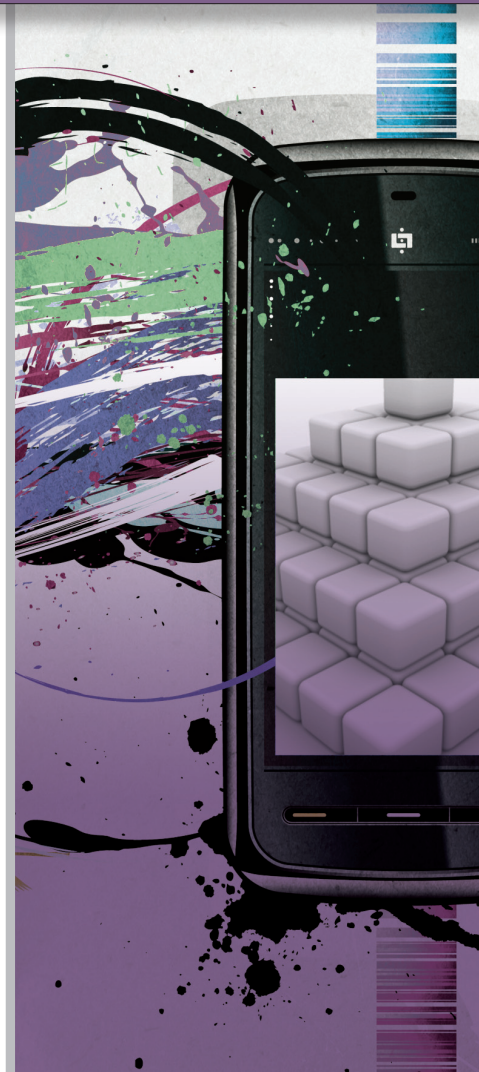


IT in the Telecom Industry

Reaching the next level



Information technology is the very essence of the telecommunications industry. Since the early 1990s, new technologies, new business models and a flood of mobile subscribers have increased the telecom industry's dependence on IT. Meanwhile, companies have had to deal with increasingly fierce competition and declining margins. The result? Nondiscretionary IT costs have exploded. Today, the challenge for telecom companies is to balance the ever-increasing need for sophisticated IT with the need to keep IT costs reasonable. In other words: making IT a driver of value.

Providing telecom services requires a massive amount of information technology (IT) support. IT costs represent nearly 5 percent of telecom revenues, compared with industries such as manufacturing, utilities and food, which spend just over 2 percent of their revenue on IT. In telecom, complex and constantly changing tariff structures require sophisticated IT systems for mediation, rating and billing. Real-time processes such as billing of prepaid accounts require a fully IT-automated process chain. Moreover, IT has become an integral part of telecom products and services, and will continue to be in the future.

At the same time, many countries are experiencing market saturation for voice telecommunication services. The result: Competitive pricing and stagnating demand have caused mobile operators' average revenue per user (ARPU) to spiral downward. Increasing data revenues from mobile broadband have lessened the slide, but not stopped it overall. Deregulation and the unbundling of services, new technologies (such as voice over

Internet protocol, or VoIP) and competition from cable network and mobile operators have sent fixed-line operators' revenues into a nosedive, too.

Our calculations reveal that overall profits in the European mobile industry could turn negative as early as 2011.¹ Clearly, telecom companies must further intensify their efforts to reduce costs and improve efficiency in order to prepare for the rough times ahead.

IT's Role in Reducing Costs and Improving Efficiency

A.T. Kearney's latest Global Cost Benchmarking (GCB) for Telecoms, based on annual input from more than 100 mobile, fixed-line and convergent participants, reveals an alarming trend: The share of IT costs within mobile operators' total process-related costs is constantly rising, almost in line with their age (*see figure 1 on page 2*).

This is no surprise, as the number—and complexity—of IT applications has grown exponentially over recent years. Older companies (10-plus

¹ For more information, see "1+1=1: Network Sharing" at www.atkearney.com.

