2008
GMA Information Technology Investment and Effectiveness Study
Grocery Manufacturers Association

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Executive Summary
The consumer products (CP) industry faces a dilemma. Based on the findings of the 2008 GMA Information Technology Investment and Effectiveness Study, conducted by IBM and AMR Research on behalf of the Grocery Manufacturers Association (GMA), senior CP business executives and IT executives believe that the IT function should play a much more prominent role in fulfilling business strategy than it does in reality. Indeed, the gap between what they think the IT function should be doing and what it actually does is expanding.

More than 75 percent of business executives and 80 percent of IT executives say that IT should be an essential investment area or operate at the cutting edge of innovation. But only 25 percent of business executives and 20 percent of IT executives believe this is actually happening. The key issues are alignment, complexity and focus.

- **Alignment:** While business executives and IT executives agree that a gap exists, they do not agree about the precise nature of that gap or how best to close it. Business executives are focusing on generating top-line growth through product innovation and maximizing opportunities in new markets. Yet they assign a low ranking to the importance of IT in building consumer brands, developing a better understanding of consumers and growing revenues.

  Meanwhile, IT executives think it is vital to align their companies’ IT and business strategies. Yet only one-tenth of the sum responding companies invest in IT goes toward revenue-generating activities – even less than was the case four years ago. Nearly two-thirds of the total IT budget is still directed to running the business, controlling costs and managing compliance. Thus, far from focusing on strategic initiatives, the IT function spends most of its time and resources performing the day-to-day tasks required to keep any business operational.

  This emphasis on IT as a cost incurred in order to keep the business running may well explain why the CP industry invests less than other manufacturing industries in IT. Although expenditure on IT has risen in absolute terms, the average IT budget is still just over two percent of revenues – as it has been for the past five years. So it is hardly surprising that IT executives see lack of funding as one of the biggest challenges they face.
• **Complexity:** One of the main barriers to improving the effectiveness of IT is the current level of technology. Despite considerable efforts to reduce the complexity of the technological environment in which they operate, most CP companies still use numerous different systems. In fact, organizations with revenues of more than US$1 billion a year typically have more than 750 different applications.

• **Focus:** The decline in perceptions of the value of the IT function itself is another major problem. The percentage of business executives who see IT as a strategic asset has slumped from 55 percent to 34 percent over the past two years, while the percentage who think that their IT departments are effective has fallen even more dramatically, from 74 percent to just 44 percent. The positioning of IT within the organization also remains an issue – with 83 percent of senior IT managers reporting to someone other than the CEO.

In 2009, IT executives will thus need to assume a higher profile and assert themselves more effectively than before, in order to make up the ground they have lost. They will also need to focus more heavily on value-adding activities, as distinct from routine maintenance, and free resources for investing in critical areas of business growth and innovation. In an increasingly demanding and competitive marketplace, CP companies must focus on what really differentiates them from their rivals – and the IT function will have to play its part in rising to this challenge. Reversing the current trends will require major rethinking of the role of IT in CP companies.
The 2008 GMA Information Technology Investment and Effectiveness Study was conducted by IBM in conjunction with AMR Research on behalf of GMA. It provides a clear picture of the state of IT within the CP industry; analyzes IT spending and investment patterns; and compares the perspectives of business and IT executives on the effectiveness of the IT function. This year’s study is the ninth such analysis to be completed.

Approach
The findings are based on two separate surveys, which were conducted between January and March 2008. The IT Spending and Investment Survey targeted senior IT executives in GMA-member companies and focused on capturing information about IT spending and strategy. The IT Effectiveness Survey targeted senior business executives in GMA-member companies and focused on evaluating the effectiveness of IT within their organizations.

In all, 118 respondents from 46 companies with revenues ranging from US$46.9 million to US$36.9 billion participated in the study. (The figures in the remainder of the report are based on the number of respondents who answered each question, since not all respondents answered every question.) The overall response rate was higher than ever before, illustrating the extent to which IT is now regarded as a core business function. (For further information on the survey population, please see Appendix 1.)

