Version: 1.07

Date: May 05, 2014

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1. PURPOSE

Market Scanner is intelligent price trend prediction software which is based on popular 24 technical studies. Further it drills down to each technical study and gives you simple meaning of the indicator's present state which could be Buy, Sell, High or Low Volatility, Overbought, Oversold or Neutral.

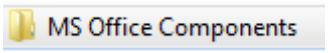
Presently it can scan more than 100 stocks including CTSH, 27 Forex currency pairs, 2 Futures and 3 Indices. It automatically filters out risky instruments and prepares a watch list for the safe trending instruments. Further it provides you buy or sell signals for the safest trades / instruments.

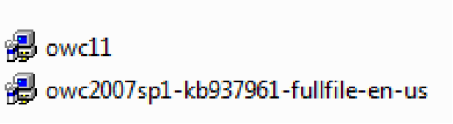
Market Scanner gives you Fibonacci Support, Resistances and Pivot points which you can use for entry and exit from the Market. Market Scanner has all potential to work as an essential tool when you trade short term intraday.

Please note this application is developed for education purpose only and should not be used in live trading.

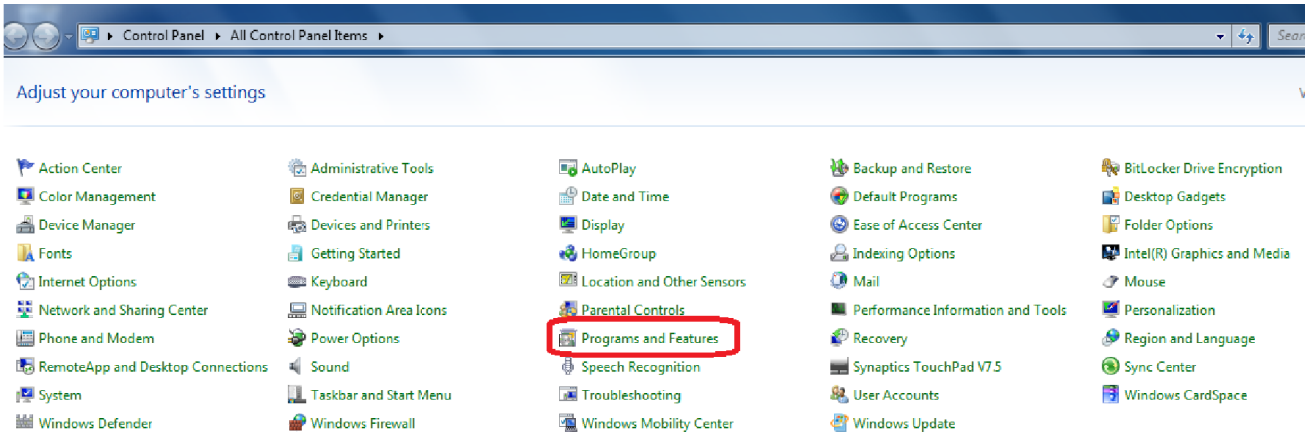
2. Project Specification:

Development Environment	Description
Languages	**VBA**
Project Type	**Office Automation –** MS Excel 2007 Add-Ins. **Windows –** Windows7 Ultimate.

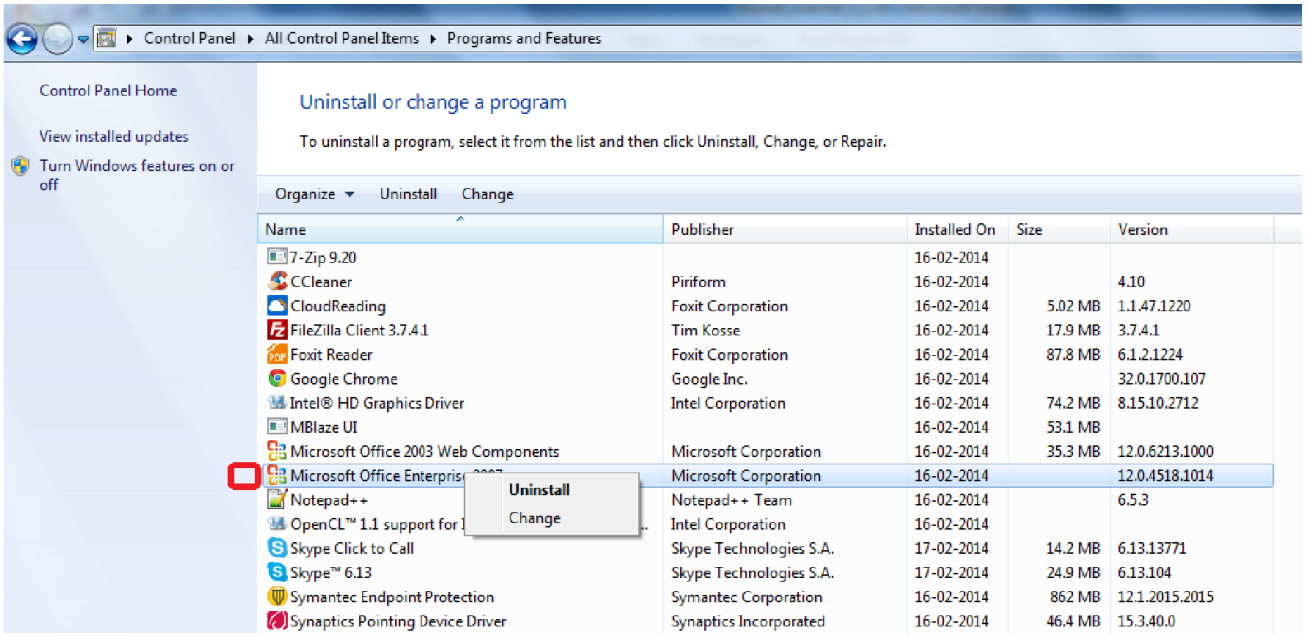
3. Install OWC (Optional): Open the folder 

you will get two OWC files, install **owc11** file first then install owc2007sp1 file. 

