Business Intelligence in the Real-Time World

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ABSTRACT

IT'S A VERY COLD AND BLUSTERY DAY, TWO PEOPLE WALK IN TO YOUR STORE. IT LOOKS LIKE A MAN AND A WOMAN, HARD TO TELL BECAUSE THEY ARE BOTH BUNDLED UP, DRESSED FOR THE WEATHER. ONE IS SHORTER THAN THE OTHER, BUT ALL THAT YOU CAN SEE ARE THEIR EYES. YOU TURN, STAND STILL, YOUR MIND KICKS INTO OVER-DRIVE—WONDERING "WHO ARE THEY AND WHAT ARE THEY HERE FOR? DO THEY WANT TO BROWSE OR BUY? DO I ACTUALLY KNOW THEM? ARE THEY RELATED? IF I KNOW THEM, WHAT DID THEY BUY LAST? WHEN DID THEY BUY IT? HOW MUCH DID THEY SPEND? WERE THEY HAPPY WITH THE PURCHASE? WHAT CAN I INTEREST THEM IN NOW? WHAT DO I DO?"—THEN, YOU SMILE AND STEP FORWARD TO GREET THE TWO, SAYING "HELLO, HOW MAY I HELP YOU?"— SOUNDS LIKE THE OPENING SCENE TO AN OLD HORROR MOVIE OR A REALLY BAD JOKE, BUT SERIOUSLY, VARIATIONS OF THIS SCENARIO PLAY OUT HUNDREDS OF THOUSANDS, IF NOT MILLIONS OF TIMES EACH DAY IN OUR GLOBAL IN-PERSON AND ONLINE ECONOMY. IT IS AT THIS VERY POINT—THE POINT OF INTERACTION—WHERE YOUR CUSTOMER AND YOUR BUSINESS MEET—THAT KNOWING WHAT TO DO IS OFTEN THE MOST CRITICAL TO CUSTOMER SATISFACTION AND GAINING LOYALTY. DO YOU ALWAYS KNOW WHAT TO DO? DO YOU ALWAYS HAVE THE MOST UP TO DATE INFORMATION FROM WHICH TO ACT?

ALL THE WORK THAT GOES INTO UNDERSTANDING YOUR CUSTOMER IS FOCUSED ON MAKING SURE THINGS GO RIGHT AT THE POINT OF INTERACTION.

The Importance of the Point of Interaction

Setting up the right environment, figuring out the right offer and making the right pitch is the front line of the consumer products and services world. All the work that goes into understanding your customer is focused on making sure things go right at the point of interaction. This is where you make an impression and hopefully a sale, and it is the convergence of operational and analytical processes for your business. How important is it? Allow me to tell a very personal story:

Like many of us in the business world, part of my job is to travel a great deal. And as you can imagine, I managed several years ago to reach a high-level status with one of the major U.S. airlines, as have many of you reading this article. The December right after reaching my high-level status I was traveling from Baltimore, MD to San Jose, CA. Unfortunately it was not a direct flight home; I had a connection in Denver, CO. Typical of the season, there were severe winter storms throughout the mid-section of the country. As luck would have it, I made it to Denver on-time, but when I exited the flight onto the concourse to go to the gate of my next flight, I saw the Departure screen, changing before my very eyes! Many flights were now cancelled or seriously delayed. Ah! Good news! My flight to San Jose was delayed by only three hours. I felt very lucky. But wait! I noticed that there is another flight listed for San Jose that had obviously been delayed, but now scheduled to depart in less than an hour. My dilemma now—do I accept my delayed flight as is or do I try to get onto the flight that is due to depart momentarily? You all know the answer of course; I had to try. Moving quickly, I stroll computer bag and roller-bag trailing, directly to the new departure gate, naturally to find that I wasn't the only person with the same goal in mind. I am now sixth in line. One by one, each traveler approached the ticket agent with their requests for ticket changes to the now very soon departing flight.

One by one, they were politely, but firmly denied their request. Listening to their conversations with the ticket agent was very dissuasive and I had almost convinced myself to just pull out and go to the nearest bar and wait the next three hours out. Then it was my turn. I sheepishly approached the somewhat frazzled agent, expecting the same polite but firm denial. Made my request, and because I was expecting "No" was stunned to hear something totally different. She looked at my current flight boarding pass and noted my airline high-level status; then she looked up at me and smiled, and took my boarding pass promptly reissuing a new one for the flight. She also managed to honor my upgrade request and have my luggage pulled and diverted, so that it would arrive with me. When I regained my composure I asked her "What just happened here?" She smiled and simply said "Exceptions can be made, and in particular for our status customers."

