saturday morning for years. And it's general discussion. It gives a background, it really does.”

For most (12 of the 14), television consisted of watching the stock market wrap up section of the daily news report. A few (2 of the 14) watched dedicated business channels on cable TV.

“The current affair type shows that talk about finance... General news, current affair type items. Again the Commsec reports and so on we watch every night and plus on the Commsec site you will see that you can download, they update them three times a day now, morning afternoon and evening, market reports in both radio and video.”

“I watch the business channel on Foxtel and that is research.”

Two investors (of the 12) also described watching television shows not directly related to the stock market at all, such as current affairs or documentaries, that provided investing ideas that could be further investigated.

4.4.3 Traditional Human Stock Broker

Three of the 26 investors in the study reported having a traditional human stock broker, at least for part of their stock investments. For one of the investors this was the primary approach used for all share purchases. This investor, being retired, purchased stocks that were recommended by the stock broker. Although the investor did do some minimal fundamentals research of their own before making a decision, they primarily relied on the broker’s advice.
“They are actually stock brokers… I'm a client. And I don't pay anything for the advice, except when I buy and sell. And I have to say the guy is pretty good. He knows I'm not a trader. He doesn't pressure me. I don't talk to him all that often actually. In fact his advice at the moment is to basically do nothing.”

The other two investors, who had considerably more experience, had both a professionally advised portfolio with a broker and also a personally managed portfolio using an online broker.

“Human broker, yep. He deals with the buy/sell for the self-managed super fund.”

“It's sort of like a broker. It's with Macquarie. So I have an advisor and I liaise with him but he trades my portfolio… But he's a full time manager. He manages other portfolios and I am one of his clients. I know him very well. I have a deal that I don't pay brokerage, I pay on performance. He can trade as much as he likes but what I pay on is a percentage of the gains above a high water mark.”

Although they were experienced enough to manage their own investments, they still considered the information they received from their human broker valuable enough to warrant the higher brokerage costs involved. The type of information provided by the brokers that was most valued was in relation to new Initial Public Offerings (IPOs) that the brokers had access to and also for ‘special situations’ such as tax effective strategies relating to stock buybacks.

“I get in on new issues early, because they are institutional issues, and I've had mixed results with those. But I have had some very good transactions with buybacks when they've been popular. And the people like Macquarie are right onto that. Now, me as an individual investor, I would find that very difficult to find out about that - with the sort of information that I get, I wouldn't know that ABC company is doing a buyback.”

“The second one would be through an informed source such as my broker, my face-to-face broker, whose opinion I value and whose opinion I trust and whose opinion I pay for… There are two issues, I think. One is the quality of information and advice which is provided. Secondly it's the value of the relationship - the personal relationship which has developed.”
4.4.4 Social Networks

All 26 of the investors in this study participated in some form of social network in relation to their stock market investing. Not all of the social networks were online, however. Some of the investors (5 of 26) specifically stated that they preferred to discuss financial matters with others only in person. The majority of the investors (17 of 26) used multiple, distinct, social networks. This study found that as well as the obvious public social networks created by online platforms such as stock forums, there were also private online social networks using a variety of technologies (see Figure 4-2). Some networks were totally distinct while others overlapped. For example, a private stock chat group may be made up of investors that are also part of a public stock forum, while some of those investors may also talk to family members privately.

![Diagram of public and private social networks of online investors](image)

**Figure 4-2 – Public and Private Social Networks of Online Investors**

**Private Personal Networks**

Private personal offline networks were still alive and strong despite all the investors in the study using online resources for a considerable part of their investing activities. Almost all of the investors (24 of 26) reported discussing stock market investing with other investors in person. The networks ranged from discussions with only a husband/wife to family members, close friends, wider groups of friends, workplace colleagues and also an investment club.

“We consult with each other - over the lunch table.”
“You do have this informal situation with friends and acquaintances where you do discuss the share market. You see we are in this area now where a lot of people we know, their incomes are dependent on the share market. So it's a main focus with them. Therefore it's a main topic of conversation - people in a certain age bracket, you know. So it's discussed all the time.”

**Private Online Networks**

Some of the investors (10 of 26) took their private networks online, using various technologies. These networks were made up of people that already knew each other in person, so the online networks overlapped and extended the personal networks. For the majority of these (7 of the 10), this involved only occasional emails with friends. One investor, however, described being part of an active group that regularly emailed each other information and stock tips and rumours.

“It's basically done via a network. So through all of us accountants, we all work in different industries, and it's all done through rumours.”

Another investor was involved in a small group using online chat facilities in the workplace, discussing stocks along with other discussions during the day.

“We have an internal messaging system at work. So I normally keep in touch with colleagues, while I’m at my desk, just chatting. And there might be a copy and paste of a screen shot from the trading website saying ‘check this out’.”

One day trader reported being part of several private online live chat groups that were password protected so only accessible to those who were invited. Most, if not all, of the members of these private chat groups were also active on public stock forums, so these private social networks were a subset of the larger public social networks found on stock forums.

“One was a private group of friends. Some lived on the Gold Coast and some in Melbourne and Adelaide. We all know each other from seminars and we have similar interests and views on things…. If half a dozen people band together and keep an eye on stocks, it's more likely you will find something that somebody else missed.”
Public Online Networks (Stock Forums)

Half of the investors (13 of 26) reported using stock forums in some fashion. The other half had never looked at stock forums at all. Two of the interviewees were heavy users of stock forums, having made thousands of postings over a number of years and using them on a daily basis. Another five were actively reading stock forums daily or weekly as a regular part of their stock research process.

“I'll always have a look to see what people are saying. You'd be surprised how many people put their opinions on there.”

“I might see a share shoot up and I'll go on Hotcopper and see what all the fuss is about.”

The other six investors only looked at stock forums occasionally. Although they reported finding useful information in posts they were also often sceptical of what was posted and the possible reasons behind posts. Two also commented they were put off by the level of aggression found on some of the forums.

Private networks within Public Networks

One discovery of this study is the existence of smaller private networks formed by members of public stock forums. As members of stock forums get to know other members from their postings, small private networks form through the use of the private messaging facilities. These forum members not only make public postings that are visible to everybody but also discuss stocks privately. Some relationships move beyond the virtual and the forum members contact each other through other means such as email, Skype or on the phone. Some may also meet up with other forum members physically and form personal relationships. In other cases, forum members have met others at seminars or training courses.

The existence of such private networks were described by both of the heavy forum posters that were interviewed, even though they were active on different stock forums and not part of the same networks.
“Some people have a good track record. You know who thinks along your lines. Especially with some of the fundamental analysts - often I’ll run the stocks by them to bring them to their attention as well, to see what they think. I developed a couple of friendships with some of the fundamental analysts because they appreciate seeing different stocks as well.”

“If I see, for instance, [forum user name], I know who that is and I know him personally. So if we discuss something, then I know if I tell him this or he tells me that, then we know exactly what to make of it and how to act on it.”

Motivations for Use of Stock Forums

The seven investors actively using stock forums described a range of motivations for using the forums, both in relation to seeking information and also providing information and opinions through posting. The primary one was that the forums are a great source of information and a way to see the opinions of many different people.

“Definitely hotcopper would have to be a huge prompting to buy stocks, and a wealth of information for new stocks. So you might be currently in a stock that is in the gas industry, and through the course of people posting they might mention other companies, that have a relation to this, that they might recommend.”

Learning about investing and trading was also mentioned as very important, with members of the forum considered to be experienced and able to provide general guidance as to how to go about trading. The forums also provided the ability to test out ideas.

“I guess I was trading for maybe 6 months and I had a bit of success and I think that was probably just luck - it was a bull market. Then I came across the stock forums and they seemed to just give really, really good advice. It wasn't until I actually got involved with the stock forum that I started making a lot more progress and it became a lot easier because I actually knew what I was doing.”

“Often I'll have a look and see what people's thoughts are, and to talk about my ideas of a stock as well. Particularly with trading breakouts, there are quite a few on there that trade in a similar way. I find it quite helpful for identifying and comparing analysis as well.”
One of the heavy forum users, a very experienced day trader, also described his activity on stock forums as an important means of communicating with the world and also a way of ‘giving back’ something to the trading community.

“So this is my main window to the world and I can discuss things that I feel passionate about.”

“At the risk of sounding cocky, I had lots of support in my early trading days from technicians more experienced than I, and this is my way of trying to give something back to as broader community as I can.”

All of the 13 investors that use forums, even the highly active ones, did mention, however, that forum postings must be taken ‘with a grain of salt’, given the anonymous nature of those posting. There was mention of the practice of ‘ramping’ – people discussing a stock with the sole goal of pushing the price up so they can sell at a profit into the rally.

Half (13 of 26) of the investors interviewed for this study did not use stock forums at all. When asked why they did not use them, the reasons were primarily to do with trust and time. Trust issues revolved around not knowing who was posting information and therefore not being able to trust what was being posted. The majority (10 of the 13 non users), however, explained that the primary reason they did not look at forums was the lack of time.

“I have limited time - you know the time frame I have to spend on this is limited. So when you’re trying to scrunch something in, when you get home from work or on a weekend somewhere, you haven’t really got time to sit and browse through.”

No Financial Discussion on Facebook

One very interesting insight observed in this study is that although a large number of the investors interviewed reported having Facebook accounts (19 of 26) and using Facebook regularly, they all reported that they never discussed financial matters on Facebook. They used Facebook to maintain social contact with their friends and family but never used it to discuss stocks with others. Surprisingly, this was even the case with the two heavy users of stock forums that had made thousands of stock related postings on those forums.

“Well I use Facebook, but I don’t use it for shares. To see how my sons are doing, that's what I use it for.”
4.4.5 Summary

The investors interviewed in this study used an extremely wide ranging and diverse set of online information sources and services. These included: online broker website, online stock investment newsletter, broker report, online newspaper, blogs, search engines, stock exchange website, company website and a wide range of other websites. The most popular sources, used by all of the investors in the study, were online broker websites, search engines and online newspapers.

Considerable use was still made of traditional offline sources such as newspapers, television and radio. These sources are primarily used for obtaining general business news and for getting the background economic picture, rather than searching for stock specific information. They can also be the source of investment ideas which are then researched further online.

Three of the investors in the study had a traditional human stock broker. For one of these investors, their broker was their primary source of advice. The other two, more experienced, investors had both a professionally advised portfolio and also managed their own portfolio using an online broker. These investors valued information provided by their human brokers in relation to new Initial Public Offerings (IPOs) and tax effective strategies.

Four types of social networks were identified in this study: private personal (offline) networks, private online networks, public online networks (stock forums) and private networks within public networks. Private personal networks ranged from husband/wife to family members, friends, workplace colleagues and also an investment club. Private online networks were groups that knew each other communicating online in various ways. This was mainly via email but also using an online chat facility in the workplace and private online live chat groups.

Public stock forums were used by half of the investors in this study. One discovery of this study, however, was the existence of smaller private networks formed by members of public stock forums. As members of stock forums get to know other members from their postings, small private networks form through the use of the private messaging facilities.

Investors reported various motivations for using stock forums. The primary ones were that the forums are a great source of information and different opinions and a good way to learn about investing and trading. To one investor, being part of the forum was also an important means of communicating with the world and also a way of ‘giving back’ something to the trading community.
4.5 Chapter Summary

This chapter introduced the theory of online investor information behaviour that was developed from analysing the interviews of 26 online investors. The Information Lenses model was presented and briefly described. The rest of the chapter then discussed, in depth, the foundation elements of the Information Lenses model: Investors and the Information World.

Chapter 5 continues the exploration of the Information Lenses model. This chapter focuses on the central elements of the model: the Stock Investing Information Process and Investment Personas.

Chapter 6 then describes how Personas and tasks influence the Information Lens itself. It also explores the bidirectional relationship between the investor and the information world - that information behaviour is a “two way street”. The information environment itself can impact investors and affect their information behaviour.
Chapter 5  Information Lenses: Personas and the Stock Investing Information Process

Chapter 4 introduced the central model of the Theory of Online Investor Information Behaviour, called Information Lenses. An Information Lens represents the set of information entities that an investor draws upon or communicates with as part of their investing information behaviour. The investor does not necessarily use all of the sources and services known to them at all times. Rather, they look through an Information Lens, seeing only a small subset of the information world at a time. The Information Lens is shaped by many contextual factors, from the investor themselves, the investment goals they are trying to achieve and the specific task they are performing at that time.

Chapter 4 discussed, in depth, the foundation elements of the Information Lenses model: Investors and the Information World. This chapter continues the elaboration of the Information Lenses model. It focusses on the central aspects of the model: the Stock Investing Information Process and Investment Personas.

This chapter firstly introduces and explores the model of the Stock Investing Information Process that was developed during the analysis by synthesizing the investment process described by all the investors in the study. Then the concept of an Investment Persona is explored in depth. This is a key component of the Information Lenses model, as individual investors can take on multiple Personas with different information behaviours in each. Quotes from participants are used to further illustrate the concepts where appropriate.
5.1 Stock Investing Information Process and Tasks

It became apparent during the analysis that the information sources and services being utilized by investors were highly influenced by the specific task that was being performed at the time, even within the same individual investor. The sources and services used for some tasks were common to all investors (e.g. buying and selling shares), while other tasks had extremely wide variation between investors in the way they were conducted and the information sources used (e.g. identifying potential stocks to purchase).

This section presents a common investment information process model that has been developed by analysing the individual investment processes as described by each investor and synthesising these into a unified general stock investing information process. This model helps present the findings related to investment tasks and their influence on information behaviour in a structured and cohesive manner.

5.1.1 Stock Investing Information Process Model

In the interviews, investors were asked to describe how they went about selecting, buying and selling stocks. During the analysis, an investing process was mapped out for each investor. As part of the grounded theory methodology involves constant comparison, all of the individual investing processes were compared with each other, looking for similarities and differences. Although there were very large differences between methods, a common pattern was found and that was developed into the Stock Investing Information Process Model (see Figure 5-1).
The model was further validated by examining each investor’s process against the model and it was found that all the investors in the study do indeed follow all the steps in the model. There is considerable variation, however, across a number of attributes – particularly time and effort.

The total time that may elapse between the start and end of the process (the time between getting an idea, buying and then selling a stock) varied enormously – from one hour to 30 years. And although every investor does go through each step in the process, the time and effort expended at each step can vary enormously. Some investors may research a company very briefly, in a few minutes, before buying it, while others can spend months going into great depths of understanding before making the purchase.

This stock investing model represents the process that investors go through for each stock. As investors typically own multiple stocks and have other stocks in consideration at any time, investors will often have multiple instances of this process occurring concurrently. For stocks that are already owned, the investor will be in the monitor holdings stage, whereas other stocks that are under consideration may be at the idea generation or company research stage.

This model has enabled the conceptual findings regarding the investment stages and tasks to be related to each other and presented in a coherent manner, in the remainder of this section.
5.1.2 Idea Generation

The largest variation between investors in their investment processes was in how they first become aware of a company as a potential investment. In some cases this stage is quite systematic and in others it can be just a matter of the investor deciding to investigate a company they interact with on a daily basis, such as a bank or supermarket.

This sub-section describes the wide variety of methods used to generate ideas and the implications on the information sources being used in the process.

Chart Market Scan

A chart market scan involves using a special purpose charting software package to automatically examine the chart pattern of each company in the market and identify those that meet a certain set of charting criteria as specified by the investor in the scan.

“I use a computerized automatic scan. So I scan every stock looking for stocks that are showing a particular trend pattern. A trend filter, if you like. So it just scans any stock showing that trend filter and it has a couple of rules on the long term trend and the short term trend and once it meets all those criteria then it flags the stock as probably ready to have a bit of a swing upwards.”

Six (of 26) investors in the study described using a chart scan as part of their investing process. The data sources used for a chart scan are relatively straightforward. Market price data can be downloaded from a range of sources such as online brokers or price data providers directly into the relevant charting package.

Fundamentals Market Scan

A fundamentals market scan is similar in concept to a chart market scan, in that a search is performed examining every company in the market. Instead of searching for price patterns, stocks are selected if they meet specific fundamentals criteria such as earnings, dividends or other financial ratios. Such search facilities are usually provided by online brokers on their website.
“There's a ranking engine on Commsec, that just ranks stocks by dividend flow and I just go and look for stocks in the ASX50 that are currently having a good dividend flow or low price/earnings ratio. Whichever way you want to look at it, dividends or PE, it probably amounts to the same thing. And I just use the ranking engine on the Commsec website. There are probably others around.”

Searches can be as simple as ranking the largest companies on their earnings or dividends, or more complex, adding filters for industry, asset values and debt levels.

“I do use the company search tool in Commsec to search for cheap companies. Usually I am looking for companies with low PE ratios and especially companies selling below their NTA [Net Tangible Asset], but you do have to be careful how those assets are valued.”

Three (of 26) investors in the study described using a fundamentals market scan.

**Industry Exploration**

At times investors will work in a top down approach by considering investing in a particular industry rather than a specific company. In the process of exploring the industry they will search for the companies that operate in that industry and will therefore become aware of the individual companies in this way.

“And then once you say, well perhaps we should be in oil stocks, I don't have any oil stocks - well I didn't at that time. Therefore, should I buy Woodside, should I buy Santos - what should I do? And then I checked them all out.”

“So, at the high level, it was coal seam gas. I got a list together and then I looked at each company individually. I had limited funds, so I picked 3.”

“Now I start at the macro level, and then I start digging, digging, using the Internet. I look at the bigger picture, and then say I'm interested in this particular sector, it has got the potential. And then I try to understand the sector a lot more. So, the first step has been Google - trying to list the companies. So, running different search queries, depending on the kind of words, you find 10 or 12 different companies.”
This method of identifying companies was mentioned by 9 of the 26 investors in the study. The actual information sources used to identify the companies in an industry varied, from company search facilities provided by online brokers to online search engines (Google).

**Volume and Price Statistics**

Another form of market data that investors used to identify possible investments were statistics related to the share prices and trading volumes. One example is looking at the stocks with the highest trading volumes on a particular day. If there is a higher than usual amount of trading volume in a company, that can signify that many traders are interested in it and it may be worthy of further investigation.

“One particular share that I made a considerable amount of money on was found by looking on the ASX daily most traded stocks. So on the ASX website, there is a list of the biggest volume for shares that have traded most volume for the day. One share stood out to me, it had massive volume. So from that, I got the code, and went to hotcopper, which is a trading forum.”

Another tactic was to look for companies where the share price had reached annual highs or lows, depending on the focus of the investor. Investors looking for rising stars may look for companies breaking 52 week highs, while investors looking for beaten down bargains may look for companies hitting 52 week lows.

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“Basically what I do, I download the whole ASX. Every week, from the AFR, you've got the share tables, so that's what I download. So I put everything in excel. And I look at the 52 week high, 52 week low, actual price and I look at the spread between the high and the low. And what I try to do, I try to look at the highest spread... But I trade on the one that I think they went so down that they won't go any lower - and I try to get them at the lowest possible, so in the long term they will go up.”

Four (of 26) investors described using this method. This type of data is freely available from online broker websites, the ASX website itself and also from newspaper websites.
Stock Investment Newsletter

Stock investment newsletters are a major information source used by investors, as described in section 4.4.1. As the newsletters contain profiles of companies – both large and small - they can be used to identify potential investments worthy of further investigation and may also bring new companies to the investor’s attention that they otherwise may not have heard of. The seven (of 26) investors that held paid subscriptions to newsletters all reported obtaining investment ideas from the newsletters.

“I use the service. When I subscribe to a service, that's what I use. So Huntley's I use. Both Huntley's and E-Trade have got profiles of companies so I get all the data from those.”

“I suppose I subscribe to the Eureka Report solely because of Alan Kohler. It's quite efficient for me to read each week. There are articles three times a week and there's a Saturday one.”

Broker Report

As described in section 4.4.1, broker reports are newsletters that full service brokers provide to their clients. As broker reports contain company analysis and buy recommendations, they are naturally a source of investment ideas for investors. The three (of 26) investors in the study that were clients of traditional investors all reported getting investment ideas from the broker reports provided by their broker.

“The report could be either from the broker that I traditionally use or it could be that he has accessed it from another broker. So I'm not particularly wedded to any particular analysts. I'm happy to receive analyst's reports that are worthy of working through.”

As also mentioned in section 4.4.1, a further five (of the 26) investors in the study also reported reading and getting ideas from broker reports, even though they were not clients of a full service broker. The five received the reports from friends, family members or were still on a broker’s mailing list even though they no longer used the broker.
“A lot of the companies that I've ended up buying, I'm on an email list for a brokering firm. We don't actually have an account with them - my grandmother actually sends me the email she gets every day. So we read through that and get some ideas.”