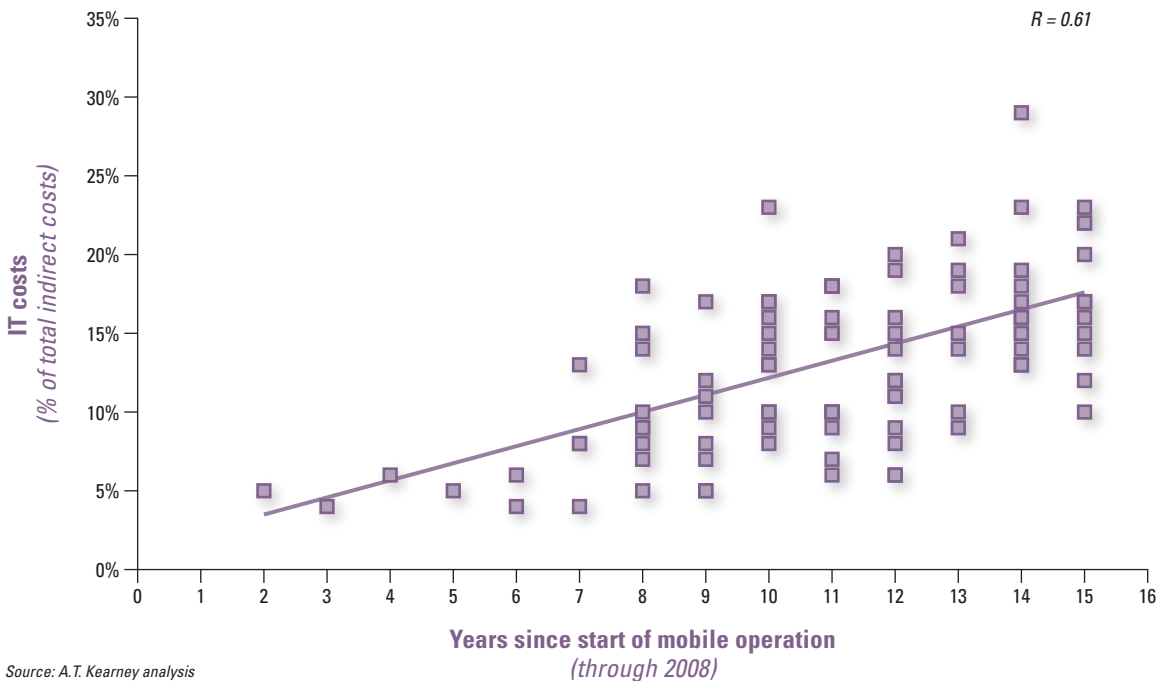
years) constantly struggle to keep their highly complex and often custom-built applications up-to-date and integrate them with new systems, as it places enormous strain on their IT departments. Even newer companies, particularly those that started at the end of the 1990s when standard software was already widely available on the market, are spending substantially more on IT the older they get.

Worse than the mushrooming costs, however, is the fact that spending on application maintenance and operations is nondiscretionary, meaning that it usually cannot be adjusted quickly or rerouted to other areas without compromising day-to-day business. So far, operators have managed to squeeze costs for application maintenance out of their infrastructure budgets, thus allowing some room in development spending. However, a significant part of that spending has to be consid-

ered nondiscretionary, too, because aging legacy applications have to be updated, competitive moves have to be matched with new products, and regulatory requirements need to be implemented. As a result, only a limited part of companies' development budgets can be considered truly discretionary—even though this is the most important part of IT executives' budgets. Careful consideration is needed to determine whether this budget should go to lowering costs by, for example, consolidating and streamlining the application landscape, or to increasing value for the business by, for instance, implementing new features and services (*see figure 2*).

With the increasing costs for application maintenance and little potential for reducing infrastructure costs, it is obvious that IT spending will become increasingly inflexible and rigid.

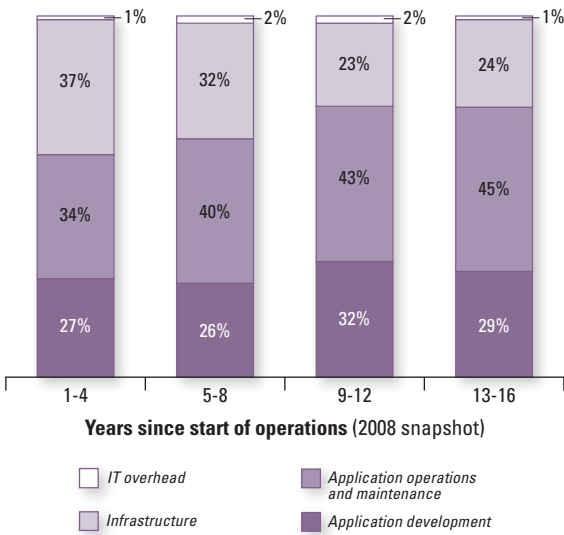
Figure 1
IT costs rise in direct proportion to the age of a company's mobile operations



Source: A.T. Kearney analysis

Figure 2

As operations age, maintenance spending increases and infrastructure spending falls¹



Source: A.T. Kearney analysis

¹ Includes CAPEX for development and depreciation for application maintenance, operations and infrastructure; split based on value.

Responding to the challenge of balancing IT costs with value has thus become more urgent.

