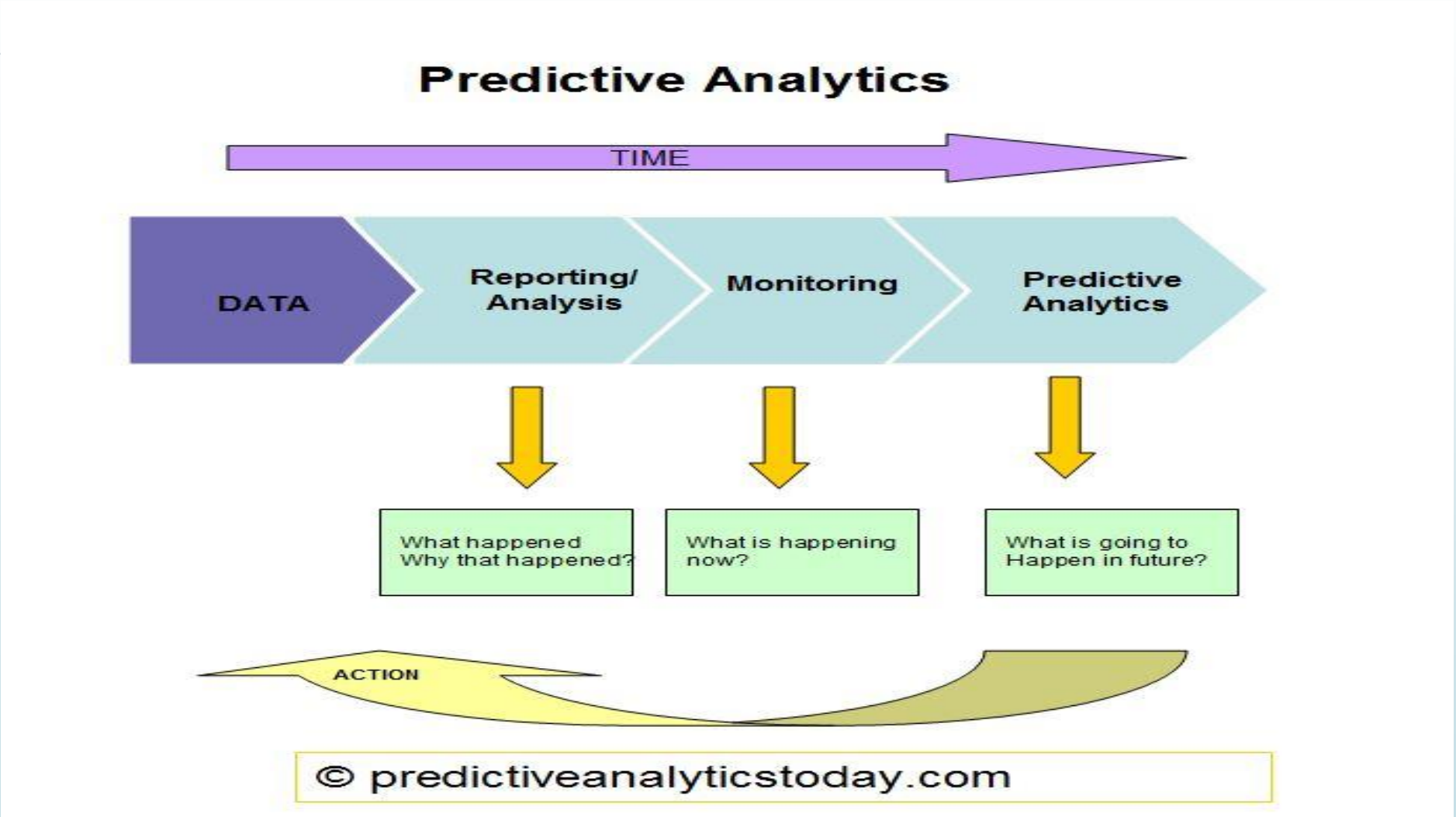
# Predictive Analytics
# &
# Predictive Modelling

# What is Predictive Modelling

- **Predictive analytics** is the branch of the advanced **analytics** which is used to make predictions about unknown future events. **Predictive analytics** uses many techniques from data mining, statistics, modeling, machine learning, and artificial intelligence to analyze current data to make predictions about future.

- **Predictive modeling** is a process used in **predictive** analytics to create a statistical **model** of future behavior. **Predictive** analytics is the area of data mining concerned with forecasting probabilities and trends.

# Predictive Analytics Process



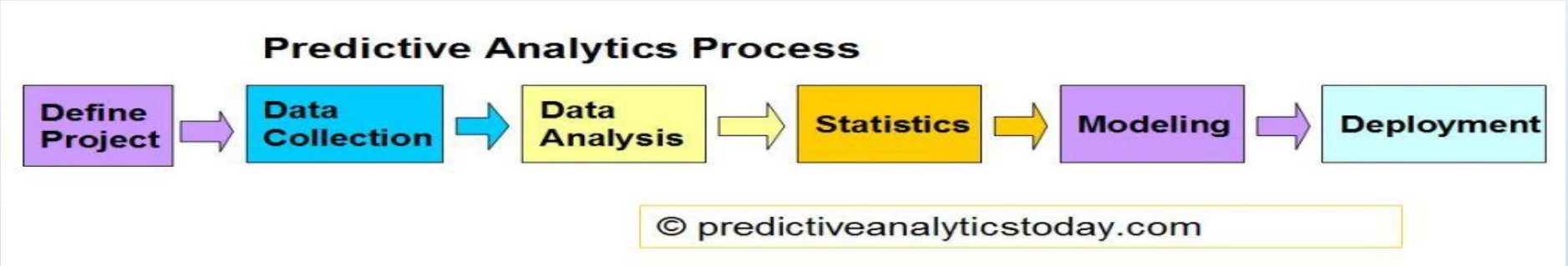
# Business process and features on Predictive Modelling

- **Business process on Predicting modelling**
  - Creating the model
  - Testing the model
  - Validating the model
  - Evaluating  the model

- **Features in Predicting modelling**
  - Data analysis and manipulation
  - Visualization
  - Statistics
  - Hypothesis testing

# How the model work

- In predictive modeling, data is collected for the relevant predictors, a statistical model is formulated, predictions are made and the model is validated (or revised) as additional data becomes available. The model may employ a simple linear equation or a complex neural network, mapped out by sophisticated software.