Now I will never say that airlines are always good examples of customer service, but at this point of interaction, this airline made an impression on me and as a result I have maintained my high-level status with them ever since.

Hopefully you have had a similar customer-positive experience or two in your life, as these occurrences do actually happen often, in both the face to face and online worlds. From a business perspective, considerable amounts of analysis and work go into profiling and understanding the buying behavior of customers, and where the point of interaction is dynamic, as it is especially for online, analytics play a critical role. Offers in the form of banners or suggestions for next purchases (such as those received from Amazon.com) or even complementary product offerings are all geared toward a recipient based on his/her past buying behavior and other demographic information.

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The Role of Analysis at the Point of Interaction

Typically there is more than one approach that can be taken at the point of interaction, however figuring out which approach to use requires information about your customer. In the old days a really successful used car salesman would size up a customer based on appearance and pick his approach based on past experience. In the modern world we've added to experience by sizing up customers electronically and introducing some straightforward clues that help guide the interactions between sales/customer service representatives and customers. If a customer belongs to your discount club or owns a status card of some type, then the representative does "A", if not does "B". However, in all cases, does a membership in your discount club really say enough about the customer to allow the representative to make a consistent value based decision? Probably not. If I have a BevMo discount card, what does that say about me and my consumer habits? Am I a regular beer drinker? Do I like cocktails? Do I drink a lot of wine? Or do I just make the occasional large purchase when I am throwing a BBQ? What type of information is actually on my BevMo card?

What would be helpful here is to be able to have a little more detailed look into my buying behavior and a simple way of indicating the insight directly to the sales representative standing across the counter from me. This is where analysis comes in, particularly when you have a fairly sophisticated point of sales system (or an online presence) you can leverage immediate outcomes. With a business intelligence tool an individual customer's behavior can easily be extracted and dissected, then an experienced analyst can find trends that can help predict behavior or interests. Naturally, this leads to decisions on what types of offers to make, approaches to making the offers, and/or other ways to improve the customer's experience.

Analysis can also be brought to bear to present more information directly to a customer. Returning to the BevMo example, the sales rep can remind me that I have already purchased 11 bottles of wine this month and if I wish to purchase one more, I will get another one free. That's an offer no one refuses!

Other examples of presenting customers with information they can act on include:

• Providing location information about a nearby store where they could pick up the newly ordered shoes without having to wait days for a delivery.

• Furnishing recurring information about when to order a new water filter for their refrigerator.

• Giving suggestions to help better select items in order to take full advantage of a sales offer.

With an appropriate operational business intelligence tool delivering this information in hand, creating a good customer experience should be considerably more straight forward.

The Problems with BI at the Point of Interaction

Understanding your customers is a preoccupation for many business intelligence experts. Slicing and dicing information to find hidden trends to help make decisions is a big part of what BI has to offer, but how do you apply this knowledge at the point of interaction? Traditional BI offers some challenges in this regard. First of all BI is primarily about the analysis of historical information. It may be a fresh as yesterday, but it rarely is focused on "right now." For analysis BI must consume a fair amount of historical information in order to prove or disprove a hypothesis. Want to know if customers who buy product A also tend to buy product B? Well the guy who left the store just did,

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but that is hardly enough information on which to base a campaign. What you need to see is a trend going back over time that shows that there is a real correlation. Then you can make a business case for some sort of promotion. Traditional BI tools are really good at finding historical trends to help improve a decision making process, particularly decisions that have far reaching implications, such as decisions around revenue trends or the popularity of a particular brand. Traditional BI is good at analyzing this type of information and allowing your organization to decide on an action.

What traditional BI is not good at is dealing with the here and now and making decisions that deal with one specific customer. Why is that? Look at the tools! Whether you use dashboards or OLAP or ROLAP or MOLAP, these tools require a fair bit of business acumen if not technical capability, and with some of them you are spending much more time hunting for information than you are spending simply absorbing it. Applying the time and expertise resources may not be feasible where they are needed most—at the point of interaction.

At the point of interaction what you may need is a simple Yes or No. An ability to train someone to do "A" or "B" based on a very simple exterior clue. In my above example about the airline, the clue was my status printed on my boarding card. For other examples it could be a notation on the checkout screen (such as the BevMor example) or computer monitor that becomes the basis for an action. But in any case it needs to be simple and well understood.

However, just because the exterior clue has to be simple, does not mean that the underlying analysis needed to deliver that clue is also simple. BI provides a wide variety of very sophisticated tools for analyzing data and predicting future trends. Wouldn't it be great if you could programmatically apply those same tools to the "right now" point of interaction?