Solving the Dilemma

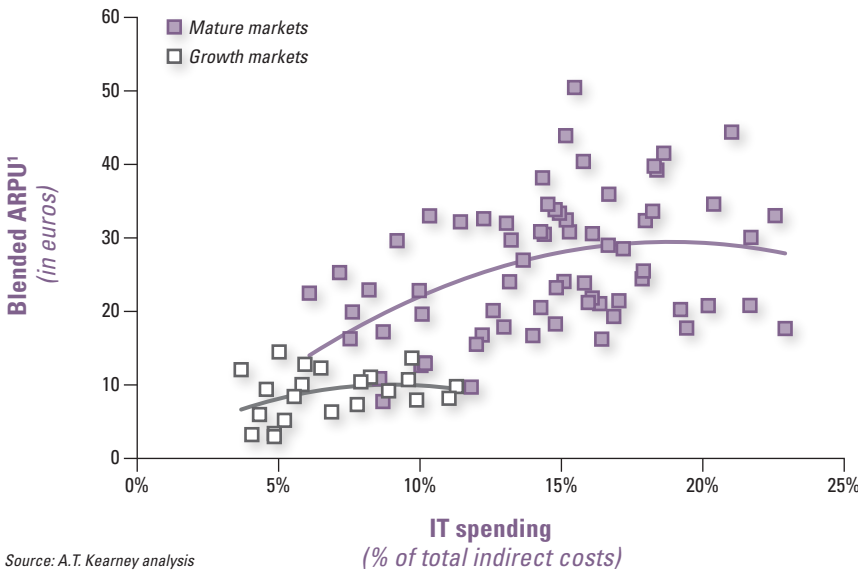
For telecom operators, there are two significant questions: What is the optimum level of IT spending? What is the best way to use the discretionary part of IT budgets to reach that level?

As to the first question, our mobile-operator data indicates that at least in mature markets, there is an initial positive correlation between total IT spending and ARPU, as IT opens up new revenue streams through advanced billing and increases customer satisfaction through better customer relationship management (CRM). At a certain point, however, further IT investments fail to pay off, and worse, going beyond that point will decrease profitability (see figure 3).

To answer the second question, we must determine first what increases IT costs, so that we may

Figure 3

The share of IT spending compared with average revenue per user



Source: A.T. Kearney analysis

Insights

- While ARPU increases with IT spending in mature markets, no correlation is found in growth markets
- In **growth markets**, demand for IT systems is weaker than in mature markets. As a result, IT is not a value driver.
- In **mature markets**, IT opens up new revenue streams to generate value. However, there is a limit at which it does not provide incremental revenue

¹ARPU stands for average revenue per user. Blended ARPU is non-harmonized.

allocate the discretionary IT investment most optimally. We have found that a distinction between external (that is, demand-related) and internal (supply-related) drivers can help with this.

External drivers. These impact the extent and complexity of the IT services portfolio: Basically, “What should we deliver and how much?” Answering this depends on the operator’s size, market strategy and environment, and legal and regulatory requirements. Therefore, IT must deal with various stakeholders both within and outside of the company.

Internal drivers affect the delivery of IT services while leaving the output unchanged and unquestioned. “How to deliver?” can typically be answered by the IT department autonomously.

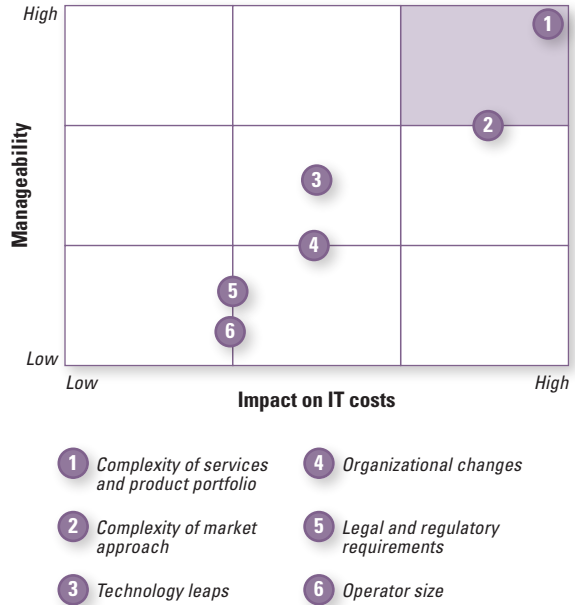
External IT Cost Drivers

Based on our GCB database and on current projects in the field, we have identified six key external cost drivers that deserve further analysis. Of these, the first two are most important from an impact and manageability point of view (see figure 4). The following offers a brief analysis of each.

Complexity of services and product portfolio. Tariffs and value-added services (VAS) are examples of major cost drivers in all stages of the IT value chain. On top of that, the ever-growing number and complexity of tariffs put a huge strain on IT systems such as CRM, order management, provisioning and billing, and increase the risk of implementation failures.

IT-driven value-added services have become an additional challenge in recent years. While traditional services such as voicemail and short-messaging services are mainly network-based and require minimal IT involvement, newer services such as mobile email, download portals, unified messaging, social networking platforms, application stores and online billing are infinitely more IT-intensive.

Figure 4
External drivers of IT costs



Source: A.T. Kearney analysis

Not surprisingly, balancing business requirements with the need for manageable IT complexity is a main value driver for telecom operators. Although an external driver of IT costs, the complexity within the product and service portfolio can be managed. Adhering to strictly fact-based and business-case-driven demand management will help keep growth within the service and product portfolios under control. Meanwhile, product life-cycle management should focus on aggressively cleaning up the existing portfolio by discontinuing outdated or unprofitable services. Together, demand management and product life-cycle management have proved successful at controlling—and even reducing—the complexity of the product portfolio and limiting unsuccessful IT development projects.

It’s worth noting that this task goes beyond the reach of the chief information officer. It

assumes, and even requires, buy-in and support from all other areas, especially finance, and sales and marketing.

