Use Cases in Sales Funnel Analytics

Surya Putchala, Sreshta Putchala

ABSTRACT— Traditional Sales funnel analysis and forecasts reported by Marketing and Sales teams are based on deterministic rules; subjectively derived based on experience and are driven by biases. This result in pipelines containing skewed forecasts which are often missed. This adds to the unpredictability of revenue projections of an Enterprise. Quantitative methods eliminate such biases by applying predictive analytics to sales pipelines and address two specific problems; Predicting the likelihood of deals that could be won in a given time period (opportunity scoring), and predicting size of the deal which could determine revenue. This will help in a decisive action on the information on pipeline, goals, sales performance and marketing.

INDEX TERMS — Sales Funnel, Lead Scoring, Opportunity Scoring, Machine Learning, Customer Segmentation, Customer Satisfaction, Sales Conversion, Big Data, Customer Relationship Management (CRM), Sales Forecasting

—————————— ◆ ——————————

1. INTRODUCTION

Most companies struggle to create an accurate sales forecast. Poor pipeline visibility and inaccurate, intuition-based predictions from sales representatives leads to a culture where the end of a quarter is often a surprise and attaining sales quota is left up to chance. And even those deals that actually do come through are often significantly different than the deal originally forecasted.

The goals of Sales Funnel Analytics (SFA) are to Optimize Sales effort and Marketing spend to:

- Understand Customer personas to run relevant Marketing campaigns
- Predict the various phases in the lifecycle of Customer journey.
- Predict Customer life-time value to device an appropriate Marketing strategy
- Rank and Predict Likelihood of customers to buy or respond or engage different segments of Customers
- Recommend relevant Products to Customers
- Convert Customers and improve value creation.
- Retain and engage more Customers

Acting on Insights gained from understanding Customers, products, marketing strategy and sales could:

- Achieve forecasts with goals and quotas for your sales team.
- Analyze Sales Representative performance
- Monitor progress at the sales rep level and understand who needs assistance.
- Understand the "real" value of sales pipeline/deals
- Benchmark for Sales rep's performance and drive productivity.
- Comparative Analysis of Sales representatives, align sales process according to their strengths (negotiation, lead generation, engagement etc)
- Act on the integrated information on pipeline, goals, sales performance, marketing and calls.

2. DATA SOURING

In order to achieve superior SFA effectiveness, deploying Big Data analytics can improve the forecast accuracy by using external Open data, Internal CRM systems and real-time tracking tools and Machine Learning algorithms.

2.1 Internal Sources

There are many factors that affect business success – identifying the most relevant data and capture is critical to exploit the power of predictive analytics. The most accessible of all the sources of information are internal data as indicated in the picture below:

Fig.1 *Data Sources that are within an enterprise*

Although, Customer data plays extremely important role, details about the following is critical for analysing various KPIs related to Sales and Marketing activities:

- Leads Details (Opportunity or a lead, deal size, customer, rep assigned)
- Marketing Actions (Campaigns, Channels)
- Representative details (Basic information, previous leads, current leads)
- Lead Cycle Details (Times for each stage of the lead, Effort)
- E-mail/calendar activities (interactions with potential consumers)
- Web/Social Media activity (Page views, clicks etc.,)
- Customer Demographics (General preferences, geographic preferences, income etc.,)
- Product/Service Features

2.2 External Sources

The quality of lead may have several Qualitative factors that needs to be captured and quantified. For example, the lead quality is different than the lead progress through the funnel. The lead progression through the funnel is quantitative and could help in planning capacities, forecasting the revenues or conversions.

Fig.2 *Data Sources that are external to enterprise*

As the sophistication of Analytics improves so as the need for additional data which needs to be sourced externally as outlined in Fig 2. In order to leverage data, not only new experiments and variations of the processes needs to be carried out, but external data needs to be put in context as well.

3.   USE CASES

SFA is essentially a Sales function. However, it has implication with marketing, product placement and customer satisfaction. The following are some of the use cases of this broad Sales and Marketing area.

3.1 Lead Scoring

A lead scoring considers all closed leads or opportunities from a CRM system; extract or derive features – either demographic or activities or attributes associated with the lead. A lead scoring mechanism is constructed from past lead behavior.