4. Installing Full components of MS Excel 2007

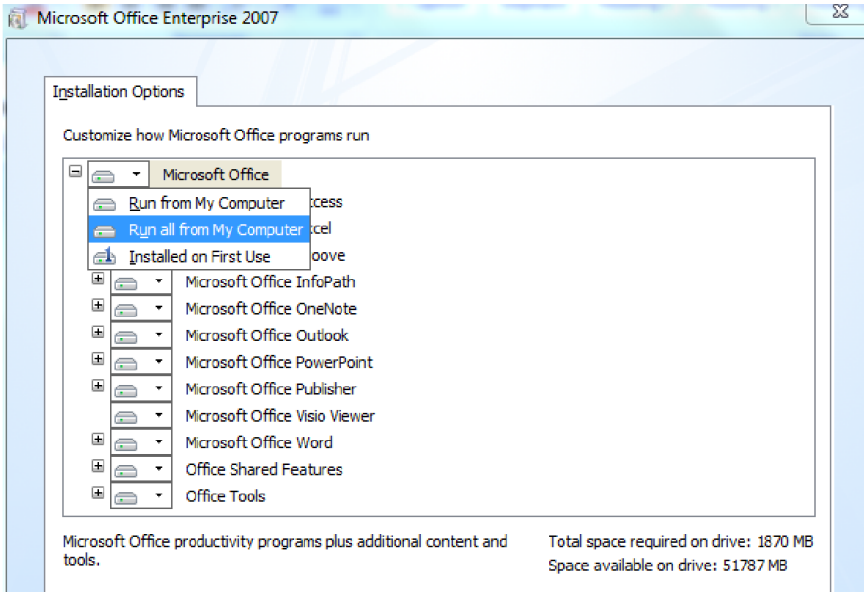


Go to Control Panel → Programs and Features → Right Click on Office → Change



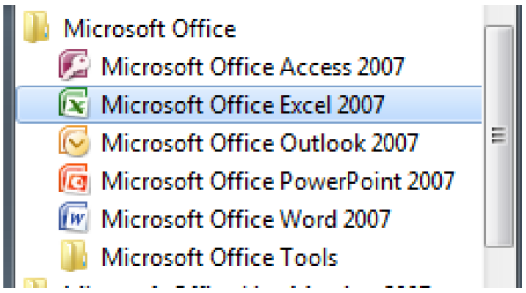
Add or Remove Features → Continue

Microsoft Office → Run all from my computer → after installation, restart the system once.

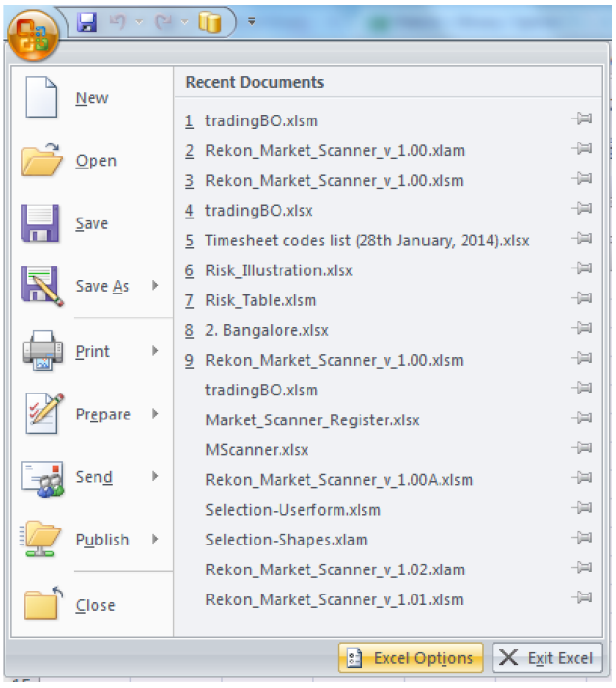


5. **Enable Macro:** Before deploying the application we need to enable the Macro Option in the User System. Please follow the following Steps to enable the Macro.

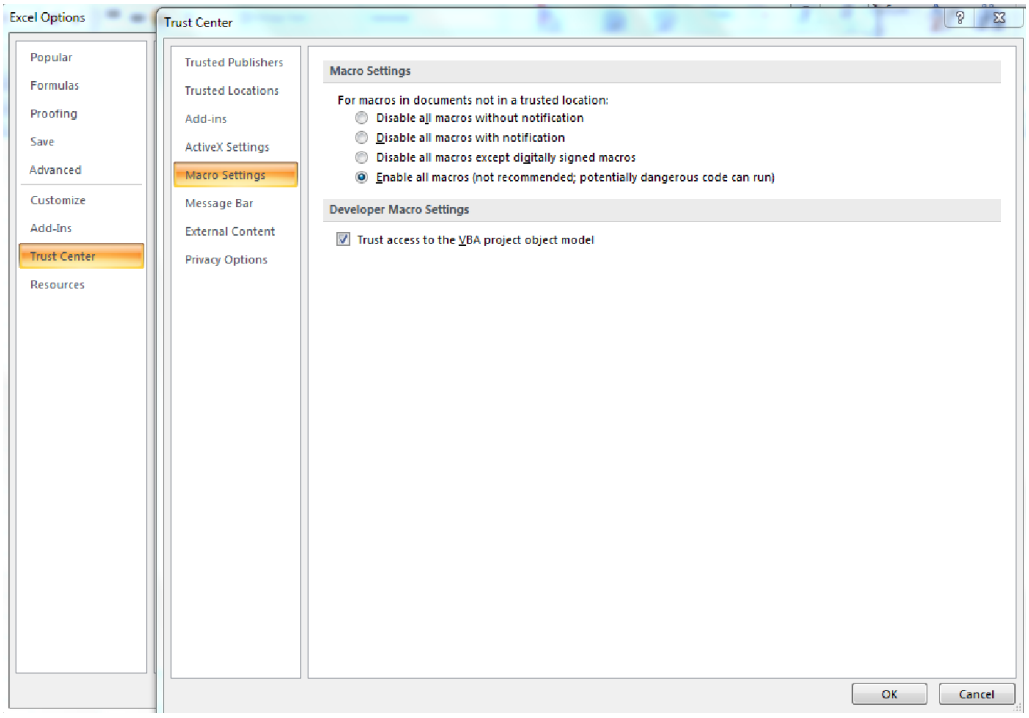
   a. Open the MS Excel 2007 Application



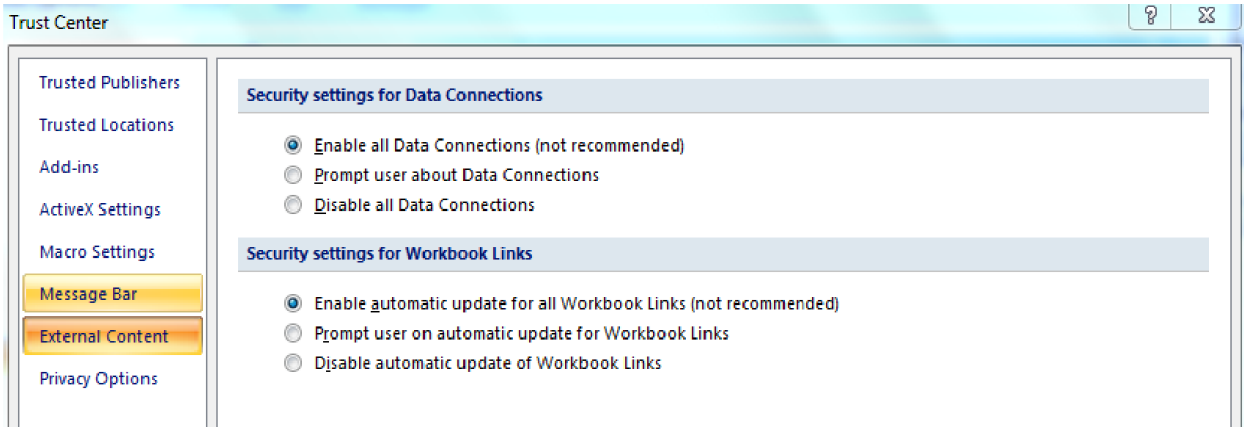
   b. Click on the Office Button and choose **Excel Options.**



