



MARKETING HEAD'S CONUNDRUM

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Jack Williams was the CEO of “We Sell Everything in Software” (WSES)¹ Inc., a company which sold innovative off-the-shelf products and had a high growth trajectory. WSES specialized in providing software solutions for different industries such as defense, clinical research, consumer goods, capital markets, security, banks, and insurance among others. Between 2010 and 2015, it was able to scale up from modest revenue of USD 2 billion to USD 8 billion. It possessed a healthy pipeline and a sales force which was aggressive in pursuing opportunities.

However, over a period of time, the competitors of WSES became aware of this lucrative space and started introducing competing products. Now, with increased competition, there was a pricing war, which naturally led to erosion of margins. Jack was under constant pressure from the analysts and investors alike to improve the margins, which he did by trimming costs from the operations. Given the size of the marketing spend (expenses such as travel cost of sales team, time spent by sales team, etc.), Jack was keen to reduce it without impacting the sales conversion.

On April 15, 2015, he met Ben Osborne, Vice President-Marketing at WSES, to determine ways to reduce the marketing spend without impacting the sales.

Jack: Do you understand Ben that \$500+ million is what we invest every year on marketing. This is 6% of our revenues and with all the pressure we have on margins, we need to do something to reduce this amount.

Ben: Jack, we have discussed this before. This is how we have built a \$9 billion sales pipeline.

Jack: Sure Ben. I acknowledge that. But would you agree that some of these may get converted without spending a penny and others will anyway be a lost deal how much ever we invest. This blanket 6% of expected sales value seems to be an area we can work on.

We need not have spent the \$1 million on ‘I am your customer Inc.’ who anyway was more than keen to buy the Finsys product to fix his management reporting.

I also can tell you that these guys in Mauritius would have never bought the Procsys product from us and we continued to shower those marketing guys with budgets that vanished faster than water in palms on a sunny day.

I am sure if we had invested \$2 million more on the ‘I am a tough nut to crack Inc.’ while selling them our Lifesys solution, we would be sitting on an

¹ Names of all companies and individuals are changed to maintain the confidentiality

additional \$50 million sales. But, these are patterns you and me notice. What about things we missed?

The marketing budget allocations were based on the expected sales value, and thereby a flat 6% of the value was allocated to marketing. Jack did not approve of this method and was exploring multiple options with Ben. Ben believed that the sales force was in touch with the customer and understood the situation better. Hence, allocation to projects should be based on the probability to clinch a deal as indicated by the instincts of the sales force. However, there was a risk in using instincts to estimate conversion probabilities. The sales force in a few instances may estimate a high chance to win a customer and WSES could lose. Each salesman may use a different process to arrive at the win probability and there was no methodical structure to it.

Jack believed that the estimation of probabilities by the sales force was kind of a “good to have” information but not the best and certainly not the most methodical; at best, it could be used as ancillary data. However, given that WSES pursued around 1,000 opportunities every year, which they either won or lost, they should be having a more concrete way to interpret the data.

ABOUT WSES

WSES has been headquartered in London and was started by Jack and his friend in 2005 when they realized that there was an opportunity for selling customized software solutions. They started with the creation of a services product – Procsys – and in a decade added an array of products to meet needs across multiple industries. Some of their products such as GTMsys, Finsys, Procys, and Lifesys have been market leaders in their segments.

WSES started with the focus on clients from the United Kingdom and in 5 years they started offices across the globe. In 2015, about 50% of their revenues were derived from the United Kingdom and the rest from other countries. WSES also had an enviable track record in customer service and claimed that 90% of its customers had placed repeat orders.

MARKETING SPEND IN WSES

WSES classified marketing spend under various categories and did not include spend on advertising under it. With the increase in geographical spread, the marketing spend of WSES also increased. WSES had development centers primarily in the United Kingdom and on multiple occasions clients had expressed interest in visiting the development center before taking a decision on whether to buy WSES's products. All these contributed to an increase in marketing spend. Following are the various cost elements under which marketing spend was categorized by WSES.

