# Overview of Business Intelligence

1. Business Intelligence: the process of collecting data and transforming it into information, analyzed by business users to make better decisions and improve their company performance.

Business intelligence can cover many business function areas; some of them are listed below. However, this research paper will concentrate on three areas: SCM, ERP, and CRM.
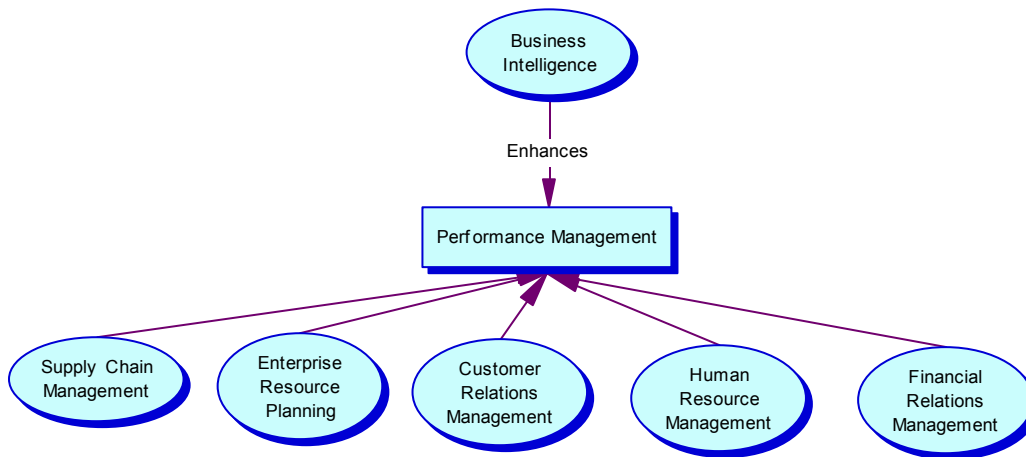

2. Turn data into business action:

Data	Discovery	Business Actions
Transaction	Customer segmentation	Customer retention programs
Operational	Demand and forecasting	Where to advertise
Demographic	Affinity merchandising	Optimize mailing list
Lifestyle	Product and customer profitability	Maximize store layout
Financial	Fraud patterns and profits	Cross-product marketing
Economic		Improved risk profiles
Government		Funds collection
Associations		

3. The Data to Information Challenge
- Extract data from different database on different servers
- Transform data so they are meaningful for the end-users
- Cleanse data if necessary
- Load data and keep history in a suitable environment
- Secure data and filter access according to end-user rights
- Give to the end-users easy and simple to use query and analysis tools
- Insure quick and constant response time whatever question the end-users ask

- ➢ Allow sophisticated analysis
- ➢ Offer advanced calculations capabilities and simulation
- ➢ Design, administer and maintain the applications