**Media**

Although traditional media sources such as newspapers, radio and television tend to provide general background information, they can also provide investors ideas to potential investments. This may typically be an investor reading an article about a company in the business section of a newspaper or in a financial magazine and deciding to do some further research.

“A few years ago I bought into a company called Vocus because I read an article about them in The Age that they were a star growth company. I usually don't jump on stocks because of a newspaper article, but I checked them out anyway. They were selling on a low PE and the directors were buying big time.”

At times, however, investment ideas may also come from news articles or TV shows that are not directly related to the stock market at all.

“So, I made quite a significant investment into coal bed methane, long before it became popular. And that's just because I saw a television program on rural Australia that looked at company activity in a district, nothing to do with the stock market, and they highlighted one particular company which was one of the coal seam gas companies, and I said, ‘This has got to be a winner - nobody loses’. ”

Ten (of 26) of the investors in the study reported first hearing about a company in a newspaper, magazine or television program.

**Experiential**

Experiential investing is an investor choosing to invest in a company or industry they have personal experience with. The experience may be through their profession or employment (e.g. they work for the company) or simply because they use the company’s products or shop in their stores.
“So I knew that because of the growth of the Indian economy, there would be significant uptake of steel production, and I had worked in the steel business, so I understood that the PE ratio for a particular set of shares was relatively cheap.”

“And I bought Wesfarmers because I’d been to Bunnings a few times, and I was really impressed with their employment policies and the way in which they employed people with disabilities. And so I went and had a look at them and I felt that their forward earnings, their prospects, were much better than Woolworths.”

Eleven (of 26) of the investors in the study mentioned buying a stock because of some personal experience with the company. Identifying stocks based on personal knowledge of the company or their products was a method actually promoted by the famous fund manager Peter Lynch in his book ‘One Up on Wall Street’ (Lynch 2000).

**Professional Advice**

The three investors in the study that have a traditional human stock broker naturally got stock investment ideas from their broker as that is the advisory service the broker is providing and being paid for. The type of investment ideas most valued by those three investors were ‘special situations’ such as share buybacks and advice on tax effective techniques such as dividend stripping (buying stocks before a dividend is paid and selling after the dividend is received).

“Overall, the value add provided by the face-to-face broker has been in excess of his costs. So I’ve reconciled that he’s added greater value, albeit that you could go elsewhere. So the service quality and the advice quality provides a value add which gives him a proposition which is worthy of payment.”

“Because they do have a role that they play that I can't play... I mean they have a whole heap of researchers - they have a whole department that do nothing else but research the value of companies and so forth. And so, the research department tells the broker, who I deal with, what are good buys. Now, what they do that I would never know, is how to get into buybacks and tax effective investments, and for that reason, they are very good.”
**Word of Mouth**

Another avenue of becoming aware of a potential investment is directly from others in the investor’s private social networks. While slightly more than half (15 of 26) of the investors in the study described getting stock tips from friends and family, most said they rarely acted on them. For three (of 26) investors, however, their private social network was purposely their primary source of investment ideas. They obtained most of their investment ideas from trusted friends and family, but still conducted their own research on the company before making a purchase.

> “Because I don't research per se, I'll hear rumours and then react on those rumours, there have been stocks that we've bought and sold throughout the years. You know like, a report's going to come out and it will go up 10% or 20%, so you buy and you sell.”

**Online Forums**

Another avenue similar to ‘word of mouth’ is reading public online stock forums looking for potential new investments. As described in section 4.4.4, seven (of 26) investors in this study regularly used online stock forums and another six read them occasionally. All of these investors described picking up new potential investments from these forums or learning about other companies in the same industries to those they already had investments in.

> “But if I am looking for new shares, what I will do is I will go on to Hotcopper. There is a forum called day trading diaries, where basically all the day traders go on there, and some people list charts of shares, some people list announcements pending... so people look that a share might be a quick trade. Other people list volume per share etc. So that's a really good place - just strictly talking about day trading here - to see what's hot and what's not, and what people are into and what people are not.”
5.1.3 Stock Selection

Once an investor becomes aware of a stock as a potential investment, the investor adds the stock to their prospective watch list and then goes through an iterative selection process. This process is one of gradual refinement, where stocks are investigated in more detail by conducting research into the company to better understand the company and its operations.

At each iteration, the investor makes a decision whether to keep the stock as a prospective investment or to reject it. The time frames vary widely between investors and forms of investing. A stock may be rejected quickly if it does not meet one of the investor’s basic requirements, while others may remain as prospective stocks for many months. A day trader may perform the entire selection process every day, while a long term investor may only search for new investments once a year.

“For instance, when I looked in the gas area, I was able to search for all the companies that were related in that industry. So I got a list of 15 and I banged that into a watch list. And then, at my leisure, I did the research on each individual company.”

The actual reasoning process is also widely varied between investors, with decisions being made based on charts, fundamentals, company management or opinions of others. Many investors reported that they whittle down their prospective list to three or four companies and then they may choose to invest in just one or perhaps make smaller investments in all of them.

“So I would look at long term trends, over a long period of time, and then I will narrow down a group of shares that would meet those parameters. Then I'll come into a shorter term and see which ones I could toss out - so it's like a process of elimination until I've got a few left. When I've got maybe 2 or 3 that I'm deciding between, that's when I would look at the fundamentals, just to see is there something hidden that I don't know about this particular company.”

“I may end up with 3 or 4. If all 3 or 4 are pretty much the same, I'll just pick one of those.”
### 5.1.4 Company Research

As part of the investment process, investors conduct research into a company to learn more about it and to understand its operations and financials. The most intense research is usually during the selection process, when a company is being considered as a potential investment, but also continues at a lower intensity while the company is held as an investment.

There might be a flurry of more research activity if a major company event occurs such as a takeover offer, or when the investor considers selling the stock or perhaps buying more.

The actual form of company research varied widely between investors, depending on the investment methodologies they are following. From a charting perspective, the chart of the company might be studied in greater detail with more complex indicators and over multiple time frames. From a fundamentals perspective, an investor will investigate a company in more depth by looking at the earnings and dividends over time, financial ratios, forecasts of future earnings etc. Investors may also seek opinions about the stock from their various social networks.

> *Then I go and look into details. Try and read the annual reports of the last 2 or 3 years. Look at the directors - what is their background? Now, within IT, if they're running healthcare IT and I found some companies that they don't have anyone with technology expertise, but have significant medical expertise, I have been suspicious about those companies."

The amount of time and effort put into the investigation process also varied widely between investors. Some were satisfied with checking a minimal number of basic financial ratios, forecasts or chart patterns, often available on their online broker website.

> *But generally speaking I would buy on forward PEs and general feelings about the economy. I bought Fortescue Metals in 2008... I would have read about it in the press. And then I had a look at the Commsec site and a look at its forward earnings. And there was no prospect of dividends at that stage. And I thought strongly about what they were trying to do, which was sell iron ore to China. And I felt that if China was going to industrialise and people were going to move to the cities they would be using steel, so that seemed like a reasonable investment."

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While others studied the company in great detail, trying to understand as much as they could of the workings of the company and the industry it operates in.

“As I say I go through their financials and determine which I believe to be a good operating company. Then I look at their indicators, how consistent are their earnings, what percentage of dividends are they paying out… There are a number of indicators like that. The management team I look at. There are a couple of people's name that I have in mind, and if they are in the company, I would straight away sell my shares, because I have found they are totally corrupt and using the company for their own purposes.”

5.1.5 Buy

At some point during the iterative selection process, the investor makes a decision to purchase shares in the company they have been watching. The information sources involved in all the steps up to the decision to buy – idea generation, stock selection and company research - are widely varied between investors.

The online services used to conduct the actual transaction, however, are the same for all the investors in the study – the trade details are entered using the website of an online broker.

Another factor in the decision to buy a stock is also the availability of funds. This is often related to the financial position of the investor themselves, with investors moving between different stages in their lives where funds available to invest in stocks fluctuate.

“But as dividends come in you re-invest your dividends. If you don't invest for 18 months and you've got 3 rounds of dividends and the money piles up, you've got to buy something.”

“Now, we haven't been looking at it as much, because personally we've just started a mortgage, so we haven't had as much free money to put into it.”
Buy More of the Same Company

At times investors decide to buy more shares in a company they already own rather than looking for a new company to invest in. This is often because they already have done the research on the company and have a good understanding of its operations.

“I still tend to buy something that I've already got. I've had BHP shares for a long time - I think they are terrific. Mainly because of the buybacks they've had. I always try to repurchase after a buyback for less.”

Six (of 26) investors described using the purposeful tactic of repeatedly buying and selling shares of the same company over periods of time as the price rises and falls, while continuing to maintain a shareholding for the entire period.

"Well, when it had gained a lot of money, I did sell half of them, and I bought them back a bit lower. I only did that once with Woodside."

“I've owned Telstra on and off about four times over the years. I've bought them when they've trended lower and then sold when they went back up again, making a nice profit each time.”

5.1.6 Monitor Holdings

Although investors identify and investigate stocks using many different approaches, once they purchase the stock, they all tend to monitor their holdings in a very similar fashion. All 26 investors reported checking the announcements made by the companies they own, including those who primarily selected the stock because of the chart.

To some extent, all investors become interested in the operations of the company once they own it. Announcements are usually obtained via the broker website, as they are usually flagged when the investor checks the stock prices on their watch list.
“I look at everything. Fundamentals, news releases, charts, everything. Now I'm part of the company. I own part of that company. I need to be informed on what they are doing. Because that's what buying a share in a company means. You are a part owner. I need to understand what my company is doing. And whether I agree with the management or disagree with the management. I might agree or disagree with their strategy. I may not do anything if I believe it's not going to be good for the company. So I might look at the chart and see what the chart is telling me. And if I do get some signals to get out, then I will get out.”

Monitor Watchlist

Every investor also reported monitoring the changing stock prices of their current holdings. This is usually done via a watch list on the online broker website. Some investors check their holdings every now and then, perhaps weekly, while others check multiple times during the day.

“Every day I have it minimized and every half an hour – depending - you can sort of tell halfway through the morning if something is going to happen. If you see nothing's going to happen, I don't really worry about it too much. I'll probably look at it 10 times a day at least. Just to see what's going on.”

“Yes, this I watch every day. I've got my portfolio, and I've got my watch list. And I watch this probably 10,000 times every day <laughs>.”

5.1.7 Sell

At some point in time during the monitoring process, the investor may decide to sell some or all of the shares in a company they are holding. Investors in the study were asked what information may prompt them to sell and the answers were widely varied.

Factors and information that lead to a decision to sell are not always related to the stock itself but can also be related to the general market or the circumstances of the investor.
Reassess

Inherent in the monitoring process is that periodically stocks are reassessed. Each time an investor reassesses the holding of each stock they own, a decision is made to keep the holding, sell some or all of the holding, or perhaps buy more. This reassessment may be done in a systematic manner, reassessing the entire portfolio at regular intervals of time (from daily to annually). A stock holding might also be reassessed as a reaction to some event, such as a major announcement, change in profit or sudden changes in the stock price.

“So I hold those for 12 months to minimize any capital gain. So essentially, you get to the end of the first 12 months before you even look at them again. But then after that, every month, you're evaluating are they still on the list or not, and you might drop a couple out and sell them, and bring some more in. So basically it's a monthly thing.”

Price Related Selling

Stock price is a major factor in the selling decision process, although the approach to pricing varies greatly between investors and portfolios. If stocks are bought as long term investments, the fluctuating stock price is not that much of a consideration, as the investor is focussed more on the dividends and the long term price movements.

Where stocks are purchased with the specific intent of making a profit from stock price movements, then obviously the price will play a major part in the reassessment and decision to sell. The price trigger for selling may come from the chart giving an indication that a price trend has changed and therefore the stock should be sold. In other cases the investor may have a predetermined amount of profit they were looking for and sell when that target was reached. This was mentioned by four (of 26) investors.

“At this stage [after buying], I will set a selling price and I directly put a sell order on the website - straight away... Because I don't have much time to closely monitor the price, so I prefer to set a price, you know... So if I can get 20%, you know, gain, excluding brokerage, then I would just set the price at that number. And if the market is going down really badly, I will sell, you know, if I will lose more money, I would set that price at 10% or even 20% lower than the buying price.”
The practice of stop-loss selling was also mentioned by seven (of 26) investors in the study. This practice involves selling the stock quickly if the stock price goes lower after the purchase has been made, to limit the loss to a specific percentage of the funds invested. Five of these investors used stop-loss orders provided by their online broker, where the broker automatically sells the stock if the price falls below a certain trigger point, while the other two performed the same function manually.

“That depends on the location where I know my stop loss would come in. The chart tells me the stop loss at this point in time would be X, I assess the risk of this particular trade as the maximum loss, and if I'm happy to risk $600 then that determines how many shares I buy.”

“And maybe about 4 years ago I was really keen on finding online brokers that provided stop losses. But I've given up on looking for that because it's too expensive, and I'm the stop loss basically so I don't use any online automatic stops.”

**Performance and News Related Selling**

As all investors are monitoring their holdings by checking market announcements, sell decisions can be prompted by a company making a profit warning announcement to the market. These are usually accompanied by the stock price falling as other investors sell, so the price movement may also be an additional trigger to sell. An investor may also decide to sell after reassessing the company in relation to its recent performance and deciding that things are not going to improve any time soon.

“Take for example Paperlinx. I didn't like the way the company was going. And then they started to not pay dividends at all. Coupled with the rumours of how badly the company was managing - they were selling plants and downsizing - so I thought I'll get out of this. I did the same with Qantas, I got out of those, for the same reason. They stopped paying dividends and their performance was abysmal - too much competition from overseas.”
**Portfolio Related Selling**

A decision to sell a stock may also be made because a decision has been made to buy stock in another company, but funds are not available for the purchase. The investor may choose to sell some of the stocks they already own to fund the new purchase. An investor may choose to sell a stock that has gone up in price, locking in a profit, or they may choose to sell a stock that has performed poorly.

Taxation can often be a major consideration when it comes to choosing which stocks to sell within a portfolio. If the investor has made a large capital gain where tax would be payable, selling losing stocks will allow capital losses to offset the gain and reduce the tax bill. The stock in this case has not been sold because the investor thinks the company is performing badly but due to an event caused by another stock in the portfolio. In some cases if the investor still believes the stock being sold has a promising future they might re-purchase the stock again at a lower price after the sale.

“I got rid of a lot of deadwood last year. I had a very large capital gain. Unfortunately one of my shares was purchased by a Canadian company so I got a cash payout - I didn’t have any choice. So I offloaded some of the losses to offset the gain. But if that hadn’t have happened I would have retained them."

**Investor Related Selling**

As investors do not treat their stock holdings as completely isolated from the rest of their finances, there will be times where an investor decides to sell stocks simply because they need the money for some other purpose in their life.

“I basically sold because I needed the money for travelling so I sold all the shares and transferred the money out of my share account, to pay for travelling."

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5.1.8 Summary

This section presented a model of the Stock Investing Information Process that represents the process that investors go through for each stock. While all the investors in the study do follow all the steps in the model, there is enormous variation in time and effort. The steps of the process include: idea generation, stock selection, company research, buy, monitor holdings and sell. As investors typically own multiple stocks and have other stocks in consideration, they will often have multiple instances of this process occurring concurrently.

The Idea Generation stage had the largest variation between investors in relation to variety of methods and information sources used. The different methods of getting an idea included: chart market scan, fundamentals market scan, industry exploration, volume and price statistics, stock investment newsletter, broker report, media, experiential, professional advice, word of mouth and online forums.

Once an investor becomes aware of a stock, it is added to a prospective watch list and then the investor goes through an iterative selection process whereby the stock is investigated in more detail. Investors conduct research into the company to learn more about it and to understand its operations and financials. The most intense research is usually during the selection process, but also continues at a lower intensity while the company is held as an investment. At each iteration, the investor makes a decision whether to keep watching the stock as or to reject it.

At some point during the iterative selection process, the investor makes a decision to purchase shares in the company they have been watching. Sometimes this decision has more to do with funds becoming available to invest than with the company itself. At times investors will decide to buy more shares in a company they already own rather than looking for a new company.

One key observation of the use of information sources through the stages of the process was that while information practices were incredibly diverse in the early stages of the investment process, the later stages tended to be more homogenous. Regardless of how they became aware of a stock and researched it, all the investors tended to monitor their holdings in a very similar fashion. They all checked company announcements, even those who primarily selected the stock using charts. All investors seem to become interested in the operations of the company once they own it. All investors also reported monitoring stock prices using a watch list on their online broker website.
Inherent in the monitoring process is that periodically stocks are reassessed, where a decision is made to keep the holding, sell some or all, or perhaps buy more. Triggers for selling were also quite varied. Price related selling involves selling because the stock price has reached some predetermined target – either to lock in a profit or limit a loss. Selling might also be triggered because of an unfavourable company announcement. Sometimes a stock is sold not because of the stock itself but because the investor wants to rebalance their portfolio or take a tax loss to offset other profits. At other times the investor just needs the money for something else in life.
5.2 Investment Persona

An Investment Persona is a role an investor takes on in trading a particular stock portfolio. It is most influenced by the goal of the portfolio, the investment approach taken to achieve the goal, the time frames involved and the market sector(s) of the stocks involved. An individual investor can have multiple Investment Personas and their information behaviour may be different for each of those personas.

It became clear during the study that more than a third of the investors interviewed were performing multiple sets of information behaviours.

The same individual investors described using different methods and information sources, depending on the type of investing they were involved in at the time. The most common pattern of such behaviour, but also the most striking, was short term traders who were also long term investors.

For example, all four of the highly active day traders interviewed described using charting methods to select stocks for short term trades, for periods as short as a few hours to a few weeks. Often this form of trading was in small-cap stocks from the speculative end of the market, with some even trading in derivatives or the futures market. At the same time, the very same investors had long term investments that they held for a number of years. These stocks were selected and monitored in a completely different way, using the company’s fundamental data such as profits and dividends, with only some reference to the chart. They tended to also be chosen from different sectors of the market to those stocks being traded, such as only large blue chip companies or only ‘green energy’ companies.
The two starkly different information behaviours were being conducted by the same investor but at different times. This phenomenon has been given the name ‘Persona’, to reflect the observation that the same investor may take on a different role, or wear a different hat, and behave in a different manner, depending on which stock portfolio they are dealing with.

The information behaviour of the same investor can therefore change drastically from one moment to the next, depending on which Persona they are taking on at that particular moment in time. Under the Trader persona, they may only be looking at charts using market price data, using a specialist charting package and paying little or no attention to the fundamental financial data of the company. In the Long Term Investor persona, they may analyse the financials of a company in depth and invest in large companies with strong future prospects, paying minimal attention to the price chart. Each persona gathers different forms of data, from different information sources and perhaps even different social networks.

Another interesting example of multiple personas was one investor who reported breaking their investments up into ‘blue chip’ and ‘speculative’ segments, committing certain percentages of their funds to each grouping. Again, their information behaviour would vary greatly depending on which persona they were working in at the time.

“Because I borrow money to invest and I have an interest bill, I need to have a portfolio that does deliver some dividends. So, I am forced to invest a certain amount of my money in stocks that yield. So that restricts me, a little bit, in what you might term speculative investment.”

Under the Income Generator persona, they restricted their stocks to very large companies and did little more than glance at the fundamentals on their broker website. When it came to their Venture Capitalist persona, however, the very same investor put major efforts into discovering and researching new technologies and the small companies operating in them. They utilized a wide range of information sources and studied the companies in depth before investing in them.

Of the 26 investors interviewed for the study, 11 were found to have multiple personas. Therefore 37 individual personas in total were identified during the analysis in the study. Details of these 37 personas are listed in Appendix A.
In some cases the difference between the personas was stark, such as the four traders (using charts) who also had long term investments (using fundamentals). In other cases the personas were more subtly different, such as the one investor who invested in both their own name and also in a Self-Managed Superannuation Fund (SMSF), using an online broker for their personal investments but using a human broker for their SMSF.

Each persona was unique and different in some way to any other. Nonetheless, the analysis identified certain attributes that tended to have the largest influence on information behaviour: the Investment Approach taken, the Time Frames involved and the Market Sector of the stocks being purchased. The next sections discuss each of these in more detail and how they influence the investment behaviour within a persona.

### 5.2.1 Investment Approach

The most influential aspect of an Investment Persona is the investment approach being used. The investment approach will determine, to a large extent, the types of information sources that will be utilized. The investment approach also shapes the information strategy being used and the two are closely intertwined. Four distinct investment approaches were identified during the analysis: fundamentals, charts, professional advice and word of mouth. Each of these is described in the remainder of this section.

