



The  
New Voice  
*of the*  
CIO

*Insights from the  
Global Chief Information  
Officer (CIO) Study*

**IBM**



*This study is based on conversations with more than 2,500 Chief Information Officers worldwide.*



**Patrick Toole**  
Vice President and Chief Information Officer  
IBM Corporation

## *A note to fellow CIOs*

Welcome to the first IBM Global CIO Study. For this groundbreaking report, we met face-to-face with more than 2,500 of you, from 78 countries, 19 industries and organisations of all sizes. Through our conversations, we gained an unprecedented amount of insight into what it takes to help grow profits as a CIO today.

You told us about the need to balance a variety of seemingly competing demands, a need that is stronger than ever before. Like your colleagues in the executive suite, you see substantial change on the horizon: business models, budgets and macroeconomic factors, and so much more. At the same time, you set the bar high as you respond to near-term challenges, enacting standardisation and centralisation to lower enterprise IT expenses. And many of you aspire to fully leverage data to support decision making.

The pages ahead contain an analysis of what we have learned by listening to you. You and your peers are increasingly active in setting strategy and solving business problems. There is a fundamental focus in three areas: making innovation real, raising the Return on Investment (ROI) of IT and expanding business impact.

One benefit of speaking with such a large and diverse group of CIOs around the world is the opportunity to share their practical advice and success stories with you. I hope you'll agree that this study is more than just interesting; it's also a useful tool, providing a glimpse into what works well for you and your peer CIOs now, as well as your visionary plans for the future.

We encourage you to bring ideas from this study into discussions with your executive peers. As CIOs, we are responsible for both business and technology leadership. We understand the mechanics of how to make our organisations more productive, innovative and smarter. We are well positioned to help our organisations gain competitive advantage today and in the years ahead.

Thank you to all who invited us into your offices and enabled us to turn up the volume on the New Voice of the CIO.

A handwritten signature in black ink, reading "Patrick Toole". The signature is fluid and cursive, with a prominent initial "P".

**Patrick Toole**  
Vice President and Chief Information Officer  
IBM Corporation

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## How our research was conducted

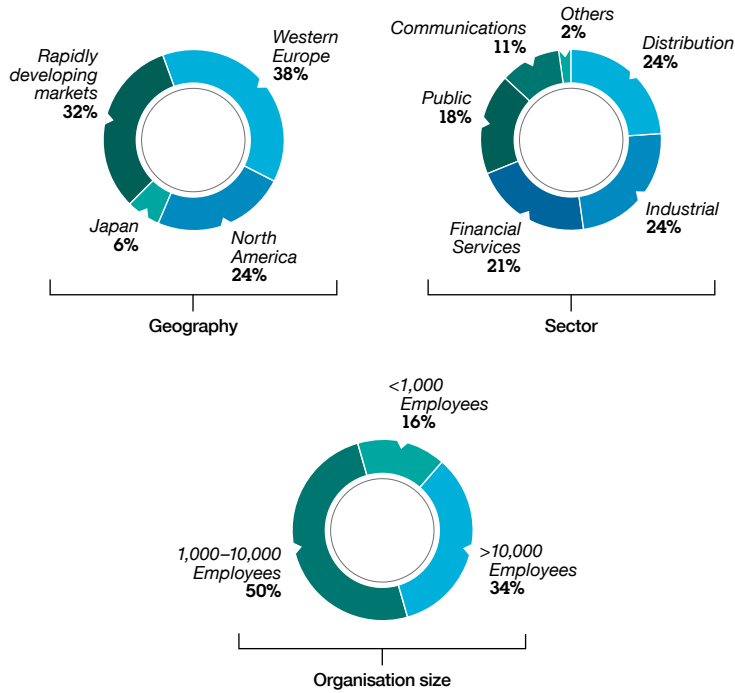
This report is the inaugural edition of our IBM CIO study - the latest in the ongoing C-Suite Study Series developed by the IBM Institute for Business Value. To understand the challenges and goals of today's CIOs more clearly, we met with 2,598 of them, in what is the largest known face-to-face sample of these executives. Between January and April 2009, we interviewed these CIOs, who represent different sizes of organisations in 78 countries and 19 industries.<sup>1</sup>

Our analysis used 2004–2007 profit before tax (PBT) growth, relative to peers in their industries, to associate organisations with one of three growth levels: High, Medium or Low. For organisations where this information was not available, we used statistical correlation to assign levels, based on closest overall similarity of answers.

To simplify the terminology in this report, we will primarily refer to CIOs who work in organisations with high PBT growth as “High-growth CIOs” and to those working in organisations with low PBT growth as “Low-growth CIOs”. Presenting our findings in terms of these categories offers CIOs a more structured approach to identify where they want to increase their focus and how to do it.



**Figure 1** More than 2,500 CIOs worldwide participated in this study  
Our diverse sample was the largest group of C-Suite respondents that IBM has interviewed face-to-face.



## Executive summary

In a fast-moving business environment, how can today's CIO make the biggest impact on behalf of the entire organisation? To answer that question, we listened to over 2,500 CIOs worldwide. These one-hour, face-to-face conversations, along with our statistical and financial analyses, made clearer the changing demands on CIOs. Not content to be known only as consummate IT experts or perpetual seekers of savings, CIOs are redefining their role.

The voice of the CIO is being heard in new ways - as CIOs are increasingly recognised as fully-fledged members of the senior executive team. Successful CIOs are much more actively engaged in setting strategy, enabling flexibility and change, and solving business problems, not just IT problems.

Today's CIOs spend an impressive 55 percent of their time on activities that spur innovation. These activities include *generating buy-in for innovative plans, implementing new technologies and managing non-technology business issues*. The remaining 45 percent is spent on essential, more traditional CIO tasks related to *managing the ongoing technology environment*. This includes reducing IT costs, mitigating enterprise risks and leveraging automation to lower costs elsewhere in the business.

CIOs universally acknowledge that some of their most important objectives too often seem to clash: *How can we support the introduction of new services while avoiding the disruption of existing services? How can I reduce costs while improving services? How will I balance the need to influence business strategy with the need to provide top-notch IT support?*

### **Complementary, yet sometimes conflicting roles**

An Electronics CIO summed it up well: “In IT, we are not magicians, but we are certainly jugglers”. On any given day, CIOs are poised for the unexpected, leading an organisation that solves a myriad of problems for customers, both internal and external. Without question, IT functions represent the lifeblood of most businesses. But CIOs told us that they can only turn more attention to new technology ideas *after* addressing current IT needs.