4. An Example: IBM Business Intelligence Software
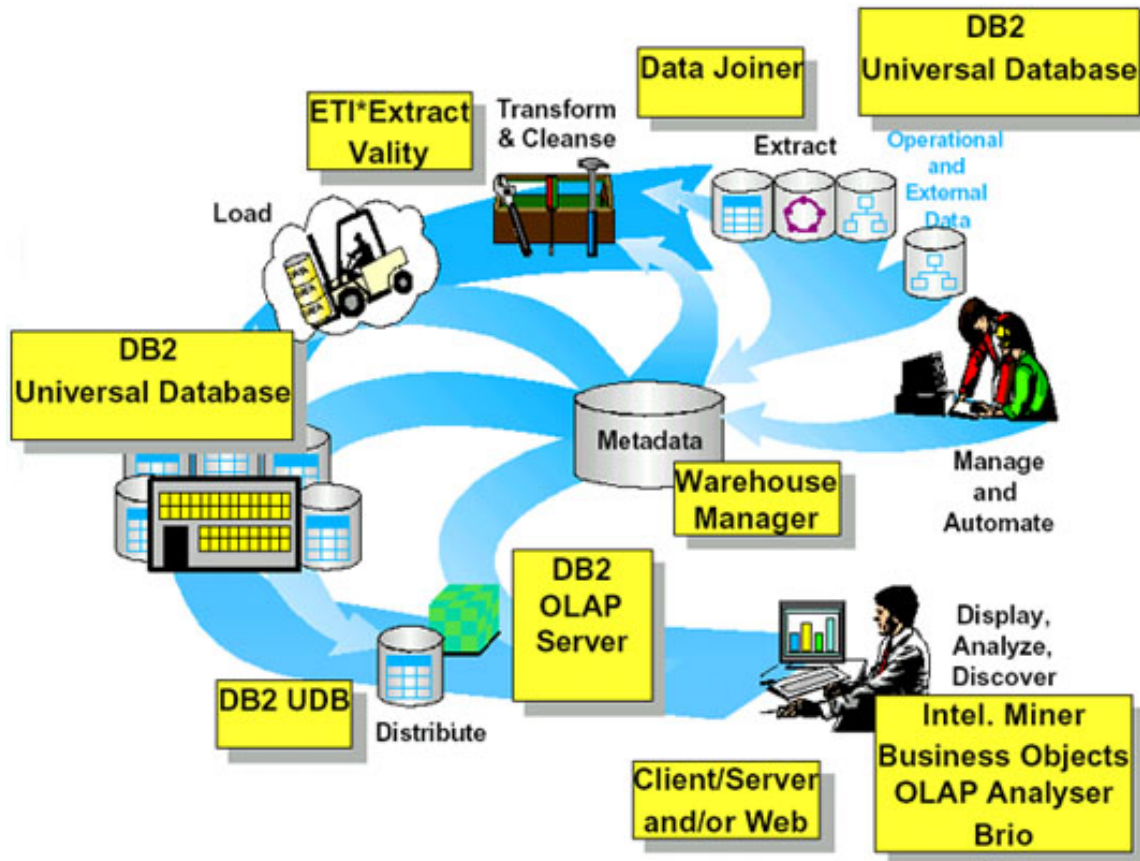
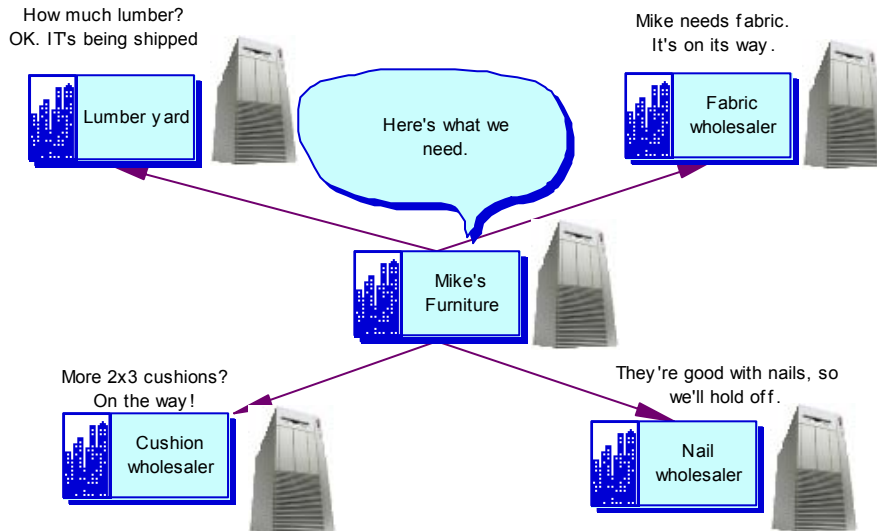

Supply Chain Management

Supply Chain Management is the integration of key business processes from through original suppliers that provides products, services, and information that add value for customers and other stakeholders.

Important technology improvements to boost SCM:
- ➢ The Internet, which provides the technological infrastructure for business to communicate
- ➢ Data acquisition applications
- ➢ Data manipulation tools
- ➢ Data disseminations tools

The following diagram illustrates how technology streamlines the supply-chain cycle and seamlessly incorporate supply chain into the corporate business management.

