

Abstract geometric lines in the top-left corner of the page, consisting of several thin black lines forming various polygons and intersecting each other.

ANALYTICS WITH EXCEL

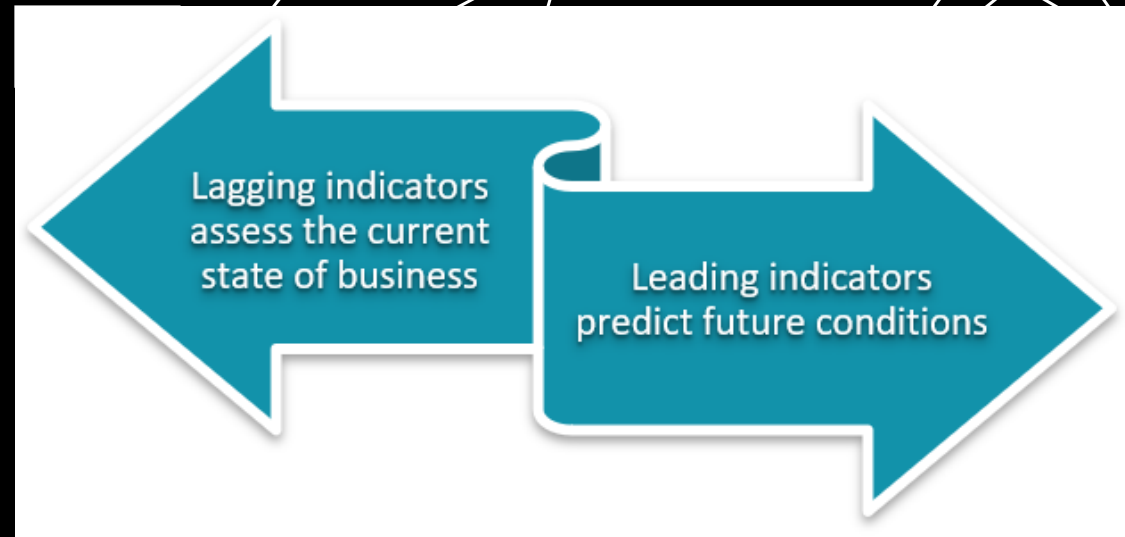
Kunaal Naik

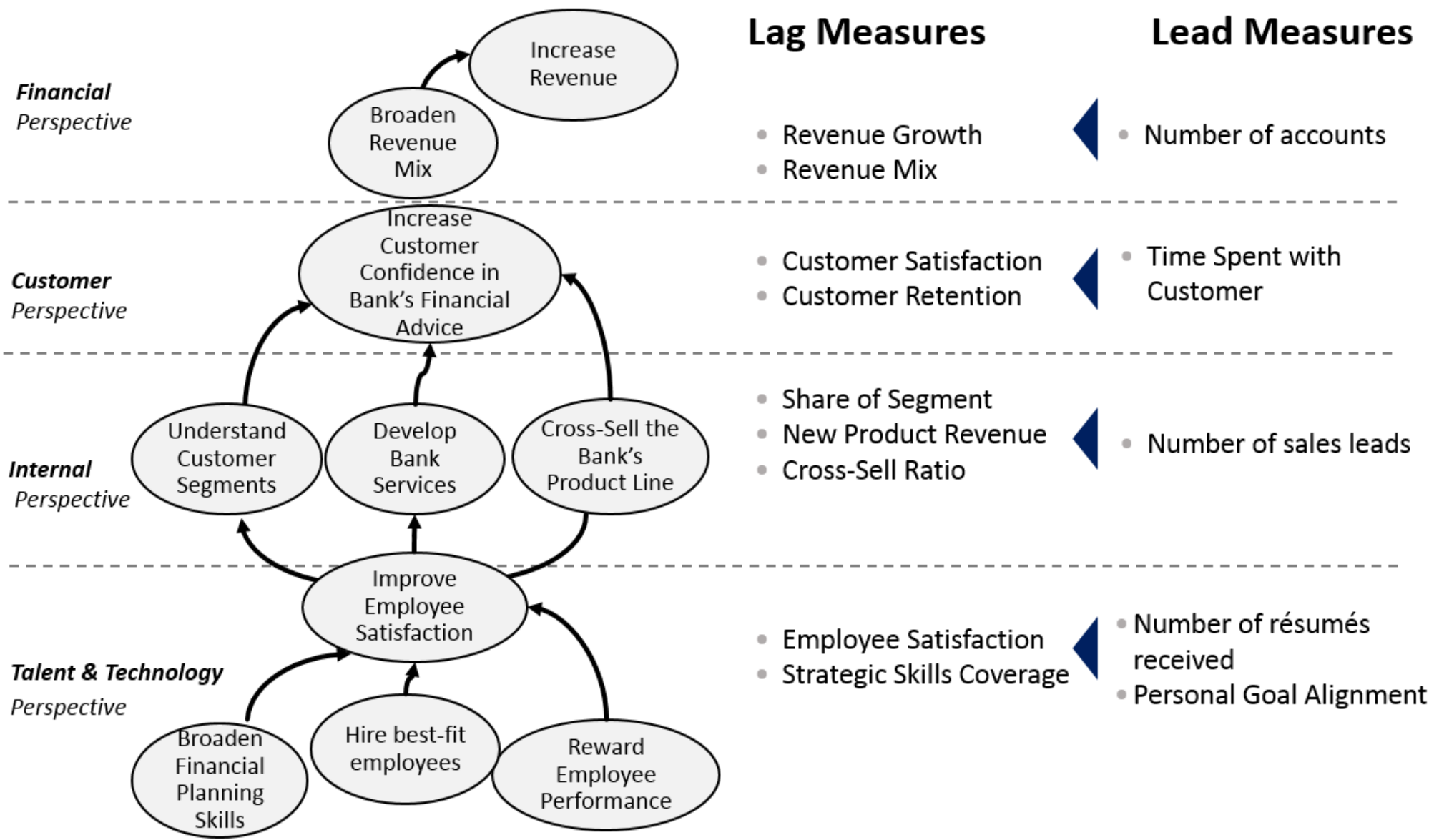
ANALYTICS

A detailed study or examination of something to understand more about it.

Simply put, we analyze Business through Metrics and KPI's and take actions to either increase Revenue or reduce/optimize costs.

How to look at metrics?





REPORTING

What happened?

> Cricket Scorecard

ANALYSIS AND MONITORING

Why did it happen?

> Why someone got out? Why did Virat not perform?

PREDICTIVE ANALYTICS

What will happen?

> Will India win the Finals?