After thousands of interviews, we found that successful CIOs actually blend three pairs of roles. These dual roles seem contradictory, but they are actually complementary. To characterise each role, we have coined a term that describes its dominant quality. At any given time, a CIO is:

- An Insightful Visionary *and* an Able Pragmatist
- A Savvy Value Creator *and* a Relentless Cost Cutter
- A Collaborative Business Leader *and* an Inspiring IT Manager.

By integrating these three pairs of roles, the CIO:



### ***Makes innovation real***

It's not enough to just plan for innovation - it needs a robust foundation. When acting as an Insightful Visionary, a CIO is perceptive, promoting a broad technology agenda to help the business profit from leading-edge initiatives. The flip side of the Visionary is the Able Pragmatist role. As a Pragmatist, a CIO deals with the realities of the business. The Pragmatist also facilitates the productivity of current IT solutions to allow more time and budget for innovation.



### ***Raises the ROI of IT***

Using IT to produce greater business value is vital, accompanied by an ongoing focus on lower costs and higher efficiency. A Savvy Value Creator finds new ways to help customers and the organisation profit from how data is used. The Relentless Cost Cutter, its counterpart, is focused on managing budgets and processes to eliminate or reduce costs.



### ***Expands business impact***

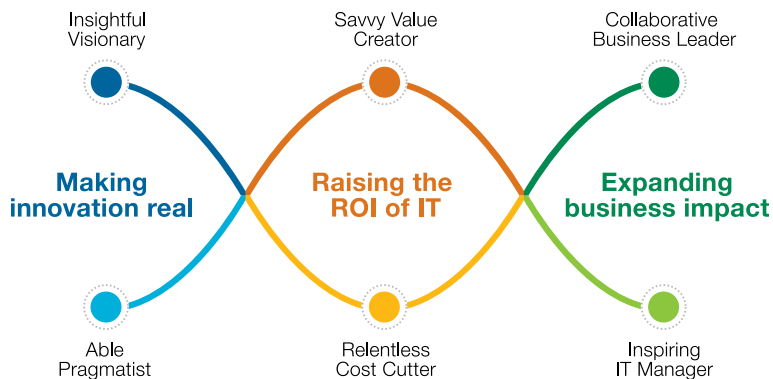
To contribute the most to the organisation, proven expertise in both business and technical matters is essential. Part of the time, CIOs will engage with the enterprise as Collaborative Business Leaders, to drive new business initiatives and cultural shifts jointly with fellow CxOs. At other times, the Inspiring IT Manager role occupies centre stage to motivate the IT organisation and deliver superior IT performance.

### Adjusting the mix, one pair at a time

It's no surprise that CIOs must reconcile seemingly opposing mindsets. But our findings revealed ways they can be more effective in this everyday balancing act. Even some experienced CIOs acknowledged that they are sufficiently strong in just one or two of the six CIO roles. Yet every role requires at least some attention.

The realities facing each individual influence how that CIO can and should manage change at any given time. Many factors impact the decisions about how much emphasis to place on any single role. Among these are macroeconomic and regional conditions, industry-specific forces and various organisational characteristics, as well as the CIO's own skills and aspirations.

In the pages that follow, we share with you the voices of many CIOs and what they are doing to achieve three primary goals: to make innovation real, raise the ROI of IT and expand business impact.





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*and* more about  
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# *Making innovation real*

## *Insightful Visionary and Able Pragmatist*

*Envisioning and enacting innovation* is the overarching goal of the first pair of complementary roles. The Insightful Visionary helps the business explore how technology can drive innovation, while the Able Pragmatist makes it possible to bring innovative plans to life.

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*“Over time, the CIO role is less about technology and more about strategy.”*

Dave Watt, Director of Business Services, Altgas Ltd.

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## Insightful Visionaries

### CIOs as active members of the strategic team

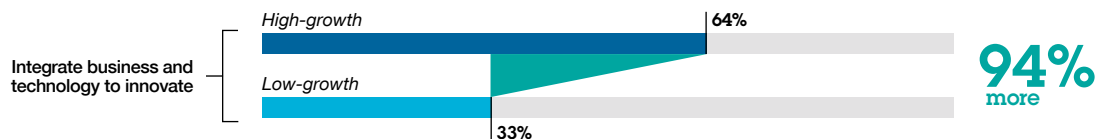
Successful CIOs are seen as Insightful Visionaries who bring innovation to the forefront. They inject leading-edge technologies into products and services to foster the future growth and profitability of the enterprise. High-growth CIOs exert a wide span of organisational influence. Sixty-two percent of them are *members of the most senior management team*, compared to 46 percent of Low-growth CIOs. “As a member of the board, I have direct influence on the company’s strategy,” said a Switzerland-based CIO.

To innovate, High-growth CIOs actively *integrate business and IT across the organisation* 94 percent more often than Low-growth CIOs. “There is no innovation in my organisation without the involvement of IT,” said a Government CIO in Brazil.

Across our sample, CIOs spend about 20 percent of their time *creating and generating buy-in for innovative plans*. But High-growth CIOs do certain things more often than Low-growth CIOs: *they co-create innovation with the business, proactively suggest better ways to use data and encourage innovation through awards and recognition*.

“For us, innovation means generating diverse ideas to address a particular need,” said an Energy and Utilities CIO from the United States. “Then we distil them into an actionable plan that results in business improvement.”

**Figure 2 Innovation works best when CIOs integrate business and technology**  
Visionary CIOs recognise that successful innovation requires deep involvement with the business.





### Create plans that enhance competitiveness

When we asked CIOs to identify their visionary plans for enhancing their enterprises' competitiveness, *business intelligence and analytics* was the top answer, selected by 83 percent of our sample. A Media and Entertainment CIO in Belgium told us better business intelligence will "bring marketing analysis to a higher level, to improve buying behaviour and increase advertising ROI".

Many others agreed that they seek information-led innovation based on treating information as an asset. "Facts drive decisions," said an Insurance CIO. "Plans for imbedded analytics need to enable data capture at the customer touch point."

The next most popular answer about visionary plans was *virtualisation*, cited by 76 percent of CIOs. Rounding out the top three was *risk management and compliance* (71 percent). CIOs reiterated the importance of mitigating risk, and many described their organisations as risk-averse.