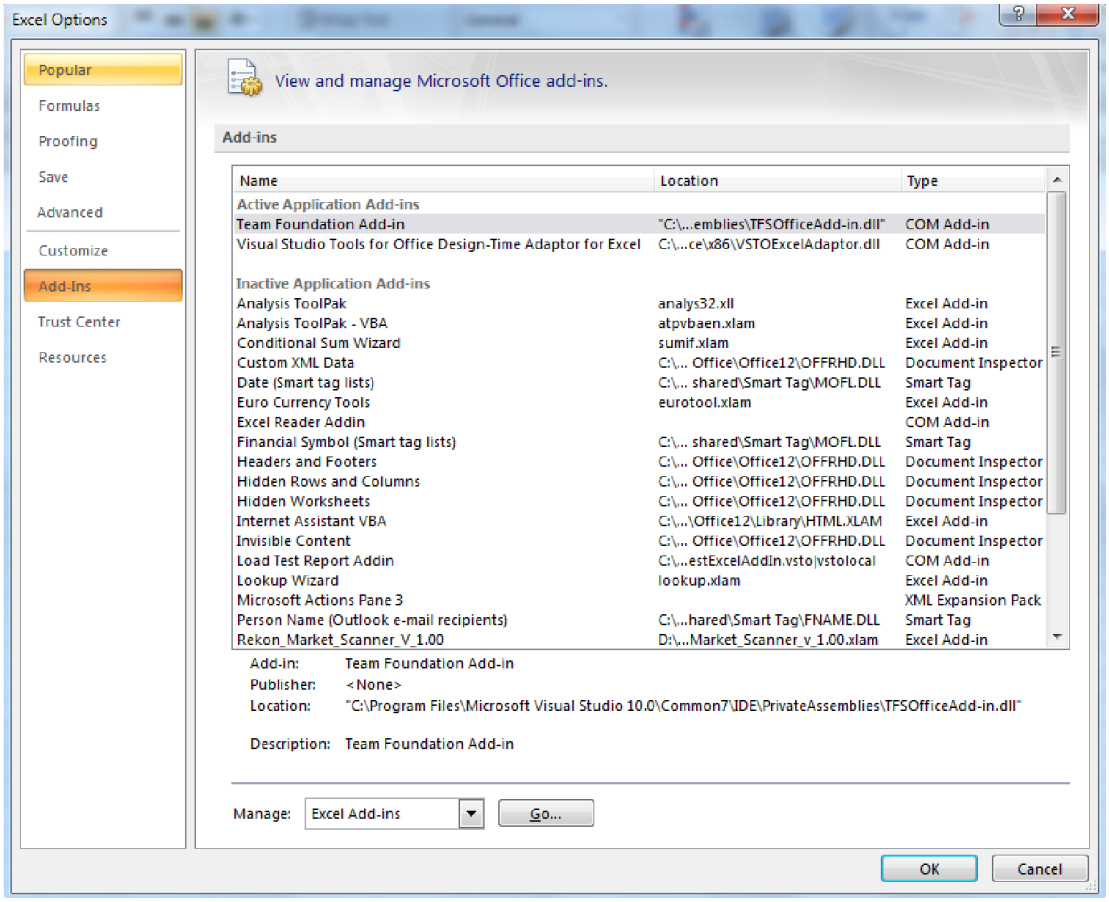
   c. Then go to **Trust Center, Trust Center Settings.** In the **Macro Settings** choose **Enable All Macros.**

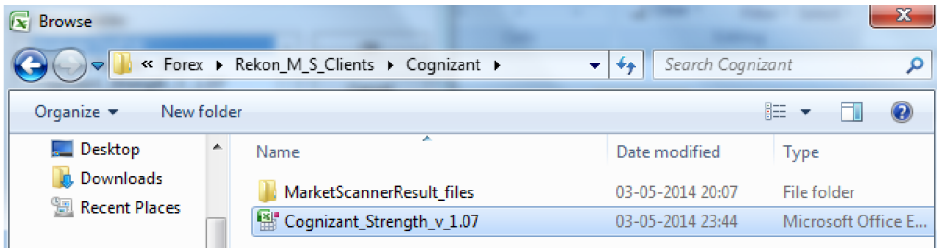


d. Enable External Contents for uninterrupted data connection.

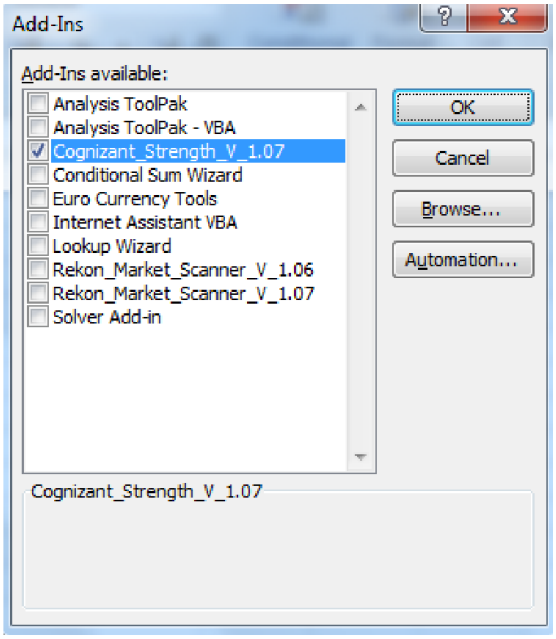


e. **Click Add-Ins. Click on "Go". Click on Browse.**

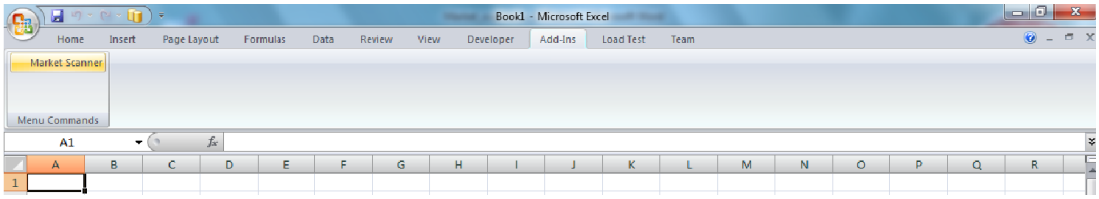




f. **Click Cognizant_Strength_V_1.07 from available Add-Ins. Click on Ok.**



g. **You will find an additional ribbon "Add Ins". Click on Market Scanner.**



6. **Removing Add-Ins:** To remove the Market Scanner Add-Ins from MS Excel just follow the steps as instructed below.