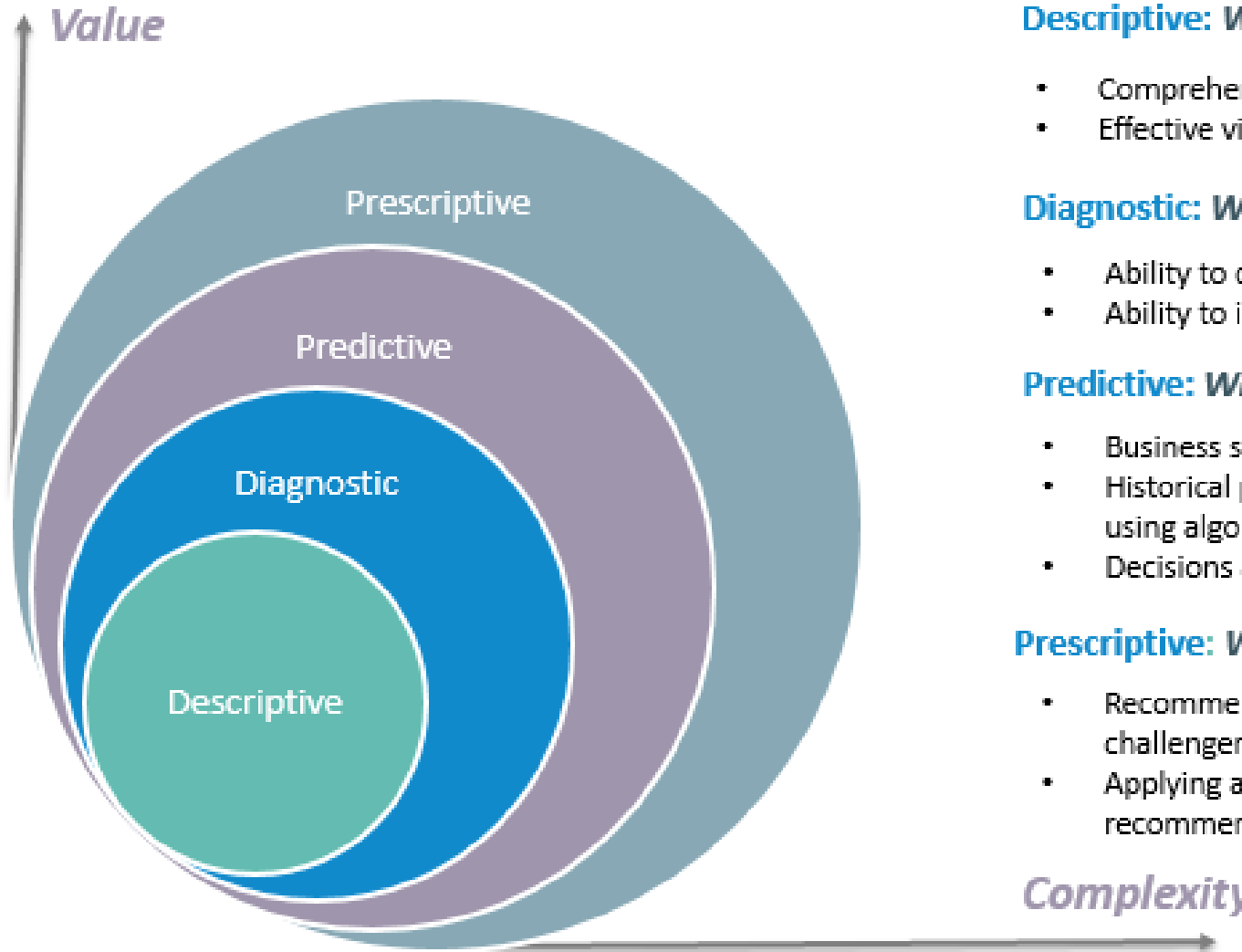
PRESCRIPTIVE ANALYTICS

What should I do next?

> What team to choose for next season?

ANALYTICS WITH EXCEL

4 types of Data Analytics



What is the data telling you?

Descriptive: *What's happening in my business?*

- Comprehensive, accurate and live data
- Effective visualisation

Diagnostic: *Why is it happening?*

- Ability to drill down to the root-cause
- Ability to isolate all confounding information

Predictive: *What's likely to happen?*

- Business strategies have remained fairly consistent over time
- Historical patterns being used to predict specific outcomes using algorithms
- Decisions are automated using algorithms and technology

Prescriptive: *What do I need to do?*

- Recommended actions and strategies based on champion / challenger testing strategy outcomes
- Applying advanced analytical techniques to make specific recommendations



WHAT IS POSSIBLE ON EXCEL?