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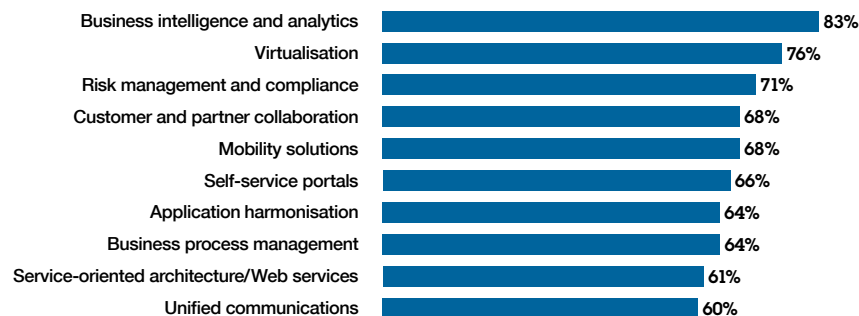
*"Many of our IT innovation plans are budgeted through the business units, which has been a great way to ensure joint commitment to a project and its benefits."*

Rebecca Rhoads, VP and CIO,  
Raytheon Company

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**Figure 3 CIOs have visionary plans**

CIO innovation is not limited to IT solutions: risk management and compliance, customer and partner collaboration, and business process management were all responses in the top ten.



NOTE: CIOs were asked to select all applicable answers to the question, "What kind of visionary plans do you have for enhanced competitiveness?"

## Able Pragmatists

### CIOs “keep the engines humming” and are ready to innovate

“Like many other companies, we are always exploring the possibility of utilising external entities to help manage the day-to-day IT operations so that, internally, we can focus on more strategic initiatives.”

Kurt Rao, Corporate Vice President,  
Information Technology, Time Warner Inc.

Able Pragmatists do what needs to be done efficiently - the natural counterpart of the Insightful Visionary role. The pragmatic CIO recognises that the consistent delivery of existing commitments lies at the heart of every successful IT organisation. This, in turn, allows more time and budget for innovation.

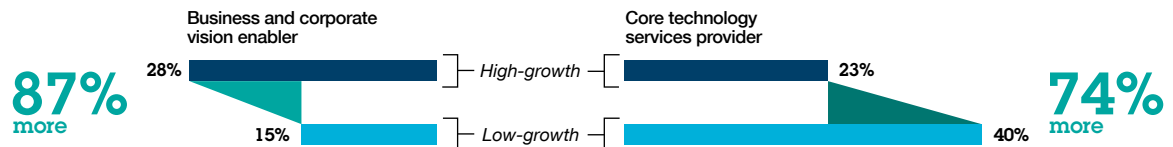
Even as they turn an eye towards the future, High-growth CIOs know they must be both practical and vigilant in meeting everyday IT demands. The Visionary may see a new opportunity, but it takes a Pragmatist to seize it.

In order to focus on more transformational, forward-thinking aspects of the business, 56 percent of High-growth CIOs use *third-party business or IT services*, versus 46 percent of Low-growth CIOs. An Energy and Utilities CIO said: “We do a better job today than a few years ago of managing and getting value from third-party relationships”.

High-growth CIOs spend the greatest allocation of time and budget on *new technology and business initiatives*. They devote 87 percent more of their time to *enabling the business and corporate vision* than Low-growth CIOs. By contrast, instead of being able to focus on potential improvements, Low-growth CIOs spend 74 percent more time than High-growth CIOs engaged in activities related to *providing core technology services*.

**Figure 4 Pragmatic CIOs set the stage for innovation**

CIOs in high-growth organisations spend significantly more time on activities related to enabling the corporate vision versus providing core technology services.



**Prioritise ways to improve communication**

Organisations keep looking for new ways to improve productivity - strengthening the lines of communication within the enterprise, as well as with business partners and external customers. Strong emphasis on collaboration is far more evident among High-growth CIOs. Our study found that High-growth CIOs actively use collaboration and partnering technology within the IT organisation 60 percent more often than Low-growth CIOs. Even more impressively, High-growth CIOs used such technology for the entire organisation 86 percent more often than Low-growth CIOs.

Pragmatic CIOs transform the organisational mindset when it comes to collaborating in new ways, particularly with external customers. A Retail CIO in Spain told us: “We are much more open to collaboration with our partners than in the past”.

However: “Collaboration tools need to be institutionalised to meet the demands of the business,” said a Consumer Products CIO in China. And an Insurance CIO in Denmark said: “We do make the best of current technology, but we need to investigate new tools to increase collaboration”.

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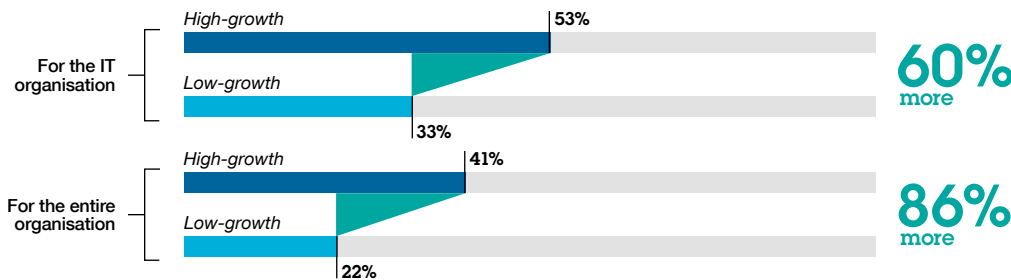
*“Being the provider of core technology services is critical for the corporation to keep working in the present. It’s also fundamental for the organisation’s existence in the future.”*

Koldo Etxeberria, CIO, Kutxa

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**Figure 5 Able Pragmatists strongly emphasise collaboration and partnering technologies**

High-growth CIOs use these tools much more, both for their own organisations and the entire enterprise.



## Case Study

### **King Abdullah University of Science and Technology Making innovation real**

King Abdullah University of Science and Technology (KAUST) is set to open in Saudi Arabia in September 2009. As a new international, graduate-level research university, it will offer degrees in 11 fields of study.<sup>2</sup> KAUST's strategic vision is to be a world-class academic institution leading in four areas: Resources, Energy and Environment; Biosciences and Bioengineering; Materials Science and Engineering; and Applied Mathematics and Computational Science.<sup>3</sup>

CIO Majid Al-Ghaslan was part of the KAUST executive team building a university - from the ground up - in only three years. The team faced significant operational challenges, including creating an entire research organisation, and designing and implementing the leading-edge IT strategy. IT decisions had to meet the needs of research staff, students and other stakeholders from the start, while taking into account major future business and technological innovations.