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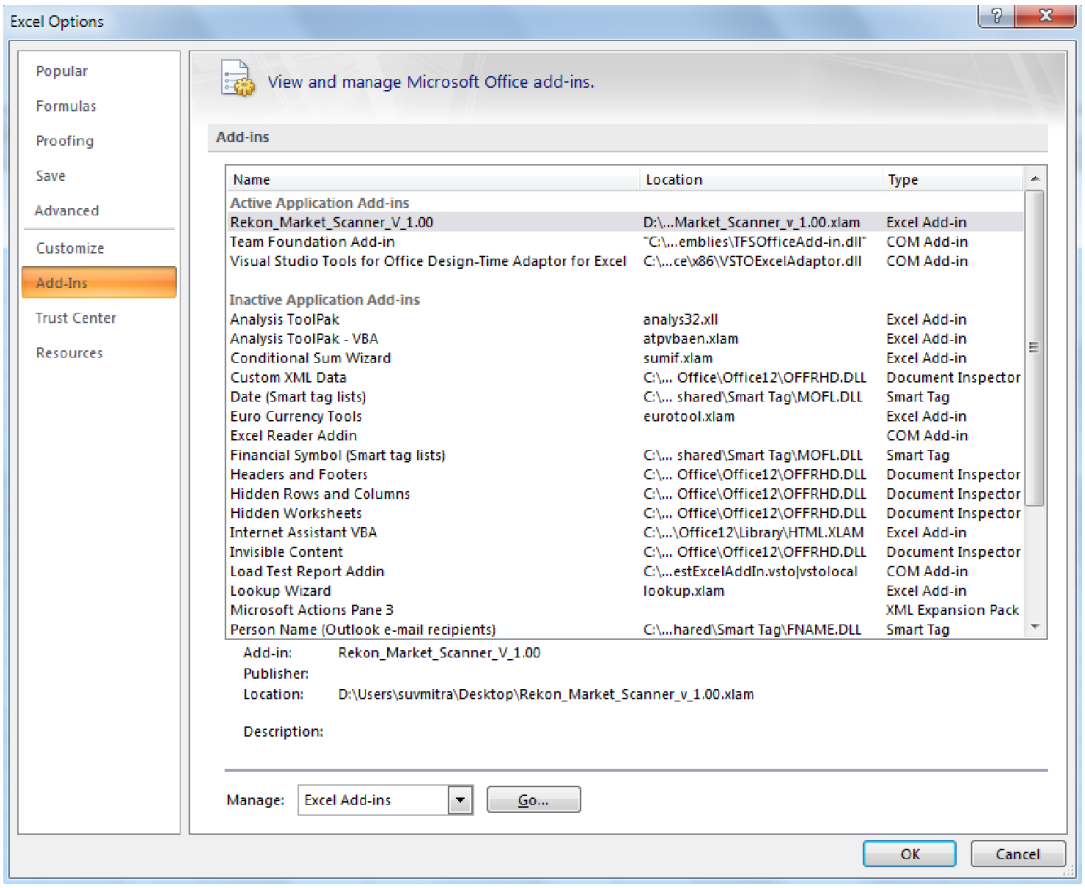
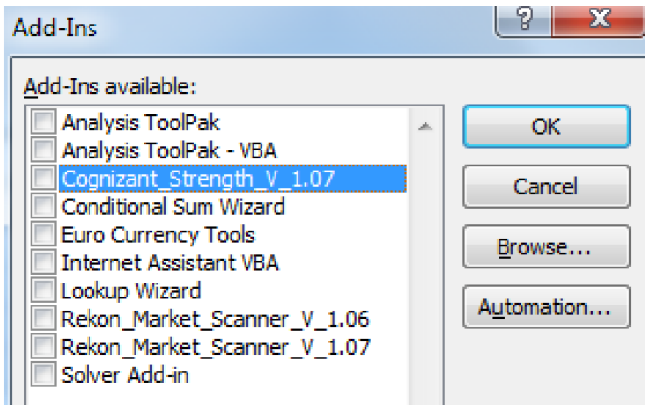
A. Excel Options →Add-Ins →Go



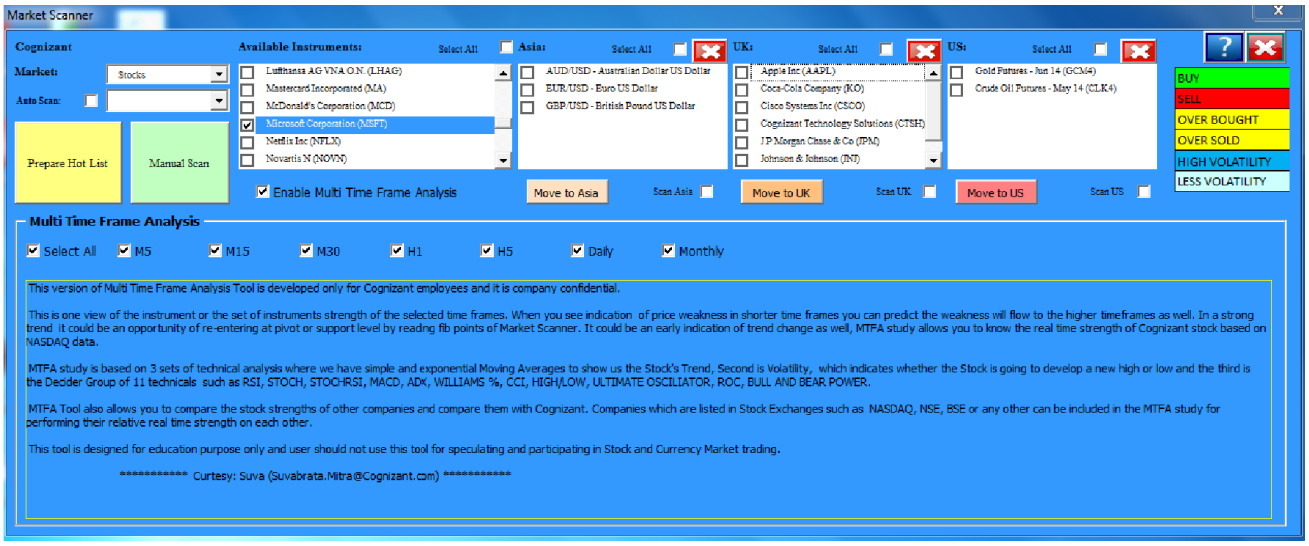
B. Check Off the Add-Ins →Ok



7. **User Activation for Market Scanner:** Market Scanner validates your "User Activation Status" every time you initialize the application. In case your copy of Market Scanner informs you about the "Activation status" or "Expired subscription status", you need to contact the Admin (suvabrata.mitra@cognizant.com).

8. **Internet Connection for Market Scanner:** Market Scanner requires a High Speed Internet connection. In case of No internet or too slow internet, you will get alert from the application and application will terminate itself.

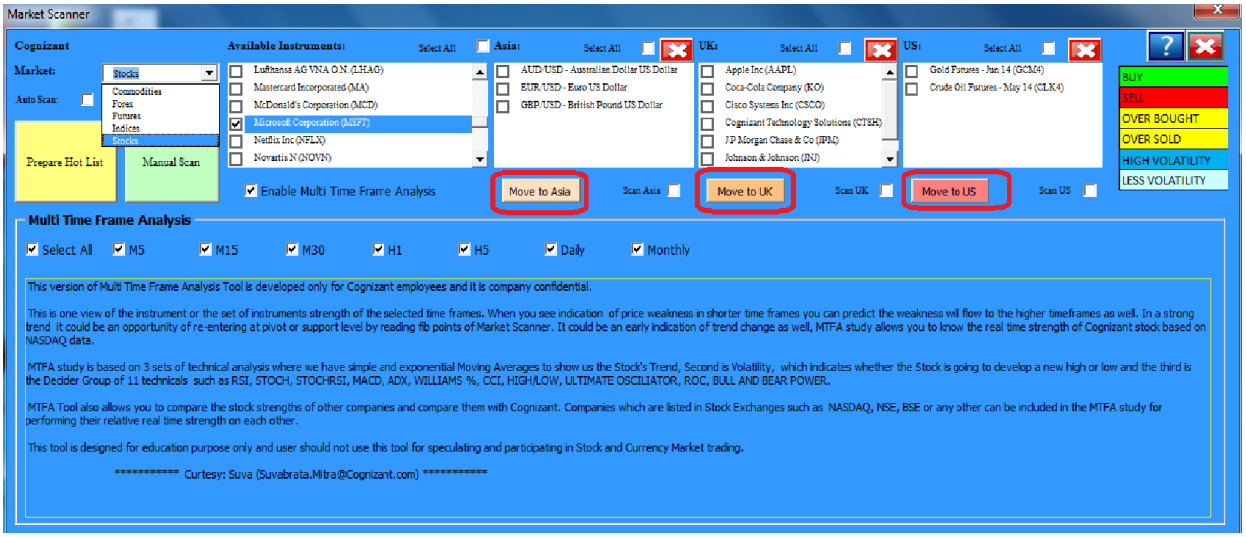
9. **Live Signals from Market Scanner:** Once you successfully set up the system and you are good up to the point 8, Market Scanner is ready for you to provide real time signals for 100 plus stocks, 27 Forex currency pairs, 3 indices and 2 futures!