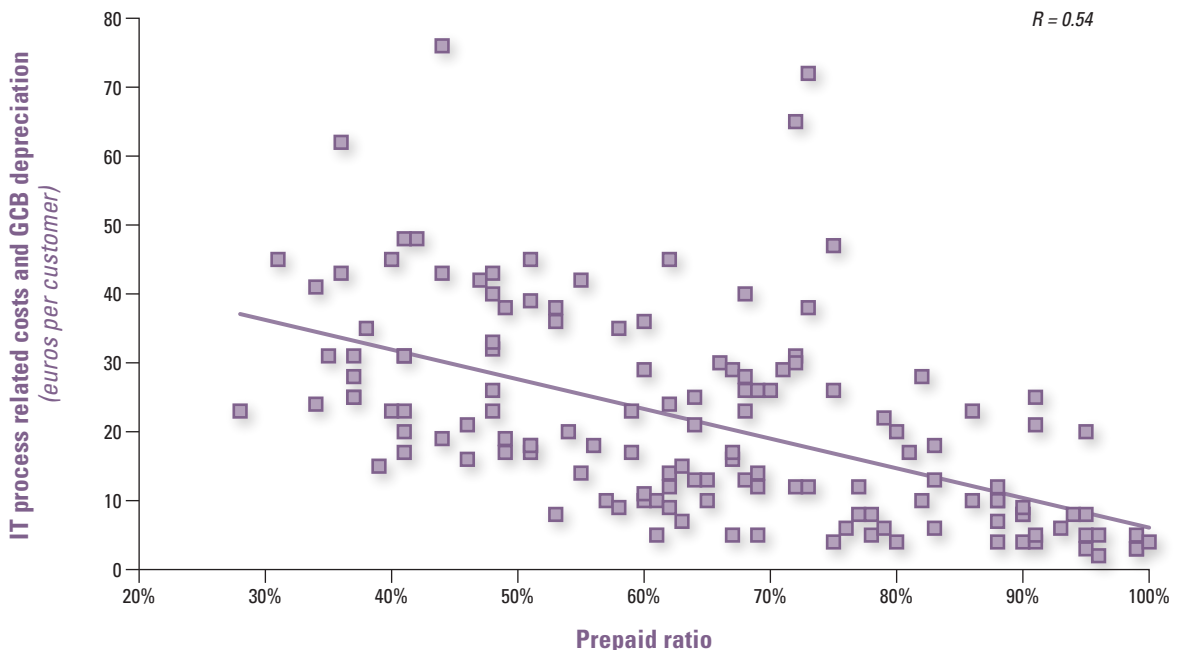
Complexity of market approach (marketing, sales and customer service). The number and characteristics of a company's customer segments, and the sales and service channels through which customers are being served, are important drivers of IT costs. For example, mobile operators with prepaid-only offerings, as are found in emerging markets in Africa and Asia, have significantly lower-than-average IT costs (see figure 5). By relying on the billing functionality of the intelligent network (IN), such operators do not need an IT-based billing system. These telecoms also often decide to go without a CRM system or, at best, they implement a very basic one. As a result, IT only has to provide the most basic services, such as

an enterprise resource planning (ERP) system and desktop management for internal employees' computers. In contrast, the business-customer segment often requires extensive IT customization in billing and customer-care systems.

Thus, the number and characteristics of sales and customer-care channels, along with the functions and services offered in these channels, will further drive external IT costs. While operators with a largely prepaid customer base typically have less sophisticated sales force management, CRM or data-mining tools, operators with a strong postpaid or business customer base usually invest heavily in better understanding and addressing their customers through these tools.

As with managing product and service complexity, strong interaction between IT and the commercial area will help manage demand and IT

Figure 5
IT costs compared with ratio of prepaid customers



Source: A.T. Kearney analysis

complexity. This is especially apparent in the multitude of failed CRM or converged customer database implementations in the market. Many of these projects failed to meet time, quality and budget targets due to unmanageable complexity. This has been especially true for converged operators, where mobile and fixed-line businesses with disparate customer databases and data structures present even more complexity (*see sidebar: The Case For—and Against—Convergence*).

Technology leaps. Technological advances such as fixed-mobile convergence, video-on-demand, mobile email and femtocells pose a challenge for IT as their implementation normally requires new IT systems, or significant modifications to existing IT.

For instance, the convergence of traditional mobile and fixed circuit-switched networks, toward integrated packet-switched next-generation all-IP networks will require new ways of billing, meaning that all related IT systems will have to be updated or new ones put in place. Strict demand management and careful assessment are critical to minimizing the impact of such technology leaps on IT costs.

Organizational changes. Besides mergers, acquisitions and large-scale reorganizations, the current trend toward convergence is leading to significant organizational changes for many telecoms, which have a considerable impact on IT systems. Such changes bring with them the need to connect, merge or split different systems and databases, or to harmonize previously separate processes and data structures.

