

Digital Telecomms, PCs and the Internet

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Telecomms Becoming Digital

There is a better way to filter out noise and that is to concentrate on the technical data that is provided by the Stock Exchange. Again it is necessary to filter this data so that you only work on the data that has the highest opportunity for returning your invested time and effort. In other words, you need to filter the data, and this is where computers can do a huge amount of work for you in a very short time.

Yep, before the days of hand calculators and personal computers, we did these averages in Maths in Secondary school, using direct addition and long division. (In those days even slide rules were not allowed then in class as they provided an “unfair advantage to some students!”)

There were (and still are) so many applications for calculating and applying averages in all types of industry and business situations, but our teachers had ‘subject’ blinkers on and never were able to tell us why we had to learn the method, how to apply it in practice and what the pitfalls were in application. There is a lot to be said for rotating teachers and industry / business people on a very regular basis – like conscription!

In my professional career, I was one of the “lucky” ones that had a Personal Computer (PC) of sorts on my work desk in 1976. This computing power was several years before the first IBM-based PC came on the market, and this was not your regular Personal Computer! This was an HP 9825a Instrument Controller¹ as shown below.



This instrument was far more an Instrument Controller than anything else, in fact there was no word processor application on that computer – apart from a text / program editor, and the display consisted of a single row of 32 segment LEDs – no screen. This was however, cutting edge silicon on sapphire, 8-bit technology.

This instrument controller, its associated Impact Printer, Graph Recorder and several Interface Plug-ins in total cost about as much as a suburban Sydney house at that time! This mini-computer provided an extraordinary advantage in local programmed

¹ www.hpmuseum.org/hp9825.htm

number crunching, and my maths prowess launched like a rocket as the horizons rapidly expanded!

One of the instruments it controlled was a Graph Recorder, so it didn't take more than a couple of days and I was plotting service reliability results – and I didn't have time for the vast analysis applications in the Stock Market till some two decades later!

Computers excel in analysing data, and turning this data into meaningful information, but the problem is which data? The standard answer is End Of Day (EOD) data! But there were many questions that had to be resolved before this became practical.

But from where, and how was the data to be transported? In the mid 1970s, data transfer was almost unheard of as modems were still in their infancy and it was not uncommon to physically transport magnetic tape disks instead of using wideband data interfaces. In those days, 1200-baud modems were the leading edge technology of the time and Internet had another decade to develop and grow before it became reality in businesses and homes.

By 2003, with Internet now very mature, but really only readily available in capital city areas of Australia; it was all too easy to log onto a data provider, download the end-of-day (EOD) data, merge that data with the existing history, perform automatic name changes and share splits and this is almost always automatic!

In the 1980's in Australia, the telephone switching companies got wise and changed their manufacturing from analogue techniques to digital techniques, resulting in global design philosophy with greatly reduced manufacturing costs (and immensely reduced maintenance requirements too).

These new switches had the facility to switch digitally based long distance (long haul) transmission, and this opened the door to much cheaper and faster data transmission speeds, and a range of higher data rate digital services that could not be inexpensively provided using analogue technologies.

Economically, the operational costs really plummeted so profits should have really soared but they didn't because but in the meantime, the Australian Federal Government of the days introduced telecommunications competition into Australia.

The new immense overhead costs of competition to a very large degree plateaued the end user costs as the then Telecom Australia's Engineers and Technicians were largely replaced by Marketing Lawyers, Sales Consultants and extremely expensive and rather useless advertising campaigns.

By the 1990's data modem connected Bulletin Boards were created and these were early applications of the Internet Protocol. This in turn opened the door to facilitate data downloading and that was the secret to providing daily downloads of stock exchange data to homes (and not just big business).

These sequential technology breakthroughs paved the way for practical Technical Analysis on PCs from the mid 1990's onwards.

Sampling and Saving Electronic Data

In the world of Electronics, the standard interface between analogue and digital techniques is often done with electronic “Sample and Hold” circuit, and a counting circuit. The analogy of using the stock exchange’s High, Low, Open or Close prices is very similar to an electronic interface between analogue (continuously moving in time) electronics and digital (quantum values clocked in time) electronics.

In electronics, an analogue sample of the “amplified” or “conditioned” signal (usually as a voltage) is switched to hold a charge in a small capacitor. The charged capacitor is then switched into a circuit where the held charge is transferred. The sample and hold cycle then repeats itself on a regular clocked basis.

Similarly, an oscillating analogue waveform is usually counted over a specific time and that could be transferred as a digital value into digital electronics. These analogies in electronics are extremely similar to what happens in the stock market and how trade data is transferred into end of period data.

The beauty of these “Sample and Hold” circuits is that “time stands still” while the measurement is taken, and once the measurement is taken it can be saved “forever”. In electronics, the usual clocking rate is usually in the order of the MHz to GHz range, so this process can be very fast!