- 1) Travel cost of sales team
 - a. Air fare/Train fare/Taxi
 - b. Hotel – boarding and lodging expenses
- 2) Time spent by sales team on an opportunity
- 3) Client visits – When clients visited the development centers, WSES paid for the client's travel, boarding and lodging expenses.
- 4) Time spent by technical experts in the development center – when clients visit the development centers.
- 5) Time spent by support staff – Legal, finance, etc.
- 6) Logistics costs

MINING THE HISTORICAL DATA

On April 16, 2015, Jack and Ben met again to find a solution to the problem that they were discussing the previous day. WSES maintained the records of all the leads and their outcome in its enterprise resource planning (ERP) system.

Jack: Are there patterns that are coming out from data that can say 'before' allocating budget to the opportunity what are the odds of clinching the deal based on past history?

Ben: I know where you are coming to Jack. I think we should involve Mark Smith who has an ear to what data has to tell us. I have a scheduled connect with him now and I can call him here.

Jack: Would you like to have a coffee? I am making one for myself.

Ben: Let me call Mark while you take out the best coffee beans from your collection.

Jack, a coffee connoisseur, looked at his coffee collection wondering what was best for the occasion. His choice was between the Sumatra Mandheling coffee with a Vienna roast and Kenya coffee. His inclination to taste something lemony led him to choose the Kenyan coffee. Although generally not considered a delicate or subtle coffee, Kenya coffee was still very crisp in its vibrancy and lemon-zest aroma. Notes of citrus were often revealed, sometimes with hints of blackberries and a peppery lemon quality and undertones of black currant.

Ben: Just spoke to Mark and also managed to give him some context. He should be here in fifteen minutes.

While Jack was preparing the coffee, a short guy walked in. With brown hair and black eyes, this 29-year-old clearly embodied the guy next door. At a young age, being a Ph.D. in statistics was no simple feat but

pride was the last thing you could see on his face. Neatly dressed in a suit, and wearing a smile, he took his chair next to Ben. Anyone looking at his smile could say that he was doing what he was most passionate about. Looking at him, Ben heaved a sigh of relief hoping that the data presented and interpreted by this young man would provide a way to solve the nagging problem that they were bugged with. Jack and Ben explained the problem to Mark.

Ben: Do you think we have a choice to let data help us decide the marketing budget allocations?

Mark: We do Ben. If we have the historical data, we can check what data is saying. Sometimes data shouts. It is just that we are too busy to listen or we are listening through the nose.

For instance, in this case, we can consider techniques such as logistic regression or discriminant analysis.

Ben: Mark, I do not watch Big Bang Theory since I find it too technical, can you explain to us in simple English?

Mark then explained to Ben that since the outcome for any opportunity was a win or loss (which is a binary outcome), they could use statistical techniques such as logistic regression or discriminant analysis to predict the probability of a win or a loss. Mark was thinking of performing a discriminant analysis so that he could identify the variables that significantly impacted the probability of clinching the deal. By doing this, they would be able to establish a mathematical equation such that Ben's team could input the details of any new opportunity and the equation would predict the probability of clinching the deal (based on past historical pattern).

Mark promised that he would start working on the project and come back to Jack and Ben in a week's time with his recommendations on what was potentially possible.

DATA COLLECTION AND PROBLEM ANALYSIS

Mark started his research with available data. WSES Inc used Oracle ERP and Mark realized that since the implementation of Oracle (in January 1, 2011), data on every sales opportunity was available in the system. The sales leads had collected information on a variety of fields for every sales opportunity and there were about 50 different fields for every opportunity. Mark then requested for a meeting with Ben to clarify his understanding about which data field would be more useful for determining the probability of clinching the deal.

"The good news is that we have four years of data for each and every opportunity", remarked Mark to Ben.

“Yes, the team is quite disciplined. Though there are few cases where all data is not populated for an opportunity, we generally do not miss out information on any important fields”, said Ben.

“This is exactly what I need, but how accurate will be your prediction?”, exclaimed Ben.

Mark told Ben that before he could answer the question on accuracy of prediction, he would need help from Ben to develop a good business understanding. He would need help from Ben to identify potential variables which could impact the probability of clinching the deal. Ben said he would gladly help Mark and together they identified all potential variables which could impact the probability of clinching the deal (see **Exhibit 1**).

