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## Leading Ideas

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Booz & Company

from **strategy+business** issue 47, Summer 2007

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# The Energy-Efficient Supply Chain

by Peter Parry, Joseph Martha,  
and Georgina Grenon

**A**s concerns mount about fuel prices, long-term energy availability, and climate change, companies' attention is finally turning toward one of the most pervasive places where energy can be conserved: the industrial supply chain. Simply put, the supply chain is the production and distribution network that encompasses the sourcing, manufacturing, transportation, commercialization, distribution, consumption, and disposal of goods, from the ore mine to the trash can.

Four primary factors drive businesses' interest in the energy-efficient supply chain. First is the desire to cut energy costs. Second is concern about regulation — through trading permits, mandated caps, and other means, governments will increasingly press businesses to limit the amount of carbon they release. Third, a growing segment of customers favor companies that credibly demonstrate reduction of carbon impact. The fourth driver is productivity: The economies that a company like Wal-Mart or Tesco puts in place to reduce emissions can reduce other costs and improve operations as well.

On January 18, 2007, Tesco CEO Terry Leahy announced that the retail chain would reduce the carbon footprint of all stores and distribution centers by 50 percent over the next 15 years. That kind of target cannot be realized by placing

unilateral pressure on suppliers. It requires efforts that build trust and transparency along the value chain. When suppliers and customers understand one another's contributions to carbon emissions, they can identify ecological and economic waste that would otherwise be hard to see.

For example, in 2006, the Carbon Trust, a United Kingdom-based research and advisory group, discovered a "perverse incentive" in the sourcing of raw potatoes for manufacturing snack foods. (The analysis appeared in the group's report, "Carbon Footprints in the Supply Chain: The Next Step for Business," [www.carbontrust.co.uk/Publications/publicationdetail.htm?productid=CTC616](http://www.carbontrust.co.uk/Publications/publicationdetail.htm?productid=CTC616).) Charged with studying the carbon footprint of potato chips, the Trust's researchers found that because prices are set by weight, farmers typically control humidification to produce moister and therefore heavier potatoes. Even within the strictly limited specifications of moisture content set by the food manufacturers, these few grams of extra water are significant. The extra cooking needed to burn them off accounted for an unexpectedly high percentage of the chips' energy consumption.

An obvious solution, wrote the Carbon Trust, would be to change the procurement contract — to provide farmers with an incentive to produce potatoes with less moisture. This would better position the manufacturers to take advantage of carbon trading credits and other

regulations for greenhouse gas reduction. And it would set a precedent for further collaboration between food makers and their agricultural suppliers.

Similar approaches have been used to study the energy footprints of a range of products, from the United Kingdom's *Mirror* newspaper chain, to Unilever's Vaseline hand lotion, to cameras made by Kodak and Hewlett-Packard. Even though it has been 15 years since the pioneer packaging-reduction incentives of Germany's "Green Dot" labeling program were put into effect, there is still much to learn about the waste of energy and materials in the typical supply chain.

In the potato chip case, for example, production-related greenhouse gases dwarfed the emissions from transportation. In other cases, transportation and logistics are much bigger factors, with enormous potential gains. A 1993 study of Landliebe Yogurt (a local brand made and sold in Stuttgart, Germany) revealed that the ingredients in a single container — including milk, strawberries, wheat, cultures, glass for the jar, paper for the label, and aluminum for the lid — had traveled a total of more than 9,100 kilometers (about 5,600 miles) before reaching the consumer's hands.