In 2008 we have also added, where relevant, comparisons between the responses of high performing and low performing companies. For our purposes, high performers reported compound annual revenue growth for 2006/2007 in excess of seven percent, while low performers reported compound annual growth of less than seven percent.

This report provides a detailed analysis of the data, including comparisons of the findings with those of the 2006 and 2004 GMA Information Technology Investment and Effectiveness Studies. It also draws on insights provided by AMR Research and on IBM experience in thought leadership and client engagements.
The role of IT in the changing market

The global consumer marketplace is rapidly evolving. Five mega-trends, in particular, are reshaping the context in which the CP industry operates:

• **Consumer value drivers fragment.** The consumer marketplace is fragmenting as a result of pronounced shifts in demographics, attitudes and behavior. It is also polarizing; consumers are trading up to high-value, premium brands on the one hand, and trading down to low-cost commodity providers on the other. Often the same consumer will trade up or down across different categories based on personal preferences.

• **Gatekeepers become more guarded.** Traditional mass-marketing techniques are becoming less and less effective, as time-strapped consumers use new technologies to exert more control over their interactions with business and block communications that are irrelevant to their individual needs and interests.

• **Information exposes all.** With the development of advanced wireless devices and on-line networking, consumers are becoming increasingly well-informed and empowered. They can access information when and where they want it, in the form in which they want it. As a result, shoppers are much more knowledgeable when they go to the store.

• **Mega-retailers break the boundaries.** A few strong retailers have become “mega-retailers.” They have expanded rapidly across countries, channels and product/service categories, acquired deep insights into how their shoppers behave and can dictate the terms on which they trade with their suppliers. The “brand on the door” is thus becoming more important than the “brand on the shelf.”

• **Partnering becomes pervasive.** Competition is no longer a solo game. Leading retailers, CP companies and their suppliers are joining forces to create integrated, collaborative “value networks” that offer a stronger, more competitive value proposition.

These trends are changing the purchasing behavior of consumers and creating new challenges for CP companies, many of which they will only be able to address by using new technologies. So analyzing the way in which some of the leading CP companies use IT, the importance they accord it and the areas in which they plan to invest in the future is now an especially pertinent exercise.
Conflicting priorities

The 2008 GMA Information Technology Investment and Effectiveness Study shows that senior business executives in CP companies are focusing primarily on growth. Thirty-six percent of those surveyed are concentrating on new product introductions. Another 25 percent plan to maximize any opportunities that arise or look to new markets, while the rest are focusing on the more traditional strategies of enhancing returns on existing assets or increasing margins (see Figure 1).

Despite the emphasis on expansion, however, most of the money CP companies spend on IT still goes toward running the business, controlling costs and managing compliance rather than supporting growth initiatives. Respondents recognize the need to make strategic investments; they are spending 26 percent of their IT budgets on strategic issues this year, which is significantly more than the 16 percent they invested in strategy development in 2004 and reflects growing recognition of the strategic advantages IT can provide. But the proportion they allocate to revenue-generating activities is just 10 percent, even less than it was four years ago (see Figure 2). This is at odds with their main objectives and insufficient to sustain real growth – although the problem is partly that, without industry-specific packaged applications for product lifecycle management, business intelligence and customer relationship management, they lack a clear IT architecture to power their growth strategies.
Moreover, many CP companies may soon be forced to spend more on compliance. Although responding companies have succeeded in reducing the proportion of their IT budgets they dedicate to managing compliance this year, major retailers are introducing an expanding set of supplier mandates that require improved product-tracking and other quality measures. The regulations governing the labeling of foods, including where they originate and the ingredients they contain, are also becoming much more rigorous, putting CP companies under increasing pressure to improve their tracking and data management skills.

**Spending on IT**

Collectively, responding companies increased their spending on IT significantly in 2007. The average IT budget rose by 7.9 percent, with much of the uplift going on capital programs (see Figure 3). But while expenditure on IT has increased in absolute terms, it has not increased as a percentage of sales. Between 2004 and 2008, the average IT budget continued to hover at just over two percent of total revenues, having peaked at 2.24 percent in 2003 (see Figure 4). It is notable however that high-performing CP companies are already investing more in IT than their low-performing counterparts. In 2007 high performers invested 2.5 percent of their revenues in IT, while low performers invested just 2.1 percent.