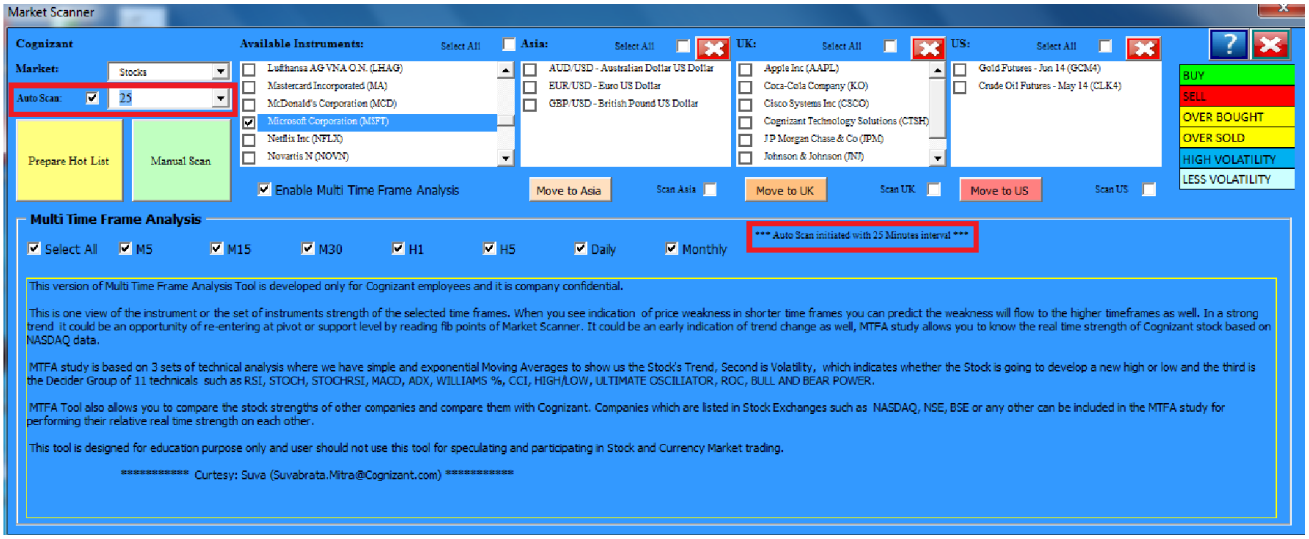
9.1 Preparing your trading portfolio:

A. Creating Portfolio for Trading: Stock market is open for 24 * 5 days in a week and it has 3 major sessions Asia, UK and US, Market scanner allows you to create different portfolios for these sessions so

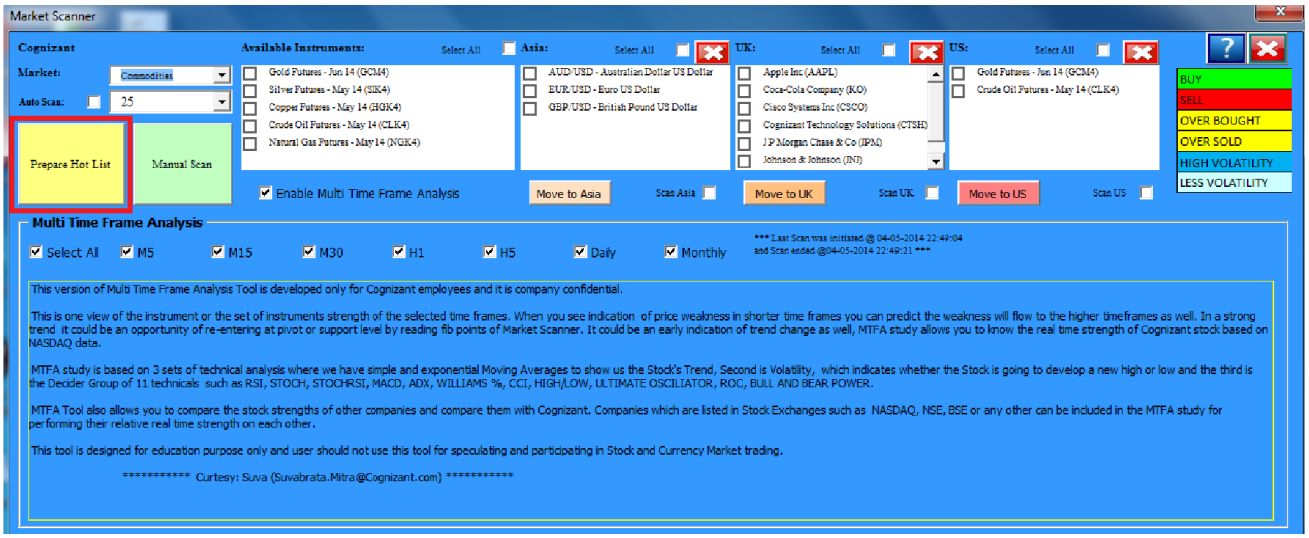
that you can save and trade you favorite instruments without wasting time.



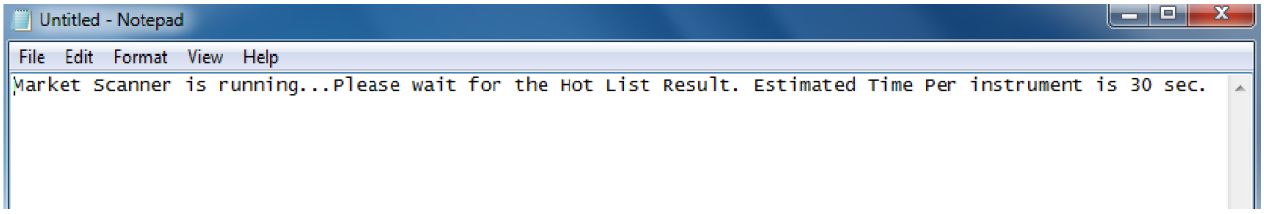
B. Set Auto Scanning "ON": You can set auto scanning "on" and set a time interval for refreshing analysis automatically.



C. Prepare Hot List for trading: This prepares a report based on “Price Action” and only shows you the best instrument for trading at the moment.