The implications of such organizational transformations for IT are often overlooked or undervalued, and IT is often involved too late or too little in the decision-making and planning processes. Like other cost drivers, a collaborative approach will limit the impact on IT. Cross-functional teams can be formed to tackle IT challenges early in the transformation process.

Legal and regulatory requirements. Complex regulatory requirements such as digital archiving and lawful interception pose significant challenges for IT processes and systems. While the degrees of freedom for IT are often very limited, some optimization is possible when managing these challenges. For example, we have seen different IT department projects related to the

The Case For—and Against—Convergence

Following moves by France's Orange, O2 in the Czech Republic and Switzerland's Swisscom, a growing number of telecom network operators have recently announced mergers of (or close cooperation between) their mobile and fixed-line units. Examples include Deutsche Telekom's German, Hungarian, Croatian and Slovak operations, and Vodafone's German operations.

Many telecom companies see converging fixed-line and mobile

services as a remedy for falling revenues and a way to regain customer loyalty. New product bundles such as "triple play" (fixed voice, broadband and TV) or even "quadruple play" (adding mobile voice and data to the triple) promise not only to lure customers into higher-priced, longer-running contracts, but also to open up new markets and revenue streams.

In terms of IT, however, this convergence has proven to be another major cause of product complexity.

Offering product bundles requires tremendous effort to connect and synthesize completely different IT systems while still providing customers with a seamless, integrated process from order management to provisioning to billing.

As a result, the prospects for convergence should be evaluated thoroughly, as potential business benefits may be overshadowed by additional IT complexity and costs.

Sarbanes-Oxley Act in similarly sized telecom firms differ by a factor of 2.5 in project-to-personnel spending

Operator size. When analyzing the value impact of size for telecoms, we found—as expected—that per-customer IT costs decrease as operator size increases. In addition, variability of costs for larger operators is lower than for smaller ones. We were surprised, however, to find that scale effects are not as significant as might be expected for mobile operators (*see figure 6*).

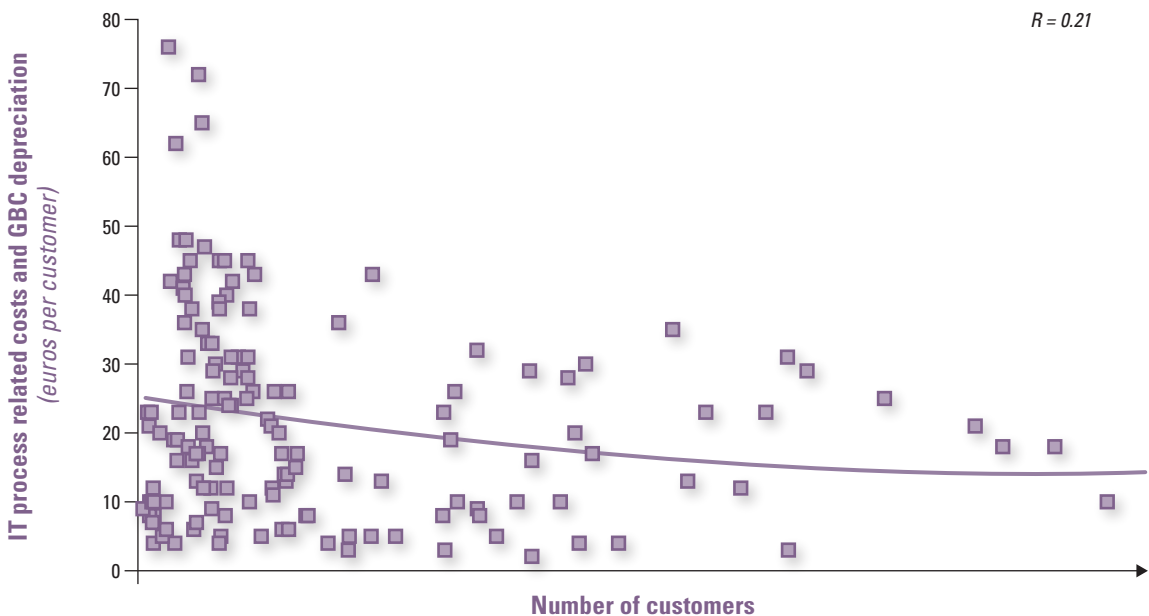
This may be due to the fact that added complexity and legacy systems at larger operators outweigh most of the advantages of being able to distribute fixed costs for expensive IT systems across a larger customer base. Lack of size is not an excuse for subpar IT performance, but it is easier for larger telecoms to optimize IT. In any case, size manageability is obviously limited.

Internal IT Cost Drivers

With these external drivers in mind, what can telecoms do internally to optimize IT costs? Based on our GCB data and current field projects, we have identified seven internal drivers of IT costs. For each internal driver, we evaluated impact on costs and ease of implementation, using quantitative data from our GCB database to the extent that it was available. When it was not, we performed qualitative analysis.

Internal drivers' impact on IT costs is relatively low compared with that of external drivers. While from a cost perspective standardization ranks first as a driver, it is extremely hard to achieve. In contrast, supplier-management processes and hardware consolidation are easiest to implement and manage. In addition, bundling certain drivers offers significant advantages for implementation (*see figure 7 on page 8*).