**FIGURE 3:**

Many companies increased their IT budgets substantially in 2007 but they are only making modest increases in 2008.

<table>
<thead>
<tr>
<th>Total IT budget</th>
<th>Prior year (US$138.8)</th>
<th>Current year (US$150.3)</th>
<th>Next year (US$153.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT capital budget</td>
<td>21.9</td>
<td>25.0</td>
<td>25.6</td>
</tr>
<tr>
<td>IT depreciation and amortization</td>
<td>28.1</td>
<td>30.1</td>
<td>31.9</td>
</tr>
<tr>
<td>IT operating/expense budget</td>
<td>88.8</td>
<td>95.2</td>
<td>95.7</td>
</tr>
</tbody>
</table>

**+8.3%** 

**+2.0%**

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.
Many CP companies have invested quite heavily in enterprise resource planning systems and other such initiatives to improve their operating infrastructure in recent years, which probably accounts for the brief surge in spending. It may also explain why most respondents have made only modest increases in their IT budgets for 2008. We expect this trend to continue in 2009, with spending on IT remaining flat, as recessionary pressures and rising commodity and energy prices take their toll.

Given the relatively modest proportion of their revenues that CP companies dedicate to IT and the heightened emphasis on reducing costs, it is hardly surprising that IT executives see lack of funding as one of the biggest challenges they face. They say that budgetary issues are second only to the alignment of the IT strategy with the business strategy in order of importance, but there is a significant gap between the amount that should be invested, and the amount that actually is invested, in IT (see Figure 5).
The gap in perceptions of IT

IT executives are quite candid in assessing the performance of their own departments. They are particularly critical of the degree of agility that is displayed, although the complexity of the technological environment in which CP companies operate may well be a contributing factor here. Conversely, they believe that their departments do well when it comes to customer service and working with external partners. They also point to a strong performance in aligning business and IT strategies – their top priority in the previous study – as evidence of success. Clearly, many of those surveyed think they have made considerable progress in this respect.

However, business managers have a rather different perspective. They think that the IT function performs well in terms of complying with customer imperatives and supporting the day-to-day operations of the business – the two areas where they believe the IT organization’s role is most important. But they are much less happy with its ability to increase productivity by making internal improvements or facilitating the exchange of data with trading partners. They also find fault with the IT function when it comes to enhancing supply chain visibility – an area in which the legal and corporate social responsibilities of CP companies are rapidly growing, as country of origin, ingredient and carbon footprint labeling requirements become more expansive (see Figure 6).
In other words, business managers clearly continue to view IT primarily as a tool for managing the nuts and bolts of the organization, not as a means of driving revenue growth. Indeed, they rank the contribution the IT function can make to building consumer brands, developing a better understanding of consumers and their needs, and growing revenues at the bottom of the list of attributes they regard as important.

Further evidence of business manager perceptions about the role of IT is found in their strong levels of disagreement about IT’s ability to either increase sales or deliver competitive advantage (see Figure 7). Here again business managers perceive a greater role for IT in reducing costs, while, on the core issue of strategic alignment between business and IT, only a small group (30 percent) reported a strong level of agreement.
Nevertheless, many business managers recognize that funding lies at the heart of some of the IT function's challenges. Sixty-seven percent say that IT should be an essential investment area, but only 24 percent think it is treated as such. Nine percent go even further; they think the IT department should sit at the cutting edge of innovation, but only a tiny minority of respondents think it actually does (see Figure 8). The question is: can the industry change the existing paradigm, when it is faced with rising price pressures and a market of largely packaged applications?

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.

**FIGURE 7:**
Most business managers strongly disagree with the assertion that IT can increase sales and are more inclined to agree that IT can reduce costs.
The need for better measurement tools

So what explains the CP industry’s reluctance to spend more money on IT? The single biggest factor, by far, is difficulty in determining returns on investment. Fifty-six percent of business managers are cautious about investing more heavily in IT because they cannot measure the benefits that will ensue (see Figure 9). Competing capital projects with a higher priority and lack of business sponsorship are also significant obstacles. But most business executives do not see lack of top management commitment, people with the appropriate skills or the instability of the technologies themselves as major issues.