Descriptive/Diagnostic

(Reporting)

Performance Scorecards

A performance scorecard is a graphical representation of the progress over time

Balanced Scorecards

The balanced scorecard allows managers to look at the business from four important perspectives

Dashboards

A type of GUI which often provides at-a-glance views of key performance indicators

Predictive/Prescriptive

(Data Science/ Machine Learning)

Statistics

T-test, ANOVA, Histogram, Descriptive Statistics

Regression

Predict continuous output – Price, Salary

Forecasting

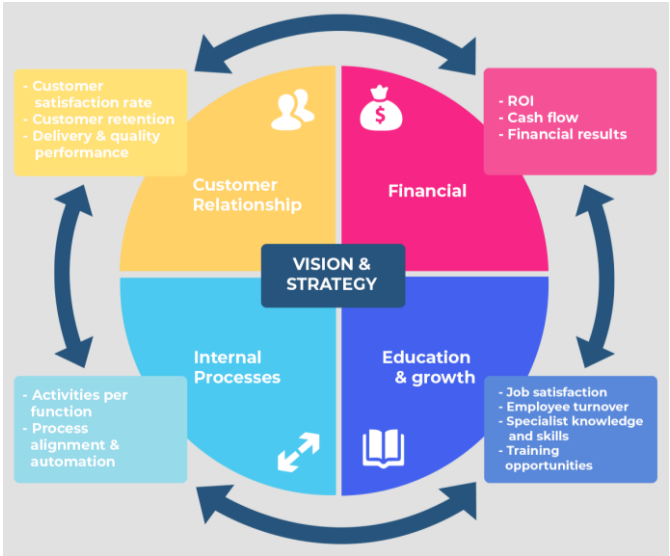
Forecast a metric into the future – Forecast Sales

EXCEL SCORECARD/DASHBOARD

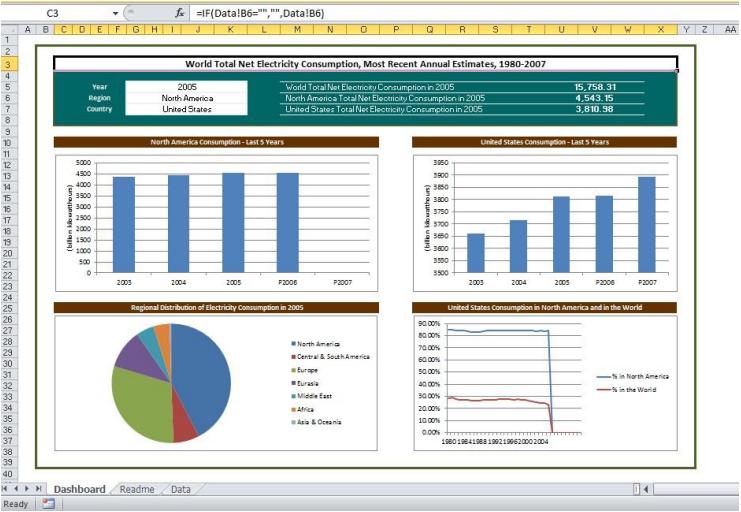
PERFORMANCE SCORECARD

Region	East		
Sales Performance	CQ	PQ	Diff
	2021-Q4	2021-Q3	
Revenue	\$ 26,140	\$ 85,175	-69.3%
Wins	138	95	45.3%
Revenue/Win	\$ 189.4	\$ 896.6	-78.9%
Pipeline	\$ 1,53,766	\$ 4,73,196	-67.5%
Leads	694	530	30.9%
Pipeline/Lead	\$ 221.6	\$ 892.8	-75.2%

BALANCED SCORECARD



EXCEL DASHBOARDS



Regression and Classification algorithms are **Supervised Learning** algorithms. Both the algorithms are used for prediction in Machine learning and work with the labeled datasets. But the difference between both is how they are used for different machine learning problems.

When we do not have labeled data and need to find the hidden patterns from the given dataset. We need **unsupervised learning** techniques.

Forecasting is a technique that uses historical data as inputs to make informed estimates that are predictive in determining the direction of future trends.

REGRESSION

Supervised Learning

Regression is a process of finding the correlations between dependent and independent variables. It helps in predicting the continuous variables such as prediction of Market Trends, prediction of House prices, etc.

CLASSIFICATION

Supervised Learning

Classification is a process of finding a function which helps in dividing the dataset into classes based on different parameters. In Classification, a computer program is trained on the training dataset and based on that training, it categorizes the data into different classes.