While each persona had a dominant investment approach, all of the personas in the study actually used a combination of approaches, using one or more of the other methods to a lesser extent, to supplement and support the primary approach.

#### Fundamentals Approach

As described in section 2.1.3, a fundamentals analysis approach to investment involves analysing and choosing companies to invest in based on their financial fundamentals such as earnings, dividends and forecast future earnings.
An investor operating a persona using a fundamentals approach will therefore be seeking numerical, factual data such as earnings, dividends, assets and associated ratios. They may also be seeking qualitative information in relation to the company’s management and industry sector. This data is gathered from a wide range of online sources, which can include the broker’s website, company announcements and publications (from the company’s own website, the online broker or the ASX website), investment newsletters and broker reports.

Personas using a fundamentals approach require a wide range of data to be gathered from a wide range of sources, some being numerical, some being qualitative and some being interpretations of original data or opinions of others. There is a higher potential for data errors, so fundamental investors are more likely to need to gather data from multiple sources and compare them to ensure they have accurate data.

“Once I identify the share, then what I do, I investigate the company. I look into their annual reports, their financials, how much debt they've got, I look at their current and long term liabilities and assets. And I look at the board of directors and their background. Then after that, if I think it's a winning investment, I put it on my watch list, and when I have money, and it's the price I want, then that's when I buy the shares.”

“I just try to get a better understanding of the business. I try to understand what exactly they are doing. So if you ask me what Sigma is doing today in terms of their technology, I should be able to tell you what their architecture stack is and what their IT investment is going to be next year. So that's a fairly detailed macro understanding of their business structure, from an IT perspective – for a company that is using IT for healthcare... By the time I make the decision to buy, I probably know that company inside out, as much as any analyst who tracks them on a quarterly basis knows them.”

Twenty-two personas (of 37 in total) were identified as using fundamentals as their primary investment approach.
Charts Approach

As described in section 2.1.4, personas primarily focused on charts (also known as technical analysis) are interested in movements in the share price and the patterns that the price movements form. If the current trend is a rising share price and that trend is expected to continue according to the pattern, then shares may be purchased with the expectation that they can be sold in the future at a higher price. If the share price is falling then the share can either be avoided or sold short by borrowing shares and selling them, with the intention to buy them back at a lower price in the future. Chartists are also particularly interested in points where trends reverse their direction and short term trends cross over long term trends, known as break-outs.

“I was trading break-outs at that stage. They tend to work best on mid cap and small cap stocks and it took me a while to realise that I couldn't trade that on my big caps. So I worked out a couple of systems that worked well on the big caps. So I tend to use, generally, mean reversion type trades on the big caps. And those same strategies also tend to work fairly well on futures as well.”

“Because I'm a technical trader, I believe that you can actually almost see what's happening by knowing what the chart is telling you.”

The data required for charting is considerably different to that for fundamental analysis. Stock price data is usually downloaded from a single online source and often downloaded into specialized charting packages.

“Amibroker is a charting package and I get premium data which feeds into it.”

The data itself is relatively straightforward, being price data points generated by the transactions on the stock market itself. There is very little potential for data error as the prices are provided directly from the exchange with no interpretation or modification required by others. In this regard the data gathering task for personas operating with a charts approach is much simpler compared to fundamentals approach based personas.

Six personas (of 37) were identified as using charts as their primary investment approach.
Professional Advice Approach

As described in section 4.4.3, three of the investors in the study received professional advice from a traditional human stock broker. For one of the investors this was the primary approach used for all share purchases. This investor primarily relied on the broker’s advice but did do some of their own research before making a decision. This approach to investing requires less effort and information gathering than ‘doing it yourself’, as the stock selection and research process is effectively outsourced to the stock broker as a professional advisor, who is paid for this service with higher transaction fees than an online broker.

“The fellow who is advising me now - I’m not going to go into companies I don’t know anything about. I prefer them to be blue chips, and he’s just built it that way. So much in term deposits, so much in hybrids and so much in shares.”

The other two much more experienced investors managed their own portfolio of stocks using an online broker but also had a stock broker managing another portfolio. In these cases the professional advice was taken in relation to more speculative stocks and also for ‘special situations’ that may arise, such as tax effective strategies relating to stock buybacks. Although both of these investors received professional advice, they were also experienced enough to conduct their own analysis on the companies before making decisions. The advice was primarily to alert them to opportunities that they would otherwise not become aware of due to lack of time or expertise.

“So he and I discuss how we play the market all the time. He sends me emails with things he thinks are good to invest in and he asks me if I want to invest in them and sometimes I say yes and sometimes I say no. So that's quite active trading. The advantage of doing that is I don't have to do the research. He does the research and I use his expertise to trade.”

Three personas (of 37) were identified as using professional advice as their primary investment approach.
Word of Mouth Approach

Although more than half of the investors (15 of 26) in the study reported receiving stock tips from others, a small subset of these investors purposely chose to make advice they receive from others as their primary investing approach.

Three of the investors based their share purchasing decisions primarily on the advice they received from trusted friends. Further investigation was still carried out however, with the Internet being used to conduct background checks and verify information they have received.

“I just relied on a couple of bottles of wine, a nice lunch, and the recommendation from my friend the director. So I guess that was my information system.”

“Well I have people that are very aware of the market and who occasionally seem to have, as everybody's friend has, a big tip. Except, this person has been extremely successful and he is also much more prepared to take a risk than I am.”

The primary reason given for preferring word of mouth advice from others, over conducting their own research, was that they did not believe they had enough time or skills to find stocks on their own and that they had access to much more knowledgeable and trustworthy friends.

“I don't think I have that much time to do the research, so I more believe in my friend's recommendation. So I have a few friends that I trust, that are very good at trading. So they will suggest watching some stocks. Then I will make my own decision, which one to choose.”

One of the investors believed that the best advice could only be obtained from people that had intimate knowledge of the markets.

“Basically I'm relying on word of mouth and trust. You've got to really know people in the market. I'm a bit cynical. You've really got to know someone.”

A further two investors similarly used word of mouth advice as their primary investment approach, but from public online sources such as stock forums rather than personal friends or family. In these two cases the personas involved were highly speculative and both investors also operated more conservative personas at the same time.
“It's just browsing through the forums, the yahoo forums, and the yahoo finance forums, and seeing what people are talking about - this is going to go up... I’ll pick up a stock from that and say "let's give it a crack", because that's money I can afford to lose.”

Six personas in total (of 37) were identified as using word of mouth as their primary investment approach – two of these personas belonging to the same individual investor.

**Combinations**

In reality, all of the personas use a combination of the above approaches, although each persona does have a primary approach which dominates. Stocks may be chosen as potential investments based on their fundamentals, but then the chart may be consulted to determine the best entry point. Chartists that select stocks based on the chart trend will often also investigate to some extent what the company does and any recent announcements, before purchasing. An investor may hear of a company via word of mouth but before purchasing will check the fundamentals and the chart.

“So, to decide to go on board with a company, it is fundamentals - so, you know, it's got to be a good company and have prospects. Then I look at the pattern of the share price - the chart - and there are some charts that I wouldn't touch. The company might be a good company, but if it's plunging down into the depths like they all are now, I wouldn't invest in it. Even if it was good value, I would wait until there was some sign that it was turning around and going up.”

**5.2.2 Time Frame**

The holding period of an investment is the amount of time the stock is held between purchase and sale. This varied enormously between investors and personas. Some of the day traders interviewed were involved in intraday trading where the stock was bought and sold within the same day, or even within the same hour. At the other extreme, those investors with long experiences in the market reported owning the same stock for over 30 years.

Time frame was one of the common differentiators with investors that had multiple personas. For example, all four of the traders that were conducting short term trading strategies also had long term investments that they treated in quite a different fashion.
The primary goal of short term trading is to make profits with capital gains, buying a stock with the intention of selling it at a higher price in the near future. The short term strategies themselves varied from extremely systematic to random. These differences are discussed in more depth in the next section that describes the persona types of Trader and Speculator.

As the focus of short term trading is price movements, the information behaviour of short term traders tends to be focussed on price data and market news and rumours that may have a short term effect on the stock price.

Investors choosing stocks for the long term are focussed on long term capital growth, generating income from dividends or often both. Fundamental data plays a much larger role in this form of investing and investors will seek data in relation to financial ratios and dividend histories. Long term investments may also be made in companies involved in new and emerging industries, in which case information about the new technology or the industry itself is sought, as well as company specific data.

5.2.3 Sector

Personas were also often differentiated by which sector of the market stocks are chosen from. In some personas there is no limitation and all stocks are considered as potential investments. In others, however, stocks are only chosen from a more limited subset of all the stocks in the market. The most common example of this is a persona choosing to only invest in the largest companies in the market, otherwise known as “Blue Chip” stocks. For example, for a particular persona, an investor might stick to only companies that are in the top 50 or top 100. These are considered to be safer as they are less likely to fail and are more likely to pay consistent dividends.

In a persona seeking higher returns, an investor may focus on the “small cap” sector of the market, as small companies generally have a larger potential for growth and also tend to have much larger volatility in their share prices, providing more potential for quick and large profits. This sector also comes with a higher risk, however, with smaller companies more likely to fail or see large drops in their share prices.

Sector and Time Frame are interrelated, with most “blue chip” sector personas tending to also be long term while “small cap” sector personas tend to be short term focussed.
5.2.4 Summary

An Investment Persona is a role an investor takes on in trading a particular stock portfolio. It is most influenced by the goal of the portfolio, the investment approach taken to achieve the goal, the time frames involved and the market sector(s) of the stocks involved.

An individual investor can have multiple Investment Personas and their information behaviour may be different for each of those personas. The starkest example of multiple personas was highly active day traders using charts to select stocks for short term trades. At the same time, the very same investors also had a long term portfolio of stocks that they held for years and selected and monitored using fundamentals.

The most influential aspect of an Investment Persona in regard to information behaviour is the investment approach being used. The investment approach will determine, to a large extent, the types of information sources that will be utilized and the effort required in gathering data. Four distinct investment approaches were identified during the analysis: fundamentals, charts, professional advice and word of mouth.

A persona using a fundamentals approach will be seeking factual data such as earnings, dividends, ratios and announcements. This requires a wide range of data to be gathered from a wide range of sources and there is a higher potential for data errors. Charting based personas, on the other hand, require only price data that is easily obtained from the stock market and has little potential for errors. Personas using professional advice also require less effort as the stock selection and research process is effectively outsourced to a stock broker. Some personas use ‘word of mouth’ advice they receive from others (friends and family) as their primary investing approach. This is often because they do not believe they have enough time or skills to find stocks on their own. In reality, all of the personas use a combination of the above approaches, although each persona does have a primary approach which dominates.

Time frame was one of the common differentiators with investors that had multiple personas. For example, all four of the traders that were conducting short term trading strategies also had long term investments. Personas were also often differentiated by which sector of the market stocks are chosen from. The most common example of this is a persona choosing to only invest in the largest companies in the market, otherwise known as “Blue Chip” stocks. Sector and Time Frame are interrelated, with most “blue chip” sector personas tending to also be long term while “small cap” sector personas tend to be short term focussed.
5.3 Persona Types

Although each persona was different from any other, during the analysis a number of patterns emerged when personas were compared and contrasted. Personas were grouped based on their similarities and a set of persona types emerged. These persona types and associated descriptions help to illustrate the various forms of investing that the investors in the study were undertaking and also show the wide variety of investing roles, or ‘hats’, the investors took on – even within the same individual investor. While the persona types presented do represent the personas that were identified in all of the investors in this study, they are not meant to be an exhaustive list of all the possible investment personas possible for all investors.

This section presents and describes the distinct persona types that emerged from the analysis: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler.

5.3.1 Long Term Investor

The most common persona observed was that of Long Term Investor. The most defining aspect of this persona is the time frame involved – purchasing stocks with the intention of holding them for multiple years in order to benefit from the growth in the company as well as receive dividend payments where available.

Although the majority of long term investors limited the stocks they purchased to large cap Blue Chips as these were considered safer, others were more comfortable with risk and purchased stocks from all sectors of the market.

This persona had a wide range of investment approaches being employed: Fundamentals, Fundamentals + Charts, Professional Advice as well as Word of Mouth. No long term investors reported using charts alone as even the strongest proponents of charts preferred to know something about the financials of a business if they were investing in it for the long term.

“From a long term strategy, if you are looking towards retirement and are looking to generate income in your old age, I've always thought of these blue chips as an opportunity to have an income outside of super, once I'm no longer working full time. A bit like an investment property, perhaps. I never look at them as a sell strategy.”
“I think long term, our plan would be, once we have paid off our house, when we have money spare basically to invest, we would probably be looking to invest it in blue chip shares with the mind to accumulate them over time and get paid dividends and all that kind of stuff.”

Eleven personas (of 37 in total) were classified as Long Term Investor personas.

### 5.3.2 Income Generator

A variation on the Long Term Investor persona was that of an Income Generator. The two personas are similar but the Income Generator primarily looks to invest in stocks that pay dividends because they need the income for a purpose. This may be because they are retired and need the income for personal expenses, or they may be using debt for investing in stocks and need income to pay the interest on the loan.

“My general philosophy is that most of the shares I'm holding, I'm buying for a reasonable time. My intention is to hold long term and to get the dividend stream offered.”

“It's a financial activity because I'm relying on it for an income.”

Because of the focus on dividends, Income Generators stick exclusively to the large blue chip companies because they offer more safety of capital and more reliable income streams.

Seven personas (of 37 in total) were classified as Income Generators.

### 5.3.3 Trader

A Trader persona is one that looks to make short term profits from stock price movements, although “short term” could be anything from only a few hours to a number of months. One defining aspect of this persona is the time frame involved – holding periods of days to months rather than multiple years.

A key aspect differentiating a Trader from a Speculator (described next) was the concept of systems trading. All the traders that described their trading activities talked about following a system they had developed for themselves with rules in relation to stock selection, entry and exit prices, stop losses and position sizing.
“About half of them were short term trades, about 1 week in and out. And the other half would be medium term, about 6 or 8 weeks on average. So I’ve got 2 main systems going, one to trade some weekly swings and a second one to trade the monthly or quarterly type swings.”

“For the majority of my systems, yes, all in US shares. I do a little on the Australian market but there’s not enough liquidity and not enough - the thing is the price patterns I look for are fairly rare, and with a couple of hundred stocks on the Australian market, you only get the price patterns once in a blue moon. On the US markets you might get a few every night. Or up to 30, 40 or 50 sometimes.”

The most systematic traders also used specialist software packages to back test their system on historical stock price data to confirm their planned system would have produced a profit if used in the past.

“My trading rules. And I test to see if they would have worked over the past. And if they do, then I can apply them in a front trial environment where you do a simulated trial for a month or so to see whether it falls apart straight away. And then if it seems to be working you switch it live. And really it’s just giving yourself the best opportunity for success. It’s like playing a game with a coin, you know, if you’ve got a 50/50 chance of winning and you know you can win a little bit more than you lose when you win, you should, over time, make money, provided you’ve got enough money in the bank to keep playing. It’s that kind of trading - it’s rules based trading.”

The predominant investment approach used by all of the Traders was charts. Stocks were chosen based on some type of chart pattern (e.g. breakout trading is buying a stock when the price has broken out of a trading range).

“My systems output an indicator which is basically the amount of divergence between a couple of different trend filters. And the story is that the way I’ve done the system is the larger that divergence factor, the higher the probability that that trade will be profitable.”

Traders are also more likely to use limited information sources because they are often intent on sticking to their charting based trading plan at the exclusion of all other influences.
“I just am of the belief that a successful trader is someone who is completely autonomous and independent of any other external advice from any other people. My methods have been tested in a rigorous fashion and I've seen that over many years of data, my methods have proven profitable. And that's all the reassurance that I need. And so therefore I apply that without being prejudiced by anyone else's opinions. And it's proven to be the best way to trade. Not just in terms of bottom line but also in terms of emotional stability/psychology.”

Traders tended to buy stocks from the small cap, speculative end of the market, as these stocks exhibited larger price volatility and therefore offered more opportunities for quick profits. There were other variations, however, such as short term trading in blue chip stocks and trading derivatives such as options, warrants and CFDs (Contracts For Difference).

One day trader reported trading only the futures market on a daily basis, purely based on charting, and always being back to cash at the end of each day. This very same investor, however, also had a Long Term Investor persona where stocks were chosen based on their fundamentals and held for years.

Five personas (of 37) were classified as Traders.

5.3.4 Speculator

Just as a Trader, a Speculator also seeks to make short term profits from the movement of stock prices. The primary difference with a Trader is that a Speculator is not following an overall trading plan. This differentiation between personas was made primarily because the investment approaches and information sources between the two can be different, rather than for reasons of trading performance or discipline. Speculators are more likely to use a much wider range of information sources and investment approaches in making trading decisions, which may include charts, word of mouth and online trading forums.

Like traders, speculators may identify and purchase stocks using charts. But speculators may also purchase a stock because it has increased trading volume or is being discussed heavily on a stock forum. They also may buy stocks based on rumours passed on by word of mouth from others.
“Originally when I was trading stocks, I was glued to Hotcopper, because it was a source of volume, it was a source of movement. Someone would hype a stock and you would go in and see the volumes come into it, usually in the penny stock arena.”

“My mate, last week ... he works for a hospital and he heard about a pharmaceutical stock - can’t remember what it was now. It was at 30 cents but I had no money. Three days later it's at 80 cents ... I'm looking at it going argh!”

Seven personas (of 37) were classified as Speculators.

5.3.5 Venture Capitalist

Venture Capitalists are personas who focus on small, emerging companies that are not well known to most investors and are not researched by brokers. They are looking to invest in new industries that are not yet widely known to the public. In the investment industry a real venture capitalist is “an investor who either provides capital to start-up ventures or supports small companies that wish to expand but do not have access to public funding” (Investopedia 2014a). The term has been borrowed to describe these personas as the investors are acting in a similar fashion to real venture capitalists but on a smaller scale.

Often these investors obtain their inspiration or ‘idea’ from non-online sources such as television shows or magazine articles. They will then use online sources to identify and research companies that work in the particular industry they are interested in investing in. These investors are much more likely, or even forced to, search more widely on the Internet using multiple sources, as information on such companies is hard to obtain from mainstream sources such as a broker website or analyst reports.

“There's a company that is making plastics from fibre - cellulose. And I don't know whether this was in a CSIRO program - I can't remember where I saw it. So this company is manufacturing the little plastic trays that go into chocolate boxes. And it's cellulose so it's biodegradable, it's earth friendly, it's renewable. And they were also trying to negotiate a deal with airlines to replace the plastic on the trays. Instead of being a petroleum based product it would be their product. So you're thinking this has got to be a good idea. It sounds like a good idea. Because petroleum based plastic is only going to increase in cost.”
“So it's not primarily driven by the process of buy and sell, it's not driven by the process of enjoying research or enjoying doing statistical analysis or anything like that. It's driven by the enjoyment of good ideas.”

By their nature, emerging companies tend to be from the small cap, speculative sector of the market and therefore this form of investing is higher risk than investing in blue chips. But the Venture Capitalists reported being very aware and comfortable with the risks they were taking. Although they had many losing investments, the successes tended to be spectacular and make up for all the other losses.

“So there are lots of companies around that, if the idea takes off, it's a good thing. But, is it gambling? - you're hedging a bet. The technology may not come off. They may not be able to get to market for other reasons. Lots of good ideas have run aground for reasons other than the idea being no good.”

The investment approach used for this persona is primarily fundamentals, although somewhat different to the fundamentals that might be used for long term investments. The focus tends to be on the fundamentals of the industry as much as the financials of the individual companies, as less information is available on small companies with little history.

Two personas (of 37) were identified as Venture Capitalist.

5.3.6 Novice

Four of the investors in the study fit into the persona of a Novice simply because they had only begun learning about the stock market and did not seem to have yet worked out which investment approach or trading strategy was the most suitable for them. They tended to own only a few stocks and selected them based on varied reasons such as personal experience with the company, reading a media report in the newspaper or from word of mouth recommendations. Some novices stuck with blue chip stocks while others bought from all sectors of the market.