End Of Day Data and Brokers

We use the same principle as the “Sample and Hold” technology with the stock exchange with EOD High, Low, Open or Close prices. These prices and other values are held by the Australia Stock Exchange (ASX) and recorded as historical End of Day (EOD) data! The ASX took on a bulk provider approach to EOD data, and made this data available in a very restricted format, primarily for its Stock Exchange business partners.

So, EOD data was available in a limited fashion. EOD data was in the following day’s newspapers, and available from the various full price brokers, and that was about the limit of ready availability apart from an update on the ABC radio news at about 2 pm at least into the mid 1990s.

As Broadband Internet became available in the mid-1990s, the world of full priced Brokers came crashing down. These businesses were living in a dream where the typical charge for brokering a trade through the ASX cost about \$500 or about 2% of the deal, whichever was greater. So they never really worked hard to earn a very considerable income, and it was a rather closed shop to the outside.

Three stages of technology development came in rather quick succession. Firstly the trading floor in the ASX went electronic with the CHES system in 1993. Secondly the EOD prices became readily available as a bulk / wholesale product at about this time and Paritech purchased the non-exclusive rights to on-sell the EOD data over the Internet. Thirdly, on-line trading seats became available over the Internet, and companies such as E*Trade and CommSec sprung into being, with brokerage costs far lower than with the full priced brokers.

The great Brokerage rip-off holiday was over and many Stock Brokers simply went out of business in the next few years. Other Stock Brokers merged to minimise their overheads, and others merged into various banking interests.

To get an example of how devastating the Internet was to the Full Priced Brokers was, consider that these trades included a State-based stamp duty of about 0.3%, and this was halved in 1995. With the introduction of national GST the state-based stamp duty was abolished. Now also consider that the on-line brokerage was about 0.1% or about \$30 depending on which was greater. Compare that to the Full Priced Brokerage of about \$500 or about 2% whichever greater and it was no wonder that the Full Priced Brokers hit a brick wall of miniscule sales and went out of business.

So by about 1995 we in Australia had retail available EOD data available from Paritech and other retail providers, for loading into a Personal Computer (PC) in the MetaStock Format, (and other data storage formats) and the ability for PCs to run elaborate programmes that could identify the change in trends with security prices. This then opened the path for better analysis techniques, and higher trading rates.

Filtering Out the Trading Noise

A filter is a form of sieve that passes the product that you are looking to process, and (hopefully) rejects all the rest. News from the TV and radio are usually pre-sieved so that we hear the news stories from a particular point of view – usually to assist the commercial programme of companies/businesses sponsoring the broadcasting business. A “newsworthy” item always has a price tag attached in some form or another. Sad – but true!

In reading the paper or watching the TV for Financial News, much of the noise is already reduced, because the news tends to concentrate on a few of the big name shares and generally only gives either the closing price or that change from yesterday’s close till today’s close, and sometimes a very brief sentence or two about a companies initiative or predicament.

Sometimes it is better to miss out on this news entirely, and get the source that provides all the data and it is then up to you to filter out the “news noise”! As said before, a filter is a tool that hopefully rejects the data that is not to be used in further processing.

In this case, the radio, TV and other business influenced news is often so contaminated that getting the required financial data is a very slow and laborious task and simply this approach has a very low strike content.

At this stage there are two paths that need to be considered and the first area to be covered is found in Rocket Science engineering! (Where else?) When it comes to Rocket Science, the associated strain from Pure Maths is called “Control Theory” and this is all about calculating an output through a system from a known input.

The problem with trying to analyse stock exchange price movements is that they are random, but have a bias, and we need to apply clean inputs to our indicator tools so that we can analyse exactly what they are doing, and that way these tools give their indications.

What we need to do is to apply a known stimulation to the filter and see the result. This can be done with stock market prices, but in the pure sense of mathematics, they strictly are not repeatable, so mathematical equivalents to ‘turning on a switch’ and the like are imperative.

A Typical Candlestick Chart

The graph below uses EOD data to make a visual representation of a share price with an application program – in this case MetaStock. There are several other Stock market based applications that can graph stock exchange based data. Some do it better than others, and others do it worse – but none do it properly – to date!



In the Stock Market, last price for normal trading is referred to as the Close Price and this is in-effect an approximate value that is held and used for personal processing, or to cause some later activity, like Buy or Sell, or Hold!

Why choose the Close prices? Because they are readily available, and they are by far the longest held till the next sample. The next day, the weekend, even a “long weekend”! Is it an accurate reflection of the total days trading price? No! In my opinion it can be very substantially improved upon.

The problem is that we need to see the general picture without the ‘noise’ and the Close prices are bobbing all over the place as time changes, like pellets from a scatter-gun, and that makes it difficult to analyse! The plan is relatively simple! By concentrating on the Close prices, and merely graphing them, the picture becomes much cleaner, but it fluctuates with time like watching the start of a big marathon race!

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