Business Analytics

Application in different sectors

Customer Analytics

Customer profiling

The bulk of marketing traditionally casts a wide net and hopes to capture as many individuals as possible. Companies are realizing that all customers are not clones of some predefined market segment but are thinking individuals. To this end, **customer analytics encompass the continuous refinement of individual customer profiles** that incorporate demographic, psychographic, and behavioral data about each individual.

Targeted marketing

Knowledge of a set of customer likes and dislikes can augment a marketing campaign to target small clusters of customers that share profiles. In fact, **laser-style marketing is focused directly at individuals** as a by-product of customer analytics.

Personalization

As more business moves online, the browser acts as a proxy for the company's first interface with the customer. Personalization, which is the process of crafting a presentation to the customer based on that customer's profile, is the modern-day counterpart to the old-fashioned salesperson who remembers everything about his or her individual "accounts." Web site personalization exploits **customer profiles to dynamically collect content designed for an individual**, and it is meant to enhance that customer's experience.

Collaborative filtering

We have all seen e-commerce Web sites that suggest alternate or additional purchases based on other people's preferences. In other words, the information on a Web page may suggest that "people who have purchased product X also have purchased product Y." These kinds of suggestions are the result of a process called collaborative filtering, **which evaluates the similarity between the preferences of groups of customers**.

Customer Analytics

Customer satisfaction

Another benefit of the customer profile is the ability to provide customer information to the customer satisfaction representatives. This can improve these representatives' ability to deal with the customer and expedite problem resolution.

Customer lifetime value

How does a company determine who their best customers are? The lifetime value of a customer is a measure of a customer's profitability over the lifetime of the relationship, which incorporates the costs associated with managing that relationship and the revenues expected from that customer. Customer analytics incorporates metrics for measuring customer lifetime value.

Customer Loyalty.

It is said that a company's best new customers are its current customers. This means that a company's best opportunities for new sales are with those customers that are already happy with that company's products or services. Customer analytics help.

Human Capital Productivity Analytics

Call Center Utilization and Optimization.

If you have ever dawdled while on hold, waiting for a customer service representative to pick up the telephone, you can understand the value of analyzing call center utilization to look for ways to improve throughput and decrease customer waiting time. When a company's management realizes that inbound calls are likely to be from unsatisfied customers, making them stew on the phone is not going to improve customer satisfaction. In the more advanced cases, quick access to customer profile information may also affect the level of support provided to each customer (e.g.,
high level to high-value customers, minimal support to low-value customers).

Production effectiveness.

This includes evaluating on-time perfor- mance, labor costs, production yield, etc., all as factors of how staff members work. This information can also be integrated into an infor- mation repository and analyzed for value.

Business Productivity Analytics

Defect Analysis.

While companies struggle to improve quality produc- tion, there may be specific factors that affect the number of defective items produced, such as time of day, the source of raw materials used, and even the individuals who staff a production line. These factors can be exposed through one component of business productivity analytics.

Capacity Planning and optimization.

Understanding resource utilization for all aspects of a physical plant (i.e., all aspects of the machinery, personnel, expected throughput, raw input requirements, warehousing, just-in-time production, etc.) through a BI anal)tics process can assist management in resource planning and staffing.

Financial Reporting.

Stricter industry regulatory constraints may force companies to provide documentation about their financials, especially in a time when companies are failing due to misstated or inaccurately stated results. In addition, financial reporting analytics provide the means for high-level executives to take the pulse of the company and drill down on particular areas.

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Risk Management.

Having greater accuracy or precision in tracking business processes and productivity allows a manager to make better decisions about how and when to allocate resources in a way that mini- mizes risk to the organization. In addition, risk analysis can be factored into business decisions regarding the kind of arrangements that are negotiated with partners and suppliers.

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Business Productivity Analytics

Just-in-time.
The concept of just-in-time product development revolves around the mitigation of inventory risk associated with com- modity products with high price volatility. For example, the commodity desktop computer business is driven by successive generations of com- modity components (disk drives, CPUs, DRAM memory chips, to name a few). Should a vendor purchase these items in large quantity and then come up against a low-sales quarter, that vendor might be stuck with components sitting on the shelf whose commodity value is rapidly declining. To alleviate this, the knowledge of how quickly the production team can assemble a product, along with sales channel information and supplier information can help in accurately delivering products built to customer order within a predictable amount of time.

Asset Management and Resource Planning.
Utilization, productivity, and asset lifecycle information can be integrated through business analytics to provide insight into short- and long-term resource planning, as well as exposing optimal ways to manage corporate assets to support the resource plan.

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Sales Channel Analytics

Marketing.

Both the ability to fine-tune a marketing program and the ability to determine marketing effectiveness can be derived through sales channel analytics. A typical iterative process would be to identify a marketing strategy based on an analysis of a clustering of customers by profile and then to implement that strategy. The effectiveness of the strategy will ripple through the sales channel data, which can then be used to compare the actual results with expectations. The degree to which those expectations are met (or exceeded) can be fed back into the analytical processing to help determine new strategies.