“I will occasionally pick up a share trading magazine and read a few things, and if we are thinking about investing that's when we will start picking these things up. From there, the first step is to go on to Commsec, and look at the charts, read some back articles, see if there is anything going on. We are still kind of in a learning phase about it, so our research doesn't go much beyond that really. It's a bit on gut feeling just seeing how we can kind of watch and predict the markets.”
5.3.7 Gambler

A Gambler persona is one where the investor is undertaking purchasing stocks as a form of gambling – looking to quickly multiply their money with high risk bets on stocks. This form of activity was only described by one investor and only for a small portion of their overall investment funds. This investor’s primary persona was that of a highly disciplined Venture Capitalist, using a fundamentals investment approach. But when profits were taken on their main investments, the investor spoke about ‘playing’ with some of the profits with short term trades where they were prepared to ‘lose the lot’ – in their Gambler persona.

“There have been spurts when I’ve done active trading. That’s when I’ve had the opportunity when I’ve made some extra profit from selling the shares that I’ve held for 3 to 5 years. So when I sell, that’s when I get into the active trading to see if I can multiply it. That’s profit that I’m comfortable playing and losing if it comes to that.”

“The money I can afford to lose is the money that comes out of the profits from the long term investments, and that goes into the ‘play money’, the speculative fund.”

The information sources used were completely different in each of these two personas, particularly the attitude to and use of online stock forums. For their primary Venture Capitalist persona, this investor did not use stock forums mainly due to issues of trust. But when it came to the Gambler persona, the primary source of stock tips was online stock forums.

“Just Yahoo. I just read, I don’t post. I pick up a stock from that and say "let's give it a crack", because that's money I can afford to lose. So I can afford to give it a crack.”

“No I don't usually trust what is on the chat rooms. There is a high degree of bias, or prejudice, associated with those tips. Now, they can be useful, if you're happy to play with the money, which has happened in a couple of cases, but that's fine. Lost the whole lot. I read them only when I decide I want to look at speculation.”

Although there was only one Gambler persona identified in the study, there were subtle elements of gambling found in other personas as well. Investors used terms such as ‘calculated risk’ and ‘informed bet’ when describing the sorts of investments they were making.
5.3.8 Summary

Although each persona was different from any other, during the analysis a number of patterns emerged when personas were compared and contrasted. The following distinct persona types emerged from the analysis: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler.

The most common persona was that of Long Term Investor. The most defining aspect of this persona was the time frame involved – purchasing stocks with the intention of holding them for multiple years in order to benefit from the growth in the company as well as receive dividend payments where available. A variation on the Long Term Investor persona was that of an Income Generator. The two personas are similar but the Income Generator primarily looks to invest in stocks that pay dividends because they need the income for a purpose.

A Trader persona is one that looks to make short term profits from stock price movements. One defining aspect of this persona is the time frame involved – holding periods of days to months. A key aspect differentiating a Trader from a Speculator was the concept of systems trading - traders had a pre-defined trading system they followed. Just as a Trader, a Speculator also seeks to make short term profits from the movement of stock prices. The primary difference with a Trader is that a Speculator is not following an overall trading plan.

Venture Capitalists are personas who focus on small, emerging companies that are not well known to most investors and are not researched by brokers. They are looking to invest in new industries that are not yet widely known to the public.

Some personas were classed as Novice simply because the investor had only begun learning about the stock market and did not seem to have yet worked out which investment approach or trading strategy was the most suitable for them.

A Gambler persona is one where the investor is undertaking purchasing stocks as a form of gambling – looking to quickly multiply their money with high risk bets on stocks. This form of activity was only described by one investor and only for a small portion of their overall investment funds.
5.4 Chapter Summary

This chapter continued the elaboration of the Information Lenses model that was introduced in chapter 4. It focussed on the central aspects of the model: the Stock Investing Information Process and related tasks and Investment Personas.

This chapter explored the model of stock investing information process that was developed during the analysis by synthesizing the process described by all the investors in the study. Investors do not always use the same information sources at all times but instead use varied sources depending on the stage of the investment process they are involved in and the specific task at hand. While information practices were incredibly diverse in the early stages of the investment process, the later stages tended to be more homogenous.

Then the concept of an Investment Persona was explored in depth, which is a key component of the Information Lenses model. Individual investors can take on multiple Personas with different information behaviours in each. Distinct persona types that arose during the study were also presented and discussed, showing the variety of roles, or ‘hats’, that investors take on: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler.

Chapter 6 continues with the elaboration of the Information Lenses model, looking at how Personas and tasks influence the Information Lens itself. It then explores the bidirectional relationship between the investor and the information world - that information behaviour is a “two way street”. The information environment itself can influence investors and affect their information behaviour.
Chapter 6   Information World and the Investor:  
A Bidirectional Relationship

The previous chapter explored the central aspects of the Information Lenses model: the Stock Investing Information Process and Investment Personas. The use of information sources, service and social networks can vary greatly depending on the stage of the investment process: Idea Generation, Stock Selection, Company Research, Buy, Monitor or Sell. While there is enormous diversity in sources at early stages of the process, particular the idea generation stage, sources tend to be more homogenous at later stages.

Investment Personas were also explored in depth. Individual investors can take on multiple Personas with different information behaviours in each. Distinct persona types identified during the study were: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler.

In chapter 1, information behaviour was defined as “how people need, seek, manage, give, and use information in different contexts” (Fisher, Erddelez & McKechnie 2005). This definition, however, assumes that people are the only actors in the scenario and that the information itself is an inanimate object that is manipulated by people – that the relationship is one way.

During the analysis in this study it was found that information behaviour is not just about the behaviour of the investor in using information, but also what influence the information world itself may have on the behaviour of the investor - that information behaviour is actually a ‘two way street’ (see Figure 6-1).

![Figure 6-1 – Online Investor Information Behaviour Overview Model](image)
This chapter focusses on the bidirectional relationship investors were found to have with the information world. Investors not only use the information world by seeking and gathering information, but are also themselves influenced by the changing shape of the information world, as new sources and services become available.

This chapter initially presents the core element of the Information Lenses model, being the Information Lens itself. It explores how the Information Lens is influenced and shaped both by aspects of Investment Personas and also by the different stages of the investment process. This represents the ‘use’ part of the relationship.

Next this chapter explores the ways in which the information world, especially online resources, can potentially influence the investor. The Internet itself affects the motivations of investors to invest online. Various online resources and services, as they become available, also open up new investing and trading strategies that previously were not possible or cost effective.

Finally, this chapter looks at the connection between investment and information strategies and how investors inherently deal with the potential impact of information overload.
6.1 The Information Lens

An Information Lens represents the set of information entities (sources, services and social networks) that an investor draws upon or communicates with as part of their investing information behaviour.

It is, by necessity, a subset of the total information world available, as no single individual is capable of knowing, gathering and processing all available information, and not all available information is relevant or useful.

Not only does each investor have a unique Information Lens but each investment persona also has a distinct and unique Information Lens. Investors that have multiple investment personas also have multiple information lenses that they switch between, depending on which persona they are operating in at the time.

The Information Lens defines the outer boundaries of where the investor looks for information and who they communicate with when they operate in a particular investing persona. The investor does not necessarily use all their known information entities at all times. Rather, they look through an Information Lens, seeing only a small subset of the information world at a time.

The shape of the Information Lens constantly varies depending on the context of the activity at hand. The two most influential contextual elements are the make-up of the persona itself and also the task being undertaken at the time. When working in different personas, the shape of the respective information lenses may be considerably different. The information lens used when dealing with a long term investor persona can be very different to that of a trading persona. As the investor switches between personas, they also switch between information lenses. The information lens currently at hand is further focussed and influenced by the specific task being performed: idea generation, stock selection, company research, monitoring or transacting.
Some aspects of the information lens tend to be stable and change very slowly, while other aspects are fleeting and short lived. For example, the online broker website tends to be a stable and common element to all investors and personas so will tend to be a constant in the information lens at most stages of the investing process.

On the other hand, an investor operating in a speculator persona may read a rumour of an impending announcement posted on a stock forum. They may check the company website and also use Google to search for other references to the rumour. In doing so they may come across a blog entry that includes a presentation made by the company at an industry conference hinting that trial results will be ‘imminently’ made public. In this example, the investor may visit that particular company website and that blog once and never again – those sources only fleetingly being part of their information lens.

6.1.1 Persona Influences on the Information Lens

The Investment Persona has a more static impact on the Information Lens. For a given investment persona, there will be a set of information sources and social networks that are commonly accessed by the investor. Some of these sources and services may be common to other investment personas of the same investor but some may be used only within each specific persona. This section examines the aspects of a persona that have a major impact on the information lens: the investment approach and market sector.

Investment Approach

The investment approach has the most profound impact on the information lens as it defines the type of data that is needed in order to conduct that particular type of investment. The investment approach will, in general, determine the data sources that will be used on a regular basis for a particular persona.

Charts approach based personas have rather simple data requirements. Stock price data, usually of every stock in the entire market and for periods spanning from minutes to years, is downloaded from an online source (e.g. stockbroker website, software package provider or market price provider) and loaded into specialised charting software. Price data is relatively easy to obtain, and is inherently highly reliable as the data values are simple and come directly from the market itself.
“I've found another enthusiast's site where they will provide the last 10 weeks, but Commsec itself, and whilst I don't use Commsec for trading but I have a login with them, you can go into Commsec and get end of day data quite easily.”

“From Almax - they are in Glen Waverly somewhere, I think. And I have been subscribing with them since maybe 1997. The monthly fee is about $24 I think. End of day, I just download them. They have a good downloader and easy to read with Metastock”.

The information lens for a charts based persona, therefore, may be quite narrow and focussed on only the few online sources needed to download the price data. Charts based personas have an information advantage in this regard, in that they do not need to spend a large amount of time and effort on data gathering and can assume the data they do obtain is of high quality as it will not have been interpreted or processed by others.

A fundamentals approach based persona, on the other hand, requires financial data which is more complicated, involving many data values at multiple points in time. The data may be numeric, such as earnings and ratios, but it also may be qualitative, such as analysts’ recommendations. The original source of fundamental data is found in market announcements and annual reports, which are usually available electronically in pdf format. Although the documents can be easily downloaded from a broker website or from the ASX directly, the data values required for analysis are embedded in the document. The investor needs to extract the data values from the documents themselves or obtain the data values from other sources such as a broker website, financial data provider or from other documents such as broker reports or investment newsletters.

“All the information - past performance, past profitability, ratios, all of those figures - price earnings ratios. I've got a whole set of things that I look at - and dividend payments. Growth over the past period - all of those things. That data is readily available. You get it off ETrade and you get it off Huntleys. Absolutely excellent... And I don't go back to the annual reports or anything like that. No. I just get it all off the Internet.”
“I think the Commsec website is pretty good, on forward earnings. I mean the things you are interested in are future earnings, future dividends, earnings growth, dividend growth and prospective PE ratios. They are the things you are interested in.”

The information lens for a Fundamentals approach based persona will be more likely to look at a wider range of information sources. As most data sources are not directly from the original documents, there is also a higher potential for data error, so multiple information sources may be needed for verification of data values to minimize errors.

“Well yeah, to have a complete view of this company, I would go to a number of websites, you know, also for comparison, because I won’t trust only one view or one perception of this company. I’d prefer to view a number of them.”

“Sometimes a company will appear in the search results because of some error. Someone may have put in the wrong earnings number or there has been a stock split and the earnings haven’t been adjusted so it looks like they are making enormous profits but they aren’t. You have to go and look each company up in the research section to check the numbers.”

Personas primarily using a Professional Advice approach will tend to have a narrow information lens, specifically focussed on communications with the relevant broker or advisor. The stock investing process is effectively outsourced to a professional who lessens the need for the investor to gather and analyse the data themselves, instead providing simple recommendations and/or data in summarised form.

This service provided is valued by investors that may not have the time or ability to do the data gathering and analysis themselves. The professional can also provide skills and knowledge that the investor may not possess – providing general stock investment advice or providing more specialised advice in relation to tax effective strategies and stock buybacks.

One investor even described trading more in the past when he had a traditional human broker and then trading much less when he changed to an online broker, because he didn’t have the time to do all the research himself.
“Because of my time constraints I've actually cut back on my trading. You need to be sitting by the computer - and now, because I've gone online, it means that I have to keep watch. Previously, when I used to have a broker, he would call me up and say, ok look, it's time to possibly sell or buy or whatever - or look at this one - or he would give me some advice first and we would make a decision. So because I don't use a broker now, it means that my activity has actually tapered off – I trade less now than before. My broker has actually retired - the one I used to use.”

Similarly to Professional Advice approach personas, Word of Mouth approach personas also rely on the advice of others as their primary investment approach. The difference is that the advice comes from friends or family rather than a professional advisor. The information lens for a Worth of Mouth approach persona will therefore be more focussed on the investor’s social networks. Although the friend or family member(s) may be trusted, as the advice is not paid for the investor will most likely need to conduct their own further research into the company using one or more of the other investment approaches.

“I don't have time to search out companies. The only time I would do that is if I heard a rumour. I might spend a bit of time just searching the Internet. If we got information off someone, I'd actually search that person to see if they've been bankrupt or to see if they've got a funny background.”

Similarly to the Professional Advice approach, the investor is effectively outsourcing at least part of their investment information process to others, usually because they do not have enough time or ability to do it themselves.

In reality, most investment personas involve multiple investment approaches. One approach will be the primary focus and is usually the one used in the early stages of the stock selection process, but often the other approaches are also used to a lesser extent. The information lens will therefore be shaped in multiple ways depending on which approach is being used at each stage of the process.
Market Sector

The market sector of stocks can also have an impact on the information lens. The primary difference was found to be between large, blue chip companies and those from the medium and smaller end of the market (small cap), particularly in relation to fundamental data gathering.

As large, blue chip companies are widely researched by analysts and often feature in the media and research reports, obtaining fundamental data and analyst reports for blue chips is therefore relatively easier than smaller companies. Investors can get away with doing less research for blue chip companies. Not only because they are so widely analysed but also because their businesses tend to be well understood by many people, as they deal with such companies on a daily basis as consumers of their products.

“And when you invest in yielding stocks it's pretty much a no-brainer - you just go with what everybody else does - you buy a parcel out of the asx200. If you go to any broker, any radio advisor, anybody who works in the stock industry, they say, ‘well you really should have some bank shares in your portfolio’ - simple as that.”

The information lens for a blue chip investment based persona may rely on fewer information sources and be more confident of the accuracy of the data obtained. Investors in this persona may rely on their personal experience with a company and look at only a few basic ratios from the online broker website, without needing to perform deeper analysis.

“The bottom line for purchasing blue chip shares really comes down to a background sentiment that you just build up over time. I know that sounds very vague. We all know what banks roughly do - they lend money. All that sort of information you can just pick up a little bit here, a little bit there. And I find to invest in blue chips you don't really need to do that much research, because the business doesn't dynamically change overnight.”

Fundamental data for medium to small companies, on the other hand, is available from less sources as there are far less analysts and brokers following such companies. Small companies also need more monitoring as their businesses can expand and contract at a much faster rate than blue chip companies. The information lens required for a small cap based persona has to scan a wider range of sources to gather data, with a higher chance of errors.

“For companies like this there is little or no information. You won't find Aspect Huntley covering a stock like this because it's just too small.”
6.1.2 Task Influences on the Information Lens

The Stock Investing Information Process was described in detail in section 5.1. Investors perform a number of distinct tasks during the investment process: Idea Generation, Stock Selection, Company Research, Buy, Monitor Holdings and Sell. Each task has related information activities but the activities and information sources used in each task may be considerably different. Information sources were found to be diverse and widely varied early in the process (e.g. Idea Generation) but tended towards homogeneity later in the process (e.g. Monitor Holdings).

The task at hand will have a much more dynamic influence on the information lens compared to the influence of the persona. Because the investor may be constantly moving between tasks, the information lens will be constantly changing. While information sources related to an investment persona will tend to be used on a more regular or habitual basis, there may be information sources that might be used only once when performing a specific task.

For example, in researching a specific company as a potential investment, an investor may Google the company name and come across a blog discussing that company. If they do not end up purchasing shares in that company, they may never visit that specific blog again. The information sources used by an investor can therefore be very adhocratic in nature.

The shape of the information lens will change as the investor progresses through the tasks in the investment process. At the same time, the lens will also be influenced by the amount of time and effort the investor expends at each stage of the process.

Early in the process, at the Idea Generation and Stock Selection stages, the shape of the information lens will be wide but shallow. The stock selection process, as a whole, is one of filtering a large number of potential candidate stocks down to only a few potential investments. The early stages of the processes therefore involve a much larger number of stocks than the later stages. The information lens used during idea generation stage will be looking at a large number and wide range of stocks but at a relatively superficial level. The data requirements may only be minimal at this stage and easily obtained.

For example, a chartist may generate ideas by scanning for potential stocks using a chart scan. The initial scan may produce many potential candidates and then further filters or scans are used to narrow the number of stocks down further.
“So I can say I want to look for all of the shares that are current, going back 2 years that meet these parameters. And then I run a search, and it will narrow down, perhaps, 100 shares. And then I can run another formula and weed out until I've got about 60. Often when I've got 60, I tend to keep what I call a 'trend list' of shares that would qualify and it might be about 50 or 60. Sometimes I'll often eyeball those.”

Similarly those relying on word of mouth may get a stock tip from a friend or see a stock mentioned on a stock forum. Again there may be many stock tips received in this fashion with minimal data about the companies, requiring further investigation.

“I get a lot of things sent to me and when I click on them I see articles and stuff, news websites and stuff. Friends and whatever, say have a read of this, have a read of that. So they send me the URL. So I click into it.”

During the Stock Selection stage, stocks will be filtered using some basic metrics to decide whether they are worthy of further investigation or should be discarded. The metrics themselves will vary widely depending on the investment persona being used, and may involve some basic fundamental criteria such as earnings or dividends, some basic chart pattern requirements or combinations of both. The information lens at this stage is still wide but becoming a little deeper, with more data points being sought on each company.

This selection process continues iteratively, with more and more information being sought and gathered during each iteration. At this stage the information lens will be focussed on a specific company but may seek information from a wide spectrum of sources. Any news item about a stock under consideration will be of interest, as would any discussions on an online forum.

At some point the investor will want more information about a stock and may conduct some form of in depth Company Research. The shape of the information lens during this task will be narrowly focussed on the specific company and much deeper, seeking more detailed information about the company.
The actual form of data may vary widely depending on the investment approach being used. For chartists it may involve an in depth analysis of the stock’s chart in multiple time frames looking at multiple indicators. For fundamentalists it may involve lengthy analysis of financials spanning multiple years, reading analyst’s reports, checking the company’s website and looking into the background of the management using Google. Social networks may be used to ask others what their opinions are of the stock or to find out if they have information about the company that is not publicly available.

“I go through everything until I can be satisfied that every query I might have had is answered to my satisfaction. When I say that, there might be that something comes up with an adverse answer. I will then weigh that in line with my assumptions and make a decision from that. I don't like things that are hanging out there that I have left unanswered - what about or what if - I never leave anything like that, it would drive me crazy.”

Once a stock is owned, the information lens goes into monitor mode for that stock. The information lens in this mode is looking reactively for information as it arises, rather than purposefully seeking new information. Despite the vastly different methods of generating ideas and selecting companies, the information used for monitoring companies was found to be very similar for all investing personas. All used a watch-list to monitor the current prices of stocks that are held. All investors read announcements made by the company to the market, even those that selected the stock because of a chart. If an investor was reading a newspaper or magazine, they would be drawn to any article about a company they currently owned.

“I read every announcement. And look at news items. I discount many of them because I don't feel they are significant. But anything that does feel significant, I might go back and review the whole company again.”

The dynamic nature of the information lens is further influenced by the fact that an investor may be conducting all stages of the investment process concurrently, so may have multiple lenses they constantly flip between. Stocks the investor has only just become aware of will be at the idea generation stage. Other stocks might be on a prospective watch list where they have already been under investigation for a period of time. The investor may also be deeply researching one or two stocks that are in serious consideration of purchase. And finally they will be reactively reading any new announcements and articles related to all the stocks they currently own.
6.1.3 Summary

The Information Lens represents the set of information entities (sources, services and social networks) that an investor draws upon or communicates with as part of their investing information behaviour. The investor does not necessarily use all their known information entities at all times. Rather, they look through an Information Lens, seeing only a small subset of the information world at a time.

Not only does each investor have a unique Information Lens but each investment persona also has a distinct and unique Information Lens. Investors that have multiple investment personas also have multiple information lenses that they switch between, depending on which persona they are operating in at the time.

The two contextual elements that most shape the information lens are the make-up of the persona itself and also the task being undertaken at the time. When working in different personas, the shape of the respective information lenses may be considerably different. As the investor switches between personas, they also switch between information lenses. The information lens currently at hand is further focussed and influenced by the specific task being performed.