To fulfil its vision on a stringent schedule, KAUST leveraged third-party expertise in many domains. One such partnership led to the installation of a supercomputer ranked number 1 in the Middle East and number 14 in the world on the June 2009 TOP500 List of Supercomputers.<sup>4</sup> Working with a leading technology organisation expedited the hiring and training of a research team to provide technical support to supercomputer users.

KAUST has also consulted and recruited top scientific, industry and technology experts around the world. As of July 2009, more than 40 faculty members were in place, with a target of 80 by September. Although longer-term results will come later, this visionary yet pragmatic approach has KAUST on schedule to welcome its first class of students - a key step towards becoming a leading academic institution in computational-based research within three years of startup.

## Key initiatives to make innovation real

### Insightful Visionary actions

#### *Push business and technology integration*

Offer solutions for colleagues' business dilemmas, even when the answer is not directly IT-related.

#### *Champion innovation*

Explain how new processes and technologies can deliver more value to both internal and external customers.

#### *Extend CIO influence*

Volunteer to help define the overall business vision and strategy and take on other non-technology leadership roles.

### Able Pragmatist actions

#### *Enable the corporate vision*

Increase the flexibility and efficiency of infrastructure and applications to support ongoing business changes.

#### *Make working together easy*

Provide better partnering and collaboration technologies so internal and external customers stay connected and relationships are more productive.

#### *Concentrate on core competencies*

Improve business agility by accessing business services, speciality technologies or IT services through third parties.





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# *Raising the ROI of IT*

## *Savvy Value Creator and Relentless Cost Cutter*

*Achieving a higher return on IT investments is the overall objective of the second pair of complementary roles. The Savvy Value Creator devises better solutions by understanding customers' needs, while the Relentless Cost Cutter stays vigilant about trimming expenses wherever possible.*

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*“Customer interaction and collaboration are the foundation of our business model.”*

Anders H. Johansson, CIO,  
Handelsbanken

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## Savvy Value Creators

### CIOs as skilled customer advocates

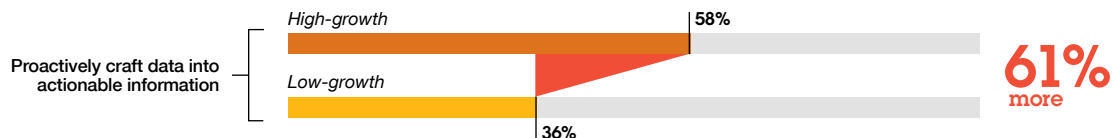
CIOs become Value Creators when they work with the business to enable superior customer experiences. These Savvy Value Creators derive greater value - both for external customers and the enterprise - by fully leveraging critical information and data.

One way CIOs are contributing is by helping the business cope with ever-increasing amounts of information. High-growth CIOs *proactively craft data into actionable information* 61 percent more often than Low-growth CIOs. “Our prosperity depends completely on our data,” said an Electronics CIO in Switzerland.

Many other CIOs echoed the importance of extracting data’s value as fully as possible. “We are actively trying to improve our data analysis because the business is more and more reliant on our data for decision making,” said a Retail CIO.

A Consumer Products CIO in Ireland explained: “We do recognise the strategic advantage of using data to support improved decision making. We are not as strong as we would like to be, but this is a key plank of our strategy going forward.”

**Figure 6 Value Creators fully leverage data**  
CIOs add value by helping internal and external customers cope with the rising volumes of data and information.





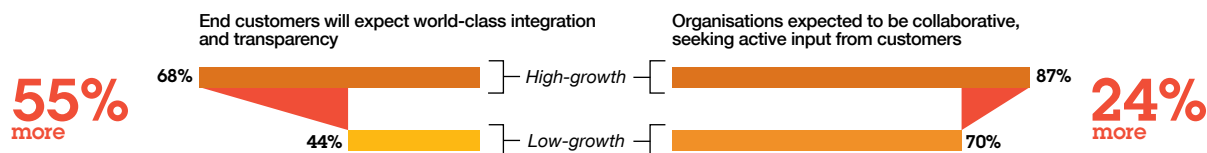
### Create value by truly understanding what customers want

High-growth CIOs create value for the business in many ways, especially through improved customer interactions. In the next five years, 87 percent of High-growth CIOs expect to *seek customers' active input and interaction*, compared to 70 percent of Low-growth CIOs. "The closer we get to production and the customer, the more value we add for them," said a Technology industry CIO.

According to a Banking CIO in France: "The challenge is to change from a 'push' model to a 'pull' model, where the customer expresses requirements and IT answers immediately". We believe effective CIOs will extend this idea far beyond collecting and responding to requirements - to proactively advise the business and point out how to do things differently to realise greater returns.

In the next five years, CIOs expect significant value to come from more emphasis on collaborative relationships with customers. Sixty-eight percent of High-growth CIOs anticipate their customer interactions will *feature world-class integration and transparency*, compared to just 44 percent of Low-growth CIOs. "We have data transparency with many customers - to the point where we share it," said an Energy and Utilities CIO.

**Figure 7 Savvy Value Creators meet customer needs**  
High-growth CIOs anticipate much greater levels of integration, transparency and collaboration with customers in the next five years.



## Relentless Cost Cutters

*“We are looking at any and all opportunities to streamline.”*

Denis Gingue, Senior Vice President and CIO, Charming Shoppes

### CIOs as perpetual seekers of savings

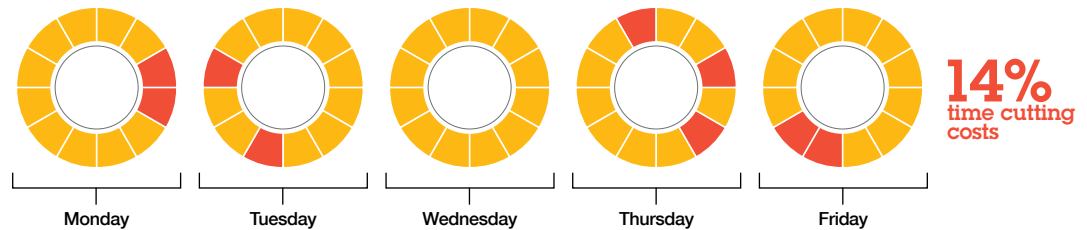
Cost Cutters act on the deep desire to eliminate expense wherever possible. To do so, CIOs are necessarily relentless about scrutinising budgets and processes to trim the fat. Across our entire sample, CIOs spend about 14 percent of their time *removing costs from the technology environment*.