Technology streamlines the supply-chain cycle

How much lumber? OK. IT's being shipped

Lumber yard

Mike needs fabric. It's on its way.

Fabric wholesaler

Here's what we need.

Mike's Furniture

More 2x3 cushions? On the way!

Cushion wholesaler

They're good with nails, so we'll hold off.

Nail wholesaler

Supply Chain Management Processes

SCM process	Description
Customer relationship management	Identify key customers or customer groups, which the organization targets as critical to its business mission.
Customer service management	Provides the single source of customer information.
Demand management	Given the variability in customer ordering, which requires the organization to balance the customer's requirements with the organization's supply capabilities.
Order fulfillment	To effectively integrate of the firm's manufacturing, distribution, and transportation plans to meet customer need dates.
Manufacturing flow management	Market changes require the flexibility to perform rapid changeover to accommodate mass customization.
Procurement	Strategic plans are developed with suppliers to support the manufacturing flow management process and development of new products.
Product development and commercialization	Customers and suppliers must be incorporated into the product development process to reduce time to market.
Returns	Enables identification of productivity improvement opportunities and breakthrough projects.

Management Components of Supply Chain Management:

➢ Planning and control
➢ Work structure
➢ Organization structure
➢ Product flow facility structure
➢ Information flow facility structure
➢ Management methods
➢ Power and leadership structure
➢ Risk and reward structure
➢ Culture and attitude

Case Studies

Chevron Texaco, during the past 10 years, Chevron Texaco, the nation's eighth largest company, has shifted from a supply-driven business model to a far less costly demand-driven model. Each year, the company has invested $15 million in supply chain technology --- proprietary systems that capture real-time data, as well as advanced planning systems and an SAP implementation. Refining, marketing and logistics departments use the demand data captured at Chevron filling stations, plus other points of sale such as airlines and trucking companies, to plan refinery loads, time spot-market purchases and schedule refill deliveries. The data, and the integration work that allowed it to be shared across the company, has improved decision making at every point in the customer-facing supply chain. Chevron's year 2000 profits increased by more than $100 million to $778 million, much of it attributable to the successful shift to a demand-driven supply chain.

Bayer CropScience is the world's second-largest agrochemical company and a global provider of crop solutions, products and services. Because its enterprise resource planning (ERP) system lacked the flexibility to retrieve and analyze data, Bayer CropScience turned to SAS Supplier Relationship Management for help at its U.S. operations. SAS' powerful analytical SRM technology helps Bayer CropScience in the United States collect, analyze and leverage supplier data and purchasing history. With an accurate view of total spending over time, the company can rank its supplier base, match business objectives with individual supplier performances, identify areas for cost consolidation and predict optimal procurement strategies.

With SAS, Bayer CropScience in the United States gets:
➢ An offline data warehouse that integrates data from its SAP AG ERP system and from other sources.
➢ Integration of external data such as that from the U.S. Bureau of Labor, which Bayer CropScience in the United States uses to factor inflation into spend analysis.
➢ Integration of other internal purchasing-related data not tracked in its ERP system, such as supplier status and details of purchasing card transactions.
➢ Predefined interactive reports based on analysis of purchasing data.
➢ Customized OLAP interface that helps purchasing analysts find ways to save money.

Schneider Electric is the world's largest manufacturer of electrical distribution systems and components. In such a large organization, there is an excellent chance of finding profitability in managing the supply chain. Schneider' SMS takes advantage of the joint efforts of SAS and D&B data content that culminated in their SAS SRM solution, which makes transparent the affiliation of companies that have different names. All purchasing information from the various Schneider subsidiaries is extracted on a monthly basis, codified according to the D&B/SAS application, put through the validation and control engine, and consolidated. The information is then stored in a data warehouse, from which metadata and reports may be extracted. After being sorted by commodity, the information is then fed back to the subsidiaries so that they may track and compare their progress with the various suppliers.