The Investment Persona has a more static impact on the Information Lens. For a given investment persona, there will be a set of information sources and social networks that are commonly accessed by the investor. The investment approach has the most profound impact on the information lens as it defines the type of data that is needed in order to conduct that particular type of investment. The market sector of stocks the persona is focussed on can also have an impact on the information lens as it will limit the stocks the persona will look at.

The task at hand will have a much more dynamic influence on the information lens compared to the influence of the persona. Because the investor may be constantly moving between tasks, the information lens will be constantly changing. The information lens will be different depending on which distinct task the persona is involved in during the investment process: Idea Generation, Stock Selection, Company Research, Buy, Monitor Holdings and Sell.

The dynamic nature of the information lens is further influenced by the fact that an investor may be conducting all stages of the investment process concurrently, so may have multiple lenses they constantly flip between.
6.2 Information World Influences on the Investor

The information environment itself, particular online services and the Internet, can have an influence on the information behaviour of the investor. Changes in the information world can affect changes in the investor or their investing persona.

At a fundamental level, the advent of the Internet itself has enabled brokers to offer stock transacting services online at drastically lower costs than previously available.

With online broker websites and the stock exchanges themselves also online, investors now have easier access to information that was previously more difficult and expensive to obtain, such as market announcements.

But the influence of the Internet goes beyond simply enabling investors to do what they would have done anyway, only more cheaply and easily. As new online sources and services become available, they enable investors to conduct new forms of investing and trading that may not have been previously possible or economical. The goals and expectations of investors evolve over time as new online sources and services evolve.

The Internet can also have motivational effects on the investor by making stock market investing itself more interesting or exciting. The existence, however, of a seemingly endless amount of information online can also pose a constant threat of information overload for the investor. Investors need to find ways of avoiding information overload from occurring.
6.2.1 Internet Affects Motivation

Before online investing, the individual stock market investor looked up stock prices in the newspaper, researched companies by reading annual reports and had to talk to a human stock broker to make transactions. With online investing, not only is the information more easily available, but it is also more visual. The website of an online broker can be far more visually appealing than a newspaper or printed annual report. Being able to see stock prices and profits/losses constantly changing adds a dynamic element to the whole process that may also increase the excitement factor for the investor.

For the majority of the investors in the study, the fact that stock trading is available online does affect their motivation to invest or trade. When asked the question ‘Would you still invest in the same way without the Internet?’, the most common answer was that they would probably still invest in stocks but in a much more muted fashion and less actively. This section explores the different ways that the Internet influences investor motivation, as reported by the investors in this study.

**Ease of Access Increases Interest in Investing**

With the advent of online trading, investors can visit their broker’s website any time of the day that suits them, to look for information or place orders. They can use the Internet at any time of the day or night to search for information, research companies or communicate with others through stock forums or personal social networks.

This very fact of easier access to information and services makes the activity of stock investing more interesting to investors. The majority of the investors (20 of 26) stated that they would be less interested in stock investing, or not at all, if they had to perform the same tasks manually using paper information sources and the phone to speak to a broker.

“I wouldn't have been as interested if I constantly had to go through a phone broker. I like having the control that, you know, at night, late at night, you can enter a trade if you wanted to, or on the weekend. You don’t have to worry is it office hours - can you phone? You don't have to think ‘gee I just entered it and I want to change my mind, I have to phone the broker back’. So I probably wouldn't have gone down this path, even, if the Internet wasn't available.”
“It's very good that I can look in one place and get a whole bunch of information, and am able to make my decision. Instead of having to go research all over the place. Or I have to go see someone to get advice. Whether it's seeing or calling a broker. I like the idea that it gives you some sense of autonomy on what you are doing, because you have got all the information there to make your decision, without it being someone advising you specifically.”

**Being Online makes investing more interesting and exciting**

The fact that investing itself is online increases the interest in the activity itself. Having the ability to check prices and look up information at any time of the day, using any number of devices and getting instant feedback not only makes the activity easier but also makes it more interesting. This influence was mentioned by 15 of the 26 investors.

“But it's true, you go in and you can see the index every time you go to the computer screen, it makes you interested in the share market.”

“Definitely, because whenever I think about it I can just jump online and do it, especially with smart phones now you can do it anywhere. I've been on trains and just been bored and picked my phone up and it's there on my home screen and I just click straight on it and it starts bringing up announcements and I just thumb through them.”

As online activities become more integrated into people’s everyday lives, stock market investing just becomes one of those activities. It can be not just a financial activity but also a form of ‘play’ or distraction during the day.

“Because I think it's an instant thing, or relatively instant. You don't have to rely on someone else to do something for you... If I want to buy something or if I wanted to put a bid on something, it's instant. And I've grown up with all of this kind of technology. I guess my generation has.”

“I suppose having the Internet there, it gives a little bit of control, peace of mind, little bit of play, you're checking what they tell you, wasting time during the day seeing what your stocks are doing. Getting excited one day, upset the next.”
Instant Access Increases Feelings of Being in Control

Another way that the Internet was found to influence motivation was that having instant access to information at any time of the day, and the ability to place orders at any time and see them execute instantly, gives some investors an increased feeling of being in control of their investments. Only a small number of the investors (4 of 26) specifically mentioned this as an influence.

“I think I'd still be interested in trading (without the Internet), but I think that the barrier of not being able to take control of it myself would be a problem for me. I'd still be interested in it but I think I might be shied away from it just because of the barrier of controlling it. I need to feel like I've got my finger on the button. So that's what the Internet brings for me.”

“With being online I feel much more involved and in control. Because I can just jump online at any time. I can sell them at this price and buy them at this price, and click the box for any time within 30 days, if it hits that price it will automatically buy them for me.”

Information Availability Increases Confidence

The availability of information and ability to trade instantly was also found to have an influence on the confidence level of a minority of the investors (3 of 26). They expressed the opinion that having easy access to information online made them more confident that they had the right information to invest.

“I am influenced by the ease of which - the ease I can invest. And I feel confident that I have the information so readily available - it gives me the confidence to trade.”

“Because it feels like it de-risks it, for me. Especially in light of GFC and everything, you want to have control over what is going on. Because you could have a terrorist attack somewhere - you don’t want to have to wait for your broker, or for you to get that information.”
6.2.2 Information Availability Enables Strategies

The very existence of the Internet, the online brokering and information services it enables, and the lower transaction costs provided by online brokers, allows investors to conduct investing strategies that would otherwise have been impossible, too time consuming or too expensive. This section expands in more detail the different ways that online information availability has expanded the horizons, goals and expectations of the investors in this study.

Lower Brokerage and Faster Data Access Enables Trading Strategies

Trading strategies that rely on frequent, short term, trades are highly dependent on fast data access and low brokerage costs. At the extreme, day traders conduct multiple trades in stocks during a single day and hundreds in a month. For example, one of the active day traders in the study averaged 300 transactions per month. The availability of low cost brokerage and the ability to quickly enter trades electronically enables individual investors to conduct trading strategies that would otherwise not have been possible. Lower brokerage allows multiple smaller transactions to be conducted, taking advantage of short term movements over days or even minutes.

“No, I just couldn't do it. I couldn't get the data anywhere near as easily or at a reasonable price. The brokerage costs - presumably you'd have to operate through a human broker - the brokerage costs would mean I couldn't trade my systems at all.”

“I couldn't day trade without live, real time data. So phoning for a particular price - I'm looking at 2000 stocks every time - well my programs look at 2000 stocks on every search - so I couldn't work that way and I probably wouldn't.”

As information availability and speed of access improves over time, investors are influenced by these changes in sources and consequently change their strategies. The trading possibilities continue to expand as the availability of information expands.
“For instance, 10 years ago, I could not trade these little bites, 100 shares at a time, because the brokerage implications would have killed it. With Peritrade, now I can do that. And of course the speed of the Internet connection has made much shorter term trading possible and more feasible than when I had the old 64K dialup line.”

“The speed and progress of technology gives me the ability now to scan the entire market intraday. After an hour even, at 11am, I can run the first scan to pick up something promising… Then I run it during lunchtime again, and possibly even an hour before close. That was not possible even 2 or 3 years ago.”

**Online Access to Information Enables Research of New Industries**

A few of the investors (5 of 26) commented that the wide range of information available to them through the Internet has enabled them to invest in companies and industries that they otherwise would have known nothing about. Instead of sticking to only industries that they were personally familiar with, the Internet has allowed them to find information and learn about new industries and expand their horizons in terms of companies they might invest in.

“But with the advent of the Internet, I began to understand that the knowledge was available for me to learn about other businesses. Earlier there was no way that I could have understood healthcare, unless I had actually worked in that business.”

“So yes, it has made a big difference, the Internet - on my learning ability. The Internet has certainly played a part in broadening the kind of business I would look at, it has widened the pool of businesses I would look at.”

“Previously I was depending on a couple of brokers giving you their spin/view on the world. What the Internet has been able to do is that it now gives you many different perspectives… now, with the Internet, you can do anything you want with any company you can look at.”
6.2.3 Summary

Investors have a bidirectional relationship with the information world. Investors not only use the information world by seeking and gathering information, looking through an Information Lens, but are also themselves influenced by the changing shape of the information world, as new sources and services become available.

The Internet itself can affect the motivations of investors by making online investing a more interesting and exciting activity. The very fact that the Internet gives easier access to information and services, at any time of the day or night, can make the activity of stock investing more interesting to investors. The fact that investing itself is online can also increase interest in the activity itself and make it more exciting. As online activities become more integrated into people’s everyday lives, stock market investing can become one of those activities.

Having instant access to information, and the ability to place orders at any time and see them execute instantly, can give some investors an increased feeling of being in control of their investments. It can also increase their confidence that they have access to the right information.

New online sources and services open up new investing and trading strategies that previously were not possible or cost effective. The availability of low cost brokerage and the ability to quickly enter trades electronically enables individual traders to conduct trading strategies that would otherwise not have been possible. The online availability of a wide range of information also enables some investors to invest in companies and industries that they otherwise would have known nothing about.
6.3 The Investment - Information Strategy

Every investor needs an information strategy to cope with the potential impacts of information overload and bad information. This section discusses these potential negative impacts and the strategies that are used by investors to avoid them.

Each persona has a distinct information strategy. It may be explicitly defined and thought out by the investor or it may be implicitly determined by the inherent restrictions of the persona.

In this way, a persona can provide a built in information strategy that works to help the investor avoid information overload, without the investor necessarily being consciously aware of it.

6.3.1 Information Tap and Filter

To try and better understand the relationship investors have with information, the study considered the analogy of the relationship humans have with water. This is an example of using the grounded theory technique of conceptual comparison – comparing a concept from the data with another concept from a different domain, looking for similarities and differences.

Water is absolutely essential to human life, but the quantity and quality of the water must be controlled. Too little water can result in dehydration, but too much water can result in drowning. Only clean water can sustain life - dirty or poisoned water can cause illness.
Similarly, investors have an essential need for information. Investing without information is paramount to throwing darts at a board, or worse. But there is a limit to the amount of information a single person is able to process. A single individual does not have the capacity to know all available information about all the stocks in the market and also does not have the capacity or time to process all the new information that is created daily about every company and re-evaluate what the price of every stock should be on a daily basis.

Most individual investors have limited time to devote to investing so simply do not have enough time to process all the available information. Even professional investors (i.e. fund managers) would have difficulty knowing and processing all available information on all companies in the market (2000 on the Australian Securities Exchange alone). Any investor that attempted such a feat would soon be overwhelmed and suffer from information overload.

Investors also require data and information that is accurate. Making investment decisions based on erroneous data can obviously lead to losses. As data and information can take several forms, the techniques used to ensure information quality vary. Investors that use primary financial data need to ensure that the values are accurate. This may involve extracting the values directly from the original source, such as company announcements, instead of relying only on financials presented in a broker report, which may be prone to human error during the analysis. Investors may also seek to verify financial values such as earnings, dividends and ratios by cross checking these values between multiple sources. Data in relation to market prices, used to draw charts, is the most reliable form of data as it comes direct from the exchange with no human interpretation. Finally information can also take the form of opinions of others and rumours. These types of information are inherently more unreliable but also potentially more valuable, if they prove to be accurate. Investors reported dealing with rumours in two distinct ways: either ignoring them completely and never trusting them, or taking them on board but checking multiple sources to see if they corroborate.

So the information strategy requires both a tap and filter, to borrow further from the water analogy. A tap is required to control the amount of information to that which can be usefully absorbed. Too much information can result in information overload and poor decision making. A filter is also required to ensure the quality of the information. If incorrect facts are used to make decisions then errors can result. If unfounded rumours are believed then bad decisions will be made.
6.3.2 Information Rationalisation

One of the primary mechanisms that investors use to control the flow of information to a manageable level is that of information rationalisation. This involves selecting and paying attention to only specific information sources or data points and ignoring all other information that is potentially available. There were many different examples of such rationalisation described by the investors in the study, but the common thread with all was that they only looked at a specific set of values or sources because they considered those were sufficient.

“I'm sure there have been some newsletters over the years. But at the moment I've sort of rationalised it down to basically the Eureka report, the stuff available through the e-trade guys, and the variety of analyst reports through my face-to-face broker.”

“The only thing I might look at is the amount of liquidity or volume that they are trading… Other than that, no I just ignore the fundamentals completely. I mean there's 9000 US stocks - I haven't got a chance to know what they all do.”

A general pattern in relation to the level of rationalisation and the experience level of investors was also observed (see Figure 6-2).
Those investors with the least experience, less than 5 years, conducted a high level of rationalisation, in that they only looked at a few information sources such as newspapers and information available through their online broker. These investors explained that this was because they were just starting out and still learning as they went along, so they didn’t have the skills to delve into more complicated data or know what other information sources were available.

Investors with more experience, between 5 and 20 years, consulted a wider range of information sources and performed more in depth analysis using many more data points, so were using a lower level of rationalisation. This was the case for both chartists and fundamentalists. The more experienced chartists used many different types of charts and pattern analysis tools. The more experienced fundamentalists performed very in depth analysis of companies and their financials before investing in them.

The investors with the greatest experience levels, more than 20 years, however, described using a high level of information rationalisation. They tended to only look at a limited number of data points and information sources. They described this as a consequence of narrowing down, over the years, the data points and/or sources that provided them the greatest value, and sticking to those while ignoring much of the rest.

“I can never find everything possible, so I limit myself, ideally to my own counsel. I look at 2 or 3 different chart periods and templates and act accordingly. If there is some additional sentiment information, I treat it as a discretionary trade and bend my rules, again something I shouldn’t do, but yes I might do that in one or two cases.”

“But given that I only read the Eureka Report and look at the Commsec website and only look at a very, very small part of the Commsec website, I don’t feel that I’m personally overloaded with information. But I think it is possible to be. I suspect that I must feel in some way that that's all I need to know.”
6.3.3 Persona has a Built In Information Strategy

A persona defines a set of boundaries in relation to the investment process. Inherently these same boundaries also define the information gathering requirements for the persona. Each attribute in a persona that potentially limits the number of stocks or reduces the volume of information required, also reduces the effort required to gather that information.

The investment strategy used for a persona is therefore inherently also an information strategy – the two are highly interconnected and impact each other. The two ways this was most evident was in the choice of investment approach and market sector.

**Investment Approach Impact on Information Strategy**

By following a particular investment strategy, the investor is also employing an information strategy to make the information gathering and processing task manageable, even if they are not consciously aware of it. For example, an investor may choose to follow charts as their primary investment approach. The investor might decide to do this because they truly believe charts can predict price movements and by using charts they will improve their chances of making money or controlling their risk.

At the same time, the investor is also limiting the amount of information they need to gather and process. The primary data source for charts is the daily price movements of all the stocks in the market, which can be relatively easily obtained from a number of online sources. The chartist can load the data into a specialised PC based charting package and generate simple or complex charts with ease. The package can also scan the price movements of the entire market using a chart market scan, again with relative ease. An investor using this method is able to quickly scan and analyse many stocks with a minimal data gathering workload.

Another investment approach is to follow the advice of others. This may take the form of following professional advice, or from following the advice of friends or family members – the 'word of mouth' investment approach. These investment approaches may be followed because the investor believes they do not possess the skills or time to do their own analysis and they trust the advice of their broker or friend.
At the same time, however, by following the advice of another, an investor limits the amount of information they need to gather and analyse themselves, making their information workload far more manageable. Following professional advice or the 'word of mouth' of others is an information strategy as much as it is an investment strategy.

The fundamentals investment approach is potentially the most time consuming and requiring of a higher amounts of data, but there are strategies used to lessen the risk of information overload there as well. One is to use analysis that has been done by others, such as broker reports or investment newsletters. This can provide a summary that is quickly digested without the investor needing to gather all the data from primary sources themselves. Another method is where the source of investment ideas does not come directly from stock market itself, but from other sources such as mass media (e.g. television shows or magazine articles). This allows investment research to be conducted alongside everyday activities such as reading a newspaper, flicking through a magazine or watching television. Regular non-investing information activities can be utilized to generate potential investment ideas.

**Market Sector Impact on Information Strategy**

If a persona decides to limit investments to a specific sector of the market, that also automatically limits the amount of potential information that needs to be gathered and analysed.

Investors with long term personas may decide to stick to large companies only, believing these to be safer to invest in as they are less likely to go bankrupt. For example, a long term persona might choose to only invest in the top 50 or top 100 stocks. This has a number of inherent impacts on the information strategy.

By limiting the number of stocks to potentially invest in, they also limit the number of stocks they need to gather, read and understand details about to a more manageable number. Understanding and tracking 50 companies at most would be achievable whereas doing the same for 2000 stocks would not. Sticking to the biggest companies also lessens the effort required to obtain analysis information. Since the biggest companies are followed and analysed by more brokers and analysts, there is more availability of analyst’s reports, opinions and forecasts, making it easier for the individual investor to analyse the stock.

Investors may also decide to stick to specific industries (e.g. mining or financials). This may be because they already have knowledge of that industry or they believe the industry has better future prospects.
By doing so, they again limit the number of potential companies they need to gather data about and also they are more likely to have or develop the skills to understand the data they do gather in that industry.

### 6.3.4 Summary

Every investor needs an information strategy to cope with the potential impacts of information overload and bad information. Investors have an essential need for information, but there is a limit to the amount of information a single person is able to process. A single individual does not have the capacity to know all available information about all the stocks in the market. Investors also require data and information that is accurate.

So an information strategy is required that is both a tap and filter. A tap to control the amount of information to that which can be usefully absorbed, and a filter to ensure the quality of the information is high. One of the primary mechanisms that investors use to control the flow of information is that of information rationalisation. This involves selecting and paying attention to only specific information sources or data points and ignoring all other information.

A general pattern in relation to the level of rationalisation and the experience level of investors was observed in this study. Investors with the least experience conducted a high level of rationalisation, in that they only looked at a few information sources, because they were still learning. Investors with more experience consulted a wider range of information sources and performed more in depth analysis, so were using a lower level of rationalisation. The most experienced investors, however, used a high level of information rationalisation. They tended to only look at a limited number of data points and information sources. This was because they had narrowed down, over the years, the data and sources that provided them the greatest value.

A persona defines a set of boundaries in relation to the investment process. Inherently these same boundaries also define the information gathering requirements for the persona. Each attribute in a persona that potentially limits the number of stocks or reduces the volume of information required, also reduces the effort required to gather that information. The investment strategy used for a persona is therefore inherently also an information strategy – the two are highly interconnected and impact each other.
6.4 Chapter Summary

This chapter focussed on the bidirectional relationship investors have with the information world. Investors not only use the information world by seeking and gathering information, but are also themselves influenced by the changing shape of the information world, as new sources and services become available.

In seeking information, investors do not use all sources at all times, but instead look through an Information Lens, viewing only a small subset of sources at a time. This Information Lens is influenced and shaped both by aspects of the investment Persona and also by the different stages of the investment process.

The Information World can also influence the investor. The Internet itself can affect the motivations of investors by making online investing a more interesting and exciting activity. New online sources and services open up new investing and trading strategies that previously were not possible or cost effective.

Investors can also be impacted negatively by the potential of information overload. Investors deal with this threat by controlling the volume and quality of information they deal with to a manageable level, using Information Rationalisation. As well as providing an investment strategy, personas also provide a built in Information Strategy.

This chapter concluded the presentation of the Theory of Online Investor Information Behaviour. The next chapter compares the theory that has evolved from this research to theories and findings from existing literature. This is done as part of the research process described in chapter 3. Chapter 7 will discuss where the theory confirms previous research and also where it contrasts. It will also highlight the contributions to knowledge made by this study.
Chapter 7  Literature Comparison and Discussion

The Theory of Online Investor Information Behaviour, developed by this study, was presented over the previous three chapters (chapters 4, 5 and 6). Theories, concepts and findings from previous studies, related to online investing and spanning a wide range of disciplines, were presented in chapter 2.