While searching for new sources of organisational and customer value, virtually all CIOs are looking for cost-cutting opportunities. Among the top management priorities cited by a Banking CIO in Canada is to “position the IT organisation to handle increased activity with minimal additional cost”. Simply put, CIOs aspire to do more with less.

But nobody said it was easy. “Budget pressures are driving a lot of issues to the table,” explained an Education CIO. Here’s how a Retail CIO in the United States described the dual challenge: “The balance between new projects and cost control is the dichotomy of my life”.

**Figure 8 CIOs are busy cutting costs almost daily**

For a CIO working 60 hours per week, about 9 of those hours are spent cutting costs.



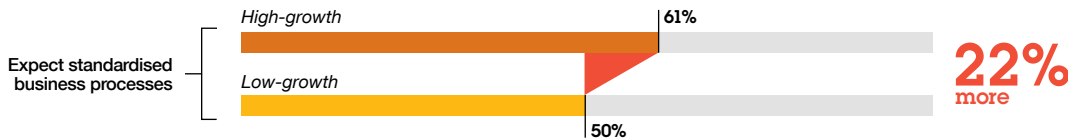
**Reduce costs through different infrastructures and processes**

To control costs, CIOs commonly view a central technology organisation as the future of their function. Centralised infrastructures and processes enable shared services optimisation that, in turn, provides economies of scale. Three-quarters of all CIOs - including those in both high PBT growth and low PBT growth organisations - anticipate having a *strongly centralised infrastructure* in five years. A Chemicals and Petroleum CIO explained that the nature of this centralisation is “not in terms of physical location, but rather in the way it is handled”.

Organisations achieving higher growth recognise that standardisation is another key to cutting costs. Within five years, 22 percent more High-growth CIOs than Low-growth CIOs expect to implement *completely standardised, low-cost business processes*. A CIO in the United Kingdom said: “Expectations have changed. It is about delivering a service through a simple process that can be repeated.”

And successful CIOs realise that automation - where it makes sense - also helps lower costs within the enterprise. “Driving down costs through automation is very important at the moment,” a CIO in Dubai told us.

**Figure 9 Cost Cutters standardise**  
 Many Cost Cutters aim to simplify and automate processes.



## Case Study

**Sara Lee**

### **Raising the ROI of IT**

Sara Lee, a global manufacturer and marketer of consumer products, generated more than £9 billion in net sales across 200 countries in the 2008 tax year.<sup>5</sup> As part of its 2005 business transformation programme to unify a somewhat fragmented company, one of Sara Lee's strategic goals was to focus resources to achieve leading positions in core categories and geographies.

Newly appointed CIO Steve Merry aimed to build a high-calibre IT organisation, branded as SLiCE (Sara Lee Innovation Centre of Excellence), in 2008. Its dual objectives were to enable the success of enterprise growth plans through the innovative use of IT and to reduce IT costs across the enterprise.

One primary focus of SLiCE was to attack inefficiencies in business processes and supporting IT solutions. Following a company-wide SAP initiative and the outsourcing of major service delivery capabilities to strategic service providers, costs are expected to drop by 25 percent between 2005 and July 2011. At the same time, IT productivity and value realised from IT investments have improved dramatically.

Such results have enabled new types of innovative IT investments, including "Connected Coffee Machines" in the Foodservice business, and significant work in Product Life Cycle Management to maintain brand positions and be first to market. SLiCE is also applying business intelligence (BI) technology to allow faster responses to marketplace dynamics, such as the development of algorithms to allow highly reactive pricing for the Fresh Bakery business.

The success of Sara Lee's SLiCE initiatives has contributed several hundred million dollars to the bottom line so far, with an additional £65 million contribution expected over the next two years. These savings allow Sara Lee to keep investing in IT initiatives that can help drive top-line growth.



## *Key initiatives to raise the ROI of IT*

### **Savvy Value Creator actions**

#### *Make the data “sing”*

Surprise the business with unexpected ways to meet customer needs and otherwise profit from enterprise data.

#### *Reach customers in new ways*

Keep looking for more profitable paths to the end customer.

#### *Enhance integration and transparency*

Address growing end-customer demands by proposing leading-edge technologies to create “one version of the truth”.

### **Relentless Cost Cutter actions**

#### *Standardise to economise*

Simplify, then standardise those business processes that are deemed necessary - also work to standardise and reuse IT components, such as servers and databases.

#### *Centralise the infrastructure*

Consolidate and use third-party services whenever it makes financial and business sense, particularly to gain economies of scale.

#### *Keep cost reduction a top priority*

Remain diligent and creative in discovering new ways to lower enterprise costs related to technology.



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“IT is now seen  
as a *key enabler*  
to business goals  
and mission.”

“IT has been very  
successful in the past,  
but there is no guarantee  
of future success –  
only in situations  
where we’ll have  
change  
business

# *Expanding business impact*

## *Collaborative Business Leader and Inspiring IT Manager*

*Strengthening ties with the business* is the crux of the third pair of complementary roles. The Collaborative Business Leader thoroughly understands the organisation's core business and builds strong partnerships, internally and externally. The Inspiring IT Manager demonstrates personal IT expertise and advocates deeper skills across the IT organisation.

*“IT is now seen as a key enabler to business goals and mission, and is engaged in delivering business strategy. Managing with defined goals and intent makes it easier for IT to align to business needs.”*