Enterprise Resources Planning

Enterprise Resources Planning software is a network of systems. It attempts to integrate all departments and functions across an organization onto a single computer system that can serve all those different departments' particular needs --- which includes all the divisions of the organization, including administrative applications (finance and accounting), and human resources applications (payroll and benefits). ERP brings organization's business units together under a single software complex. The greatest benefit of ERP is integration, all illustrated by the below diagrams.
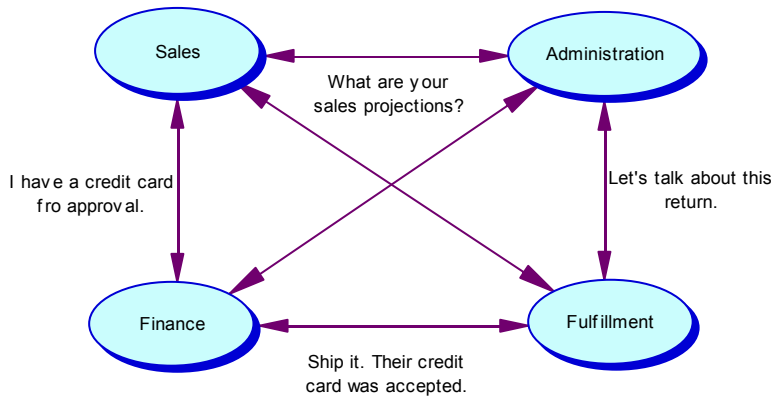
ERP vanquishes the old standalone computer systems in finance, HR, manufacturing and the warehouse, and replaces them with a single unified software program divided into software modules that roughly approximate the old standalone systems.

ERP's best hope for demonstrating value is to improving the way the organization takes a customer order and processes it into an invoice and revenue --- otherwise known as the order fulfillment process, where ERP takes a customer order and provides a software road map for automating the different steps along the path to fulfilling it.
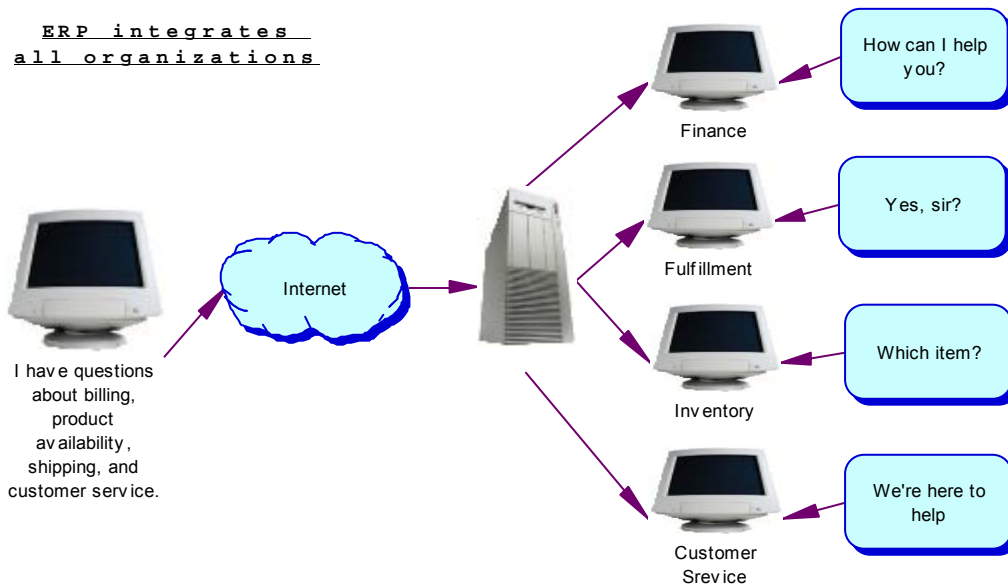
Why is ERP so popular?
➢ The need for a system that improves customer order processing
➢ The need to consolidate key business functions for an internal good, like interconnecting, manufacturing, accounting, administration, and fulfillment.
➢ The need to integrate separate technologies, along with the functions they provide, into a common, organization-wide organism
➢ The need to provide a solid foundation on which next-generation technologies and applications can be built.
➢ E-business demands a smooth, efficient, effective ERP.