Figure 6
Total IT costs per customer vs. number of customers



Source: A.T. Kearney analysis

The following offers a brief analysis of these internal drivers.

Degree of application standardization and consolidation. This is the most important internal driver of IT costs. A lack of standardization increases individual applications' maintenance and overall costs for new developments, while a lack of consolidation increases costs for functional areas such as billing. For example, instead of having one billing and one CRM system, many operators use multiple platforms to fulfill what they perceive as special requirements. We have seen mobile operators with as many as five billing systems for one customer segment. Multiple systems, of course, lead to multiple costs.

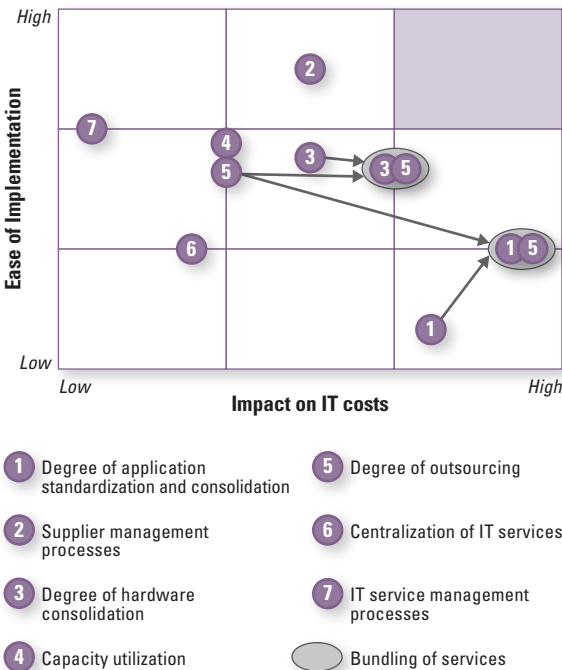
Our analyses show that application maintenance and operations costs per customer decrease

significantly and cost variability is reduced considerably when major IT systems—billing, CRM and ERP, for example—are standardized.

The analysis in figure 8 shows the advantage of standardized software packages, but does not demonstrate whether that advantage applies only to fully integrated application suites (integrated rating, billing and CRM) or if it also applies to consolidated “best-of-breed” combinations of standardized packages (such as Siebel for CRM, Amdocs for billing and SAP for ERP). Although the best-of-breed approach requires some additional integration efforts, it seems to be dominating the industry. As a result, interfaces between different vendors are becoming more standardized and easier to implement. Best-of-breed approaches are typically based on a service-oriented architecture (SOA), which allows for step-by-step replacement and consolidation projects; so best-of-breed can offset the increased costs for individual solutions through lower implementation risks.

Of all internal drivers, standardizing and consolidating the application landscape is hardest to achieve and sustain. Executing it within a fragmented legacy architecture requires significant investments not just in money, but also in time—which is often the bigger problem in a rapidly changing environment. Perhaps more than any internal driver, tackling this one requires buy-in from all areas of the company. In addition to internal IT application standardization and consolidation, the benefits of cross-country standardization and consolidation have become a hotly debated topic for mobile operator groups. Some groups are pushing hard for it, while local operators are unsure about whether the benefits really apply locally. Nevertheless, there is much activity in this area, with some mobile operator groups starting to consolidate their local ERP systems into integrated systems serving multiple countries in a region.

Figure 7
Internal drivers of IT costs



Source: A.T. Kearney analysis

While the theoretical benefits seem obvious, GCB analyses are not yet showing a clear trend. At the moment, the picture is mixed: some groups are seemingly reaping the benefits of consolidation and standardization, while others have actually increased costs. This is largely due to the fact that most groups are just embarking on this journey; the potential benefits are overshadowed by duplication of functions and implementation costs.

