Blazing the new digital trail

More companies than ever before are keeping track of what their customers are asking for and buying. How do the best companies take data from millions of transactions and convert it to a successful business strategy? Larry Rosenberger, John Nash and Ann Graham have been exploring the new frontier of data, analytics, decisions and actions.
By 2010, businesses and consumers worldwide will spend $1.5 trillion annually on information technology hardware, software and services, according to the US information technology market research firm, IDC. Displacing the paper trail is a digital trail, residing in computer databases, both private and public. There isn’t a business or a consumer anywhere today that isn’t touched by the trillions upon trillions of revealing bytes moving through wired and wireless, stationary and mobile information technologies.

For all leaders of 21st-century corporations, the most urgent question is: how can companies create financial and customer value from unprecedented access to such huge amounts of digital data? But almost equal in importance is this question: can companies also use this data to create business value?

In business-to-consumer industries, analytics (the science and art of identifying and interpreting patterns in data, then technologically massaging that data to accomplish a defined task) are all the rage. Some companies have mastered analytics. Tesco, the UK-based global grocery and general merchandise retailer, and Netflix, the US online DVD-rental service, have both used proprietary algorithms coupled with customer transaction databases to create cost-effective, mass-customized consumer experience business models in their respective markets. Such companies have not only been successful in their own right, they have often disrupted the success of their competitors.

Busting open
When Reed Hastings founded Netflix in 1999, he saw video stores as a prime target for disruption; and he saw Blockbuster, then the market leader, as the one to beat. Blockbuster, which launched its online channel in 2004, hasn’t been able to grow its customer base even within striking distance of Netflix. In 2008, Netflix claimed 7.5 million customers, while estimates are that Blockbuster has perhaps half that many.

Nor has Blockbuster been able to beat its rival on the quality of the experience Netflix delivers to its customers, largely based on the strength of its mathematical skills and business acumen. The way Netflix outperforms Blockbuster most is through its recommendation engine, called Cinematch, which runs proprietary predictive algorithms that analyse individual customer buying patterns and opinion ratings of movies to predict which movies the person will like. The algorithm is written to optimize both a customer’s preferences and inventory conditions. It can even pick up a customer’s tastes for obscure and cult movies.

While Blockbuster rewards its regular customers with traditional volume discounts (that is, if you order more movies, you’ll pay less for each one), Netflix rewards its regular customers by getting better at knowing what they prefer with every transaction and giving them choices they will like every time they reorder. The more a Netflix member uses its services and the recommendation tools on the sites, the better the algorithms get, the more personalized and appealing the experience becomes over time and the more valuable the customer data becomes.

Decision management
The Economist has described Tesco’s collection of data on its 13 million-plus loyalty-card holders as a “mind-numbing” flow of purchasing data across 55,000 product lines. Models analysing preferences and behaviours use 40–50 customer variables from a 40-terabyte database to characterize customers. Mathematical techniques can predict that, if a customer is buying certain products (for instance,
a lot of beef and no breads or pastas), that person is probably on the low-carbohydrate Atkins diet. Tesco will then refrain from sending offers for high-carb products to these customers. The model can predict how long a person has been on the diet or if their shopping patterns are changing, and this information might be used to project sales of bread and pasta months ahead.

While combining data, analytics and computing power is important, at the end of the day what drives the results a company achieves are the millions of decisions it makes that are informed by every customer interaction and transaction. This is what we call decision management. Analytics is part of decision management; but the two are not synonymous.

From a technology perspective, decision management encompasses a class of information technology (IT) that embeds algorithms inside IT systems and automates the execution of decisions derived from analytical models. Decision-management technology pulls together the know-how of mathematicians and information technologists as well as executives, managers and employees. Instead of viewing IT infrastructures as systems for processing data, as we have in the past, executives need to think about the IT infrastructure as a resource for automating, improving and connecting decisions.

Even successful companies don’t appreciate how much value can be created or lost in a single transaction, and how the cumulative effects of bad or careless operational decisions can harm performance. Such technological savvy is most valuable in situations in which companies are managing high volumes of transactions with customers and making repeatable operational decisions – such as in call centres, all types of consumer lending and insurance claim processing, point-of-sale credit card approvals and direct marketing. Decision-management systems allow companies to control or change the logic behind millions, even billions, of operational decisions every day by simply making a change in the analytic model.

