

Introduction to Algo Trading

As the saying goes: The journey is the destination! In this journey of quant...um leap, we will take our readers in the world of finance as viewed by a mathematician. Quantitative approach to finance is as old as the field of finance itself. Quant believes in the underlying philosophy that numbers, their analysis and interpretations goes hand in hand. This is the first of the several parts of quant...um leap articles which will help you get your feet wet with the introduction to one of the most talked about subject in the field of quantitative finance today called Algorithmic trading.

I very distinctly remember, the year was 2007 and month was August. The biggest trader at our 300 Mn. Dlr. Prop desk in Merrill Lynch Tokyo office was losing 2 Mn. dollar every day and was in red by over 8 Mn. Dlr in 4 days, before he could hit the panic button and get out. The tremors was felt everywhere from Goldman Sachs Alpha fund to Renaissance Medallion fund. Quant traders and portfolios were punished globally for being too lackluster, too widespread and too many players sailing the same ship. The aftermath of this tremors gave birth to high frequency or Algorithmic trading, as investors begin to shy away from holding portfolios overnight and started getting into – quick get in and get out mentality.

Algorithmic trading as we know of today, amounts to over 67% of the total volumes traded in US. In Europe this figure is about 45% and in Asia about 25% and growing the fastest. Not only the volumes, but profits are mind-boggling too. TABB group in US reported that in 2009, the top 300 Algorithmic trading firms made more than USD 21 Bn. in profits! Whenever, I talk to my engineering background friends, in any major I-Banks today, their assignments very closely replicates making whole or part of Algorithmic trading platforms, which are being heavily funded by I-Banks and hedge funds globally to compete in the marketplace.

So how does one start getting into the sea of Algo trading? Well first things first, this is no rocket science. Traders, across India have been doing Algo Trading “manually” for over a decade now. Simple rules, when followed with 100% discipline gives rise to Algo trading. Morgan Stanley, back in 1970’s followed a simple rule. They would sell 1 dollar of Ford shares for each dollar of GM shares they bought whenever there was a relative distortion in the share prices of the 2 stocks. They would play on the rule that Ford and GM both being car manufacturers should move in tandem and hence any short term distortion in their prices would be a temporary effect and they should mean revert back to their long term relationship of moving together. This simple rule, became the cornerstone of statistical arbitrage, one of the most widely used Algo trading strategies globally.

Traders form rules, with years of observations in the market. Algo trading merely automates and makes them disciplined so that statistics takes over emotions – when the rule needs to be followed next time in the marketplace. The rules stems from widespread know-how of technical trading, may be charts, may be simple observations like Nifty having a uni-directional trend in the last 1 hour of trading etc. There is no defined code or logic regarding what the rules could be – but hey! A word of caution – the simpler the rule is the better would be Algo trading strategies. Problem often is that people from mathematics and Ph.D backgrounds tends to miss out on simple and finer details and gets into complex mathematical formulas – but a trader who can see his charts and identify simple buy and sell rules – tends to get an upper hand. The reason is not very hard to imagine think of why Apple’s iPad was a huge success and Windows Tablet was a dud! Intuitive and simple strategies are easy to understand, easy to code, easy to manage and easy to monitor on a day to day basis thereby paving way to more profits in the real world.

Introduction to Algo Trading

No introduction to Algo trading is complete if a person does not know what the end-goal of implementing an Algo strategy is. I meet a lot of clients, who wants to set an Algo desk, since that's the buzz-word without knowing what would be the final outcome. There are people on other side of the spectrum who clearly defines their goals – I want to make Rs. 30,000 per day or I want to manage a portfolio of 1000 Cr. with a 12% alpha on top of Nifty Index etc. As long as a firm or individual is not clear what he wants an Algo strategy / desk to do, he cannot find the right mix of team, infra set-up etc. to meet his ends. Billions of dollars are spent in waste R&D by firms globally, in search of the next Archimedes principle when what they really need is a Newton's theorem to meet their end goal and not an Archimedes principle...oops!