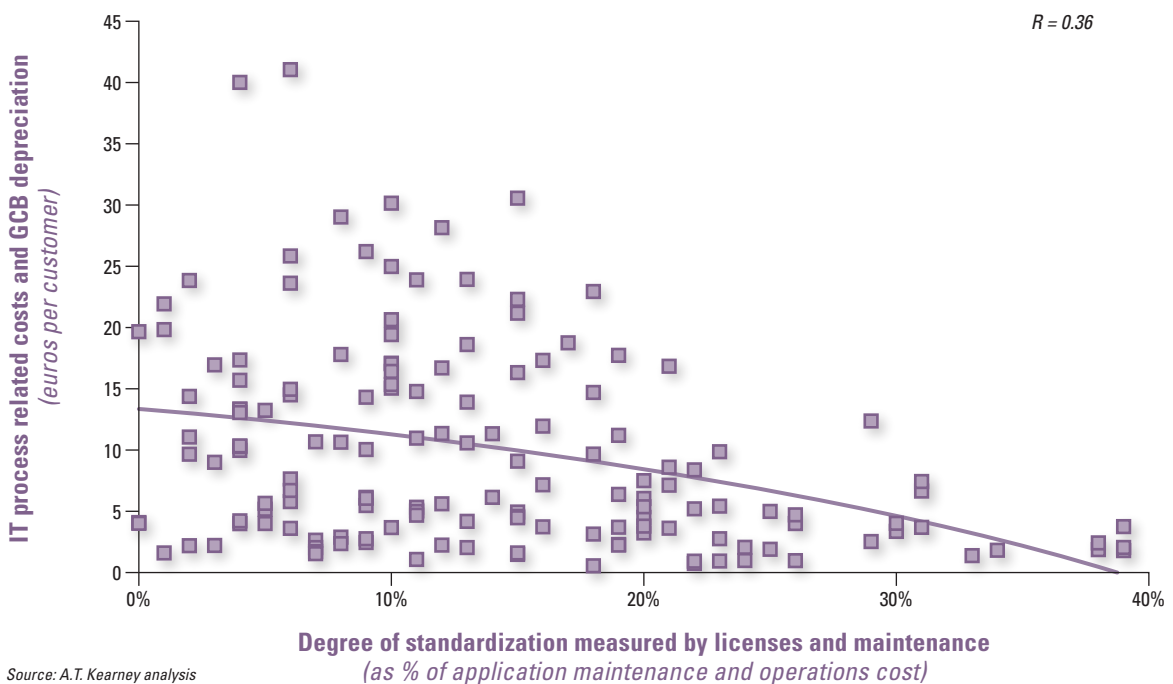
Group consolidation and standardization requires strong leadership and clear rules. When these are not in place functional duplication and further complexity are a risk.

Supplier management processes. The quality and structure of supplier management processes and cooperation between IT and procurement departments are crucial for optimizing value from outsourcing and external-services contracts.

While IT and procurement typically invest substantial effort setting up supplier relationships and negotiating initial prices, maintaining and revisiting these relationships and prices on a regular basis is often overlooked. Much can be gained from setting up effective supplier-management processes in terms of managing deliverables and prices. A bonus is that this is relatively easy to implement.

On a cautionary note, we have seen many examples of supposedly favorable outsourcing relationships in which, over time, supplier performance eroded and costs increased. One operator had an IT infrastructure outsourcing contract that offered very favorable rates when measured by cost per server, cost per gigabyte of storage and cost per printer. But GCB benchmarking revealed that measured against overall drivers such as cost

Figure 8
Application management costs compared with degree of standardization



Source: A.T. Kearney analysis

per customer or cost as a percentage of revenue, the contract was less favorable. We later discovered that our client was misunderstanding demand, and therefore mismanaging the supplier by ordering more than they needed.

Degree of hardware consolidation. Hardware consolidation offers considerable cost-reduction potential and may also be a first step toward a successful outsourcing of IT infrastructure. A complex, fragmented hardware landscape of different servers, databases and storage systems distributed across various data centers is a recipe for high costs. New technologies such as virtualization offer the potential to reduce this fragmentation and thereby reduce maintenance and operational costs.

There are two main approaches to hardware consolidation. The more conservative (and more common) approach is internal consolidation, in which operators virtualize servers and storage systems, or centralize data centers. However, consolidating existing infrastructures—especially data centers—in one location involves high relocation costs and outage risks. Therefore, internal consolidation is a gradual, rather than urgent, process for most operators.

The other option is external consolidation, often associated with the terms “cloud computing” and “hardware as a service.” External consolidation promises lower costs due to better utilization and just-in-time availability of resources within the cloud. Though this option is gaining popularity, concerns over loss of control and data security are keeping most operators from jumping onto the bandwagon.²

Capacity utilization. The degree of utilization of available IT capacities can leave a significant impact on IT costs. It should be obvious that operating at low levels of utilization imposes costs for unused capacity. However, what is often over-

looked is that operating close to or even above maximum capacity may adversely affect costs, too. This is especially true for development projects in which constant pressure and stress lead to lower quality and increased maintenance costs. Systems running at full load are more prone to failure, too, and keeping them up and running typically requires additional effort.

Thus, effectively managing available resources and achieving the right level of utilization are key tasks. A best practice is to have an internal core team cover the base load, and to support this team externally when workloads peak. When that happens, the internal team shifts from a production to a management role, using their specific knowledge to supervise the external support team—and to ensure that all knowledge stays within the organization.

Degree of outsourcing. Contrary to popular belief—which often regards outsourcing as the solution to every problem—our GCB analyses show that outsourcing only has a positive effect on IT costs when a certain degree of standardization has already been achieved. Furthermore, only areas in which an outsourcing provider can take advantage of economies of scale across multiple clients are of relevance for outsourcing. As a result, the main benefits of outsourcing are in areas such as desktop management, storage infrastructure and the hosting of standardized software (*see figure 9*).

This is especially true if outsourcing is preceded by and then bundled with other drivers, such as hardware consolidation or application landscape standardization and consolidation. Thus outsourcing becomes a major step toward reducing costs and stabilizing IT costs.