This chapter will compare and contrast the theory and findings developed by this study with theories, concepts and findings from previous studies. This enfolding of the literature is done as part of the research process described in chapter 3. It is an integral part of the grounded theory methodology and also multi-grounded theory, also described in chapter 3.

The discussion in this chapter will strengthen the theory by theoretically grounding it within the literature. This is done by demonstrating where aspects of the findings in this study confirm and contrast with findings from previous studies. The discussion will also highlight where aspects of the findings in this study are not found in previous studies. This will highlight the gaps in the literature and the contributions to the body of knowledge made by this study. These contributions will be further elaborated in chapter 8.

In order to achieve this comparative analysis and contrast with the literature, this chapter has been structured according to the components of the Theory of Online Investor Information Behaviour, as presented over the previous three chapters. These sections are:

- Investor Characteristics
- Online Investor Motivations
- Online Investing as a Serious Leisure
- Information Sources
- Social Networks
- Stock Investing Information Process
- Investment Persona
- Information Lens
- Investor World Influences on the Investor
- The Investment – Information Strategy
7.1 Investor Characteristics

As described in section 4.2, the individual characteristics of investors themselves influence their investing and therefore their information behaviour. These characteristics include the investor’s personal profile, the skills they possess and their investment experience. The attributes related to personal profile that arose in this study included age, gender, the amount of time available for investing and attitude to risk.

In this study, age was found to only have a minor influence on information behaviour. The younger investors were more likely to search out information from multiple online information sources and more likely to be using online stock forums and social media. Findings from previous studies have been mixed. Some of the adoption studies described in section 2.3.2 found that younger investors were early adopters (Li, Lee & Cude 2002), whereas others reported age not being a factor (Teo, Tan & Peck 2004). Loibl and Hira (2008) found that their ‘reluctant investors’ group was the oldest group in their survey, indicating that older investors are less information intensive. So, in general, this study supports previous findings in relation to age.

Gender, in this study, was not found to be a major influence on information behaviour. The women in this study were just as active and representative of all investor types as the men. This is in contrast with both Loibl and Hira (2008) and O’Connor (2012), who found women were substantially less information intensive than men. Both of these studies, however, involved larger and wider populations of investors, whereas this study purposely sought investors from the active end of the spectrum. As this study only interviewed five women, the results may have been different with different women, so no conclusions can be drawn.

Time (or lack of it) was an issue that arose often during the interviews. Those investors who were working had limited time to spend on investing and this limited their information gathering efforts. Although time as an issue for investors has largely not been reported in previous studies, Lisa O’Connor’s (2011) study of a women’s investment club did find that the women classified as ‘managers’ were working women who joined the club as a way of setting aside time to attend to their financial growth, because they had limited time in their busy lives.
A wide range of risk attitudes was evident with the investors in the study, from very conservative to high risk takers. Williamson and Kingsford-Smith (2010) also found a similar range of risk taking attitudes in their interviewees. Higher risk takers in this study were generally found to be seeking to invest in riskier stocks and these stocks generally require more information gathering and checking of data. Conservative investors stuck to large, blue chip companies and therefore had lower information effort requirements. Loibl and Hira (2008) also found that the two groups of investors with the highest information intensities were also the highest risk tolerant groups. The findings related to risk attitudes, therefore, largely confirm previous findings.

The skills and knowledge that each individual investor possesses influences their investing and information behaviour. These include their investment skills, IT skills and domain knowledge. This study found that investors with more experience had developed their investing skills and were more proficient and efficient at both investing and information gathering. Also, investors who were professionally trained in finance or accounting were more likely to study the fundamentals of a company. Neither of these findings has been previously reported in the literature.

In relation to IT skills in general, all of the investors in the study were sufficiently IT literate to conduct basic online investing activities. This correlates with Williamson and Kingsford-Smith (2010), who reported that all the investors they interviewed used the Internet, at least for part of their information seeking. Where IT skills were found to have a larger influence was in the more IT intensive activities of charting and systematic day trading. Those chartists and traders with IT backgrounds reported programming their own indicators using specialised trading packages. This finding has not been previously reported in the literature.

Investors were also found to draw upon their domain knowledge of industries or technologies that they may already have from other aspects of their life. They tended to invest in industries that they already understood. Although this finding has not been specifically mentioned previously in the literature, O'Connor (2012) did hint at this in her description of one retired investor who had built up a network of professional connections during his career. Even in retirement he tended to invest in companies in that industry, relying on his knowledge of the field and his contacts.
Each investor has a different past investing experience and that experience influences the form of investing they undertake. Investors in the study often described their stock investment experience as a journey of learning. All the investors described their investing and trading evolving over time. The learning journey was also shaped by successes and failures along the way. These observations in relation to investors’ learning journey have not previously been reported in the literature.

In summary, the findings in relation to age, risk attitudes and time availability confirm findings from previous studies. Although the findings related to gender contradict previous findings, the number of participants was too small to draw any conclusions from this. The findings related to investor’s investment skills, IT skills in relation to trading packages, use of domain knowledge, the learning journey investors go through and their past successes and failures, are all largely new and form one of the contributions to knowledge made by this study.

### 7.2 Online Investor Motivations

Previous studies have primarily focussed on what motivates investors to adopt online trading, as described in section 2.3.2. Investors will adopt online trading if they have a positive attitude towards it, others in their social network have adopted it and if they believe that online trading systems will be easy to use and perform the tasks they need to perform easily.

This study confirms all of these previous findings in relation to adoption factors. All of the investors interviewed considered the Internet to be a wonderful boon, making the task of gathering information and conducting trades vastly easier and cheaper than it would otherwise be. So much so, that many investors said they would be less interested in stock market investing without the Internet, as described in section 6.2.1. The issue of the Internet affecting investor motivations is discussed further in section 7.9.

This study, as described in section 4.3, delved deeper into what motivates investors, taking the lead from the study by Konana and Balasubramanian (2005) that developed the Social–Economic–Psychological (SEP) model, described in section 2.3.3.
In relation to ‘economic factors’ as defined in the SEP model (see Figure 2-3), some of the investors in this study were looking to use stocks to ‘make money’ in the sense of generating profits from trading, while others were primarily investing to generate an income from the dividends. Also, by investing as an individual they avoided paying fees to investment managers. These are elaborations of the ‘Utilitarian gains’ factor described in the SEP model.

There was also a strong theme in this study that investors want to be in control of their own destiny. They prefer to make their own decisions rather than entrust those decisions to professionals. Similar investor desires were also noted by Konana and Balasubramanian (2005), although they viewed these as potentially negative and classed this psychological factor under ‘illusions of knowledge and/or control’. Williamson and Kingsford-Smith (2010) also found that the “desire for control over their investments emerged often during the interviews and was an important reason they invested online” in their study, so this study confirms previous studies that online investors are motivated by wanting to control their own money.

For some investors in this study, investing in the stock market was also seen as an intellectual challenge that went beyond the simple goal of making money. They not only enjoyed the activity in terms of competition – beating the market – but also as a test of applying their own set of logic to a chaotic market and succeeding. This motivation has not been previously reported in the literature.

In summary, all the investors in this study believe the Internet makes the task of gathering information and conducting trades vastly easier and cheaper, confirming much of the previous studies into adoption factors. Going beyond adoption, this study also confirms previous studies that online investors are motivated to make money, but provides greater elaboration on these motivations: generating profits, earning an income and lowering fees. Investors also desire to be in control of their destiny, a theme also reported in earlier studies. Online trading as an intellectual challenge was also found to be important to some investors, and this is a new motivational factor not previously reported in the literature.
7.3 Online Investing as a Serious Leisure

To over half the investors in the study, online stock investing was more than just a financial activity. They described it as an interest or hobby. An activity that they enjoy doing but that also has a financial aspect to it as well. For some, the fact that it was online increased the appeal of it as a hobby. Stock investing was also seen by some as an activity or career that could be continued during retirement. As a way of both generating an income and also keeping the brain active.

It is clear, to this study, that these investors are involved in a serious leisure activity, as described in section 2.7: “the steady pursuit of an amateur, hobbyist, or career volunteer activity that captivates its participants with its complexity and many challenges. It is profound, long-lasting, and invariably based on substantial skill, knowledge, or experience, if not on a combination of these three. It also requires perseverance to a greater or lesser degree” (Stebbins 2009b).

Online investing can be clearly identified with each of the qualities of a serious leisure activity. To be highly competent at stock market investing requires a significant effort in learning and the development of skills and knowledge – often quite complex knowledge. Perseverance is certainly required at times by investors, who can and do invariably suffer financial losses. The benefits that investors gain from online investing can be more than just financial. They can also gain a sense of personal enrichment, feelings of accomplishment and self-gratification, as evidenced by the discussion on investor motivations in section 4.3 relating to controlling their own destiny and intellectual challenge. The motivations for using online stock forums, discussed in section 4.4.4, show that some investors are also motivated to be part of and contribute to a social group of like-minded people – yet another benefit associated with serious leisure.

As discussed in section 2.7.2, this study is not the first to identify online investing with the serious leisure perspective. The only other researcher, however, to do so, is Lisa O’Connor (2011, 2012). In her study of a woman’s investment club (O’Connor 2011), the groups of women she labelled as ‘hobbyists’ and ‘mentors’ were identified as fitting the characteristics of serious leisure. In her study of retired investors (O’Connor 2012), she found that the information-intensive participants “exhibited the vocational zeal that focuses on the acquisition of special knowledge, skill, and training” and that “these participants also radiated energy and enthusiasm about investing during their interviews”.
This study adds further weight to the findings from these two previous studies (O’Connor 2011, 2012) - that online investing is indeed, clearly, a serious leisure activity. This study, however, provides a stronger association between the aspects of online investing and the defining qualities and benefits of serious leisure. It also provides a new perspective in relation to online investing being an activity or career that can be continued during retirement, as a way of both generating an income and also keeping the brain active.

### 7.4 Information Sources

The investors interviewed in this study used an extremely wide ranging and diverse set of online information sources and services. These included: online broker website, online stock investment newsletter, broker report, online newspaper, blogs, search engines, stock exchange website, company website and a wide range of other websites. All of these sources are very much in line with the information sources reported by Williamson and Kingsford-Smith (2010) and Loibl & Hira (2008), described in section 2.6.2.

The most popular sources, used by all of the investors in this study, were online broker websites, search engines and online newspapers. The same sources were also found to be the most utilized by Williamson and Kingsford-Smith (2010) and Loibl & Hira (2008), so this finding confirms those previous studies on this point as well.

In this study, considerable use was still made of traditional offline sources such as newspapers, television and radio, although they served a different purpose to online sources. These sources were primarily used for obtaining general business news and for getting the background economic picture, rather than searching for stock specific information. They were also the source of investment ideas which were then researched further online. Both Williamson and Kingsford-Smith (2010) and Loibl & Hira (2008) reported newspapers, television and radio were also used by many of their investors. Previous studies have not, however, made a distinction between the way online and offline sources are used. The observation of this study that offline sources are primarily used for getting background news and investment ideas but not for company specific research is new.
Three of the investors in this study had a traditional human stock broker. For one of these investors, their broker was their primary source of advice. The other two, more experienced, investors had both a professionally advised portfolio and also managed their own portfolio using an online broker. These investors valued information provided by their human brokers in relation to new Initial Public Offerings (IPOs) and tax effective strategies. As 30% of investors still have a human stock broker (ASX 2012), it is not surprising to find investors in this study using a broker. The types of advice valued by experienced investors – IPOs and tax effective strategies – have not been reported in previous studies.

In summary, investors in this study used an extremely wide ranging and diverse set of online information sources and services which were very much in line with sources reported by previous studies. The level of usage of offline sources such as newspapers, television and radio was also similar to past studies, but the observation that offline sources are primarily used for getting background news and investment ideas but not for company specific research is new. This study also contributes the perspective that online investors may still value traditional stock brokers because they provide valuable information on IPOs and tax effective strategies.

7.5 Social Networks

Four types of social networks were identified in this study: private personal (offline) networks, private online networks, public online networks (stock forums) and private networks within public networks – described in section 4.4.4. Private personal networks ranged from husband/wife to family members, friends, workplace colleagues and also an investment club. All such personal private networks have also been reported as important to investors by a number of previous studies, as described in section 2.6.3.

Private online networks were groups that knew each other communicating online in various ways. This was mainly via email but also using an online chat facility in the workplace and private online live chat groups. Apart from investors using email, which has been mentioned in previous studies, the only example found in the literature of this type of private online social network was a participant quote in Williamson and Kingsford-Smith (2010): “I belong to several investment groups where we’ve got our own little Yahoo email group”. No previous studies have specifically mentioned private online social networks as a category of investor social networks.
Public stock forums were used by half of the investors in this study. Online stock forums have been well reported in the literature, but the majority of studies have been from the field of Finance and have focussed on the impact of stock forums on markets – described in section 2.4.2. A relatively few studies have investigated the information content of stock forums and these are discussed in section 2.4.1. These studies are limited, however, in that they have studied only the publicly visible forum postings.

This study has reported the existence of smaller private networks formed by members of public stock forums. As members of stock forums get to know other members from their postings, small private networks form through the use of the private messaging facilities. This discovery has not been previously reported in the literature.

What motivates stock forum users has also received very little attention in previous studies. One exception was a study by Das, Martínez-Jerez and Tufano (2005) that interviewed Glenn, the most prolific poster on the Amazon boards at the time (see section 2.4.1).

In this study, investors reported various motivations for using stock forums (see section 4.4.4). The primary one was that the forums are a great source of information and different opinions, and a good way to learn about investing and trading. To one investor, being part of the forum was an important means of communicating with the world and also a way of ‘giving back’ something to the trading community. These findings largely support the motivations reported by Das, Martínez-Jerez and Tufano (2005) but this study describes a wider and deeper range of motivations.

In summary, this study provides a new way of classifying investor social networks: private personal (offline) networks, private online networks, public online networks (stock forums) and private networks within public networks. While private personal networks and public online stock forums have been well covered in previous literature, this study contributes insights into private online networks and the discovery of private networks within public networks. This study also contributes new insights into what motivates investors to use online stock forums.
7.6 Stock Investing Information Process

Numerous books and papers have been written recommending how investors should invest, each recommending investment approaches, techniques and methods. The basic mechanics of buying and selling stocks are also well covered in the literature (see section 2.1). No study was found, however, describing the process individual investors actually go through when investing in stocks. The Stock Investing Information Process, presented in section 5.1, is therefore one of the major contributions made by this study.

This model represents the process that investors go through for each stock. The steps of the process include: idea generation, stock selection, company research, buy, monitor holdings and sell. The Idea Generation stage had the largest variation in relation to the variety of methods and information sources used. While each of the different ways of generating an idea, described in section 5.1.2, would be common knowledge to those investors using them, they have not previously been brought together and described under the concept of Idea Generation.

While investors researching companies by using fundamentals or charts is well known and described in section 2.1, the task or stage of iterative stock selection combined with company research has not been previously described in the literature. This study also reported multiple triggers for selling, which again have not been specifically described in the literature.

Another key contribution of this model is the observation of how the use of information sources changes through the stages of the process. While information practices were incredibly diverse in the early stages of the investment process, the later stages tended to be more homogenous. This finding is also not previously mentioned in the literature.

Williamson and Kingsford-Smith (2010) noted that, in their study, “it was sometimes difficult to ascertain whether preferred sources of information changed according to the particular investing task”. The Stock Investing Information Process model sheds considerable light on this question.

In summary, the Stock Investing Information Process has not been previously described in the literature and is one of the major contributions made by this study. This model represents the steps that investors go through for each stock: idea generation, stock selection, company research, buy, monitor holdings and sell. The model describes a wide variety of idea generation methods not previously brought together under the new concept of Idea Generation. While information practices were incredibly diverse in the early stages of the investment process, the later stages tended to be more homogenous, which is also a new finding.
7.7 Investment Persona

Another major contribution made by this study to the body of knowledge is the concept of an Investment Persona - a role an investor takes on in trading a particular stock portfolio, described in section 5.2. An individual investor can have multiple Investment Personas and their information behaviour may be different for each of those personas. No previous study has identified that an individual investor can be conducting two different forms of investing at the same time, each with a different form of information behaviour. A few studies have reported investors compartmentalizing their stocks into two mental portfolios, with one portfolio being for speculation/gambling (Konana & Balasubramanian 2005; Williamson & Kingsford-Smith 2010).

Previous studies have tended to treat the individual as a single entity, reporting characteristics of the individual as a whole or reporting the information sources used by the individual. This study has shown, through the development of the Investment Persona concept, that an individual can actually have multiple investment personalities, using different investment approaches and information behaviours in each.

The most influential aspect of an Investment Persona in regard to information behaviour was found to be the investment approach. A persona using a fundamentals approach will require a wide range of data to be gathered from a range of sources and there is a higher potential for data errors. Charting based personas, on the other hand, require only price data that is easily obtained from the stock market and has little potential for errors. The only previous study found to mention the issue of potential data errors for fundamentals investors was Williamson and Kingsford-Smith (2010), primarily in relation to the use of online broker websites.

Although each persona was different from any other, the study identified a distinct set of investment persona types (see section 5.3): Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler. It was no surprise that Long Term Investor and Income Generator were the most common personas, as most general investment literature recommends buying and holding stocks for the long term. Trading systems are well documented in the many books available on charting and trading, so the concept of investors being Traders and Speculators is also not new. Previous studies have also linked stock investing with gambling (Kumar 2009; Williamson & Kingsford-Smith 2010; Zwick 2005), so the Gambler persona is not a complete surprise either. The concept of a Venture Capitalist persona, however, has not previously been described in the literature in relation to individual investors.
While almost all of the above investor types can be recognised individually in the literature, no single previous study has identified and classified these different types of investment personas and described them in detail, as has been done in this study. Neither has any previous study recognised that one individual investor could behave as multiple investor types at the same time.

In summary, a major contribution made by this study is the concept of an Investment Persona - a role an investor takes on in trading a particular stock portfolio. An individual investor can have multiple Investment Personas and their information behaviour may be different for each of those personas. Investment persona types identified were: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler. No single previous study has identified and classified these different types of investment personas, nor has any previous study recognised that one individual investor could behave as multiple investor types at the same time.

### 7.8 Information Lens

The Information Lens, described in section 6.1, represents the set of information entities (sources, services and social networks) that an investor draws upon or communicates with as part of their investing information behaviour. The investor does not necessarily use all their known information entities at all times. Rather, they look through an Information Lens, seeing only a small subset of the information world at a time. Not only does each investor have a unique information lens, but each investment persona also has a distinct and unique information lens. Investors that have multiple investment personas also have multiple information lenses that they switch between, depending on which persona they are operating in at the time.

There are similarities between the concept of an Information Lens and the concept of an Information Source Horizon defined by Savolainen and Kari (2004b) as “an imaginary field, which opens before the ‘mind’s eyes’ of the information seeker”. Information Source Horizons are a variation of the Information Horizons framework developed by Diane Sonnenwald (1999, 2005), described in section 2.5.5. Information Horizons defines that information behaviour happens within a context (e.g. academic, family life) and within each context are various situations (e.g. teaching a course). For a given context and situation, the information sources may be different.
The Information Lens concept is similar to an Information Horizon in that both propose that people look at a limited set of information sources for a given context and situation. The idea is taken a step further by this study with the addition of the concept of the Investment Persona. An Information Horizons context could roughly be considered ‘investing’ in the case of this study. A situation, in this particular context, is somewhat closer to the concept of a task, such as researching a company. The Investment Persona adds another structural element that is somewhere between a ‘context’ and a ‘situation’, that provides a deeper explanation of the information behaviour of investors. An Information Lens, being constantly influenced by both the persona and the task at hand, is more dynamic than an Information Horizon.

The investment persona has a more static impact on the information lens, while the task at hand will have a much more dynamic influence on the information lens. The dynamic nature of the information lens is further influenced by the fact that an investor may be conducting all stages of the investment process concurrently, so may have multiple lenses they constantly flip between. Along the same lines, Savolainen and Kari (2004b) have previously described Information Horizons as being of two types. “Relatively stable horizons indicating the ways in which people tend to value information sources across situations” and also “dynamic, that is, problem- or situation-specific horizons, sensitive to unique requirements of a task or project at hand”.