Chris Ferguson, CIO, Elders Rural Services

## Collaborative Business Leaders

### CIOs as true partners with other executives

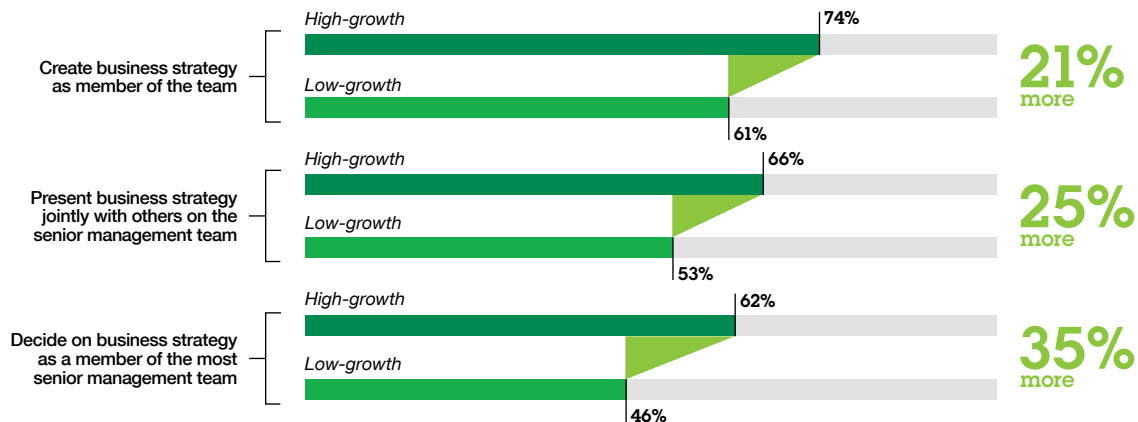
CIOs act as Collaborative Business Leaders when driving new business initiatives and cultural shifts jointly with fellow CxOs. When asked how their senior management teams would *rate technology’s contribution to the business*, 47 percent more High-growth CIOs than Low-growth CIOs selected “high” or “very high”. A Media and Entertainment CIO said: “I attend every board meeting and interface two or three times a month with several board members”.

Beyond participating in business strategy meetings, CIOs who are Business Leaders accept leadership positions to address non-technology issues. An Automotive CIO said: “I do a lot of partnering with my peers and am the owner of several business strategies”.

Collaboration among CIOs and their business colleagues is clearly valuable and in demand. “I help business leaders figure out what they want to do with technology, then I work on how to deliver it,” said a Defence and Security CIO in the United States.

**Figure 10 Successful CIOs actively partner with fellow executives**

Strong Business Leader CIOs are much more engaged in developing and communicating business strategy to the rest of the enterprise.





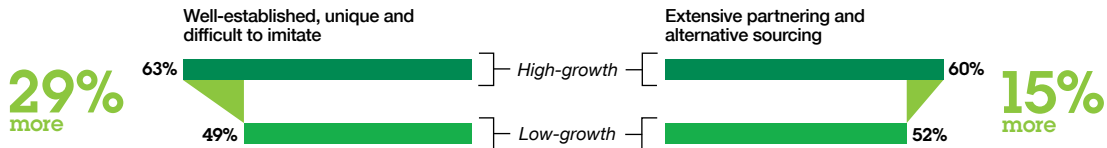
### Create better business models jointly with colleagues

Most probably due to their closer collaboration with the business, High-growth CIOs have higher expectations for their enterprises' future business models. In five years, 63 percent of High-growth CIOs expect their business models to be *well-established, unique and difficult to imitate*, compared to just 49 percent of Low-growth CIOs. Similarly, 60 percent of High-growth CIOs anticipate that their future business models will entail *extensive partnering and alternative sourcing*, versus 52 percent of Low-growth CIOs.

"IT has been very successful in the past, but there is no guarantee of future success - particularly in situations where we'll have to change business models," said a Banking CIO. Collaborative Business Leaders not only recognise the need to improve business models, they are actively joining forces with their executive colleagues to do so. They understand that technology is an enabling tool to be leveraged to facilitate the rapid adaptation of business model changes.

A Healthcare CIO in the United States described his company's collaborative approach, which has both formal and informal aspects: "Business and IT are tightly aligned: there are monthly board meetings with IT. But the chairman also has regular walk-in meetings with me."

**Figure 11 Business Leader CIOs influence future business models**  
Closer ties with peer executives give Business Leader CIOs more positive expectations regarding their enterprises' future business models.



## Inspiring IT Managers

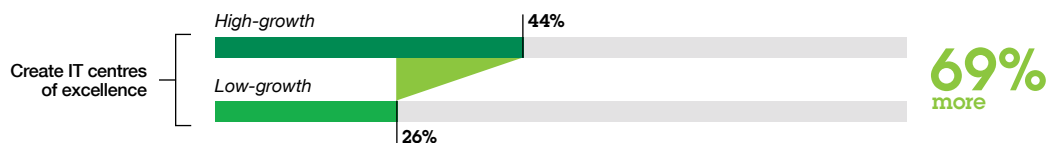
### CIOs as consummate IT experts

While partnering closely with the business is vital, High-growth CIOs realise the importance of honing and applying IT expertise - not just their own, but that of the entire IT organisation. Inspiring IT Managers create a work setting that enables the professional growth of IT staff. They demonstrate high technical literacy that earns the respect of their technical thought leaders.

Strong IT Managers motivate their IT staff to strive for excellence by providing learning opportunities that also meet the needs of the business. Although CIOs have traditionally made it a priority to build IT skills, many now see the need for increased business acumen as well. "We're planning to send IT staff to the business units to develop their skills, but have not yet been able to organise it in a systematic way," said a Retail CIO.

To build an environment that fosters greater IT expertise, High-growth CIOs *create IT centres of excellence to help realise business and technology innovation* more often than Low-growth CIOs. One Government CIO noted: "We have centres of excellence for Enterprise Resource Planning (ERP) and business applications, collaboration and security - some are more formal than others".

**Figure 12 Inspiring IT Managers create IT centres of excellence**  
As strong IT Managers, CIOs create and concentrate top-level IT expertise to help solve business problems.



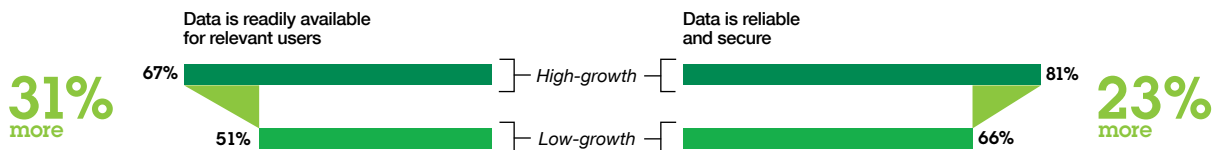
**Foster IT expertise to extract and preserve critical business data**

CIOs have typically made data collection a top priority. Yet even when data exists, no CIO can take its availability for granted. Just 67 percent of High-growth CIOs said *data is readily available for relevant users*, versus 51 percent of Low-growth CIOs. “The benefits of making information available are beyond comprehension,” an Education CIO in Saudi Arabia told us.