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.
Of course, many CP companies have already made the sort of IT investments that are easiest to measure – those that deliver improvements in operating efficiency or cut costs. However, many business executives have traditionally focused on the financial reasons for investing in IT, rather than looking at its strategic potential as a catalyst for business transformation – and it is generally more difficult to assess returns on investment in IT projects which are intended to stimulate growth, take place in the context of multiple functional initiatives or span the entire enterprise, since there is often no easy way of tracking the contribution of different departments and allocating the benefits fairly.

Moreover, this year’s results show a marked improvement since 2006, when 82 percent of business managers reported that unclear returns on investment were the main reason why they hesitated to invest greater sums in IT. Even so, the survey findings suggest that many chief information officers (CIOs) still need to make a more cogent business case for the projects they want to promote.

Further evidence that IT managers need to argue their case more persuasively comes from the fact that nearly one-third of all respondents still do not have formal programs in place to measure the financial returns from their IT projects – a state of affairs that has changed very little over the past four years (see Figure 10). There are good grounds for adopting a quantitative approach, since using hard financial measures provides a benchmark for future initiatives and increases the likelihood that they will be successful. That said, concentrating on the numbers at the expense of strategic considerations prevents a company from investing in the sort of IT projects that will support its long-term future – and the decline in the number of business executives who cite unclear returns on investment as a hurdle may indicate increasing awareness of this fact.

**FIGURE 10:**
One-third of IT respondents still do not measure IT investment returns.

<table>
<thead>
<tr>
<th>Year</th>
<th>Yes</th>
<th>Currently designing/ implementing</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 Study</td>
<td>32</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>2006 Study</td>
<td>32</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>2008 Study</td>
<td>31</td>
<td>38</td>
<td></td>
</tr>
</tbody>
</table>

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.

Note: The decline in the percentage of respondents claiming to have measurement systems already in place is attributable to changes in the survey population. It may also reflect the identification of weaknesses in measurement systems that have already been implemented and the need for further refinements.
It is probably no coincidence, for example, that the gap between the importance IT executives attribute to customer service and the quality of the IT function’s performance in this respect is smaller than any other, as Figure 5 shows. A growing number of CP companies are using formal procedures to measure the extent to which their employees are satisfied with the IT services they receive, and IT managers are responding accordingly (see Figure 11).

Yet, even though the IT organization scores highly on customer service, perceptions of its value have actually declined. Only 44 percent of business executives think that their IT departments are effective or very effective – compared with 74 percent of those who were polled in 2006 (see Figure 12). This is possibly because expectations of what new technology can provide sometimes outstrip the reality, and disillusionment then sets in. But whatever the reason, it should be cause for serious concern; an IT function that is seen as ineffective is unlikely to attract additional funding.
The reporting hierarchy

The majority of top IT managers in the CP industry still report to the chief financial officer (CFO) or chief operating officer (COO), as they did in the previous survey. Only 17 percent report directly to the chief executive officer (see Figure 13).

![The reporting hierarchy]

This speaks volumes about the weight CP companies typically place on IT, since a CIO who reports to someone other than the CEO may not be in a position to play as effective a role in shaping strategic decisions. It is also relatively unusual; research conducted by IBM shows that the percentage of CIOs who report to the CFO is lower in many other industries (see Figure 14).

![The Senior CP company IT Executive is more likely to report into the CFO than in most other industries.]

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.
The proliferation of systems

The technological environment in which CP companies operate also remains very complex. Thirty-three percent of responding companies still use custom-built applications rather than packaged products, as they did in 2006. But this makes it much more difficult to integrate a company’s systems, both internally and with those of its partners and customers, so that it can collaborate with them more effectively. The total number of applications CP companies use also remains very high, especially in large companies (see Figure 15).

FIGURE 15: The complexity of the technological environment is still a major problem in the CP industry.