The dynamic nature of the Information Lens is also a demonstration of a technology (the Internet) being used in a constantly evolving manner, a premise also proposed by Orlikowski and Iacono (2001) in relation to the IT artefact. Section 2.3.4 describes the theory of Diffusion of Innovations and the concept of re-invention: the degree to which an innovation is changed or modified by a user in the process of adoption and implementation. In this case, it could be considered that not only is there re-invention taking place but there is continual re-invention.

Every time the investor uses the Internet, it may be used in a different way to any previous time. The Internet has already been adopted, but the way it is used is constantly being re-invented by the user, so re-invention may not only occur at the point of adoption but may continue. This finding agrees with yet another premise by Orlikowski and Iacono (2001) in relation to the IT artefact – that technology is adapted and used in different ways over time. The same idea could also be applied to the concept of ‘translation’ from Actor-Network Theory (see section 2.3.5). It may be possible that the Internet is not simply translated by the investor at the point of adoption but is constantly being re-translated every time it is used.
The task impact on the information lens can also be considered in relation to Bates’ modes of information seeking (Bates 2002) (see section 2.5.2) and incidental information acquisition described by Kirsty Williamson (2005) in her ecological theory of information behaviour (see section 2.5.4). Not all of the tasks in the stock investing information process involved purposeful information seeking (directed and active according to Bates). In the idea generation stage, some methods of idea generation are purposeful, such as running a chart market scan. Other investment ideas can come from ‘browsing’ activities such as reading a newspaper or having a chat with a friend, which is incidental information acquisition. Likewise, in the monitor holdings stage, the investor may purposely seek to read company announcements, but may also come across a newspaper article about a company they own or hear a rumour about the company from their social network.

In summary, the investor does not necessarily use all their known information sources at all times, but instead looks through an Information Lens, seeing only a small subset of the information world at a time. There are similarities between the concept of an Information Lens and the concept of Information Horizons (Sonnenwald 1999) and Information Source Horizons (Savolainen & Kari 2004b). The Investment Persona, however, adds another structural element that is somewhere between a ‘context’ and a ‘situation’, that provides a deeper explanation of the information behaviour of investors. The dynamic Information Lens could also be seen as an example of the Internet being continually re-invented (Diffusion of Innovations) and re-translated (Actor-Network Theory) every time it is used. This is also in line with the view that the IT artefact is constantly in a state of change and adaption (Orlikowski & Iacono 2001). The information lens is not always in purposeful seeking mode but can also gather information incidentally.
7.9 Information World Influences on the Investor

As discussed in section 6.2, investors actually have a bidirectional relationship with the information world. Investors not only use the information world by seeking and gathering information, but are also themselves influenced by the changing shape of the information world, as new sources and services become available.

The Internet itself can affect the motivations of investors by making online investing a more interesting and exciting activity. The very fact that the Internet gives easier access to information and services, at any time of the day or night, can make the activity of stock investing more interesting to investors. The fact that investing itself is online can also increase interest in the activity itself and make it more exciting.

When asked the question ‘Would you still invest in the same way without the Internet?’, the most common answer by the investors in this study was that they would probably still invest in stocks but in a much more muted fashion and less actively.

These findings broadly support the online investing adoption studies, outlined in section 2.3.2, that investors will adopt online trading because it is easy to use and performs the tasks they need to perform easily. But these findings go much deeper, showing that the online element itself increases investor interest in using it. Investors are not just using online trading systems instead of a human broker because the online systems are easy to use and useful but they want to use them because they are online. They would be considerably less interested in investing in stocks overall if they had to deal with a human broker.

These findings also go deeper by exploring the different mechanisms in which investors are influenced by the information world. The availability of low cost brokerage and the ability to quickly enter trades electronically enables individual traders to conduct trading strategies that would otherwise not have been possible. The online availability of a wide range of information also enables investors to invest in companies and industries that they otherwise would have known nothing about. These specific influences have not been mentioned in any previous studies.
The idea of the information world influencing information behaviour is not new, however, in the field of Information Science. The first proposition from the Information Horizons framework states that “human information behaviour is shaped by and shapes individuals, social networks, situations, and contexts” (Sonnenwald 1999, 2005) (see section 2.5.5). The idea of contextual factors from the world around the individual influencing their information behaviour is also central to both the Everyday Life Information Seeking (ELIS) framework Savolainen (1995) (see section 2.5.3) and also the Ecological Theory of Human Information Behaviour by Kirsty Williamson (2005) (see section 2.5.4).

Conceptually, Actor-Network Theory also sees the world from a similar point of view. The Internet, rather than being just a technology, is a non-human actor. It is seen as being a hybrid entity, possessing both social and technical elements. The idea of the Internet being an actor that influences other actors, including humans, is a viewpoint from Actor-Network Theory that corresponds to these findings that the information world influences the investor.

In summary, investors have a bidirectional relationship with the information world. Investors not only use the information world but are also themselves influenced by the changing shape of the information world. The Internet itself can affect the motivations of investors by making online investing a more interesting and exciting activity. It can also enable new trading strategies that were not previously possible and allow investors to learn about new industries. These findings generally support the findings from adoption studies (perceived ease of use and perceived usefulness) but go much deeper in explaining how investors are influenced by the information world. The idea of the information world influencing information behaviour is also consistent with theories from the field of Information Science and Actor-Network Theory.
7.10 The Investment - Information Strategy

Every investor needs an information strategy to cope with the potential impacts of information overload and bad information. Investors have an essential need for information, but there is a limit to the amount of information a single person is able to process. So an information strategy is required that is both a tap and filter. A tap to control the amount of information to that which can be usefully absorbed, and a filter to ensure the quality of the information is high.

The concepts of an information tap and filter are similar to the information overload strategies identified by Savolainen (2007a): filtering and withdrawing (see section 2.2.4). Filtering involved skipping over certain information items in a stream, such as spam email or news items not of interest, and the withdrawal strategy involved limiting the number of information sources used.

The few studies to specifically address information overload in the context of online investing found that most investors developed strategies for dealing with the problem, including the use of investment software (Williamson 2008, 2010; Williamson & Kingsford-Smith 2010) and that investors kept extensive records to deal with information (O'Connor 2012).

This study found that one of the primary mechanisms that investors use to control the flow of information is that of Information Rationalisation. This involves selecting and paying attention to only specific information sources or data points and ignoring all other information. The term ‘Information Rationalisation’ actually evolved from an in-vivo code based on the following quote (in grounded theory an in-vivo code is a code concept name taken from the words of respondents – see section 3.5.2):

“But at the moment I've sort of rationalised it down to basically the Eureka report, the stuff available through the e-trade guys, and the variety of analyst reports through my face-to-face broker.”

Information Rationalisation is also based on the concepts of bounded rationality and satisficing developed by Herbert A. Simon (1955) – that when a decision maker cannot test all possible solutions they develop simplified measurements and accept a ‘satisfactory’ solution (see section 2.2.3). Along these same lines, since investors do not have the capacity to evaluate all available information sources, they rationalise both the information sources and also the data points within those sources to the few that they believe will provide them the most satisfactory results.
A general pattern in relation to the level of rationalisation and the experience level of investors was also observed in this study. Investors with the least experience conducted a high level of rationalisation, investors with more experience used more information so were using a lower level of rationalisation, but the most experienced investors used a high level of information rationalisation by looking at a limited number of sources. These findings have not been previously reported in the literature.

A persona defines a set of boundaries in relation to the investment process. Inherently these same boundaries also define the information gathering requirements for the persona. Each attribute in a persona that potentially limits the number of stocks or reduces the volume of information required, also reduces the effort required to gather that information. The investment strategy used for a persona is therefore inherently also an information strategy – the two are highly interconnected and impact each other.

This concept that an investment strategy is also inherently an information strategy is new. Previous studies have treated information overload as something investors cope with by developing a record keeping system or using investment software (O'Connor 2012; Williamson 2008, 2010; Williamson & Kingsford-Smith 2010). The observation of this study is that the investment strategy and information strategy are one and the same and provide a natural way of coping with information overload.

In summary, one of the primary mechanisms that investors use to control the flow of information is that of Information Rationalisation. Although the term is new, the concept is similar to the strategies of filtering and withdrawing reported in previous studies. Information Rationalisation is also based on the concepts of bounded rationality and satisficing. A pattern in relation to the level of rationalisation and the experience level of investors was also observed: less experienced investors rationalise more, experienced investors use more sources and rationalise less, but the most experienced investors go back to high rationalisation. This pattern has not been previously mentioned in the literature. It was also found that the investment strategy and information strategy are tied. A persona defines boundaries in relation to the investment process and inherently these same boundaries also define the information gathering required. This concept of viewing the investment strategy as also inherently an information strategy is new.
7.11 Chapter Summary

At a very broad level, the Theory of Online Investor Information Behaviour, represented by the Information Lenses model in Figure 7-1, can be seen as being grounded in the literature via the top and bottom sections of the model: the Information World and The Investor. The middle sections of the model are relatively new and make up the primary contributions of this study: the Investment Persona, the Stock Investing Information Process, Information Lenses, Information World Influences on the Investor and the Investment-Information Strategy.

Figure 7-1 - Grounding of Theory of Online Investor Information Behaviour in Literature

Regarding characteristics of The Investor, the findings in relation to age, risk attitudes and time availability confirm findings from previous studies. Although the findings related to gender contradict previous findings, the number of participants was too small to draw any conclusions. The findings related to investor’s investment skills, IT skills in relation to trading packages, use of domain knowledge, the learning journey investors go through and their past successes and failures, are all relatively new and form one of the contributions made by this study.
Regarding Investor Motivations, this study confirms previous studies in relation to adoption factors such as ease of use and usefulness. Going beyond adoption, this study also confirms previous studies that online investors are motivated to make money, but provides greater elaboration on these motivations. Investors’ desire to control their destiny is a theme reported in earlier studies but online trading being an intellectual challenge is a new motivational factor.

Although this study is not the first to identify online investing with the serious leisure perspective, only one other researcher has done so (O'Connor 2011, 2012). This study adds further weight to the findings from these two previous studies - that online investing is a serious leisure activity. This study contributes a stronger association between the aspects of online investing and the defining qualities of serious leisure and also provides the perspective of online investing being an important retirement activity or career.

Investors in this study used a wide range of online and offline Information Sources and these are all very much in line with information sources reported by previous studies. Personal social networks were found to be important, also confirming previous studies. This study does, however, provide a new way of classifying investor social networks: private personal (offline) networks, private online networks, public online networks (stock forums) and private networks within public networks. While private personal networks and public online stock forums have been well covered in previous literature, this study contributes insights into private online networks and the discovery of private networks within public networks. This study also contributes new insights into what motivates investors to use online stock forums.

The Stock Investing Information Process has not been previously described in the literature and is one of the major contributions made by this study. This model represents the steps that investors go through for each stock: idea generation, stock selection, company research, buy, monitor holdings and sell. The model describes a wide variety of idea generation methods not previously brought together under the new concept of Idea Generation. While information practices were incredibly diverse in the early stages of the investment process, the later stages tended to be more homogenous.

Another major contribution made by this study is the concept of an Investment Persona - a role an investor takes on in trading a particular stock portfolio. An individual investor can have multiple Investment Personas and their information behaviour may be different for each. No previous study has recognised that one individual investor could behave as multiple investor types at the same time.
Investment persona types identified were: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler. These different types of investment personas have not been previously identified and classified in this way.

The investor does not necessarily use all their known information sources at all times, but instead looks through an Information Lens, seeing only a small subset of the information world at a time. The concept of an Information Lens is not entirely new, bearing conceptual similarities with Information Horizons. The Investment Persona, however, adds an extra structural element somewhere between a ‘context’ and a ‘situation’ that describes the influences on the Information Lens in more depth, in the specific context of online investing.

The dynamic aspect of the Information Lens could also be seen as an example of the Internet being continually re-invented (Diffusion of Innovations) and re-translated (Actor-Network Theory) every time it is used. On the one hand, this grounds the theory with the theories of Diffusion of Innovations and Actor-Network Theory. On the other hand, the concept of continual re-invention may potentially be a new concept that needs further investigation.

Investors have a bidirectional relationship with the information world. The Internet can affect the motivations of investors by making online investing a more interesting and exciting activity. It can also enable new trading strategies that were not previously possible. These findings generally support the findings from adoption studies but go much deeper in explaining how investors are influenced by the information world. The idea of the information world influencing information behaviour is also consistent with theories from the field of Information Science.

Information Rationalisation is one of the primary mechanisms that investors use to control the flow of information is that of. Although the term is new, the concept is similar to the strategies of filtering and withdrawing reported in previous studies, and is also based on the concepts of bounded rationality and satisficing. A pattern in relation to the level of rationalisation and the experience level of investors was observed: less experienced investors rationalise more, experienced investors use more sources and rationalise less, but the most experienced investors go back to high rationalisation. This pattern has not been previously mentioned in the literature. It was also found that the investment strategy and information strategy are tied. A persona defines boundaries in relation to the investment process that are inherently also boundaries for the information gathering effort required. This concept of viewing the investment strategy as also inherently an information strategy is new.
This chapter served to compare and contrast the theory and findings developed by this study with theories, concepts and findings from previous studies. This enfolding of the literature was done as part of the research process described in chapter 3 and is also an integral part of the grounded theory methodology.

The discussion in this chapter grounded the theory within the literature. This was done by demonstrating where aspects of the findings in this study confirmed findings from previous studies and also where aspects of the findings in this study differed from those of previous studies. This highlighted the gaps in the literature and the contributions to the body of knowledge made by this study. These contributions will be further elaborated in chapter 8.
Chapter 8  Conclusions

This study has developed a new Theory of Online Investor Information Behaviour that provides a deeper and richer understanding of the information activities and Internet usage of stock market investors. The theory was the result of a qualitative study that involved interviewing twenty-six individual investors about their information practices and analysing the transcripts using a Grounded Theory methodology (Strauss & Corbin 1998). Viewing the data through the perspective of Information Behaviour made it possible to explore how online investors use the Internet in depth.

As online trading is now used by the majority of investors, understanding how they gather, use and share information is of major importance to service providers, regulators, researchers and to investors themselves. And yet, little is known about how individual investors actually use the Internet, with relatively few previous studies having investigated the actual information practices of online investors. The Theory of Online Investor Information Behaviour, developed by this research, helps to fill this gap.

This conclusion chapter summarises the research and shows how the resulting theory that was developed answers the research questions presented in chapter 1. Firstly, the essence of the Theory of Online Investor Information Behaviour is presented and how this theory answers the research questions is discussed. The contributions of this research to the body of knowledge are then highlighted. To conclude the thesis, limitations of the study are discussed together with a discussion of the implications of the findings to both research and industry and finally some suggestions for future research are made.

8.1  Essence of the Research

The essence of this research is encapsulated in the two models presented and described in detail throughout chapters 4, 5 and 6. These models are the Information Lenses model (Figure 4-1) and the Stock Investing Information Process model (Figure 5-1). These two models are reproduced together in Figure 8-1, and a brief description of each of the components follows.
Figure 8-1 - Essence of the Theory of Online Investor Information Behaviour - Information Lenses model and Stock Investing Information Process model
Characteristics of The Investor themselves influence their information behaviour, and these include attributes from their personal profile, skills, experiences and motivations. The Information World represents all the possible information sources, services and social networks available to the investor. Information sources are both online and offline, as are various forms of personal social networks.

An Investment Persona is a role an investor takes on in trading a particular stock portfolio. It is most influenced by the goal of the portfolio, the investment approach taken, the time frames involved and the market sector(s) of the stocks involved. An individual investor can have multiple Investment Personas and their information behaviour may be different for each of these. A number of persona types were identified in the study: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler.

An Information Lens represents the set of information entities that an investor draws upon as part of their investing information behaviour. The investor does not necessarily use all of the sources known at all times. Rather, they look through an Information Lens, seeing only a small subset of the information world at a time. The Information Lens is highly dynamic and is shaped by the current Persona and the task at hand.

The Stock Investing Information Process represents the steps that investors go through for each stock: idea generation, stock selection, company research, buy, monitor holdings and sell. Investors will often have multiple instances of this process occurring concurrently. The use of information sources, service and social networks can vary greatly depending on the stage of the investment process. While there is enormous diversity in the use of sources at early stages of the process, sources tend to be more homogenous at later stages.

Investors not only use the information world by seeking and gathering information, but are also themselves influenced by the changing shape of the information world. The Internet itself can affect the motivations of investors by making online investing a more interesting and exciting activity. New online sources and services open up new investing and trading strategies that previously were not possible or cost effective.

Investors can also be impacted negatively by the potential of information overload. Investors deal with this threat by controlling the volume and quality of information they deal with to a manageable level, using Information Rationalisation. As well as providing an investment strategy, Personas also provide a built in Information Strategy.
8.1.1 Research Questions

This section presents the research questions posed in chapter 1 and answers each question in light of the theory generated by this study, summarised in the previous section. The study sought to answer the following research questions:

**What drives the information behaviour of online stock market investors?**

The information behaviour of online stock market investors is driven by their various contexts. This includes the context of the Investor themselves, the context of the Persona they are taking on, the context of the task they are currently performing and the context of the Information World at that particular point in time. The factors that make up all of these contexts combine to shape the Information Lens that the investor is using, at any particular moment in time. This determines the information sources, services and social networks they use and how they use them.

**What information behaviours do online stock market investors exhibit?**

The information behaviour of investors is highly dynamic. Investors do not use all known sources at all times but instead look through an Information Lens, seeing only a small subset of the information world at a time. There is a wide diversity in the methods, information sources and social networks used by investors. Some investors conduct multiple forms of investing, taking on multiple Personas at the same time, and may switch between them at will. Investors follow the same general process (idea generation, stock selection, company research, buy, monitor holdings and sell) but with large variations in time and effort at each stage. Sources used are diverse in early stages of the process but are more homogenous in later stages.

**How is investor behaviour influenced by the information environment?**

Investors are influenced by the changing shape of the Information World. The Internet can affect investor motivations, making online investing more interesting and exciting. New online sources and services open up new investing and trading strategies that previously were not possible or cost effective. Investors can also be impacted negatively by the potential of information overload. Investors deal with this threat by controlling the volume and quality of information using Information Rationalisation. As well as providing an investment strategy, Personas also provide a built in Information Strategy.
What motivates online investors?

Online investors are, not unexpectedly, motivated to make money and/or generate an income. Beyond the financial aspect, they want to be in control of their own destiny and manage their own finances. Some are attracted to the intellectual challenge of beating the market. For some investors, online stock market investing goes beyond being just a financial activity. It is a substantial interest or hobby – a Serious Leisure (Stebbins 2009b). It can also be an activity or career to be continued during retirement - to keep the brain active.

8.2 Contributions of this Research

This section briefly highlights the contributions to the body of knowledge made by this research. As the context of online investing spans a range of disciplines and the theory developed brought concepts from these disciplines together cohesively, the findings from this study are relevant and make contributions to not only one discipline but to a range of research fields.

Theory of Online Investor Information Behaviour

While this is not the first study to investigate the information behaviour of online investors, it is the first to develop a comprehensive theory that explores information behaviour within the context of online investing in depth. This new theory describes the influences on online investor information behaviour in more depth than previous studies.

This theory also brings together concepts from a diverse range of disciplines in a cohesive manner. This allows the theory to potentially be relevant to multiple fields of research, including Information Science, Information Systems, Behavioural Finance and Serious Leisure.

Investment Persona

An Investment Persona is a role an investor takes on in trading a particular stock portfolio. An individual investor can have multiple Investment Personas and their information behaviour may be different for each. No previous study has recognised that one individual investor could behave as multiple investor types at the same time.

Investment persona types identified in the study were: Long Term Investor, Income Generator, Trader, Speculator, Venture Capitalist, Novice and Gambler. These different types of investment personas have not been previously identified and classified in this way.
**Stock Investing Information Process**

The Stock Investing Information Process has not been previously described in the literature. This model represents the steps that investors go through for each stock: idea generation, stock selection, company research, buy, monitor holdings and sell. The model describes a wide variety of idea generation methods not previously brought together under the new concept of Idea Generation.

**Information Lens**

The concept of an Information Lens is not entirely new, bearing conceptual similarities with Information Horizons (Sonnenwald 1999). The Investment Persona, however, adds an extra structural element somewhere between a ‘context’ and a ‘situation’ that describes the influences on the Information Lens in more depth, in the specific context of online investing.

The dynamic aspect of the Information Lens could be seen as an example of the Internet being continually re-invented (Diffusion of Innovations - section 2.3.4) and re-translated (Actor-Network Theory – section 2.3.5). It also contributes a deeper understanding of the Internet as a complex IT artefact (Orlikowski & Iacono 2001). This concept of continual re-invention may be a new concept that needs further investigation.

