Chapter 3
A Service-Oriented Approach towards Real Time Financial News Analysis

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ABSTRACT

In this paper we look at the difficulties which retail investors face to obtain all news which affects companies in their portfolio. We provide a high level overview of available financial news categories and sources, the different research strategies applied to the data, and the technical problems this raises. We propose a service-oriented system to enable real time financial news analysis which will reduce the time which the investor must spend searching for and interpreting relevant news.

INTRODUCTION

Advances in technology have dramatically changed the structure and nature of customer interactions with financial services. These changes have allowed individuals to take control of their financial dealings, without the intervention of financial intermediaries. This change is especially evident in the area of online securities trading, where the availability of tools and information on the internet has reduced investor reliance on financial planners, advisors and brokers. The tools that are commonly available allow investors to follow the markets for stocks, bonds and traded funds and manage their holdings of these assets.

Online trading is typically offered through a B2C portal model that provides trading services, often in combination with other financial products. These online trading portals have revolutionised the brokerage industry by offering low, flat rate fees...
discount commissions on stock trades, free online streaming pricing and quote information, online order entry combined with direct order execution. The ability of trading portals to offer direct order execution is a product of exchanges moving to electronic trading. Virtually all exchanges now support some form of electronic trading, which may be operated in tandem with an open outcry trading environment. These trading systems accept orders from online trading portals and provide quote and price information back to the trading portals.

Financial economists argue that prices in financial markets evolve through time in the following way: \( P_t = P_{t-1} + \varepsilon \). That is, that the current price of a stock is determined by the last observed price and the price impact of the “news” about the stock that has been released since the last trade. A common feature of all trading portals is the availability of price information, along with tools to analyse and chart the evolution of these prices. These portals often also provide investors with a news feed sourced from a financial news provider. Ideally investors need to develop a method that can convert the text based information in the news stories into a quantitative price impact measure, \( \varepsilon \), which can be combined with the history of prices to inform trading decisions.

**Consumer Requirements**

It is unlikely that every consumer will adopt the same news analysis strategy, and as such it is necessary to provide consumers with tools that can be tailored to their requirements. In this section we briefly outline the searching behaviours and typical problems faced by target users of a news analysis system.

A traditional Fund Manager has a long term investing strategy and therefore is not as concerned about receiving news from the primary source, but does need to acquire news from a reliable source (i.e., not from a news aggregator). Furthermore, they are unlikely to trust an algorithm to interpret news for them as they prefer the news to be interpreted by human domain experts (i.e., market analysts and/or fund managers). However, the sheer volume of news available makes it impractical for human domain experts to interpret every piece of news. Therefore they are more likely to utilise tools which help them filter news using keyword(s), and/or topic(s), to find the news which could affect stocks in their portfolio. Whilst they may use these tools to filter news in near real time, they are more likely to perform ad-hoc queries over an extended date range to investigate what happened after a similar story occurred in the past (Note: they are more interested in the mid to long term impact of news, than the intraday impact).

Quantitative Analysts/Developers working for hedge funds develop algorithms to trade in real time and thus can utilise news to gain an edge over their competitors. Therefore, they require news from the first source which releases the content to the market (i.e., not from a news aggregator which experiences inherent delays) and need tools to process the content in real time. Furthermore, they require large archives of news in full text format so they can perform text mining and produce trading models which can exploit historical trends between news and abnormal trading behaviour. It is easier for them to incorporate numerical information into their models, and thus they are the most likely consumers to utilise sentiment analysis tools. These tools generate numerical scores which indicate whether the author of the news had a positive or negative view of the company discussed in the text. It should be noted that these consumers typically would have no requirement to search the news database itself as they are not really interested in reading the content, simply training their models to exploit statistically significant trends in the news and trading data.

**Existing System Solutions**

Tools that are capable of performing complex news analysis, such as the translation of news stories...