CLUSTERING

Unsupervised Learning

Clustering is the task of dividing the population or data points into a number of groups such that data points in the same groups are more similar to other data points in the same group and dissimilar to the data points in other groups. It is basically a collection of objects on the basis of similarity and dissimilarity between them.

FORECASTING

Time Series

Timeseries forecasting in simple words means to forecast or to predict the future value(eg-stock price) over a period of time.

DATA SCIENCE - MODELS

Diagram illustrating the linear regression equation:

$$Y_i = \beta_0 + \beta_1 X_i$$

Labels and arrows:

- Y_i : Dependent Variable (arrow pointing up)
- β_0 : Constant/Intercept (arrow pointing down)
- β_1 : Slope/Coefficient (arrow pointing up)
- X_i : Independent Variable (arrow pointing down)

REGRESSION

OUTPUT (y, dependent variable)

Continuous nature or real value (House Price, Salary)

DATA (X, y)

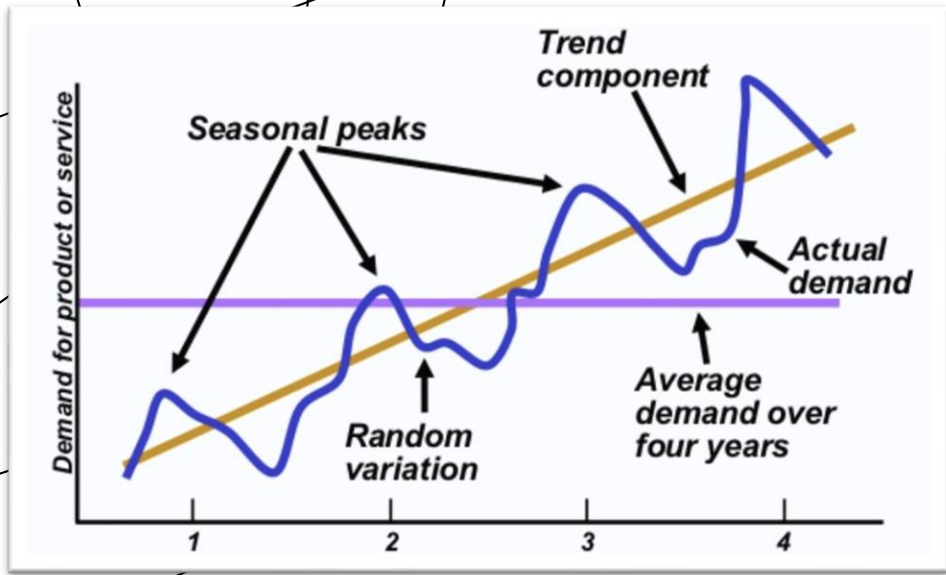
The task of the regression algorithm is to map the input value (x) with the continuous output variable(y)

DATA PREPROCESSING

Missing Value, Outliers, Normalization/Standardization, Correlation Matrix

METRIC

R Squared, Mean Squared Error, Root Mean Squared Error



TIME SERIES FORECASTING

OUTPUT (y, time-based value)

Future Value based on time (Coal Price, Demand Forecasting)

DATA (y)

Forecasting uses the series along with time to forecast into the future

DATA PREPROCESSING

Moving Average, Lagging, Central Moving Average, Trend, Seasonality, Cyclicity, etc ...

METRIC

$$MAPE = \frac{1}{n} \times \sum \left| \frac{\text{actual value} - \text{forecast value}}{\text{actual value}} \right|$$



HANDS ON



CASE STUDY

REGRESSION

Data - Marketing Spends

Objective – Optimize Marketing spends for maximum Sales

FORECASTING

Data – Sales

Objective – Forecast 1 year Sales for Strategy Planning

SCORECARD

Data – Marketing and Sales

Objective – Build a Performance Scorecard to show Pipeline and Revenue metrics

Metrics – Revenue, Wins, Revenue/Win, Pipeline, Leads, Pipeline/Lead