Some of the innovations of the next five years will focus on reducing this type of inefficiency. Marks and Spencer, for example, has a specific initiative under way to reduce "food miles," sourcing its wares from nearby locales and working with local farmers to increase the growing season. Other initiatives will increase transportation efficiencies: A truck that once carried 150 items will now carry 300, or carry the same volume of goods with less

fuel. Other projects will reduce and simplify packaging, closely track the joules consumed, or switch to less carbon-intensive materials and energy sources (such as renewable energy and more efficient lighting sources). Already, some business-to-business producers and service providers, including gasoline retailers and

is defining your approach. It is likely to be a combination of three types of measures: reducing your footprint through demand reductions and energy efficiency in design, construction, and operation; replacing conventional energy sources and materials with low- or zero-carbon alternatives, includ-

## One can't conclude that nearby farms or recycled materials are always preferable from a climate change perspective.

airlines, are using government-mandated pollution credits to offer climate change-conscious services for customers ("buy our product and help offset your own greenhouse gas impact").

As businesses become more and more serious about this, managers will increasingly find themselves asking, What is it about the way we operate that causes our entire supply chain to waste energy? There will be many surprises. One should not conclude that all lightweight snacks, nearby farms, or recycled materials are preferable from a climate change perspective. Every supply chain is different, with unique opportunities for using information technology, management practice, incentives, and sheer common sense to reduce the carbon footprint.

The first step is thus understanding the specific carbon footprint of your business's supply chain, in the context of overall strategy and operations. The second step is discerning the extent to which emissions are related to your specific needs, versus those inherent in supply chain management. The third

ing materials and equipment with low-embodied carbon; and offsetting unavoidable carbon emissions through a program of credit trading and other verified means.

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Also contributing to this article were Booz Allen Vice President Nick Pennell and Senior Consultant Timothy Gange.

## Making Offshore

# Engineering Pay Off

by **Anil Verma and Serge Lambermont**

**M**ost manufacturers can easily tick off any number of practical reasons either for building new factories in China, India, Vietnam, and other low-cost nations or for buying parts from suppliers based in those countries. Simplified supply chains, better inventory management, and sharply reduced costs are among the obvious benefits. But the same group displays less enthusiasm for offshoring design and engineering.

On the face of it, that's a logical response. For one thing, compared to manufacturing and materials, engineering typically accounts for a tiny portion of the total cost of a product and therefore tends to merit little attention from top management. And perhaps more importantly, many manufacturers view engineering as the company's "crown jewel" — and they thus desire to keep it close to home, where it can be sheltered from intellectual property theft.

These rationales, however, overlook a critical but seldom recognized fact: As with factory operations, not all engineering tasks are created equal. Some design tasks are

complex, continually evolving, or proprietary, and require sophisticated skills, a high degree of consultation with customers, or protection from piracy. Consequently, these activities are usually best maintained in-house. But other endeavors, such as engineering simple, modular parts, are the equivalent of commodities and can be handled advantageously in low-cost regions.

Indeed, a global engineering footprint — one that includes engineering facilities in both developed and developing nations — can generate measurable cost savings and greatly increase customer satisfaction. By shifting auto parts engineering operations from the United States to Eastern Europe and Asia, for example, the Delphi Corporation slashed its overall engineering costs by as much as 65 percent. Moreover, the company's non-U.S. revenues grew significantly, a substantial benefit of its extended engineering footprint in locations such as Sao Paulo, Bangalore, Seoul, Tokyo, Shanghai, Krakow, Singapore, and Juarez.

The approach many companies take in figuring out their mixed footprint is to distinguish between *performance-based* design cycles, which typically involve myriad

changes in design from one generation to the next, and *cost-based* cycles, used for products with a mature underlying technology and slow rate of innovation. With performance-based cycles, upper management and customers (in the case of suppliers), as well as the marketing, sales, design, and engineering departments, usually play a big role in the frequent blueprint alterations. To juggle the continuous flow of new ideas and implement them efficiently, it is critical to have cross-functional development teams tied closely to corporate headquarters and a skilled engineering workforce — the kind often found only in more developed regions. But cost is not a major factor.

The opposite can be said about cost-based cycles. For these tasks, limiting expenses is the overriding issue, and frequent consultation with management, customers, and other stakeholders is unnecessary. The product's design and fundamental technology are well established and unlikely to undergo significant alteration. Consequently, companies can benefit from offshoring these engineering processes to low-cost nations.