Many CIOs admitted that their users can’t always access the information they need in a timely manner. A Government CIO in the United States noted: “Data is readily available to users, but it’s tough to find if you’re a novice”.

Perhaps even more surprisingly, only two-thirds of Low-growth CIOs believe their data is both *reliable and secure*, compared to 81 percent of High-growth CIOs. Again and again, CIOs told us that their data ranked higher in security than reliability, although security concerns do still exist. On a scale of one to five, with five being the highest, a Retail CIO said, “Data security equals five and data reliability equals three.” Like many other respondents, an Insurance CIO in the United Kingdom described his company’s data as “very secure, but not as reliable as it could be”.

**Figure 13 Inspiring IT Managers stay focused on data**  
High-growth CIOs are doing more to improve users’ access to data, as well as its quality.



## Case Study

### **Australia Department of Immigration and Citizenship Expanding business impact**

Between 2007 and 2008, the Australia Department of Immigration and Citizenship (DIAC) helped about 143,000 people migrate to Australia, resettled another 13,000 refugees under the Humanitarian Program and issued 4.6 million temporary entry visas.<sup>6</sup> The agency sought to improve processes associated with the “lawful and orderly entry and stay of people in Australia, including effective border security”.<sup>7</sup> In July 2006, DIAC kicked off its four-year Systems for People (SfP) programme, one of the largest business transformation projects by any Australian Government department.

Deputy Secretary and CIO Bob Correll spearheaded the SfP programme. The programme’s primary objectives are to redesign business processes, find better ways to manage and use information, and implement modern technological support.

Essential to the programme is the ongoing measurement of realised business benefits. The intended financial and non-financial benefits of SfP were first articulated, then updated as needed during development. Post-implementation benefits were then measured during formal reviews with business users. A robust governance framework was also established to keep tabs on achievement of programme outcomes and to resolve emerging issues. A diverse group works with executives to drive the governance effort, including representatives from Finance, the Australian Taxation Office and the Australian Graduate School of Management.<sup>8</sup>

Now into its third year, SfP results have been positive and widespread. Along with significant improvements in border security processes, portals tailored to DIAC staff roles now enable case management for people in immigration detention and other vulnerable clients. Within two years of the start of the programme, an estimated 75 percent of end-to-end business processes were being supported in the single information system.



## *Key initiatives to expand business impact*

### Collaborative Business Leader actions

#### *Know the business*

Improve your understanding of the organisation's most pressing business problems.

#### *Get involved with business peers in non-IT projects*

Capitalise on opportunities to expand your scope of responsibilities beyond the IT organisation to directly influence the business agenda.

#### *Present and measure IT in business terms*

Engender shared responsibility for business success through joint performance metrics based on business outcomes.

### Inspiring IT Manager actions

#### *Cultivate truly extraordinary IT talent*

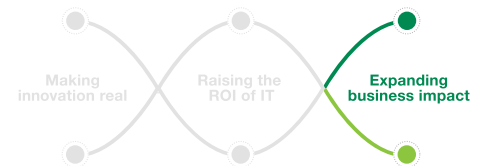
Identify and grow savvy technologists into thought leaders who can expand the impact of IT.

#### *Lead the IT forces*

Position yourself as a strong leader who makes attainment of existing IT service commitments the top priority.

#### *Enhance the data*

Devote as much attention to data accuracy, availability and integration as to data security.





“Because our company is at a fast-growing stage, we are *more focused* on the business.”

“Our model is driven by economic growth. We must survive.”

“We need (an) ahead restructuring IT organisation to meet the needs of the business.”

# *Tuning to context*

## *A CIO's reality*

Managing change presents unique challenges to virtually every CIO. The most effective CIOs consider the full range of possible influences when evaluating how each pair of roles should be prioritised.

## Why a multifaceted CIO has evolved

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*“Because our company is at a fast-growing stage, we are more focused on the business and not the IT systems of the past.”*

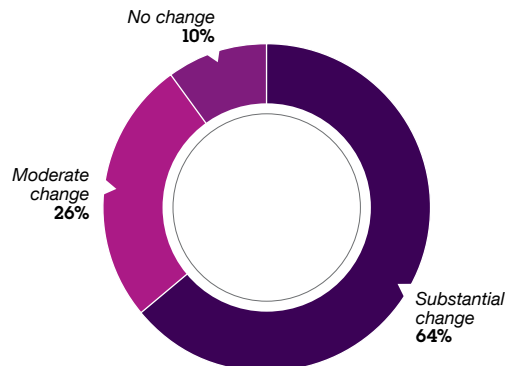
Tim Ye, IS Director, Greater China,  
General Mills

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Compared to our past research, more CIOs are in a state of flux than ever before - an overwhelming 90 percent of our respondents *expect moderate to substantial change* ahead. *Business model changes, budgets and macroeconomic factors* top the list of important external forces expected to impact IT over the next three years. A Consumer Products CIO described the three forces as inextricably blended: “All of these external forces are interdependent. My budget depends on macroeconomic factors, which in turn change our business model.”

A Retail CIO in France expects customers to incite other changes as well: “New customer relationships will bring a new business model”. In truth, many industries face unknown and currently immeasurable changes ahead. As a CIO in the United States noted: “The business model is still being defined for healthcare”. Across our sample, CIOs agree there will be an ongoing need for adaptability to unplanned changes and events.

**Figure 14** **Nine out of ten CIOs expect moderate to substantial change for their organisation**  
To deal with change on many fronts, successful CIOs regularly assess how they need to optimally blend all the roles that are part of their jobs today.





## Today’s CIOs perform a wide range of non-traditional tasks

Regardless of its source, CIOs in High-growth organisations manage change successfully 42 percent more often than those in Low-growth organisations. “My job is to be the change agent,” said a Media and Entertainment CIO.

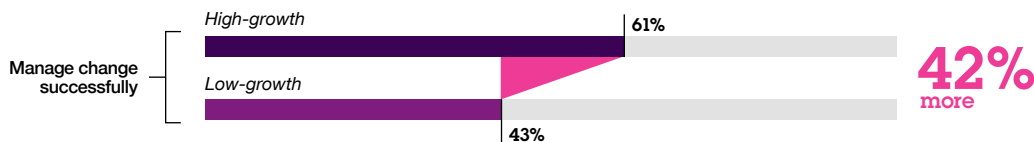
To support the new reality of ubiquitous change, today’s CIOs spend an impressive 55 percent of their time on value-enhancing activities such as *creating and generating buy-in for innovative plans, implementing new technologies and business initiatives, and managing non-technology business issues*.