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.

The continued complexity of the technological environment is an issue that extends beyond the number of applications. Across the board, respondents reported higher numbers of operating and database management systems, storage platforms and middleware technologies (see Figure 16). The complexity of the business, and the technological environment, is likely to increase further as supply chains globalize, the number of supply chain participants grows, collaborative requirements multiply and regulations expand.

FIGURE 16: Complexity reaches beyond just the number of applications.

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.
Emerging priorities

Despite this technological complexity, the industry is making progress on several major fronts. More than three-quarters of the CP companies participating in the 2008 survey now have demand signal repositories (DSRs) to capture and process data generated at the point of sale, and use it in managing their own operations. Fifteen percent also collect data on consumer spending patterns and track lost sales opportunities as a result of out-of-stock items, while seven percent use dashboards that provide near real-time demand visibility and predictive modeling, in order to anticipate demand more accurately and reduce out-of-stocks, in the face of increasing demand variability (see Figure 17).

Many CP companies are also extending their reach beyond their own four walls and taking responsibility for product fulfillment all the way to the store shelf. This is a significant shift from the situation in prior studies, where management of the supply chain typically ended at a CP company’s distribution center. One of the main reasons for the change is the increasing volume, quality and availability of retailer data. However, due to cost pressures, many CP companies are funding these investments from their line-of-business budgets (primarily sales and marketing) as Software as a Service (SAAS) spending. This limits the IT function’s ability to make an impact.

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.
Moreover, more than half of all respondents do not currently use DSRs to aggregate and analyze data from multiple distribution points and retailers. They rely, instead, on orders as the primary demand signal. This is understandable in companies that are trying to curb their costs, but those that are expanding will soon find that they need DSR strategies to support the tracking of new product innovations and movement in global markets. The leaders will have an advantage. Forty-one percent of those companies that use DSRs report improvements in their demand forecasting and planning, for example, while 14 percent have been able to reduce their inventories (see Figure 18).

![Figure 18: CP companies that use demand signal repositories enjoy various benefits, including improvements in demand forecasting and planning.](source)

Many CP companies are also struggling to integrate a wide range of disparate systems and, here, service-oriented architecture (SOA) could prove helpful. At present, SOA is still in its infancy and yet to realize its full potential. In the future, however, SOA could be used to overcome complexity through “hub-and-spoke” configurations that link different tools and systems, independently of the platforms on which they operate. The industry is actively working in this area. Nearly two-thirds of respondents are currently exploring the potential of SOA, and 15 percent are already in the process of implementing an SOA framework. But more than half of them are focusing on the back-office benefits of SOA; they see it as a means of managing their supply chains more efficiently rather than strengthening and streamlining their sales and demand fulfillment processes (see Figure 19).

![Figure 19: Responding companies believe SOA has various applications, but more than half see it primarily as a means of improving their back-office functions.](source)
A substantial number of CP companies likewise plan to invest in new enterprise software between now and 2010 in order both to expand into new geographic markets and to maintain the value of their existing investments. Eleven percent of respondents are already upgrading their enterprise resource planning systems, while another 19 percent intend to do so within the next three years. But interest in two much newer areas – product lifecycle management and customer management software – is also increasing dramatically. Twenty-five percent of those surveyed want to implement new product lifecycle management systems, and 20 percent intend to implement new customer management systems, by the end of the decade (see Figure 20).

**FIGURE 20:**
Product lifecycle management and customer management systems are coming of age.

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis; AMR Research.
The latest *GMA Information Technology Investment and Effectiveness Study* highlights the core issues of alignment, complexity and focus. Indeed, for many CP companies the lack of alignment between the goals of business and IT executives remains a significant issue. While the former are focusing on growth and innovation, the latter are more concerned with controlling costs. This gap takes on added relevance given the growing criticality of business analytics, customer and shopper insights, and supply-chain collaboration. This may help to explain why the percentage of business managers who see IT as a strategic asset has steadily declined in recent years (see Figure 21).