Centralization of IT services. With the advent of convergence, many network services are becoming more software-based. Still, many telecoms’ network departments are running these

² For more information, see “SaaS: Managing the Anti-IT Application” at www.atearney.com.

services and operational support systems (OSS), even though software-based systems require a different set of skills. In addition, many telecoms still “hide” their IT services units in other, non-IT areas, such as value-added services development in the marketing department, and call-center IT in customer services.

Centralizing such software development and operations processes within the IT department offers further potential for synergies due to better resource usage, IT processes knowledge and integration with other IT systems.

In a further step, centralization of IT in shared service centers across countries offers additional potential, especially for mobile operator groups. However, this requires finding the right mix between centralized and local services, as not all IT functions are suitable for centralization. For instance, different accounting systems may require different ERP implementations, or different market structures may require different tariffs and thus

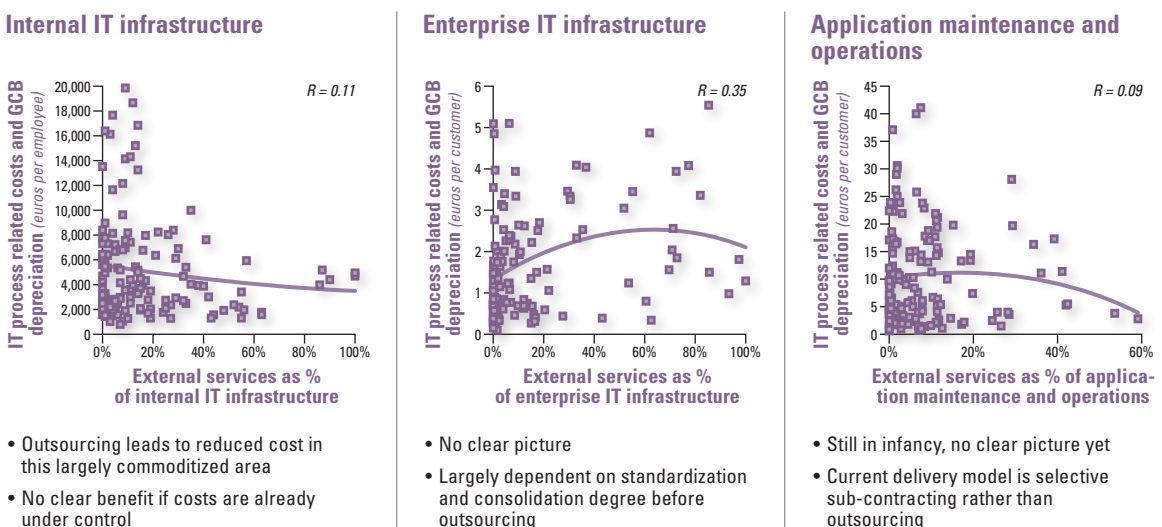
different billing systems. In such cases, centralization may actually hamper effectiveness, and therefore costs.

Finally, IT centralization is often met with resistance, as functional areas or countries do not want to give away their IT capabilities and their direct control over IT.

IT service management processes. Standardized IT services management based on frameworks such as the Information Technology Infrastructure Library (ITIL) or enhanced Telecom Operations Map (eTOM) provides structures and approaches for process and quality improvements that can be helpful when merging fragmented infrastructures and organizations.

However, processes and quality will not improve automatically with the introduction of such frameworks. Actually, the opposite can happen if the process is managed poorly and too much effort is spent on the framework and not enough on the actual work.

Figure 9
The impact of outsourcing



Source: A.T. Kearney analysis

As a result, a clear value contribution of IT services management frameworks cannot currently be seen in the benchmarks. Operators should evaluate on a case-by-case basis what is required to achieve optimal results in this area.

Addressing the External and Internal Factors

Considering all of these factors, we offer five recommendations for IT effectiveness in the telecom industry:

Stay in constant dialogue with the business. Enforce rigid demand management, and check and optimize demand-management processes when indicated.

Pick the low-hanging fruit. Evaluate and optimize supplier- and service-management processes, analyze collaboration with the network department, and optimize the division of labor between internal and external resources.

Prepare the IT transformation by tidying up infrastructure and delivery. Double-check the make-or-buy strategy with an eye on desktop management and data centers.

Implement a joint business and IT application landscape optimization program. Based on

the previous steps, reduce complexity and costs by consolidating applications and services, and use a service-oriented architecture to increase flexibility.

Regularly challenge your make-or-buy strategy. And evaluate new concepts such as software as a service (SaaS) or cloud computing.

Finding Support

When it comes to determining how to get the most out of the discretionary IT budget to achieve the right level of IT spending, it should be obvious by now that only a limited portion of IT value can be created solely by managing internal IT-supply-related factors. A much larger amount of value can be realized by effectively managing the IT-related project portfolio together with the business, prioritizing demands and resources, by avoiding redundancies, and by structuring optimal releases and release cycles for all affected platforms.

To manage demands across the whole organization and to prioritize scarce IT resources, CIOs need support from peers on the business side and from the CEO. Without support, the CIO cannot effectively address the crucial internal and external factors that drive IT costs.

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