# How the model work(cont.)

- Here you will learn what a predictive model is, and how, by actively guiding marketing campaigns, it constitutes a key form of business intelligence. we'll take a look inside to see how a model works-

1. **Predictors Rank Your Customers to Guide Your Marketing**
2. **Combined Predictors Means Smarter Rankings**
3. **The Computer Makes Your Model from Your Customer Data**
4. **A Simple Curve Shows How Well Your Model Works**
5. **Conclusions**

# Why Predictive Modelling

Nearly every business in competitive markets will eventually need to do predictive modeling to remain ahead of the curve. Predicting Modeling (also known as Predictive Analytics) is the process of automatically detecting patterns in data, then using those patterns to foretell some event. Predictive models are commonly built to predict:

- **Customer Relationship Management**
- **the chance a prospect will respond to an ad**
- **Mail recipients likely to buy**
- **when a customer is likely to churn**
- **if a person is likely to get sick**
- **Portfolio or Product Prediction**
- **Risk Management & Pricing**

# Some Predictive Models

Ideally, these techniques are widely used:

- Linear regression
- Logistic regression
- Regression with regularization
- Neural networks
- Support vector machines
- Naive Bayes models
- K-nearest-neighbors classification
- Decision trees
- Ensembles of trees
- Gradient boosting

# Applications of Predictive Modelling

- Analytical customer relationship management (CRM)
- Health Care
- Collection Analytics
- Cross-cell
- Fraud detection
- Risk management

❖ **Industry Applications**

Predictive modelling are used in insurance, banking, marketing, financial services, telecommunications, retail, travel, healthcare, oil & gas and other industries.

# Predictive Models in Retail industry

- **Campaign Response Model** – this model predicts the likelihood that a customer responds to a specific campaign by purchasing a products solicited in the campaign. The model also predicts the amount of the purchase given response.

- Regression models
- Customer Segmentation
- Cross-Sell and Upsell
- New Product Recommendation
- Customer Retention/Loyalty/Churn
- Inventory Management

# Predictive Models in Telecom industry

- **Campaign analytics**

Based on historical data and customer profiles, it is possible to classify customers according to their likelihood of buying a product or a service through a campaign. Thus, every campaign can target the set of customers with better purchasing potential for that service/product. While these statistics-driven campaigns yield higher ROI, they also reduce the irritation caused by non-relevant communication, thereby indirectly reducing customer dissonance.

- **Churn modeling**

The customers leaving the current company and moving to another telecom company are called churn and it can be reduced by analyzing the past history of the potential customers systematically.

- **Cross-selling and up-selling**

A very real challenge in the telecom industry is how to increase yield from the current subscribers, or how to improve Average Revenue per User (ARPU).Cross-selling and up-selling activities can now be supported by predictive analytics, while drawing on association rules and transaction histories. Analytics driven cross-selling and up-selling campaigns provide remarkably higher returns.

- **Customer lifetime value analytics**

The Customer Lifetime Value model provides the predicted yield from each customer over the customer life cycle. High priority customers can be given loyalty bonuses, preferential treatment through personalized service, better credit norms for contract subscribers etc. This analytics model may be utilized across all the functions like marketing, credit Risk, customer service and so on.

- **Customer segmentation**

Customers are segmented both at the pre-subscription and subscription phases. At the first stage, segmentation helps reach out to prospects with higher predicted conversion rates, thereby increasing the campaign success rate as well as the ROI. During campaigns, subscribers are divided into segments to which specific campaigns are targeted.

- **Marketing spend optimization**

A Marketing Spend Optimization model helps marketing managers and product managers take decisions based on what works and what does not. This analytics model has been of considerable benefit to the marketing function, and is hence widely used to improve marketing Return on Investment (ROI).

- **Fraud analytics**

Data synthesis can help telecom service providers (TSPs) navigate their complex organizational structures and target and collect relevant fraud data when the need arises.

  - Provide future-proof detection techniques
  - Guard against habitual offenders
  - Ensure that pre-paid service is truly risk free
  - Launch profitable IP-based services

- **Network optimization**

Network management is possibly be the most complex operation in a telecom company, the size of the investment decisions and the cost of a failure in terms of customer perception. Predictive analytics help forecast traffic patterns and peak period routing, and is thus of immense benefit in the smooth running of network operations. Analytics can ensure that network operations are run as pro-actively and scientifically, taking cognizance of changing traffic patterns.

- **Price optimization**

Price optimization contributes significantly to revenue development and profitability and is especially important in the corporate sales segment, where awareness of the impact of the various pricing options offered is critical. Simulated scenarios can help evaluate the revenues at various price points. These models are widely used by product managers and finance teams.

- **Sales territory optimization**

optimization of sales territories is necessary to align and balance workload and market potential. the focus of the model is usually on how to reach the markets efficiently, this model is used mainly for revenue and workload allocation activities. It's also extensively used for allocation of territory for managing operations, among channel intermediaries in pre-pay business units.

# Predictive Analytics Software

- SAS Analytics
- R
- STATISTICA
- IBM Predictive Analytics
- MATLAB
- Minitab

# Thank you