Operational Business Intelligence

DESIGNING AND BUILDING A BI ENVIRONMENT SPECIFICALLY FOR THE POINT OF INTERACTION

Let's look at the example of a Bank. In today's highly competitive banking environment, banks are constantly looking to keep their customer base together while enticing customers from rival institutions. Free checking, free online banking, checking accounts with interest, no fee ATM transactions, free debit/check cards are just some of the ways that a rival bank can use to tempt customers away from their current bank. Customer retention/attraction programs are key reasons why banks are interested in methods for predicting which customers might be ready to jump to the competition. This is particularly true for high value customers. When creating retention plans around high value customers, typically the customer service representative figures prominently in the conversation. What would be really helpful for the rep is a way of predicting if a specific customer is at risk. Then they could answer questions such as: Have we created the right type of environment? Do we understand our customer's business needs? What level of responsiveness is expected? One way of obtaining the answers is from an analysis of a customer's transaction history over time. Specifically, is the current transaction or recent transaction history indicative of someone about to close their account? For a successful solution a combination of analytical capabilities of BI with the operational systems used at the point of interaction is needed. This is where Operational Business Intelligence comes in.

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GATHERING CUSTOMER INFORMATION

Continuing with the bank example, the customer service representative wants to make sure that she has a complete look at a customer's transaction history, possibly across multiple banking systems. Part of the analysis will include discovering how long a customer has been with the bank, and how many different accounts they have. She will also need to know: Do they have outstanding loans? Are there family relations or business associates with the bank? All of this and more can factor into an analysis of the customer. Since a historical record of activity is key to predicting behavior, a traditional data warehouse or a data mart can be utilized, as they typically have all the recorded activity. It is important to note that this approach is not feasible without the benefit of a data warehouse or data mart.

ANALYTICS AND PREDICTIVE ANALYTICS

Once a substantial record of history has been obtained, the traditional BI analyst steps in to look at the aggregate of all the specific customer's data. They look for trends in banking behavior that signal someone is about to close an account, such as: Have they stopped their direct deposits? Have they started transferring large, steady amounts of cash to another (outside) account? Did they recently close another account, such as a credit card? Was there a change of branch or address? Looking at the historical information the analyst can prove or disprove all their hypotheses to come up with a model for predicting behavior.

One question that may crop up; if I have the model why not just tag the customer record? Why do I need to make the analysis operational? The answer is that the current transaction may be the most critical piece of information for your analysis, and you want to make the decision at a time when you have the best opportunity to influence the outcome. So while historical information is great, it does not mean as much as the information about what is happing right now.

DELIVERY OF INFORMATION

Delivery of this information is critical. The delivery needs to be fairly straight forward so that behaviors can be consistent. When training an employee or the system to behave at the point of interaction, you don't want a lot of variables in play to confuse things.

Linking an operational BI system into your point of interaction systems can be a real win in this case. A simple red box or highlighting of a name can be enough of a clue to the service representative for them to take a specific, predetermined action. For online systems, this hook up is even easier because it is programmatic. One requirement though, is that your operational BI system should be easily integrate-able with your point of interaction system. Therefore using a system that is based on a Service Oriented Architecture (SOA) or clearly defined user interface (UI) is important. Another thing to look for is the ability to translate analysis into operations. If the analysis done to generate a predictive model is not easily carried into the operational system, you will create a lot of work for yourself and possibly lose the flexibility to make changes to the system as new information presents itself.

Measuring the Benefits of Operational BI

Measuring the benefits of Operational BI is straight forward. If the process starts with a hypothesis (if a customer buy's "A" will they be interested in "B"), you should build your measurement based on that hypothesis. By introducing the system, were you able to increase the sales of "B" to customers of "A"? Since, presumably selling "B" has a monetary benefit it lends itself to a fairly direct ROI as well.

Measurement for some things however is a little trickier, particularly measuring systems designed to retain customers. How do you know that a customer was really going to leave? One way to the answer is to go back to your analysis. Based on the initial analysis that generated the predictive model,

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how many customers should have left over the period of time in question? Did that number grow or shrink over the measured period of time? By attaching an average value to these customers, you can again produce a fairly reasonable ROI.

Bottom line: an operational BI system should be focused on influencing the interaction with your customer to provide benefit to both the customer and your business. This differentiates operational BI from traditional BI. Traditional BI, like eMail, is often seen as a tool with a very fuzzy ROI, but hard to imagine doing business without it. Nonetheless, it is easy to see the benefit from Operational BI because it directly addresses your business.

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