It addresses and derives the following Insights:
- Win Predictions – Used to predict if a lead will win given a set of features extracted from data? This prediction will also find a pattern to determine the probability if this lead to convert in pre-defined period.
- Age Prediction – How long does it take the lead to move to the next stage.
- Lead momentum analysis - Identify Hot, Warm leads
- Ranking the leads in order of priority
- Historical Lead Health - Open leads, Lost leads, Average time of leads in each stage
- Identify Inputs/actions required to close the deals

3.2 Opportunity Scoring

Opportunity scoring models make use of the funnel phases which are time-dependent. The features are extracted at a specific stage of the funnel during its lifecycle, rather than the outcome (won/lost) of the Opportunity. Hence, at every stage, only the stage progression is used to score the opportunity. Hence the Sales team has the visibility at the phase level as well as the probability of that opportunity to convert. The following questions are very important for Sales teams to allocate their resources:
- The probability an opportunity to convert
- The probability an opportunity to won in a specified period/quarter?
- How is funnel health to meet the expected sales/revenue projections and commits made by the Sales reps.
- Identify positive and negative factors that are influencing the outcome of a deal

Evaluate Opportunities currently in pipeline. This helps in focusing on effective opportunities. The goal is to:
- Identify opportunities that are promising but not closed or Committed.
- Identify opportunities that are at risk but are committed by the Sales Reps.
- Identify unrealistic targets by assessing quality of the pipeline
- Understand the "real" value of sales pipeline/deals

3.3 Sales Rep Scoring

Understanding Sales Representative behaviour deeply and rating or scoring him helps in optimal allocation of leads to the him.
- Identify strength/weakness of a Sales Representative by assessing his performance record and understand his sales effectiveness.
- Monitor progress at the Representative level and understand who needs augmentation of inputs or needs assistance.
- Comparative Analysis of Sales reps, align sales process according to their strengths (negotiation, lead generation, engagement etc.)

Understanding the Sales rep's behavior and propensities is important as understanding the customer segments. The scoring will help in:

- Benchmarking a Sales rep with his peers
- His Propensity to certain of Types of Deals
- His strength/susceptibility Analysis
- Understanding Open Opportunities for each Rep
- Average Deal Size for each rep
- Conversion Rate Stage wise for each rep

3.4 Channel-Partner Analyses

Understanding the effect of channel partners towards conversion rates of leads at each stage will allow us to determine the positive and negative factors influencing the outcome. Channel effectiveness analysis goes beyond immediate impact and helps in promotional activities.

Increase each channel conversion rates through comparison analysis with other channel partners whether they are direct partners or third-party channels. Channel partners play key role in bringing deep insights of the business as they are direct contact of the leads. Therefore, it is essential to know who are the key and have an ongoing feedback as it allows you to make confident business decisions. Analyzing optimal campaign channels could be based on Channel Source, Channel Type, Demographic influence and Timing (seasonality).

For each Channel Partner, at least three data points (previous, after and current records) are needed to conduct analysis on channel effectiveness.

3.5 Pipeline Forecasting

The Sales funnel generally represents the progression of leads till they convert. The Fig. 3 illustrates a marketing funnel and the phases represent. A customer journey goes through various phases represented in the diagram:

Fig.3 *Typical Sales Funnel*

Awareness (when a product or service of a company is advertised through various channels), Interest (when the potential customers get interested in the product or service that is advertised. This phase can be considered as "leads" for the Business. Decision phase is when the customer is making a serious consideration to buy the product. This is tantamount to the "opportunity". Action results in either the lead is converted or lost. We construct a lead scoring from past lead behavior.

Some of the expected Insights for this use case are:

- Historical Lead Health - Open leads, Lost leads, Average time of leads in each stage
- Identify Inputs/actions required to close the deals

3.6 Marketing and Lead Generation

The 4Ps of Marketing strategy involves the following:

- Product line (Competing products in the market)
- Pricing (Comparative pricing in the market)
- Promotion (Competitor strategies)
- Placement (market place dynamics)

Some steps in order to lay foundations for marketing analysis are:

- Building customer profiles by using Demographic, Behavioral, Transactions and Customer Preferences.
- Identifying Customer Segments. Number of groups, Characteristics of each group
- Targeting those customers through various channels including Social Media.

3.7 Campaign Effectiveness (AB testing)

Campaigns are run through various channels (emails, web events, social media channels) etc., Its effectiveness is measured in order to allocate marketing Dollars.