As a mindset, decision management looks at decisions as a distinct part of a business process, one comprised of a work flow, a well-defined set of actions associated with an operational task, and a decision flow, the set of alternatives or choices made in the given work flow. Suppose your business process is the direct-mail marketing of credit cards to new customers. Then, the decision flow that relates to this business process includes many decisions, for example:

- What products and product features you should offer
- Which prospective customers you should target
- When to send offers to these people
- Which channels you should use to send your offers

Most companies have reached the limits of wringing costs out of business processes through automation of the work flows of non-strategic administrative business processes (e.g., payroll, employee benefits administration and receivables management). We think the next wave of competitive opportunity is to use decision-management technology to improve and connect decision flows of functions, such as marketing and customer service, to achieve competitive differentiation and revenue growth. This is especially critical in mass-market consumer businesses that are trying to lower the cost of differentiating their products and services by delivering unique value to customers that competitors can’t match.

Framing decisions

Decision-management systems create a critical feedback loop connecting customer data to different types of analytics models to decisions to actions and, lastly, to customer reactions. The figure, above, illustrates this well.
Consider how this framework applies in a bank lending process. Fair Isaac, our company, invented the credit score to help lenders analyse each applicant’s credit risk while handling many more loan applications than they ever had before. The company’s best-known product, the FICO® score, is a credit score based on Fair Isaac’s proprietary algorithms to analyse an individual’s credit history and to predict his or her behaviour, for instance, the risk they won’t pay back the loan on time.

The basic idea behind this credit scoring algorithm is to choose and weigh a set of variables: how often a person has applied for credit, balances outstanding, a customer’s repayment record and the kinds of loans he has – such as mortgages, car loans and student loans. These variables are chosen because they are highly predictive of a person’s likelihood to manage his or her debts responsibly based on his or her past actions. FICO scores are calculated through an algorithm that considers data on multiple variables, drawn from external databases such as credit bureaus. The output of the process is a single three-digit number that represents all the variables. The higher the score, the less risk a borrower is to a creditor.

Fair Isaac introduced the credit score in the 1950s, although it took almost two decades to automate the process. In 1972, Earl Isaac, one of the co-founders of Fair Isaac, wrote the software for a system called ASAP (Automated Strategic Applications Processing) to automate the processing of credit applications. With ASAP, Fair Isaac entered the software business and found that the automation of the loan approval process was as valuable as the mathematical formulas used to score applications. Today, the credit score is a standard tool applied in automated decision-management systems used by commercial lenders around the world. All retail banks use credit scores to manage everything from loan approvals and interest rate levels to lines of credit for a wide variety of lending products and for millions of customers and prospects. Insurance companies also use scores in deciding individual customer eligibility and which services to offer. Some healthcare providers are beginning to use scores, post-treatment, to determine who they should pursue to collect delinquent fees and who they should write off.

Many credit card issuers build sophisticated decision models that take predictions into account when determining how large a credit line increase they should offer, if any, to different groups of credit card holders. A decision model is a mathematical representation of the quantitative relationships among four types of elements:

- The data elements known about the prospects/customers at the time of the decision: for example, the cardholders’ risk scores, their current balances and credit limits, recent spending activities and finance charges
- The decision to be made: in this case, the amount of a credit line increase (which could be zero) to give to each card holder
- The consumers’ behavioural reactions to the decision made and the action taken: for instance, how much more spending, balance building and incremental repayment risk will occur as a result of giving consumers this credit line increase
- The impact of those behaviour reactions on the credit card issuer’s key business metrics: in this example, incremental revenue, receivable balance, credit loss and profit contribution

Having constructed a formal mathematical model, the lender can in theory solve for the “optimal” credit line increase to give to each cardholder.

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Trends

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the customer of what the company offers – a product, a service or an experience. For example, ING, the Dutch insurance company, installed a decision-automation system based on proprietary predictive analytics models used to lower the cost of its benefits claims management process while speeding up service. Before ING installed the system, it was using a screen for fraudulent claims that was slowing down the claims process for customers and not detecting significant fraud. So the company implemented a system to analyse claims in real time, to identify those that were unlikely to be fraudulent. Based on analysis of the factors that indicated a fraudulent or nonfraudulent claim, ING was able to identify the claims that could be settled without a screen. This way, claims could move through the processing phase faster without increasing risks.

The result? This new system raised customer satisfaction because payments were made more quickly, and ING reduced processing costs by 20–40 per cent over the previous claims management process with only a small increase in losses due to fraud. In this case, ING systematically identified a way to shorten claim processing for select customers. Here, predictive analytics offered a one-two punch: a better way to manage resource constraints (that is, costs) and greater customer satisfaction.