![Figure 21: Perceptions of the strategic value of IT have fallen significantly over the past four years.](image)

**CONCLUSION**

Today's intensely competitive and complex landscape demands that CP companies undertake concrete steps to achieve greater alignment between the business and IT. While the majority (61 percent) of IT executives again rank “Aligning business and IT strategies” as the number one factor driving IT priorities for the coming year, this is clearly insufficient.

CP companies should consider investing more time during project planning to more closely align the expectations of business and IT executives around objectives, personnel, budget and time requirements, and benefits realization. Greater alignment can also be realized via formal review processes with regular checkpoints to make sure that, as business requirements change, there is a shared understanding about the impact of those changes. One further action to consider is the expansion of the responsibilities, and perhaps even the number, of business-IT liaisons to proactively bridge the gap.

*Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.*
Addressing the business needs of CP companies more effectively will also require leadership. It is only by assuming a higher profile and asserting themselves more effectively that CIOs can expect to make up the ground they have lost. They will also have to “follow the money.” No company can be expected to make a substantial investment in new technologies, if it cannot measure the return on its investment. Proper measurement systems for calculating and tracking returns are therefore essential.

While many CP companies are actively investigating, if not actually investing in, new technologies, many are still hampered by the complexity of their operating environment, with a multiplicity of systems and applications. In order to realize efficiencies and improve agility, leading CP companies are optimizing their applications investments through a combination of enterprise resource planning-complementary software and built-for-purpose hardware decisions. In this way they increase the performance and efficiency of the existing applications without substantial incremental investment.

Lastly, IT executives will need to focus more sharply on value-adding activities, as distinct from routine maintenance, and free resources for investing in critical areas of business growth and innovation. In an increasingly demanding and competitive marketplace, CP companies must focus on what differentiates them from their rivals – and the IT function will have to play its part in rising to this challenge.
APPENDIX 1: PROFILE OF SURVEY RESPONDENTS

Twenty-nine senior IT executives participated in the 2008 IT Spending and Investment Survey. They represent a broad range of CP companies. Forty-two percent work for large companies (with revenues of more than US$5 billion); 46 percent work for medium-sized companies (with revenues of between US$1 billion and US$5 billion); and 12 percent work for small companies (with revenues of less than US$1 billion). These organizations generate more than nine-tenths of their revenues in North America. Forty-five percent are global operations; 38 percent are domestic companies; and 17 percent are divisions, subsidiaries or business units of larger concerns.

Eighty-nine senior business executives participated in the 2008 IT Effectiveness Study. Five percent are CEOs or COOs; 59 percent are vice presidents or above; and 36 percent are directors, managers or hold other executive positions. They represent a wide range of functions, regardless of the position they occupy within the organizational hierarchy (see Figure 22).

FIGURE 22:
The functions represented by business executives surveyed.

Sources: GMA IT Effectiveness Study and IBM Global Business Services analysis.
Note: Survey responses are for the 89 business executives responding to the IT Effectiveness Survey.
More than half, 54 percent, of the internal IT FTEs at responding companies are engaged in developing, implementing, managing or maintaining applications. A further 10 percent are engaged in data center and/or server operations. The remainder perform a wide range of IT activities (see Figure 23).

**FIGURE 23:**
The roles performed by IT employees surveyed.

Sources: 2008 GMA Information Technology Investment and Effectiveness Study and IBM Global Business Services analysis.
FIGURE 24: Business executives are only moderately satisfied with IT’s ability to work with the business and alignment of IT activities with business strategy.

- [4] Highly satisfied
- [3]
- [2]
- [1] Not satisfied
- No opinion

Source: IBM Global Business Services, 2006 GMA Information Technology Investment and Effectiveness Study.

FIGURE 25: Supply Chain continues as the primary use of IT capital.

- [1] Current year
- [ ] Next year

Source: IBM Global Business Services, 2006 GMA Information Technology Investment and Effectiveness Study.
A near “perfect storm” is gathering around energy consumption worldwide, CP companies face the unprecedented convergence of increasing energy demands, rising costs, diminishing capacities, heightened awareness and rigorous regulatory scrutiny.