Assessing performance- and cost-based cycles will provide some initial benefits. But over a longer period of time companies will find that few products are clear-cut enough, and few customer relationships static enough, for this approach to suffice. Nuances make it difficult to place the development activity easily in one camp or the other. And customers frequently change their product designs, necessitating continual reevaluation of engineering needs in many cases. Consequently, a more effective method for suppliers is to determine

the *product* and *integration* complexity of each component in their portfolio and place these findings against one another to map the most advantageous locations for each engineering activity.

Product complexity is measured by the number of subcomponents, mechanical movements, process or design technologies, software modules, and suppliers. In the automobile industry, integration complexity is gauged by the number of intercompany interactions that are required by design, input–output

ity and integration, because it must communicate with satellite receivers for radio traffic information, with navigation systems, and with servers via mobile phone networks. Assessment of product and integration complexity thus produces a matrix of four possibilities, each with its own preferable strategy for engineering location:

**High Product Complexity, High Integration Complexity.** *Example: telematics system.* This category requires a deep well of technical talent, diverse skills, and extensive

suppliers. Because of the nature of the parts' configurations, these items should be designed close to the customer's factories in either developed or low-cost nations — what is known as a lean, distributed footprint.

**Low Product Complexity, Low Integration Complexity.** *Example: lead–acid car battery.* Leverage existing design capacity and mass production for these products. Because minimizing expenses is a critical factor in profiting from these commodities, all additional engineering needs should be offshored to a low-cost location.

At Delphi, in formulating a mixed engineering footprint strategy, we endeavored to go beyond the simplistic strategy of shifting low-tech work to low-cost countries. Instead, we hoped to create a systematic approach that defines how a company might deploy the right capabilities at the right place at the right time and at the right cost. This would allow us to better meet customer needs while improving the effectiveness of the company's engineering processes.

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## A wiring harness and a digital audio receiver, complex in different ways, deserve different offshoring strategies.

ports, connector pins, customer change requests, and interrelated systems.

For example, an automobile's wiring harness — the basic electronic circuitry for switched devices like headlights, wipers, heater, and starter — has relatively low product complexity but very high integration complexity because the part must be woven into the architecture of the entire vehicle. On the other hand, a satellite digital audio receiver is a highly complex product from a design perspective, but sufficiently stand-alone to reflect limited integration complexity. A traditional lead–acid car battery is neither complex nor integrated; its design is based on a set of standard requirements with extremely minor customization for holding brackets, labels, and the like. And an automotive telematics system, by contrast, has a high degree of both complex-

customer contact. The supplier and customer are part of one extended value stream. Consequently, the supplier's technical horsepower must be in close proximity to the customer's design center. With the skills and teamwork required to make a product like this, offshoring is not a feasible option.

**High Product Complexity, Low Integration Complexity.** *Example: digital audio receiver.* Because there are few (or no) customer touch points, product performance is a critical driver of success in this category. Offshoring to a locale with a broad base of engineering talent is feasible.

**Low Product Complexity, High Integration Complexity.** *Example: wiring harness.* A great deal of customer interaction is needed to ensure that parts in this category dovetail with other components, most of which are made by different

# Services in Search of True Marketing ROI

by **Joni Bessler, Steven Treppo, and Ashok Notaney**

**H**ow can a company with multiple marketing initiatives see a 500 percent return from one and a 25 percent loss from another and not know which is the winner?

In financial services, this problem is surprisingly common. Unlike other industries, such as consumer packaged goods (CPG), most of the financial-services (FS) industry has not devised the capabilities necessary to fully interpret the vast amount of data it collects. Thus, FS companies frequently cannot analyze the return on investment (ROI) of their marketing spend. The industry lays out more than \$10 billion annually for marketing. Its ad spending alone is approximately \$8.5 billion, putting it fourth among all industries (behind automotive, retail, and telecom/Internet), according to *Advertising Age*—and that means a lot of money is going to waste.