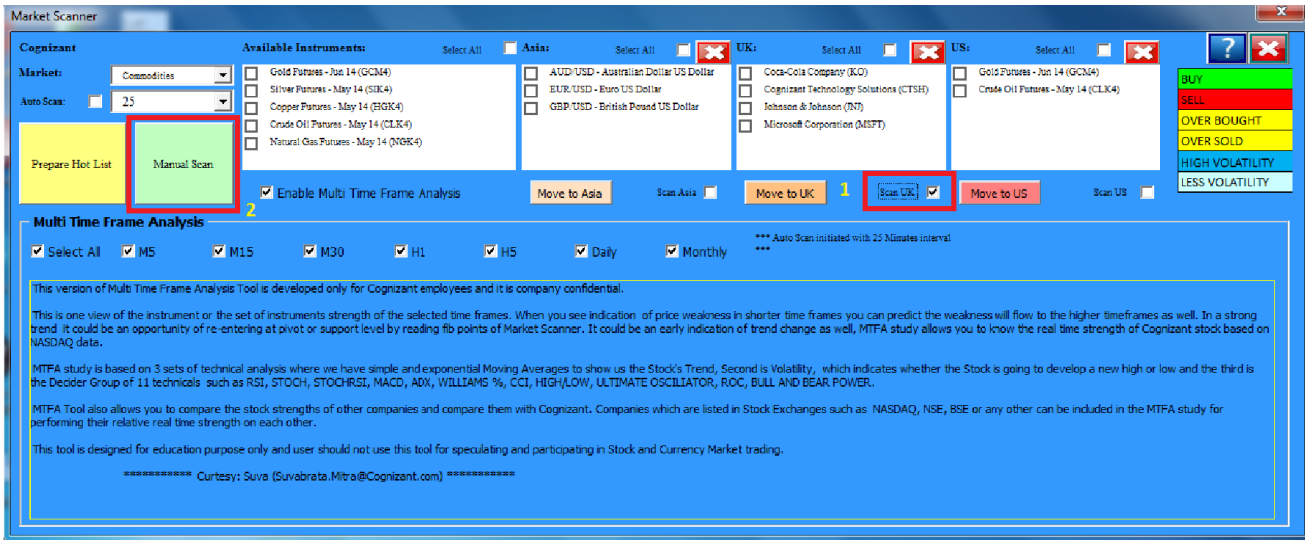
You will get a notification during the scan, please wait till the application prepares the report.



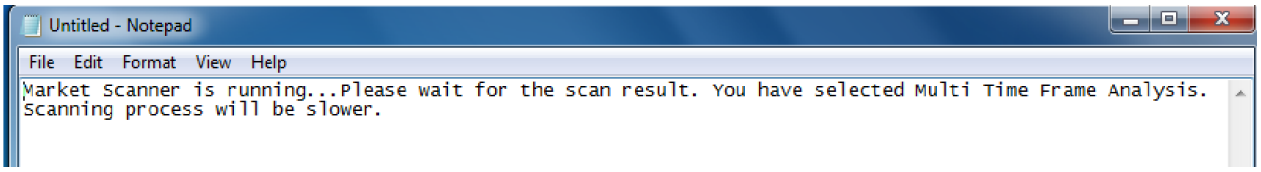
You will get a Report as below, showing you the best instrument for trading.

Silver Futures - May 14 (SIK4)
Harami Bearish Timeframe: 15 Minutes, 5 Hours
Reliability: Low
A reversal pattern.
The Harami Bearish Pattern is a two-candlestick pattern composed of a relatively small black real body contained within a prior relatively long white real body.
'Harami' is old Japanese word for pregnant. The long white candlestick is ‘the mother’ and the small candlestick is ‘the baby’. It signals that the current uptrend is losing strength.
The shadows of the second candlestick do not have to be contained within the first candle’s body, though it's preferable if they are. The Harami indicator should be confirmed with the next candlestick.
The Harami pattern is also the first two candlesticks of the Three Inside patterns. It is not as significant reversal pattern as the Hanging Man or Engulfing.

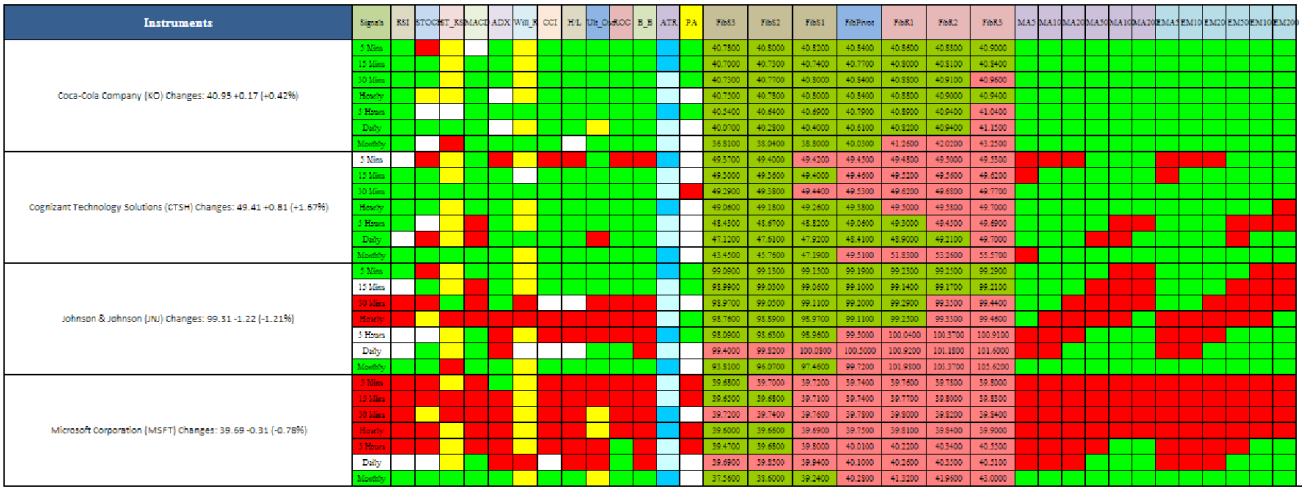
D. Select a Portfolio and perform a Manual Scan: Lets say you want to perform Multiple Time Frame Analysis for Cognizant and its Clients, simply put them in any bucket and select the Time Frames for Analysis. Next, simply click on the "Manual Scan" button.



E. You will get a response from the Market Scanner and the application will run in the system's background.



F. Scan result will be published once the scanning is finished, and you will get a very detailed yet simplified dashboard just in front of your screen!



A. **Legend**: Color "White" means Neutral, "Yellow" means Overbought / Oversold, "Blue" means High Volatility, "Green" means Buy and "Red" means Sell.

B. Fib Levels: These levels and points are very important. Price tends to react on these points, Red points or zones attract "sellers" and green points or zones attract "buyers". In multiple time frames when we observe these fib points are too close with each other, it creates "Price Cluster" and price support or resistance creates at "Price Cluster". Also short term price reversal can be observed in near "Price Cluster".

C. Trend: Traders are always follow trend for buy or sell direction. Application has a series of Simple and Exponential Moving Averages which combinely indicates the trend. It is always advisable to go with "With Trend" entry and be cautious when trend is mixed with buy and sell signals both.

D. Price Action: Application shows bullish or bearish price action signal and it is advisable to not go against them.

E. Volatility: Application shows "High Volatility" or "Less Volatility" for the instrument. "Less Volatility" indicates a ranging or sideways market where as "High Volatility" indicates market with good volume and it is better to trade "High Volatile" instruments.