ERP integration

Sales — What are your sales projections? → Administration

I have a credit card fro approval.

Let's talk about this return.

Finance

Fulfillment

Ship it. Their credit card was accepted.

ERP integrates all organizations

I have questions about billing, product availability, shipping, and customer service.

Internet

Finance — How can I help you?

Fulfillment — Yes, sir?

Inventory — Which item?

Customer Srevice — We're here to help

Case Studies

Nestlé, in June 2000, Nestlé SA signed a $200 million contract with SAP --- and threw in an additional $80 million for consulting and maintenance --- to install an ERP system for its global enterprise. The Switzerland-based consumer goods giant intends to use the SAP system to help centralize a conglomerate that owns 200 operating companies and subsidiaries in 80 countries.

What can go wrong with enterprise-wide systems implementations? Nestlé rushed to make Y2K deadline for the first phase, overlooking important integration steps. The CIO formed an implementation team of 50 top business executives and 10 senior IT people

but included no one from the groups that would be directly affected by the new business processes. Users rebelled. Morale sank; turnover soared and help desk calls reached 300 per day. In June 2000, Nestlé halted the project in mid-rollout. The company regrouped, starting from scratch and jettisoning a predetermined end date. It conducted regular surveys of user reactions to changes, delaying implementation when feedback indicated the need for further training.

Lessons Learned from Nestlé's ERP
➢ Don't start a project with a deadline in mind. Figure out the project requirements, then determine how long it will take you to accomplish them.
➢ Update your budget projection at regular intervals. So many things happen during a long project that you will be lucky to stay on target during a particular year, let alone the life of the project. Frequently revisiting your numbers will help minimize troublesome surprises.
➢ ERP isn't about the software. It's easy to put a new system in place. The hard part is changing the business processes of the people who will use the system.
➢ Nobody likes process change, particularly when they don't know it's coming. Include in the planning the people whose processes you are changing. Keep the communication lines open while the project is in the works, and measure the level of acceptance before, during and after the rollout.
➢ Remember the integration points. It isn't enough to simply install new systems; you need to make sure that they can talk to each other.

American Red Cross, the Red Cross Blood Services division had handled blood in much the same decentralized way for decades. By the early 1990s, the Red Cross's blood-products business depended on a computer network with more loops than the human circulatory system. Twenty-eight separate computer systems served the nation's 38 Red Cross blood services regions. Although all the systems were subject to the same U.S. Food and Drug Administration (FDA) regulations, each was managed independently. Each region developed its own (sometimes redundant, sometimes contradictory) procedures. There was little national collaboration or leadership.

In 1991 the Red Cross launched a seven-year, $287 million effort to overhaul and upgrade the management, operations and technology that will support the processing of nearly half the nation's supply of blood. That's the gradual conversion of those 28 regional computer systems to a single artery: the National Biomedical Computer System (NBCS) based at the Red Cross's national headquarters in Falls Church, Va.

The result: a centralized IT system and supporting business practices that standardize everything from maintaining donor histories to labeling units of blood, increasing efficiency and cutting costs while improving product quality. NBCS allows the Red Cross to adapt faster to shifting conditions--including FDA regulations--because changes affect only one system.