Financial services is not the only industry in this bind. Health care, utilities, telecommunications, and the airlines are also heavily invested in marketing and unsure of the payback. This, in turn, leaves company executives in the dark about two critical aspects of their business: the effectiveness of their promotional efforts and the performance of their marketing chiefs.

The paradox for all of these industries, but especially financial services, is that these companies

have access to a huge amount of consumer data, but lack the tools that most consumer goods companies use to gain an in-depth understanding of consumer behavior—coupons, point-of-sale data, discounting, and other types of trade expenditures. Further, CPG companies do not contend with certain complexities that affect the FS industry, such as interest rates, market psychology, or variations in customer profitability due to product mix.

It's no surprise, then, that there's no standard approach to market analysis for companies in FS and similarly hamstrung industries. They get their information in varying ways: Some amass enormous quantities of raw data; others rely heavily on anecdotal evidence. Some marketing teams still measure performance armed with only year-over-year comparison methods, whereas others use different, equally

ways to conquer these deficits and boost marketing performance while reaping significant savings. We've found three methodologies that can help marketing executives answer the following questions: How much are we really spending on marketing, and across what types of initiatives? How much of a return are we getting across the entire spend, and where is it coming from? Is the marketing strategy aligned with the sales strategy, including the desired customer relationships? The particular methodologies—or combination of methodologies—that will work for any given company depend on the amount and kind of data available. The three approaches are:

- **Breakeven Analyses.** These can add quantitative rigor to certain types of marketing expenditures that lack true outcome data. Consider the case of a mortgage bank's \$2 million TV sponsorship, which allows the bank to air several commercials during a particular show. A breakeven analysis estimates the level of viewer penetration needed to justify the cost of advertising. The bank estimates that sponsorship can reach one-quarter of the 4 million

## Many services industries lack the tools to understand consumer behavior.

simplistic forecasting models. Some still rely on “control” markets, a method most industries discarded long ago because it excludes certain markets from promotional initiatives in order to use them as a baseline, resulting in forgone sales opportunities or diminished brand presence in those markets.

The good news is that there are

households watching the show. Knowing that 2.5 percent of U.S. households are taking out mortgages during the year of the sponsorship, the bank projects that 25,000 of the viewers it will reach fall into the pool of potential customers. Given that the estimated lifetime value of a mortgage for this bank is \$4,000, it will need 500 new

customers from the pool of 25,000 to break even. The bank's national market share is already 6 percent, so it could reasonably expect to "automatically" get 1,500 of these customers, even without advertising on the program. That means that the sponsorship will have to win the bank an 8 percent market share among the show's viewers to be worthwhile — a breakeven target that the bank believes is achievable. It is therefore satisfied with this investment.

- **Impact Models.** Many FS companies have already captured the data necessary to assess their return on marketing investments; they merely need to create appropriate impact models that regularly feed this information to the marketing team in a format they can use. This requires five steps: (1) articulate the campaign's objectives and identify the variables that could affect outcomes; (2) determine which variables, such as seasonal or macroeconomic factors, are beyond the marketing team's control, and remove them from the equation; (3) use simple regression-modeling tools to establish the relative weight of all variables, then develop a pilot formula to determine the base level of sales; (4) examine the marketing variables to estimate sales lift and use that figure to determine the incremental number of products sold that can be attributed directly to the marketing campaign; and (5) calculate the "lifetime value" of a single sale, then multiply the number of products sold by the lifetime value figure to determine actual ROI.

- **Consumer Funnels.** If a company is already using its data to move customers through the successive stages of a desired relationship, a consumer funnel can be a valuable

way to examine the progression. Most FS companies place their target customers in one of six stages in their relationship with the bank: awareness, preference, intent, purchase, penetration, or retention. Examining the "conversion" factor

## One bank discovered that results it had attributed to marketing were actually related to its number of branches.

from one stage to the next can reveal weak points. For example, strong conversions from awareness to preference to intent and then a significant drop-off before purchase could indicate a sales bottleneck. However, if the conversion drop-off occurs between awareness and preference, the problem may be a lack of trust or poor brand equity.