F. Decider Group of Technicals: There are 11 technicals combinely forms this group where trader needs to consider what the majority of the technicals are saying, more than 70% should decide the direction of trade.

G. Signals: This is an overall summary for the particular time frame. Green is Buy and Red is Sell otherwise no trade for the instrument.

9.2 Sample Analysis:

A. CocaCola: Market is bullish. Fundamental reason is in summer season sell of cold drinks increases. Instrument has high volatility and bullish price action signals on multiple time frames, stock price speculation is buy, buy points can be taken from fib levels.

B. Cognizant: Instrument was on sell and presently recovering. It has shorter term bearish sign which indicates price is still not quite bullish for the instrument and sentiment is mixed. Majority on buy now further buy points can be taken from fib levels.

9.3 Trading Strategies: Following trading approaches have more than 90% success rate so let's consider the approaches once.

A. **With-Trend entry for Put:** when at-least 22 technicals out of 24 are in same direction.

* Present price is above R3 (Put Option for 30-45 mins) [Success rate 95 to 100 %]
* Present price is between R2 and R3 (Put Option for 30-45 mins) [Success rate 85 to 95 %]
* Present price is between R1 and R2 (Put Option for 30-45 mins) [Success rate 85 to 95 %]
* Present price is between Pivot and R1 (Put Option for 30-45 mins) [Success rate 80 to 90 %]

B. **With-Trend entry for Put:** when at-least 19 technicals out of 24 are in same direction.

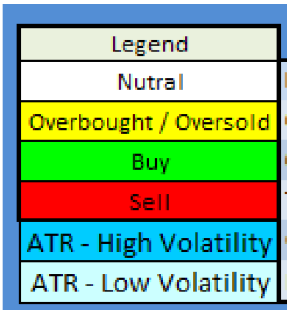
* Present price is above R3 (Put Option for 30-45 mins) [Success rate 80 to 90 %]
* Present price is between R2 and R3 (Put Option for 30-45 mins) [Success rate 75 to 80 %]
* Present price is between R1 and R2 (Put Option for 30-45 mins) [Success rate 70 to 75 %]
* Present price is between Pivot and R1 (Put Option for 30-45 mins) [Success rate 70 to 75 %]

C. **Counter-Trend entry for Call:** when at-least 3 technicals out of the first 11 are contradicting the main direction (last 12 technicals).

* Present price is below S3 (Call Option for 30-45 mins) [Success rate 90 to 100 %]
* Present price is between S2 and S3 (Call Option for 30-45 mins) [Success rate 85 to 90 %]
* Present price is between S1 and S2 (Call Option for 30-45 mins) [Success rate 80 to 85 %]
* Present price is between Pivot and S1 (Call Option for 30-45 mins) [Success rate 70 to 80 %]

8. Technical Studies Discussion

Read Market Scanner for Technical Signals:



1. RSI (14): Developed by J. Welles Wilder, the Relative Strength Index (RSI) is a momentum oscillator that measures the speed and change of price movements. RSI oscillates between zero and 100. Traditionally, and according to Wilder, RSI is considered overbought when above 70 and oversold when below 30. Signals can also be generated by looking for divergences, failure swings and centerline crossovers. RSI can also be used to identify the general trend.

$$RSI = 100 - \frac{100}{1 + RS}$$

$$RS = \text{Average Gain} / \text{Average Loss}$$

To simplify the calculation explanation, RSI has been broken down into its basic components: RS, Average Gain and Average Loss. This RSI calculation is based on 14 periods, which is the default suggested by Wilder in his book. Losses are expressed as positive values, not negative values.

2. Stochastic Oscillator (9, 6): Developed by George C. Lane in the late 1950s, the Stochastic Oscillator is a momentum indicator that shows the location of the close relative to the high-low range over a set number of periods. According to an interview with Lane, the Stochastic Oscillator "doesn't follow price, it doesn't follow volume or anything like that. It follows the speed or the momentum of price. As a rule, the momentum changes direction before price." As such, bullish and bearish divergences in the Stochastic Oscillator can be used to foreshadow reversals. This was the first, and most important, signal that Lane identified. Lane also used this oscillator to identify bull and bear set-ups to anticipate a future reversal. Because the Stochastic Oscillator is range bound, is also useful for identifying overbought and oversold levels.

```
%K = (Current Close - Lowest Low)/(Highest High - Lowest Low) * 100
%D = 3-day SMA of %K

Lowest Low = lowest low for the look-back period
Highest High = highest high for the look-back period
%K is multiplied by 100 to move the decimal point two places
```

3. StochRSI (14): Developed by Tushard Chande and Stanley Kroll, StochRSI is an oscillator that measures the level of RSI relative to its high-low range over a set time period. StochRSI applies the Stochastics formula to RSI values, instead of price values. This makes it an indicator of an indicator. The result is an oscillator that fluctuates between 0 and 1.

Chande and Kroll explain that RSI can oscillate between 80 and 20 for extended periods without reaching extreme levels. Notice that 80 and 20 are used for overbought and oversold instead of the more traditional 70 and 30. Traders looking to enter a stock based on an overbought or oversold reading in RSI might find themselves continuously on the sidelines. Chande and Kroll developed StochRSI to increase sensitivity and generate more overbought/oversold signals.

```
StochRSI = (RSI - Lowest Low RSI) / (Highest High RSI - Lowest Low RSI)
```

4. Moving Average Convergence-Divergence (MACD):

Developed by Gerald Appel in the late seventies, the Moving Average Convergence-Divergence (MACD) indicator is one of the simplest and most effective momentum indicators available. The MACD turns two trend-following indicators, moving averages, into a momentum oscillator by subtracting the longer moving average from the shorter moving average. As a result, the MACD offers the best of both worlds: trend following and momentum. The MACD fluctuates above and below the zero line as the moving averages converge, cross and diverge. Traders can look for signal line crossovers, centerline crossovers and divergences to generate signals. Because the MACD is unbounded, it is not particularly useful for identifying overbought and oversold levels.

```
MACD Line: (12-day EMA - 26-day EMA)

Signal Line: 9-day EMA of MACD Line

MACD Histogram: MACD Line - Signal Line
```

5. Average Directional Index (ADX):

The Average Directional Index (ADX), Minus Directional Indicator (-DI) and Plus Directional Indicator (+DI) represent a group of directional movement indicators that form a trading system developed by Welles Wilder. Wilder designed ADX with commodities and daily prices in mind, but these indicators can also be applied to stocks. The Average Directional Index (ADX) measures trend strength without regard to trend direction. The other two indicators, Plus Directional Indicator (+DI) and Minus Directional Indicator (-DI), complement ADX by defining trend direction. Used together, chartists can determine both the direction and strength of the trend.

1. Calculate the True Range (TR), Plus Directional Movement (+DM) and Minus Directional Movement (-DM) for each period.

2. Smooth these periodic values using the Wilder's smoothing techniques. These are explained in detail in the next section.

3. Divide the 14-day smoothed Plus Directional Movement (+DM) by the 14-day smoothed True Range to find the 14-day Plus Directional Indicator (+DI14). Multiply by 100 to move the decimal point two places. This +DI14 is the Plus Directional Indicator (green line) that is plotted along with ADX.