Akbank T.A.S. is the largest of four retail banks in Turkey vying for consumer lending and credit card services aimed at middle-income customers. Retail banks such as Akbank have historically served a small, high-net-worth customer base; but in Turkey today, growth depends on winning over the middle-income consumer, and often these consumers are using banking services for the first time. The decision-management strategy is to use technology to offer consumers speed and convenience while simultaneously managing customer profitability and losses among segments with risk profiles that the bank is not used to serving.

The service, called CepKredi (which in Turkish means “speedy cell credit”) uses a mobile phone as a channel for loan origination. Akbank’s managers decided that using the mobile phone to apply for a loan would stimulate even higher volumes of applications than the Internet, and they were correct. Akbank’s automated credit scoring and business rules management systems enable 20,000 people daily to use their cell phones to apply for loans and credit. It takes less than five minutes for a customer to dial into an interactive voice-response system and answer 11 questions, and 20 minutes to learn whether their voice application has been approved or declined. A voicemail or text message is rapidly sent to their cell phone.

Akbank’s credit decision-management system, which is also used on the Internet, covers decisions made throughout the entire credit life cycle, including prospecting and customer acquisition, underwriting loans and managing accounts. The system runs through 17 different paths, 620 rules, 390 strategies, 330 scenarios and 5,327 steps. The bank’s investment in decision-management technology is critical to its strategy of aggressive but controlled growth. In 2006, approximately 53,000 people received loans through Akbank’s mobile phone credit service. Even more impressive, since 2005, Akbank’s retail customer base has grown to more than 5.4 million retail customers. In 2007, the annual report noted that 2.35 million customers per month now use Akbank’s mobile channel to do their banking.

Precision decision marketing
In 2004, Coca-Cola invested in a decision-management technology platform that serves as the foundation for all the company’s interactive marketing programmes, across all 13 brands within the Coke product portfolio. The system includes cutting-edge data collection, analytics and automated decision-making actions.

It is relatively easy for marketers to populate a consumer database with people’s names, addresses, demographic data and, in some cases, their buying patterns. The bigger challenge is figuring out how to use that data to deliver marketing content that is useful, relevant and entertaining to millions of people – one person at a time. Further, large...
→ consumer-branded companies like Coca-Cola have long struggled to get more value from the databases of people who register for their loyalty programmes. Companies tend to start from scratch with every new marketing campaign, essentially ignoring the fact that they already have a receptive audience in their loyalty programme members.

The MyCoke Rewards website is the centrepiece of the brand loyalty-building programme Coke has devised to build customer data that feeds the decision-management system. After consumers register their MyCoke account on the Web, they enter codes that become points in their account. Codes for points come from inside the bottle tops of beverages, and the points are redeemed for merchandise and experiences. The key is making the rewards and the content on the site as relevant as possible to Coke’s prized youth demographic globally (ages 13–25). Live music lovers who drink enough Coke can cash in a few thousand reward points to attend a live taping and go backstage at a concert. Skiers can escape to a mountain resort for three days. And NASCAR enthusiasts can win lug nuts from race cars used in NASCAR events.

The more time a consumer spends on the site and the more he redeems points, the more precisely Coke can know that person’s interests and can therefore emotionally engage him in the brand. The site captures psychographic information that, unlike traditional demographic data (for example, age and residence), reveals more about individual tastes and behaviour. The decision-management platform uses business rules to automate the decision as to what content to show individual customers and when to show it.

This interactive platform is the first marketing programme ever to go across Coke’s 13 brands; it is a great example of the power of connecting decisions. Now Coke can combine actions to maximize the value of a portfolio of brands per customer segment, instead of simply managing a single product, brand-by-brand. The technology dictates the nature, the pattern and the sequence of marketing messages to individuals. These variables, of course, change as the person’s consumer data profile changes. A dynamic survey engine captures relevant pieces of data through various iterations of the algorithm. Each decision is based on millions of consumer profiles developed from data collected from multiple customer “touch points” and stored in a single data warehouse. Coke views all of its interactive marketing efforts as a way to achieve improved marketing efficiency in a fragmented media environment, ultimately reducing the company’s traditional reliance on broad-based television advertising promotions.

As technology and mathematics experts work more closely with executives to use data to conceive innovative business models and make business processes more competitive, the underlying analytics and decision-management technology will become less mysterious. And the opportunities to use these resources for competitive advantage will become more apparent. The more IT infrastructures become streamlined and integrated, the easier it will be to automate analysis and decision making and to use information technology to elevate the quality of tactical decision making throughout enterprises.

Decision management provides the critical link between strategy and execution. Given the importance and the size of that gap in most companies, it is an exciting time to be pushing the edge of the envelope with respect to all four decision-management components: data, analytics, decisions and actions.

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