Equipped with these tools, marketers in service industries can start to base strategic decisions on hard numbers rather than soft estimates. One bank, for instance, discovered that the vehicles it uses to acquire and retain customers yielded wildly different levels of effectiveness. It also found that results it had previously attributed to marketing were actually more closely related to its number of branches per capita. Another company drew on its ROI findings to slash its annual broadcast television budget from \$70 million to \$10 million, and to shift spending into cable television, online media, and sponsorship channels.

That level of understanding can enable chief marketing officers to engage more productively with the board and management in a

common language so all can understand. And senior executives can use what they learn to better assess the performance of their marketing teams. The organizational and cultural legacies within most large financial-services companies, as well

as those in many other service industries, ensure that building these capabilities will not be a simple undertaking. But the potential reward — an improvement of as much as 25 percent in marketing effectiveness — is more than worth the effort.

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# Barclays' Global Acceleration

by John Varley

In 2003, the management of Barclays Bank resolved to put our foot on the accelerator of performance. There were two main reasons. We saw an opportunity to create faster growth in shareholder value. And we thought it was important to develop our capabilities around the world so that, when customers chose a bank in the markets in which we operate, they would think of Barclays first.

This spring, we announced our results for 2006. They represented the best performance in the bank's 300-year history. Net profits rose 35 percent, to £7,136 million (about US\$13 million), and earnings and dividends per share went up 32 percent and 17 percent, respectively. We have made an emphatic turnaround in our flagship United Kingdom retail banking business, and we have sustained high performance levels in our investment banking business (called Barclays Capital) and our commercial banking activity. Approximately 50 percent of profits now come from outside the U.K., compared with 25 percent three years ago. We are also well positioned to deliver further growth, both organic and through acquisition, in the years ahead. For example, Barclays' 2005 acquisition of the South African bank Absa has made it a market leader on the African continent. We regularly evaluate other possible combinations, big and small.

These results did not take place

by accident. They represent the successful execution of that 2003 decision to transform Barclays from a company with disparate operations in many different countries to a unified global enterprise, one that now serves 27 million people. We were not certain we would succeed, and we don't take our continuing success for granted. But we have learned, in the past four years, some universal principles that allow us to keep moving forward.

- **Setting a Vision: To "Earn, Invest, and Grow."** At many times in its long history, Barclays has been a formidable force in international banking. And Barclays is an iconic

## It's an article of faith with us that whatever one's job is in Barclays, we must all be in touch with customers.

brand. But in recent years, because our portfolio was excessively concentrated in the United Kingdom, the fortunes of our shareholders were dependent on the vicissitudes of doing business in one country. This also made us curiously lacking in self-confidence, relative to the Barclays of 30 or 40 years before. So we set ourselves the task of increasing the rate of profit growth by diversifying our business base, strengthening our retail and commercial banking activities outside the U.K., and expanding such global businesses as Barclays Capital,

Barclays Global Investors (asset management), Barclays Wealth (private banking), and Barclaycard (credit cards, loans, and insurance products).

The new vision has been easy to articulate but quite difficult to accomplish. We know that our shareholders will not accept a profit growth holiday while we invest for future growth. To grow and maintain profitability simultaneously, we rely on the fundamental health of the Barclays franchise: its standing in the minds of employees, in the communities where it operates, and, most of all, among customers. Furthermore, all our employees understand that they are expected to focus their efforts on two primary tasks. The first is serving customers brilliantly. The second is complying with legal and regulatory requirements, and maintaining the finan-

cial controls that preserve our license to do business and justify the trust that our customers place in us.