**Social Networks**

This study provides a new way of classifying investor social networks: private personal (offline) networks, private online networks, public online networks (stock forums) and private networks within public networks. While private personal networks and public online stock forums have been well covered in previous literature, this study contributes insights into private online networks and the discovery of private networks within public networks. This study also contributes new insights into what motivates investors to use online stock forums.

**Online Investing as a Serious Leisure**

Although this study is not the first to identify online investing as a serious leisure, only one other researcher has previously done so (O'Connor 2011, 2012). This study adds further weight to the findings from these two previous studies. This study contributes a stronger association between the aspects of online investing and the defining qualities of serious leisure and also provides the perspective of online investing being an important retirement activity or career.
Information World Influences on the Investor

Investors have a bidirectional relationship with the information world. The Internet can affect the motivations of investors by making online investing a more interesting and exciting activity. It can also enable new trading strategies that were not previously possible. These findings generally support the findings from adoption studies but go much deeper in explaining how investors are influenced by the information world.

The Investment – Information Strategy

Information Rationalisation is a new term introduced by this study, but the concept is based on bounded rationality and satisficing. A pattern in relation to the level of rationalisation and the experience level of investors was observed and this pattern has not been previously mentioned in the literature. Another contribution is that the investment strategy used in a persona is also inherently an information strategy.

Investor Characteristics

The findings related to investor’s investment skills, IT skills in relation to trading packages, use of domain knowledge and observations of the learning journey investors go through and their past successes and failures are all largely new.

8.3 Implications of this Research

This section outlines the potential implications that the findings from this study may have to all of the stakeholders in the context of online investing: researchers, service providers, regulators and to investors themselves.

The theory presented in this thesis provides new insights into the information behaviour of online investors that can be utilised in future research. As this theory brings together concepts from a range of disciplines, the theory has potential relevance and implications to a range of research fields, including Information Science, Information Systems, Behavioural Finance and Serious Leisure.
The concept of an Investment Persona is new and the idea that a single investor can have multiple investment personalities needs to be taken into consideration. Future studies should also take into account the contextual factors involved when investigating the information practices and behaviours of online investors. It is not enough to consider an investor as a single entity that always behaves in the same way at all times. The concept of a Persona, in general, may also have implications to other theories and models of Information Behaviour. Researchers in other contexts should consider whether individuals may be acting in multiple roles.

The Stock Investing Information Process provides a greater understanding of the process and tasks investors go through. These also need to be taken into consideration by future investigations into the activities of online investors. It cannot be assumed that information sources and activities reported by investors are performed throughout the investment process.

Researchers need to understand that online investor social networks go beyond what is publicly visible on social media platforms. Smaller private networks exist within these same public platforms, as well as private online networks between groups of individuals. Researchers questioning or surveying online investors about their ‘social network’ need to be aware of all the possible networks that investors may be thinking of when answering the questions.

Future research into online investing also needs to consider that investor goals and motivations are not only generated from the individual investor themselves but are also influenced by the online environment as it changes and evolves. As new online sources and services are created, they can potentially create new trading and investment methods that did not previously exist.

This study was able to explore system usage of the Internet by stock market investors in depth, by viewing the data through the perspective of Information Behaviour. Future studies from the field of Information Systems may also be able to utilise the many theories and models available from the field of Information Behaviour to enable them to explore system usage in greater depth.

A deeper understanding of the information behaviour of online investors can assist companies providing online services to investors, such as online brokers, to better understand their customer’s needs, provide them a better service and attract more customers. Service providers need to take into consideration the style of investing each investor is potentially performing and that the same individual may be involved in multiple forms of investment at the same time. Making assumptions about how investors select and monitor stocks may constrain investors from using a service in the way that best suits their approach.
Authorities that are charged with regulating securities markets need to ensure that markets remain informed at all times. To do this, they need a better understanding of the possible information flows in the new online realm and the impact these may have on investor behaviour, to determine if securities laws need to be updated. There also needs to be some consideration to the concept that just because information is released to the market does not necessarily mean it is absorbed by all market participants at the same time.

Finally, investors themselves may also benefit from the knowledge of all the different ways online investors gather information and communicate with others. This knowledge may open their minds to investment approaches and ways of communicating with other investors that they may not have immediately thought of themselves.

8.4 Limitations of this Research

As in all studies, this study has limitations which may affect the outcomes. To gain a deep understanding and have rich results it was necessary to choose a relatively small sample of individuals to interview. The theory generated by this study is therefore based solely on the interviews with the 26 participants. Being multiply grounded in both the data and the literature, the theory can be analytically generalised (Yin 2003) and has the potential to explain the information behaviour of other investors and also be used in other contexts. The theory, however, cannot be statistically generalised to represent the entire population of online investors.

The study was conducted in Australia and all of the investors interviewed invested in the Australian stock market. Only two participants had previously invested in other countries – one in China and another in India. The findings, therefore, may have been different if conducted in another country and culture.

The qualitative nature of this study makes the potential of researcher bias inevitable. While it is important to recognize the potential influence the researcher can have during the analysis process, awareness of this potential by the researcher and following a highly iterative and multiple grounding research process sought to minimize any potential negative biases. This issue is discussed in section 3.6.1.
8.5 Suggestions for Future Research

Future research could extend the findings of this study in a number of directions.

Firstly, the theory developed by this study could be tested with a larger population of investors using a survey instrument. This would seek to answer the question of whether the theory is statistically applicable to all investors. Key aspects of the theory developed are that investors can have multiple personas that operate concurrently and the information behaviour and information sources used can vary between personas, even for the same investor. Another finding was that information sources used vary widely during the stock identification stage of the investment process but by the monitoring stage all investors tend to look at very similar data. The study also found that investors are involved in different forms of social networks. While the theory developed in this study is analytically generalised from the investors interviewed for this study, it cannot necessarily be statistically generalised to the wider population of investors. A survey would allow this question to be explored.

A second direction would be to extend this research by investigating the information activities of different groups of investors, in depth. This could take the form of investigating professional investors or perhaps focussing only on active day traders. The findings could then be compared and contrasted with those from this study to see what similarities and differences there are between these groups and individual investors. Such findings could be incorporated into the theory and allow the theory to evolve analytically to be relevant to a more diverse range of investors.

Another way to extend this work would be to investigate the information behaviour of another online context to see how much of the theory developed in this study is transferrable between context domains. Potentially appropriate contexts would be activities that are complex and on-going, that can involve considerable financial commitments, are also serious leisure pursuits and have a substantial online component. Such contexts might include: serious collecting (coins, stamps, art), online travel, photography or even those involved in crypto currencies such as Bitcoin.
8.6 Chapter Summary

Stock market investment is a very large industry, with many millions of individuals investing substantial amounts of money. With the majority of these investors now online, understanding how they gather, use and share information is of major importance to service providers, regulators, researchers and to investors themselves. And yet, little is known about how individual investors actually use the Internet. This study helps to fill this gap by contributing a new Theory of Online Investor Information Behaviour.

The theory introduces a number of new concepts and models. An Investment Persona is a role that an investor takes on and an individual investor may take on multiple Personas simultaneously. The Stock Investing Information Process maps out the tasks investors perform: Idea Generation, Stock Selection, Company Research, Buy, Monitor Holdings and Sell. Investors do not use all information sources at all times, but instead look through an Information Lens, seeing only a small subset of their information world at a time, depending on the current Persona and the task at hand. The Internet can also influence investor behaviour, by enabling new strategies, making investing more interesting and exciting or potentially threatening the investor with information overload.
### Appendix A – Personas Table

The 37 Personas that were identified within the 26 participants are listed here, detailing the Persona Type, Investment Approach, Time Frame and Market Sector.

<table>
<thead>
<tr>
<th>Persona Name</th>
<th>Persona Type</th>
<th>Inv Approach</th>
<th>Time Frame</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pers 1</td>
<td>Novice</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>Blue Chip</td>
</tr>
<tr>
<td>Pers 2</td>
<td>Income Generator</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>Blue Chip</td>
</tr>
<tr>
<td>Pers 3a - ST Trading</td>
<td>Trader</td>
<td>Charts</td>
<td>Short</td>
<td>All</td>
</tr>
<tr>
<td>Pers 3b - LT Investing</td>
<td>Long Term Investor</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>All</td>
</tr>
<tr>
<td>Pers 4</td>
<td>Long Term Investor</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>All</td>
</tr>
<tr>
<td>Pers 5a - ST Trading</td>
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<td>Charts</td>
<td>Short</td>
<td>Futures</td>
</tr>
<tr>
<td>Pers 5b - LT Investing</td>
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<td>Fundamentals</td>
<td>Long Term</td>
<td>Blue Chip</td>
</tr>
<tr>
<td>Pers 6</td>
<td>Speculator</td>
<td>Word of Mouth</td>
<td>Short/Med</td>
<td>Blue Chip</td>
</tr>
<tr>
<td>Pers 7</td>
<td>Speculator</td>
<td>Charts</td>
<td>Short/Med</td>
<td>All</td>
</tr>
<tr>
<td>Pers 8</td>
<td>Speculator</td>
<td>Fundamentals</td>
<td>Medium</td>
<td>Small Cap</td>
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<tr>
<td>Pers 9a - Prof Mgr</td>
<td>Long Term Investor</td>
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<td>Blue Chip</td>
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<tr>
<td>Pers 9b – Super Fund</td>
<td>Long Term Investor</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>All</td>
</tr>
<tr>
<td>Pers 10</td>
<td>Long Term Investor</td>
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<td>Long Term</td>
<td>All</td>
</tr>
<tr>
<td>Pers 11</td>
<td>Trader</td>
<td>Charts</td>
<td>Medium</td>
<td>All</td>
</tr>
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<td>Med/Long</td>
<td>Blue Chip</td>
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<td>Professional Advice</td>
<td>Medium</td>
<td>Small Cap</td>
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<td>Word of Mouth</td>
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<tr>
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<td>Short/Med</td>
<td>Small Cap</td>
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<td>Pers 14</td>
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<td>Blue Chip</td>
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</tr>
<tr>
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<td>Blue Chip</td>
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<td>Fundamentals</td>
<td>Short</td>
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<tr>
<td>Pers 18a – Invest</td>
<td>Venture Capitalist</td>
<td>Fundamentals</td>
<td>Medium</td>
<td>All</td>
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<tr>
<td>Pers 18b – Gamble</td>
<td>Gambler</td>
<td>Online Word Mouth</td>
<td>Short</td>
<td>Small Cap</td>
</tr>
<tr>
<td>Pers 19</td>
<td>Novice</td>
<td>Fundamentals</td>
<td>Medium</td>
<td>All</td>
</tr>
<tr>
<td>Pers 20a - ST Trading</td>
<td>Speculator</td>
<td>Online Word Mouth</td>
<td>Short</td>
<td>Small Cap</td>
</tr>
<tr>
<td>Pers 20b - LT Investing</td>
<td>Long Term Investor</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>All</td>
</tr>
<tr>
<td>Pers 21</td>
<td>Novice</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>Blue Chip</td>
</tr>
<tr>
<td>Pers 22a - ST Trading</td>
<td>Trader</td>
<td>Charts</td>
<td>Short/Med</td>
<td>All</td>
</tr>
<tr>
<td>Pers 22b - LT Investing</td>
<td>Long Term Investor</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>All</td>
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<td>Pers 23</td>
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<td>All</td>
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<tr>
<td>Pers 24a - ST Trading</td>
<td>Trader</td>
<td>Charts</td>
<td>Short/Med</td>
<td>Small Cap</td>
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<tr>
<td>Pers 24b - LT Investing</td>
<td>Long Term Investor</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>Blue Chip</td>
</tr>
<tr>
<td>Pers 25</td>
<td>Income Generator</td>
<td>Professional Advice</td>
<td>Long Term</td>
<td>Blue Chip</td>
</tr>
<tr>
<td>Pers 26a - High Risk</td>
<td>Venture Capitalist</td>
<td>Fundamentals</td>
<td>Medium</td>
<td>Small Cap</td>
</tr>
<tr>
<td>Pers 26b - Div Paying</td>
<td>Income Generator</td>
<td>Fundamentals</td>
<td>Long Term</td>
<td>Blue Chip</td>
</tr>
</tbody>
</table>
Appendix B – Interview Questions

The interview questions asked of each participant are outlined below. The questions themselves evolved during the research process, as the theory developed and new concepts were uncovered from the data. The interview questions presented here were the most recent.

1. Background
   a. How long have you been involved with the market?
   b. How often do you trade and how much time do you spend trading?
   c. What style of investor / trader do you consider yourself to be

2. Pick a stock that you have bought in the past. Please tell me:
   a. How did you initially become aware of the company?
   b. How did you research the company before buying it?
   c. How did you keep track of your investment?
   d. What prompted you to sell it, if you have sold it?

3. Is that scenario typical of most of your trading? Can you think of different examples?

4. Has your approach and how you use the Internet changed over the years?
   a. Because you have changed?
   b. Because the Internet has changed?

5. On a typical day, how do you monitor the market? Where do you look for information?

6. Which websites and/or online services do you use and what do you use them for?
   Prompt for:
   i. Online broker
   ii. Company Website
   iii. Company information provider / prices provider
   iv. Online subscription newsletter & online newspapers
   v. Chat room
   vi. Online newspaper
   vii. Using email to communicate with other investors
   viii. Facebook? Twitter?
   ix. Any other investment related websites

7. Do you think there is too much information available or is it never enough?

8. Do you consider share investing to be purely financial or a hobby/interest?
   a. Would you still monitor the markets even if you were not invested?

9. If there was no Internet, would you still do what you currently do?
   a. Does the Internet make share investing more interesting, exciting, easier?
10. Personal profile:
   a. Age group
      i. 18-29, 30-39, 40-49, 50-59, 60-69, 70+
   b. Sex (M / F)
   c. Occupation
   d. Education level
## Appendix C – Ethics Consent Form

**RMIT HUMAN RESEARCH ETHICS COMMITTEE**  
Prescribed Consent Form for Persons Participating In Research Projects Involving Interviews, Questionnaires, Focus Groups or Disclosure of Personal Information

**PORTFOLIO OF**

Business  
Business Information Technology

**SCHOOL/CENTRE OF**

**Name of Participant:**

**Project Title:**

<table>
<thead>
<tr>
<th>Name(s) of Investigators</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Arthur Adamopoulos</td>
<td>(03) 9925 5782</td>
</tr>
<tr>
<td>(2) Dr Martin Dick</td>
<td>(03) 9925 5976</td>
</tr>
</tbody>
</table>

1. I have received a statement explaining the interview involved in this project.  
2. I consent to participate in the above project, the particulars of which - including details of the interview - have been explained to me.  
3. I authorise the investigator or his or her assistant to interview me.  
4. I give my permission to be audio taped: ☐ Yes ☐ No  
5. I acknowledge that:
   
   (a) Having read the Plain Language Statement, I agree to the general purpose, methods and demands of the study.  
   (b) I have been informed that my identity will not be revealed by this research.  
   (c) I have been informed that I am free to withdraw from the project at any time and to withdraw any unprocessed data previously supplied.  
   (d) The project is for the purpose of research and/or teaching. It may not be of direct benefit to me.  
   (e) The privacy of the information I provide will be safeguarded. However should information of a private nature need to be disclosed for moral, clinical or legal reasons, I will be given an opportunity to negotiate the terms of this disclosure.  
   (f) The security of the research data is assured during and after completion of the study. The data collected during the study may be published, and a report of the project outcomes will be provided to participants on request. Any information which may be used to identify me will not be used unless I have given my permission (see point 5).

### Participant’s Consent

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Participant)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Witness to signature)</td>
<td></td>
</tr>
</tbody>
</table>

Participants should be given a photocopy of this consent form after it has been signed.

---

Any complaints about your participation in this project may be directed to the Chair, Portfolio Human Research Ethics Sub-Committee, Business Portfolio, GPO Box 2476V, Melbourne, 3001. The telephone number is (03) 9925 5594 or email address eth@rmit.edu.au. Details of the complaints procedure are available from www.rmit.edu.au/council/hoec.
Appendix D – Ethics Plain Language Statement

INTRODUCTION
You are invited to participate in a research project being conducted by RMIT University in the School of Business Information Technology. This information sheet describes the project in straightforward language, or ‘plain English’. Please read this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please ask one of the investigators.

WHO IS INVOLVED IN THIS RESEARCH PROJECT?
This research is being conducted as part of a PhD program which is being undertaken by Arthur Adamopoulos. This research project has been approved by the Portfolio Human Research Ethics Sub Committee.

WHY IS IT BEING CONDUCTED?
This project is attempting to explore how share market investors use the internet, and other software, to conduct their investing. The data elicited will then be used, together with current information systems research obtained from the literature, to develop a model that will attempt to explain how and why investors perform various on-line and off-line activities.

WHY HAVE YOU BEEN APPROACHED?
Participants in this research have been invited to volunteer some time to discuss their investment activities. You may have been approached because you were already known to the researchers, or by a referral from someone you know that has already been interviewed, or because you have responded to a general public request for participants.

WHAT IS THE PROJECT ABOUT? WHAT ARE THE QUESTIONS BEING ADDRESSED?
The primary research question is: “How do individual share market investors use the Internet?” The research is looking to explore how and why investors conduct particular activities on-line (and off-line) and what information sources they make use of and why. It is also hoped that some guidelines can be drawn as to what works and doesn’t work in relation to on-line investing. It is intended that approximately 20-30 investors will be interviewed.

IF I AGREE TO PARTICIPATE, WHAT WILL I BE REQUIRED TO DO?
You will be asked to participate in a semi-structured interview, for approximately 1 hour. You will be asked to provide some background details about yourself and your involvement with share market investing. Most of the questions you will be asked will be related to on-line activities you perform in relation to your investing – what you do, how you do it and why you do it that way. You may choose not to answer any particular question. This interview will be recorded (audio only) and you (the participant) have the right to request that recording cease at

- 1 -
any stage during the interview.

**What are the risks or disadvantages associated with participation?**
There are no apparent risks in participating in this research as it only involves a discussion of your investing activities. If any questions may cause you concern, you are free not to answer them. You will not be asked to provide any financial or share trading records. If you (the participant) are unduly concerned about your responses to any of the interview questions or discussions or if you find participation in the interview distressing, you should advise the interviewer, that you either want to strike that discussion from the record or discontinue the interview. The researchers will discuss your concerns with you confidentially and suggest appropriate follow-up, if necessary.

**What are the benefits associated with participation?**
This research hopes to benefit both the field Information Systems and also millions of on-line investors by providing some guidelines for on-line investing. The researchers are happy to make available to you, the participant, any results, papers, and other outcomes from this research.

**What will happen to the information I provide?**
All recorded data will be transcribed and encrypted and archived. The transcribed data will be kept during the analysis phase of the research on the primary researcher's desktop computer and will be stored at RMIT in the School of Business Information Technology. A USB storage device will be used to backup the encrypted data, and stored in a secure place (off-site at primary researcher's residence). All the data will be kept for 5 years upon completion of the project, after which it will be destroyed.
The interview data will be treated in a strictly confidential way and will only be viewed by the researchers involved in this project. Any outcomes from this research will be of a general nature without any details of specific participants disclosed. Where a participant’s words are directly quoted in a publication, it will be with absolute anonymity.
Any information that you provide can be disclosed only if (1) it is to protect you or others from harm, (2) a court order is produced, or (3) you provide the researchers with written permission. If the data is required for some other purpose (other than use in this project), then permission will be obtained from the participants before use.

**What are my rights as a participant?**
You have the right to withdraw your participation at any time, without prejudice. You have the right to have any unprocessed data withdrawn and destroyed, provided it can be reliably identified and it does not increase the risk for the participant. Participants also have the right to have any questions, in relation to the project and their participation, answered at any time.

**Whom should I contact if I have any questions?**
The primary investigator (Arthur Adamopoulos – arthur.adamopoulos@rmit.edu.au or 03 99255782) or his supervisor (Dr. Martin Dick – martin.dick@rmit.edu.au or 03 99255976) should be contacted, contact details given previously.

Yours Sincerely

Arthur Adamopoulos
Master of Applied Science (IT)

Dr. Martin Dick
Doctor of Philosophy in Computing

Any complaints about your participation in this project may be directed to the Secretary, Portfolio Human Research Ethics Sub Committee, Business Portfolio, RMIT, GPO Box 243, Melbourne, 3001. The telephone number is 03 9925 5994 or email address rnhm@rmit.edu.au.

Details of the complaints procedure are available from the above address or http://www.rmit.edu.au/oce/Ethics.
Appendix E – Information Lenses Model TEAR OUT
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