4. Divide the 14-day smoothed Minus Directional Movement (-DM) by the 14-day smoothed True Range to find the 14-day Minus Directional Indicator (-DI14). Multiply by 100 to move the decimal point two places. This -DI14 is the Minus Directional Indicator (red line) that is plotted along with ADX.

5. The Directional Movement Index (DX) equals the absolute value of +DI14 less - DI14 divided by the sum of +DI14 and - DI14.

6. After all these steps, it is time to calculate the Average Directional Index (ADX). The first ADX value is simply a 14-day average of DX. Subsequent ADX values are smoothed by multiplying the previous 14-day ADX value by 13, adding the most recent DX value and dividing this total by 14.

6. William %R

Developed by Larry Williams, Williams %R is a momentum indicator that is the inverse of the Fast Stochastic Oscillator. Also referred to as %R, Williams %R reflects the level of the close relative to the highest high for the look-back period. In contrast, the Stochastic Oscillator reflects the level of the close relative to the lowest low. %R corrects for the inversion by multiplying the raw value by -100. As a result, the Fast Stochastic Oscillator and Williams %R produce the exact same lines, only the scaling is different. Williams %R oscillates from 0 to -100. Readings from 0 to -20 are considered overbought. Readings from -80 to -100 are considered oversold. Unsurprisingly, signals derived from the Stochastic Oscillator are also applicable to Williams %R.

```
%R = (Highest High - Close)/(Highest High - Lowest Low) * -100

Lowest Low = lowest low for the look-back period
Highest High = highest high for the look-back period
%R is multiplied by -100 correct the inversion and move the decimal.
```

7. Commodity Channel Index (CCI):

Developed by Donald Lambert and featured in Commodities magazine in 1980, the Commodity Channel Index (CCI) is a versatile indicator that can be used to identify a new trend or warn of extreme conditions. Lambert originally developed CCI to identify cyclical turns in commodities, but the indicator can successfully applied to indices, ETFs, stocks and other securities. In general, CCI measures the current price level relative to an average price level over a given period of time. CCI is relatively high when prices are far above their average. CCI is relatively low when prices are far below their average. In this manner, CCI can be used to identify overbought and oversold levels.

```
CCI = (Typical Price  -  20-period SMA of TP) / (.015 x Mean Deviation)

Typical Price (TP) = (High + Low + Close)/3

Constant = .015

There are four steps to calculating the Mean Deviation. First, subtract
the most recent 20-period average of the typical price from each period's
typical price. Second, take the absolute values of these numbers. Third,
sum the absolute values. Fourth, divide by the total number of periods (20).
```

8. Bull and Bear Power oscillators (13):

The Bull and Bear Power oscillators developed by Dr Alexander Elder attempt to measure the power of buyers (bulls) and sellers (bears) to push prices above and below the consensus of value. The primary principles on which Elder based the oscillator are:

The highest price displays the maximum buyer's power within the day.
The lowest price displays the maximum seller's power within the day.
The moving average can be construed as a price agreement between buyers and sellers for a given time period.

The Bulls/Bears power balance is important since changes in this balance can signal the early stages of a potential trend reversal.

Elder uses a 13-day exponential moving average (EMA) to indicate the consensus market value.

Bull Power is calculated by subtracting the 13-day EMA from the day's high.

Bear Power is derived by subtracting the 13-day EMA from the day's low.

9. Highs/Lows (14):

The Highs-Lows indicator (14) displays the daily difference between the number of stocks reaching new 14-Days highs and the number of stocks reaching new 14-Days lows.

Calculation

The New Highs-New Lows is calculated by simply taking the difference between the number of instruments that made new 14-days highs and the number of instruments that made new 14-days lows.

10. Ultimate Oscillator:

Developed by Larry Williams in 1976 and featured in Stocks & Commodities Magazine in 1985, the Ultimate Oscillator is a momentum oscillator designed to capture momentum across three different time frames. The multiple time frame objectives seek to avoid the pitfalls of other oscillators. Many momentum oscillators surge at the beginning of a strong advance and then form bearish divergence as the advance continues. This is because they are stuck with one time frame. The Ultimate Oscillator attempts to correct this fault by incorporating longer time frames into the basic formula. Williams identified a buy signal a based on a bullish divergence and a sell signal based on a bearish divergence.

```
BP = Close - Minimum(Low or Prior Close).

TR = Maximum(High or Prior Close)  -  Minimum(Low or Prior Close)

Average7 = (7-period BP Sum) / (7-period TR Sum)
Average14 = (14-period BP Sum) / (14-period TR Sum)
Average28 = (28-period BP Sum) / (28-period TR Sum)

UO = 100 x [(4 x Average7)+(2 x Average14)+Average28]/(4+2+1)
```

11. Rate of Change (ROC):

The Rate-of-Change (ROC) indicator, which is also referred to as simply Momentum, is a pure momentum oscillator that measures the percent change in price from one period to the next. The ROC calculation compares the current price with the price "n" periods ago. The plot forms an oscillator that fluctuates above and below the zero line as the Rate-of-Change moves from positive to negative. As a momentum oscillator, ROC signals include centerline crossovers, divergences and overbought-oversold readings. Divergences fail to foreshadow reversals more often than not so this article will forgo a discussion on divergences. Even though centerline crossovers are prone to whipsaw, especially short-term, these crossovers can be used to identify the overall trend. Identifying overbought or oversold extremes comes natural to the Rate-of-Change oscillator.

```
ROC = [(Close - Close n periods ago) / (Close n periods ago)] * 100
```

12. Average True Range (ATR):

Developed by J. Welles Wilder, the Average True Range (ATR) is an indicator that measures volatility. As with most of his indicators, Wilder designed ATR with commodities and daily prices in mind. Commodities are frequently more volatile than stocks. They were are often subject to gaps and limit moves, which occur when a commodity opens up or down its maximum allowed move for the session. A volatility formula based only on the high-low range would fail to capture volatility from gap or limit moves. Wilder created Average True Range to capture this "missing" volatility. It is important to remember that ATR does not provide an indication of price direction, just volatility.

```
Current ATR = [(Prior ATR x 13) + Current TR] / 14

  - Multiply the previous 14-day ATR by 13.
  - Add the most recent day's TR value.
  - Divide the total by 14
```

13. Moving Average: A widely used indicator in technical analysis that helps smooth out price action by filtering out the "noise" from random price fluctuations. A moving average (MA) is a trend-following or lagging indicator because it is based on past prices. The two basic and commonly used MAs are the simple moving average (SMA), which is the simple average of a security over a defined number of time periods, and the exponential moving average (EMA), which gives bigger weight to more recent prices. The most common applications of MAs are to identify the trend direction and to determine support and resistance levels.

```
Daily Closing Prices: 11,12,13,14,15,16,17

First day of 5-day SMA: (11 + 12 + 13 + 14 + 15) / 5 = 13

Second day of 5-day SMA: (12 + 13 + 14 + 15 + 16) / 5 = 14

Third day of 5-day SMA: (13 + 14 + 15 + 16 + 17) / 5 = 15
```

2. DOCUMENT CONTROL

2.1 Document information

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Confidentiality Level	User
Proposing Changes	If you have suggestions for improving this document, please contact document owner.

2.2 Version History

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