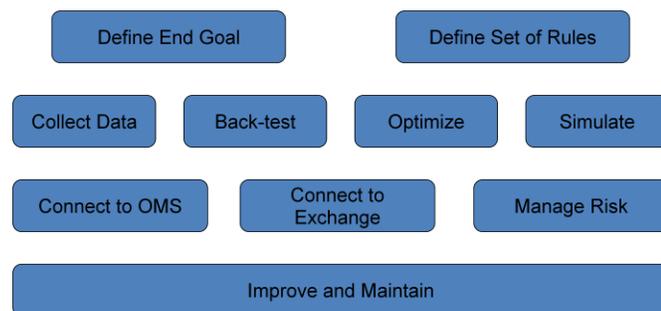


Fig: This is how I build my Algo Trading Engine

Algo trading, is often a disciplined science – and not only the trade executions but even the model development has pre-defined steps. Here I re-iterate, everything stems from defining first the end goal. Once we know the end-goal, making trading rules around them becomes simpler. For E.g. if we know that we want to make Rs. 30,000 everyday then we need to have a high frequency trading model, which can open and unwind trades within seconds or minutes and we should square off all our positions within the day. We also know that we might have to do several small trades may be 50 to 100 trades each making Rs. 500 –

Rs. 1000 on an average for us to achieve the goal. Then comes the 2nd step which is to define the exact rule. If we are playing for trending market then maybe we are looking for MACD crossovers every 5 min. to enter into the positions etc. Thirdly, I would like to collect 1 minute data of several assets like Nifty Index, Gold, Crude etc. over the last few years and back-test my strategy to see if my goal is being achieved. I might also want to put additional filters – to shave-off loss making trades to increase my chances of success – a process called as Alpha generation in Algo trading. Then comes the critical steps of risk management and money management. And last but certainly not the least is the simulated trading and developing the trade execution engines for going live.

Algo trading is a vast field and I am afraid that covering all the steps in this article might lead a large jig-saw puzzle. Hence, as an introduction the main purpose of this article was to make Algo trading look simple, make it sound intuitive so that everyone from day-traders to I-bankers can make sense of what is going on in this field and might consider it as a simple yet elegant methodology to create long term wealth.

The Quant...um leap journey will continue in the coming months with more sections, more insights and more leaps... Let the journey be the destination

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About Samssara Capital Technologies LLP

Samssara Capital Technologies LLP (“Samssara”) is an investment solutions firm focused solely on developing automated algorithmic and quantitative trading and investment strategies. It was launched in 2010 by a team of IIM Ahmedabad and IIT Bombay graduates - Rajesh Baheti, Manish Jalan and Kashyap Bhargava. Samssara caters to its clients' needs of providing an alternative asset management vehicle, with the focus on 100% automated and quantitative trading strategies.

Samssara’s products vary from pair trading (statistical arbitrage), factor models, Nifty Index beating products to very high frequency trading strategies. The team at Samssara works on mathematical models and statistics that identify repetitive patterns in equity, commodity and currency markets. The addressable market for Samssara is global - as the firm can develop and build models which can function in both developing markets with limited competition and developed markets with strong competition. Samssara’s client base includes the leading international and domestic banks, international and domestic stock brokers, family offices, corporate treasuries and HNIs.

Profile of Manish Jalan

Manish Jalan is the Chief Strategist and Director of the Algo trading firm Samssara Capital Technologies LLP. Prior to his new found Indian venture, Manish was a Quantitative Prop Trader in Tokyo, with Merrill Lynch Prop Desk handling USD 100 Mn. portfolio. Manish has worked closely with many Indian brokers and numerous International banks in algorithmic trading, trend following strategies, statistical arbitrage, factor modeling and back testing. Manish is a B.Tech and M.Tech from IIT Bombay in Mechanical Engineering.

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