With the potential variables identified, Mark started his work on cleaning the data. Over the last 4 years, WSES Inc had chased more than 3,965 opportunities and it took Mark more than a week to organize the data. All along, he had multiple interactions with Ben on business-related questions to ensure that he was not missing out any critical component of the analysis. Ben in turn kept Jack informed about the progress of the project.

Once the data clean-up was completed, Mark used SAS to build the code and run the analysis. He divided the data into four parts and used three parts to build the model. There were good accuracy results for test data and the model was significant based on Pillai's Trace and Hotelling–Lawley Trace tests. Mark then examined individual variables and identified all significant variables.

The next step undertaken by Mark was to create the mathematical equation by using the regression coefficients of significant variables, and he then ran the 4th part (test data) of the data through the model equation to arrive at the probability of clinching the deal for each opportunity.

Mark now had an accurate model and he was ready to answer Ben's question on the accuracy of the model. He had a brief discussion with Ben on the output and they decided to meet Jack to take him through the analysis and recommendations.

“This is fantastic; we are now able to predict the probability of clinching the deal. Just wonder if we can use this to optimize our budget spend. What is the next step, Ben”, asked Jack.

Ben replied “Jack, we tried that out on our ProcSys pipeline. Based on FY 14 data, we were able to achieve the objectives we were targeting at half the marketing budget. We applied the following criteria:

- Budget which stood at \$76 million needs to be aggressively cut down by 50%. We need to meet all other constraints and minimize the budget.
- Overall pipeline stands at \$1.2 billion, but cannot go below 50% of the total pipeline value.
- Probability to clinch a deal calculated by the model to be the input to calculate expected value.

- Revised expected value of sales to be 90% of the expected value of all sales opportunities
- Revised expected value of profit to be at least 90% of the expected value of profit across all opportunities
- Revised expected value of profit to be at least 90% of the expected value of profit across all opportunities.”

Jack was very excited as he understood how much this could be useful in achieving his goals. This seemed to be the right solution for him to reduce the marketing spends by meeting the other target.

“Excellent, let’s look at our current opportunities and decide which are the accounts that we want to go after in order to achieve all our targets” remarked Jack.

“Sure Jack. I would also get you a scenario analysis solution that will help you improve win rates by working on controllable factors like profit% or to go with more aggressive bid on profits to take a little risk for a lot more reward” said Mark.

“Mark – Why did I not find you before” chuckled Jack. He was already thinking about the implementation plan and how to best showcase this exciting story to the Board.

Exhibit 1

Variables in the Model

Opportunity No.	Sl. No. of the opportunity
Reporting Status	Won or Lost as per the data
Area	Includes the following area of the client (in order of size): <ul style="list-style-type: none"> • UK • Other Europe • Americas • Africa • India • Japan • Singapore • Spain • Canada
Customer Industry	Industry of the customer (in order of size): <ul style="list-style-type: none"> • Capital Markets • Banks • Defense • Consumer goods • Others • Security • Energy • Insurance • Airline • Finance • Infrastructure • Mobility • Other government • Government • Telecom equipment • Health • Clinical research • White goods • Agriculture
Product Vertical	Product category by talent required (in order of size): <ul style="list-style-type: none"> • GTMSys • Procsys • LearnSys • Finsys • Lifesys • Logisys • ContactSys
Segment	Combination of Product Vertical, Customer, and Area
Sales Value	Expected Sales value if the deal is won. This constitutes only WSES's share if it is a joint bid
Profit %	Profit as per the proposal submitted or planned to be submitted
Joint Bid - WSES Portion	WSES works jointly with multiple partners to strengthen the bid. This indicates the % of WSES portion to total value

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Exhibit 1 (Contd.)

Additional inputs for Linear Programming

Revenue Split for Sales	If size is <\$3 Mn - 100% in Year 1 If size is between \$3 Mn and \$5 Mn - 50% in year 1 and 50% in year 2 If size is between \$5 Mn and \$10 Mn – 1/3 each year for next 3 years If size is more than \$10 Mn – 25% each yearfor next 4 years
Probability to Clinch deal or lose it	Probability to Clinch deal or lose it - Predicted by the discriminant analysis model
Maximum Marketing Spend	6% of Sales Value

Source: Primary data from WSES

Note: Mn - million