Sales Performance and Pipeline.

Data associated with the sales staff can be analyzed to identify variables that affect the efficiency of the sales cycle, such as individual sales staff member, region, industry, contact people, contact times, and contact frequency.

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Sypply Chain Analytics

Supplier and Vendor Management.

Many organizations are unable to identify who their vendors are or how many vendors are supplying products or services. Supply chain analytics allow a company's manage- ment to track performance and reliability by supplier, evaluating and rating the quality of the products supplied, as well as help to optimize supplier relationships with respect to spending, procurement, and risk.

Shipping.

There are different methods by which a company delivers its products to its customers, each with its own cost schedule. For example, it may be more expensive to ship products by air than by truck, but the products will arrive at the destination faster if shipped by air. A company can minimize its delivery costs by being able to select he most efficient delivery method for any specific business arrange- ment, but knowing whether the products can be available within the right time schedule is a difficult problem, especially if your production depends on external suppliers. Therefore, merging supplier and inven- tory information with productivity data (see Business Productivity Analytics on page 19) lets management accurately determine the best way to move product.

Sypply Chain Analytics

Inventory Control.

As discussed earlier, maintaining an inventory of commodity products that exhibit volatile pricing and limited useful life creates a market risk if those products cannot be used before their obso- lescence. Alternatively, we would not want to keep the shelves empty, because parts are needed to build the products that are in the order- and- fulfillment cycle. Between the sales channel information, the pro- ductivity data, and the supply chain data, it is possible to make more precise predictions about inventory requirements. It is also possible to determine the best way to quantify and mitigate risk, especially through the development of financial products (such as barrier options) to limit financial losses.

Distribution Analysis.

Imagine that your company has a large number of retail outlets, a smaller number of regional warehouses, and a very small number of factories. The optimal distribution model would arrange for the delivery of the exact number of products from each factory to its closest warehouses so that each warehouse could deliver the exact number of products to each of the retail stores. Unfor- tunately for both companies and customers, this optimal distribution is pretty rare. If a company can predict demand for specific products within certain areas, though, the managers cannot only distribute the product to the right locations in the right quantities, but also minimize shipping costs by ramping up product creation at the factories most economically geographically located at a rate that matches the con- sumer demand.

Behavior Analytics

Purchasing Trends.
Although many product lifecycles can easily be predicted and charted, there are apparent nonlinear trends that elude predictability, the most notable cases being toy sales around winter holiday time. Yet not being able to identify a warming (or heating!) product may result in the inability to ramp up production to meet demand or the inability to move products from factory to store shelves, which can effectively dump a glass of cold water on that hot product. Behavior analytics can be used to identify purchasing patterns that indicate a growing trend that can be used to adjust a company's reaction to customer trends.

Web Activity.
In the world of e-commerce, the ability to draw and maintain customers to a Web site and then encourage them to commit to purchasing products is not only critical to success, but also much more difficult than doing the same in a brick and mortar environment. Different kinds of content presentation may lead different kinds of consumers to behave differently. It is interesting to identify patterns that lead to committed business (e.g., product purchase)mlet's call them "success patterns." Then perhaps including some personalization (see Customer Analytics on page 18), the content presentation can be crafted to direct the Web site visitor into these success patterns, which in theory should improve the probability of making a sale.

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Behavior Analytics

Fraud and Abuse Detection.
Fraudulent (or abusive) behavior fre- quently is manifested in patterns. For example, there are many popular health insurance fraud schemes involving making claims with inflated charges or practitioners prescribing expensive medications or procedures that may not be necessary. Behavior analytics can be used to seek out patterns of suspicious behavior by provider, geographical region, agent, etc.

Social Network Analysis.
Sometimes it is important to identify rela- tionships between specific entities within a system and to analyze their behavior as a group. For example, a component of criminal intelligence is finding collections of individuals whose individual behavior may be nondescript yet who act suspiciously as a group. This kind of analytical processing is valuable to law enforcement, regulatory compliance (think of insider trading), marketing (consider viral marketing, which is a strategy that encourages individuals to pass your marketing message to all of their contacts), as well as sales optimization (by finding a contact path of people to find the right audience).

Customer Attrition.
Another serious problem for many businesses is customer attrition, when a company's customers decide they no longer want to remain affiliated with that company. In competitive industries, it is much easier to convince a customer to stay with the company before the decision has been made to leave rather than afterwards. For example, offering a long-distance telephone customer a better offer than can be gotten from a competitor can recapture that customer, but it is not to the company's benefit to make this offer to (higher valued) com- placent customers. Therefore, it is important to recognize the signs that a customer is ready to cease being a customer. This can be done by evaluating patterns of behavior before previous attritions (such as a history of customer service complaints) and then using those patterns for ongoing customer behavior analysis.