3.8 Customer Satisfaction for effective Sales

All the customer touch points are rich with signals that could give an understanding of his behavior and thus engage them pro-actively and effectively. Failing to meet customer's growing expectations negatively impacts as customers respond with disloyalty and defection. [1]

Reduce Churn: Model Churn by considering Shrinking Customer Base, Declining product Profitability, Customer Service Requests, Social Media Sentiment, Competitor Market Share and Wallet Share. [1]

Improve Loyalty (brand): Provide customers with relevant and timely information to ensure they remain satisfied and engaged. Referral Programs (measure the effectiveness)

Increase Service levels: Understand the customer preferences in their lifecycle journey and customize service strategies.
Customer Surveys: To access the current customer engagement and satisfaction levels. This is critical for NPS and Reputation Management.

3.9 Smart Lead Allocation

Improve the odds of winning a lead by allocating right resources at the right time. Allocate suitable leads to each rep for increased efficiency.

- Match the sales representative to the lead
- Identify the best sales rep to a lead

3.10 Product and Customer Matching

Product Recommendation helps personalize and interact with the customer utilizing the most relevant to

each customer. [1] To know which combination of channel, product and customer is effective. Identifying the propensity of enrolments (which student, which university and which degree) and perhaps help build recommendations

- Recommendation - Which product is a better fit
- Propensity Analysis - Lead/Customer Preferences and actions
- Measure better combinations and choose the best possibilities
- Determine the weak links between channels and Products and strengthen them by various incentives

3.11 Sales Funnel Forecasting

Numerous factors affect accuracy of Sales forecasts. These factors are dynamic in nature, the sales forecast models will have to adapt dynamically, as these factors change. Hence, a finely tuned engine of ensembled "Machine Learning" and "Ranking and Scoring" algorithms shall be part of the Enterprise's core capability.

Economic Conditions such as Market Behavior and Economic Indicators (Inflation, Income)

Consumers segments- Products Consumption trend and Demographics

Forecast Factors such as Time Horizon (Short, Medium, Long term) and Trends (Seasonality, Cyclicity) affect the Forecasting accuracy.

4. SOME TECHNIQUES FOR THE USE CASES

The Machine Learning algorithms should be used according to the nature of the data. However, there are some rules of thumb that could be used for Use cases detailed above.

4.1 General SFA use cases

Some Analytical scenarios and their probable analytical treatments are given below.

- Overall Sales Forecast (by period, region, sales force) could be achieved by OLAP and Visualization techniques
- Win/Revenue Likelihood (Opportunity Scoring) using Random forests
- Predict Sales cycle length (duration for sales closure) by utilizing Poisson regression
- Predict true value of a lead by Regression methods
- Deal/Sale Health Check could be achieved by Dashboarding and Visualization techniques
- Sales Representative level Sales Quota prediction or target could be achieved by Regression methods
- Predict Benchmark Sales Quota with Regression methods

4.2 Sales Funnel Forecasting method

Sales forecasting could be treated as either a timeseries or as a regression problem. Sales Funnel's not only needs to consider both the trends, cyclicity, seasonality of the products and services that are being sold but also the substitute products, product versions, user

preferences, brand traction. Hence the traditional reliance on Time-series may perform sub-optimally dealing with Sales Funnel Forecasting.

The bottom-up forecasting is a time insensitive when the influencer variables are visible and available to predict either sales/demand as in fig 4.
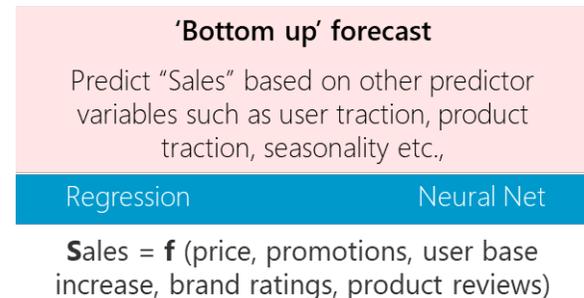
'Bottom up' forecast

Predict "Sales" based on other predictor variables such as user traction, product traction, seasonality etc.,

Regression	Neural Net

$\mathbf{S}$ales = $\mathbf{f}$ (price, promotions, user base increase, brand ratings, product reviews)

Fig.4 *Bottom Up Forecast*

The top-down forecasting is a temporal prediction with past behavior of the response variable is important. Traditional time series methods of Moving averages, ARIMA or ARIMAX could yield exceptional forecast accuracy. It is represented below in Fig. 5
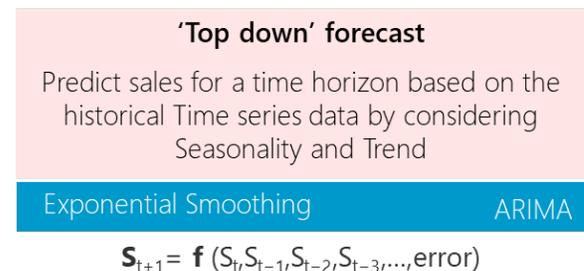
'Top down' forecast

Predict sales for a time horizon based on the historical Time series data by considering Seasonality and Trend

Exponential Smoothing	ARIMA

$\mathbf{S}_{t+1} = \mathbf{f}\ (S_t, S_{t-1}, S_{t-2}, S_{t-3}, ..., error)$

Fig.5 Top-down *Forecast*

Integrating both the Bottom-up forecasting which can use Artificial Neural network (ANN) or Regression could yield a good short-term prediction.