A glimpse of the synopsis of the successful American Red Cross ERP system:
➢ American Red Cross National Biomedical Computer System (NBCS)
➢ Launched: Aug. 12, 1996, with Farmington, Conn., Blood Services region

- ➢ Application servers: IBM RS/6000 processors
- ➢ File servers: Compaq ProLiant 300R servers
- ➢ Network hardware: Cisco routers and switches; Cabletron hubs
- ➢ Network services: AT&T frame relay and ISDN; AT&T frame relay
- ➢ Network maintenance services: NCR
- ➢ Application software: Modified, rehosted off-the-shelf application for blood processing and distribution
- ➢ System software: Oracle RDBMS, IBM's AIX, Windows NT server
- ➢ Data storage: EMC's Symmetrix 2000 Family Enterprise
- ➢ Storage systems: Symmetrix Manager
- ➢ Data warehousing: NCR's TeraData RDBMS powered by NCR hardware
- ➢ Disaster recovery site: AT&T DS-3 connects the primary (Washington, D.C.) site with the secondary (Philadelphia) site; EMC's Symmetrix Remote Data Facility (SRDF) provides mirroring of data between the sites
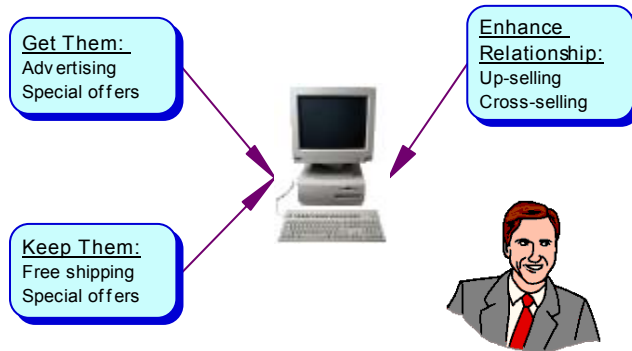
Customer Relationship Management

Customer Relationship Management is a strategy used to learn more about customers' needs and behaviors in order to develop stronger relationships with them. After all, good customer relationships are at the heart of business success. There are many technological components to CRM, but thinking about CRM in primarily technological terms is a mistake. The more useful way to think about CRM is as a process that will help bring together lots of pieces of information about customers, sales, marketing effectiveness, responsiveness and market trends.

The goal of CRM is to help businesses use technology and human resources to gain insight into the behavior of customers and the value of those customers. If it works as hoped, a business can:

- ➢ Provide better customer service;
- ➢ Make call centers more efficient;
- ➢ Cross sell products more effectively;
- ➢ Help sales staff close deals faster;
- ➢ Simplify marketing and sales processes;
- ➢ Discover new customers;
- ➢ Increase customer revenues.

The three phases of CRM

Get Them:
Advertising
Special offers

Enhance
Relationship:
Up-selling
Cross-selling

Keep Them:
Free shipping
Special offers

Customer Relationship Management processes

CRM Process	Description
Cross- and up-selling	Offering a product or service to enhance an existing product or service (cross-selling) or offering something that is better than the product or service that the customer is seeking (up-selling)
Direct marketing and fulfillment	Providing information about products and services that customers might be interested in. Also, making sure that when they ask for information, information will be provided as fast as possible.
Customer Service	Providing support for customers who are having problems with a product or service and to help resolve those problems.
Field service operation	The extension of customer service when the problem can't be solved over the telephone or via email. Field service and repair personnel can help solve large, complicated issues.
Retention management	Providing resources to most important customers. By gathering detailed information about customers, locate those who are likely to spend more money with the company and weed out those who bring in less money and cause more headaches.

Some examples of the types of data CRM projects should be collecting:

➢ Responses to campaigns
➢ Shipping and fulfillment dates
➢ Sales and purchase data
➢ Account information
➢ Web registration data
➢ Service and support records
➢ Demographic data
➢ Web sales data

The keys to successful CRM implementation:

➢ Break your CRM project down into manageable pieces by setting up pilot programs and short-term milestones. Starting with a pilot project that incorporates all the necessary departments and groups that gets projects rolling quickly but is small enough and flexible enough to allow tinkering along the way.
➢ Make sure your CRM plans include a scalable architecture framework.
➢ Don't underestimate how much data you might collect (there will be LOTS) and make sure that if you need to expand systems you'll be able to.
➢ Be thoughtful about what data is collected and stored. The impulse will be to grab and then store EVERY piece of data you can, but there is often no reason to store data. Storing useless data wastes time and money.
➢ Recognize the individuality of customers and respond appropriately. A CRM system should, for example, have built-in pricing flexibility.