- Energy costs are continuing to increase worldwide. The price of oil recently surged above $145 a barrel, and is projected by some analysts to hit $200 a barrel within the next two years. Energy availability is no longer a given and customers in many areas are facing caps on available power. The impact spans all aspects of energy consumption but is especially critical with the rapid growth of data center power and cooling requirements.

- CP companies are also simultaneously experiencing changes in the way they do business. Increases in customer and supplier collaboration requirements and access to systems is pressuring IT systems to 24x7x365 availability, further increasing the energy demands of IT.

- There is also a growing social responsibility dimension to energy usage and management that is increasingly relevant to stakeholders around the world. Organizations are also realizing that being green can be good for business, positively affecting brand image, reducing costs and becoming a competitive differentiator for customers, partners and suppliers.

- Governments are tightening restrictions and regulations around energy generation and consumption. CP companies will likely have to improve their energy efficiency to comply with external and internal goals and regulations, be able to track their energy consumption and report on their improvements.

Many CP companies are exploring “green IT” as a key component part of their overall response to this challenging cost, competitive and operating environment. Initial efforts often focus on IT equipment and facilities requirements (e.g., lighting, cooling). In addition, alternatives such as virtualization to improve server efficiency, or powering off unused equipment are also being considered.

Senior IT managers are right to focus on the environmental impact of their operations. In a 2007 report to Congress, the U.S. Environmental Protection Agency estimated that in 2006 the nation’s servers and data centers consumed approximately 61 billion kilowatt-hours (kWh), representing 1.5 percent of total U.S. electricity consumption and costing about $4.5 billion. 2006 consumption represented a doubling since 2000, and under current efficiency trends energy consumption is likely to double again by 2011. While any “green IT” initiative must clearly address servers and data center energy usage, the above statistics do not include the requirements of PCs, laptops and other IT infrastructure, nor are any lifecycle and/or disposal costs addressed. Therefore a more pervasive approach that also leverages software to address infrastructure, workload and people issues, is warranted.

- **Infrastructure**: including data centers, buildings, factories and trucks – is a major consumer of energy. Software can enable CP companies to visualize, control and automate their infrastructure to deliver new levels of power efficiency and to optimize operations by leveraging consolidation and virtualization.
Workloads: There are two important areas of optimizing workloads. First, there is the business workload that is defined by the business process activities the organization performs daily. The second focus of workload optimization is the applications and systems that support the business. Workloads are executed by people on the infrastructure within organizations, and their underlying processes and applications directly influence energy needs. Effective workload management includes the ongoing improvement of business and IT information and processes to make sure that a continual focus is placed on reducing the carbon impact of the organization.

People: directly and indirectly individuals contribute to the carbon footprint in a range of ways, from the impact of the commute to and from the office, to the physical office space and its energy requirements.

Some examples of specific activities CP companies can take to reduce energy requirements, and thereby lower carbon footprints, are as follows:

Infrastructure:
- Assess data center efficiency on a realtime, ongoing basis. This is especially important given the increasingly dynamic nature of today’s data center
- Combine workloads on servers to improve the performance utilization – leverage workload classification and flow controls
- Explore virtualization or workloads for physical servers and other hardware platforms
- Integrate management of IT and facility equipment
Model energy usage by asset and by location

Workloads:
- Explore opportunities to leverage SOA to dynamically allocate and optimize workloads across servers and applications. As applications are decomposed into reusable services dedicated servers to support specific applications may no longer be necessary
- Evaluate reducing application footprint size by assessing how much of the application
- Increase the efficiency of the application platform, or platforms, by reducing the number of physical machines required
- Consider charge back accounting for services consumed – driving ownership and thereby encouraging efforts to reduce consumption
- Combine automated process workflows with digital process content (e.g., replace paper-based documents with eForms)

People:
- Leverage advanced online collaboration tools (e.g., web-conferencing) to reduce business and client travel – these tools now enable sharing of files and even desktops, group chats, instant messaging, whiteboard and audience polling
- Enable collaborative online tools for training activities

This increasingly important area will likely be addressed more directly in the next iteration of the GMA Information Technology survey.
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