Integrated Forecasts

Using the short term forecast and a longer term forecast from Time series, more accurate projections are possible

$\mathbf{S}_{t+1} = \mathbf{f}\ (S_t, price, promotions, user base increase, brand ratings, product reviews)$

Fig.6 *Integrated Sales Forecasting for Sales Funnels*

Aggregating Forecasts at different levels of Product, Category or Region could identify macro and micro factors of business environment. Consider prediction vs. Forecasting depending on Time horizon

4.3 Sales Funnel Analysis

The fundamental questions about a sales lead as to its likelihood of positive closure, timeframe when it could be closed, and the critical factors that affect a deal success can be addressed by the techniques outlined in the Fig.7.

Fig.7 *Sales Funnel Prediction models*

The fundamental questions about a sales lead can be addressed by the technique outlined below:

4.4 Some Key Dashboards in SFA

There are few important visualizations about the Sales Funnel that are important for the Sales team. They are:

Opportunity Scoring Dashboards:
- Lead age in pipeline, stage, stalled
- Number of pushes
- Average cycle length and inactive period
- Bench marks (in comparison to other leads: Deal size, Customer efforts)

Sales Representative Scoring dashboards:
- Rep Score, Average Deal Size for each rep
- Conversion Rate (# leads converted/# leads allocated)
- Converted Revenue (Converted revenue/Tot. Expected Revenue)
- Bench marks (in comparison to other reps: Deal size, cycle time, conversion rate, revenue earned)

5. CONCLUSION

Sales Funnel analyses cannot function without related areas of Marketing, Customer Analytics. The Analytical areas also draws upon insights and information from customer Analytics.

SFA helps in a decisive action on the information on pipeline, goals, sales performance and marketing. Sales insights with exceptional efficiency requires capability of an enterprise to [1]:

- Accurately predicting future revenue
- Understanding lead conversion ratios
- Objectively coaching your team and analyzing its strengths & weaknesses
- Implementing strategies to improve your team and prioritizing sales pipeline

SFA is very broad area that covers domains such as marketing, sales, order fulfilment. SFA yields a wide variety of use cases and analytical techniques, needs data from both internal and external data sources.

REFERENCES

1. Cappius (2017) Sales Analytics, Cappius Technologies, www.cappius.com/products/sales-analytics/
2. Insidesales (2016) "Applying Data Science to Sales Pipelines for Fun and Profit", Andy Twigg, https://www.insidesales.com/insider/pipeline/sales-pipeline-management/
3. InsightSquared(2013) "The definitive Guide to Data-driven Forecasting" Zorian Rotenberg, Mike Baker, InsightSquared www.insightsquared.com/wp-content/.../Sales_Forecasting_Methods_eBook_v6_.pdf
4. Infer (2016) Infer's Guide to Predictive Lead Scoring http://infer.ignitetech.com/guide-to-predictive-lead-scoring/
5. Marketo (2010) The definitive guide to lead scoring.: A Marketo Workbook, Marketo, www.marketo.com
6. Hubspot blog "Traditional vs. Predictive Lead Scoring: What's the Difference?" Rachel Leist https://blog.hubspot.com/marketing/traditional-predictive-lead-scoring

AUTHOR PROFILES

Surya Putchala is CEO, ZettaMine Analytics. He provided thought leading consulting solutions to Fortune 500 Clients for over 2 decades. He is passionate about areas related to Data Science, Machine Learning, High Performance Cluster Computing and Algorithms. He held senior leadership roles with large IT service providers. He graduated from IIT Kharagpur.

Sreshta Putchala interns with ZettaMine Analytics. She has used various statistical methods using SQL and R and cleansed Marketo and salesforce data. She is currently pursuing her Batchelor's degree in Computer Science from Chaitanya Bharati Institute of Technology (Osmania University). Her interests are in the fields of Big Data, Machine Learning and Artificial Intelligenc