- **Adopting a Universal Banking Model.** Barclays serves customers who range from individual mortgage holders in Manchester, England, to corporations managing their risks by means of complex derivatives in different tax jurisdictions around the world. Increasingly, however, customers cannot be served in silos; for instance, our mortgage business in Spain is facilitated by our ability, through Barclays Capital, to securitize that risk

to investors. So we seek opportunities to sell and deliver services across internal boundaries. We promote synergies both within our two main divisions — global retail and commercial banking (GRCB) and investment banking and investment management (IBIM) — and between them.

When Frits Seegers, chief executive of GRCB, first looked at our customer base, he said, “I can’t believe how narrow our relationship is with them.” Customers who thought of us as their bank often had only one or two accounts with us, and the rest with competitors. Today, the “universal banking” principle continually pushes us to make it easier for customers to do more business with us.

For example, the Open Plan program, which we have now made available in many markets, allows customers to reduce their mortgage costs by offsetting them against the money they hold in savings and checking accounts. The typical savings — about £700 per year for every £100,000 borrowed — reduces our margins, but it leads to a big increase in the number of products people hold.

Other examples include our investments in a single online interface to enable customers to oversee their credit card accounts, mortgages, investments, and bank accounts together. Extracting interstitial value requires great management skill and a streamlined organization. We have halved the size of the Barclays executive committee (to five members) and decentralized operations so that many more decisions are made locally.

• **Creating Focused Points of Strategic Control and Direction.** In 2004, we combined the investment

banking, asset management, and wealth management groups into one “cluster” (IBIM). This has allowed the team leading IBIM (under Robert Diamond, president of Barclays) more latitude in reaching out to today’s financial-services customers, who increasingly need all three services together. We can now more easily use the know-how developed in asset management and investment banking to invigorate the wealth business; wealthy clients, who were previously served by a traditional stockbroker model, now have access to the same comprehensive advice and innovative products developed by Barclays for institutional clients.

The other cluster (GRCB), led by Frits Seegers, addresses the increasingly homogeneous needs of retail consumers and businesses around the world.

• **Executing a People-Based Agenda.** We focus attention on the husbandry of talent because we recognize that the quality of our advice and innovation is the primary source of our value to customers. If you’re the CFO of a listed company with a defined-benefit pension scheme that is heavily in deficit, then you want specialist — not generalist — advice; you need the best advisors in the market. We seek to create a good balance of talent development from within the organization and selective recruitment from outside. The group president’s board responsibilities include championing talent and making sure that Barclays continues to deliver on an increasingly challenging human resources agenda.

• **Putting Customer Relationships First.** Customers base their decision to choose a particular financial-services provider on the

relationship they have with that provider. We thus need to know: Do customers find us valuable, congenial, and dependable? Do we make it easy for them to maintain multiple lines of business with us? We measure customer service in a variety of ways: surveys of customers, employees, and consumers; “mystery shopper” visits to retail banks; complaint volume and market share metrics; league table standings; and tracking of community engagement programs. Because we make decisions based on these measurements, they affect the behavior of every employee. It’s an article of faith with us that whatever one’s job is in Barclays, we must all be in touch, directly or indirectly, with customers. And that applies to a group chief executive like myself just as it does to everyone else within the organization.

The Barclays journey began with a single strategic step, but it soon came to rely on the actions of thousands of employees. We have seen firsthand that when people at all levels follow a customer-focused ethic, with the support of the corporate structure and metrics, it can raise the metabolic rate of the entire company. Only then can we accelerate the three main components of our vision: to earn, invest, and grow. +

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*strategy+business* magazine  
is published by Booz & Company Inc.  
To subscribe, visit [www.strategy-business.com](http://www.strategy-business.com)  
or call 1-877-829-9108.

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Originally published in Leading Ideas,  
*strategy+business*, issue 47, Summer 2007 by Peter  
Parry, Joseph Martha, Georgina Grenon, Anil  
Verma, Serge Lambermont, Joni Bessler, Steven  
Treppo, Ashok Notaney, and John Varley.

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