Case Studies

Hewlett-Packard The company's typical customers include IT managers whose business division has purchased servers, printers and services from Hewlett-Packard. These customers also include managers in other parts of the business, and those managers request e-mail updates and newsletters that tell them when new printer drivers are available, when security updates are posted and when product updates come to market.

Even though HP had been steadily collecting business customer data and e-mail addresses from all of its sales channels but didn't have a central program or strategy for e-mail marketing. At times, as many as nine different marketing groups would blast out e-mail marketing campaigns to segments of the list, but each one was a single shot effort.

To provide useful benefits to HP, e-marketing group realized they needed to take control of e-mail campaigns from those nine different marketing groups. It also had to champion the customer-centric idea that marketing should be a long-term process that focuses on the life cycle of customers instead of looking at a sale as a singular occurrence - to focus on the e-mail marketing piece while coordinating its efforts with the larger corporate picture that included other customer-facing groups like call centers and customer service teams.

To accomplish that goal, the e-marketing group brought in e-mail analysis, segmentation and personalization tools from San Mateo, California-based Digital Impact. By analyzing its e-mail databases, HP found that its business customers fell into two groups - IT managers and end users. So instead of immediately churning out more e-mail campaigns, HP set out to learn what these groups wanted through small pilot tests. The company found that IT managers were willing to tell HP exactly what kinds of general product and support alerts and newsletters they'd like to receive while end users wanted much more specific information about the exact product they'd purchased and how to use it. So HP embarked on a carefully controlled project comparing an e-mail campaign with a direct-

mail offer. The results showed that more of their customers responded to the low-cost e-mail offer, making it over 20 times more cost-effective.

Payoff: After implementing analysis, segmentation and personalization to inform its e-marketing campaigns, Hewlett-Packard generated an estimated $15 million in new sales revenues per month.

Federal Express Corp. knows that the cost of doing business with loser customers is greater than the profits they return to the corporation. However, FedEx has an edge that most companies lack – it knows who those customers are. Data mining has pinpointed which customers are profitable – using large databases to refine its marketing efforts, which allow FedEx to target individual customers with pinpoint accuracy. Such knowledge has kicked off a marketing revolution inside FedEx, where customers are rated as the good, the bad, and the ugly. At FedEx, customers who spend a lot with little service and marketing investment get different treatment than those who spend just as much but cost more to keep. The "good" can expect a phone call if their shipping volume falters, which can head off defections before they occur. As for the "bad" (those who spend but are expensive to market), FedEx turns them into profitable customers, in many cases, by charging higher shipping prices. And the "ugly" (those spend little and show few signs of spending more in the future), FedEx chooses not to market to them anymore. However, the power of such an approach lies in a company's ability to determine how much to spend on marketing campaigns and where to direct those campaign dollars.

Bank Of America finds mining for profitable customers a tough task. The mechanics are demanding. To get a true picture of customer profitability, Bank of American calculates its profits every month on each of its more than 75 million accounts. Mortgages, for example, have different costs than checking accounts, car loans, or home-equity credit accounts. And service costs vary by how customers bank – whether they use ATMs, tellers, or the Internet.

By wading through all that data, however, Bank of America is able to zero in on the 10% of households that are most profitable. It assigns a financial adviser to track about 300 accounts – to answer questions, coordinate the bank's efforts to sell more services, and watch for warning flags that these lucrative customers may be moving their business elsewhere.

If the bank's computer notes a change in the customer's normal pattern of transactions or a falling balance, it alerts the account manager, who may post a flag to the tellers at the customer's branch warning that the account is in danger of moving. The next time the customer walks into the bank, a teller asks if they have any concerns about the account and offer them a chat with the bank manager. The heavy intervention seems to be working. Since Bank of America launched the program 18 months ago, customer defections decreased, and account balances in the top 10% have grown measurably.

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