On average, CIOs devote the remaining 45 percent of their time to more traditional, equally vital tasks. These include *managing the ongoing technology environment, resolving major problems and taking out costs*.

“It is about the ability to scale and to respond quickly to changes in demand. A lot of what we do enables the business to do things directly,” said a Banking CIO. And a Consumer Products CIO in the United States described how that company stays flexible: “We have created a variable cost model so we can adapt well to business changes”.

**Figure 15** Effective change involves moving beyond traditional CIO activities

CIOs who manage change better devote more time to innovative activities related to new technologies and business initiatives than to existing technology issues.



# A reality check: Each CIO's situation is unique

## Macroeconomic factors

CIOs need to stay abreast of market forces underway, paying particular attention to competitive moves and options for differentiating their organisations. Macroeconomic factors, for example, impact CIOs across virtually all industries and countries, in one way or another. A Chemicals and Petroleum CIO explained: "Our business model is being driven by macroeconomic factors and changing rapidly. We must become more efficient to survive."

## Regional conditions

Understandably, conditions particular to a region also have an impact on a CIO's operating environment. For example, CIOs in emerging economies may build a strong case for immediate investment in new technology to support their enterprises' current state of rapid growth. Meanwhile, their industry counterparts in established economies may - at least temporarily - be forced to tighten the reins a bit. The availability of industry-specific skills also varies by region, presenting CIOs with another factor to consider when setting priorities.

## Industry characteristics

Each CIO also needs to understand how customer expectations of products and services are changing, where competitive threats exist and how relationships with customers are evolving. For example, CIOs in a highly competitive, price-sensitive industry may need to put visionary planning on hold so their organisations stay laser-focused on current fiscal year performance.

CIO priorities also depend on how well the industry as a whole deals with change. Clearly, industry situations run the gamut from chaotic to relatively static. In particular, CIOs in Automotive, Banking and other industries said they expect radical changes to the business model. A Chemicals and Petroleum CIO in Luxembourg noted: "We are in constant evolution and this has a tremendous effect on IT".

### Organisational influences

In setting priorities among the three pairs of CIO roles, it's important to pay attention to characteristics of the organisation like the formal reporting structure, the working culture and the balance of power. The most effective CIO also makes an effort to manage upwards - not just downwards - to verify that senior management fully understands the contributions of the CIO and IT team.

A CIO faces special challenges if any part of the organisation is in flux. For an organisation involved in a merger or acquisition, strategic thinking may necessarily take a back burner for the near term, at least. Tactical issues will likely be more pressing, such as integrating business functions and platforms, addressing staff concerns about job security, and making decisions related to physical sites and supply chains.

Being prepared to handle cultural resistance can ease times of transition. But even during periods of organisational upheaval, astute CIOs will keep looking for the brightest and best staff, to help with migrating applications, establishing new platforms and the like.

### Personal aspirations

Even personal career goals comprise part of the CIO's context. As part of identifying which roles need more attention, CIOs should regularly assess skill and development goals to adjust overall career plans. Although some CIOs naturally excel as Collaborative Business Leaders, for example, others must work harder at that role. Requesting "360-degree feedback" from colleagues on a regular basis can identify unexpected strengths, as well as improvement opportunities.

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*"We need to be (and we are) ahead of the curve in restructuring our IT organisation to meet the needs of the business."*

Joe Locandro, CIO, CLP Holdings

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# *Increasing CIO success*

## *Stretching to excel in critical roles*

Through advanced statistical analysis of our findings, we contrasted three groups of CIOs and charted their unique characteristics. The following profile analysis highlights how to become: a Visionary who is even more insightful; a Pragmatist who is more able than before; a savvy Value Creator; a more relentless Cost Cutter; a highly collaborative Business Leader; and a more inspiring IT Manager.

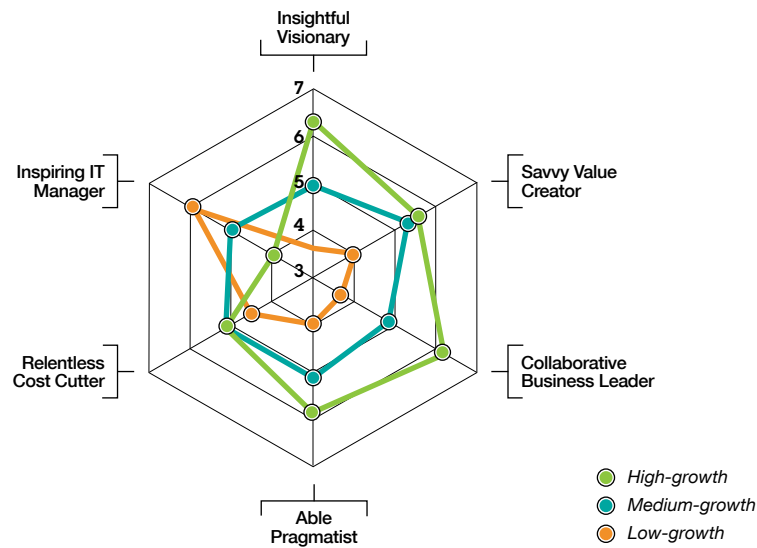
## High-growth CIO profiles differ greatly from others

Our profiles - visually represented in Figure 16 as six-pointed “spider diagrams” - offer CIOs a more structured approach to identifying areas where they want to increase their focus. The spider diagram contrasts three groups of our study respondents - CIOs from organisations with High PBT growth, Medium PBT growth and Low PBT growth.

Above all, CIOs in Low-growth organisations focus on the IT Manager role, as represented by a strong spike at that point of the spider diagram. But, as the diagram also shows, this heavy concentration ultimately shortchanges focus on the other five roles. The profile of CIOs from Medium-growth organisations shows a comparatively low, though nicely balanced emphasis across all roles.

CIOs in High-growth organisations use an approach that is still well balanced, although this group de-emphasises some aspects of being an IT Manager. As a result, the High-growth profile is characterised by three peaks that align with the Visionary, Business Leader and Pragmatist roles. These peaks correspond to High-growth CIOs’ heavy emphasis on proposing innovative change, collaborating with colleagues across the business and putting innovation into practice, respectively.

**Figure 16** Profiles show striking differences among the three CIO groups  
 High-growth CIOs make distinctly different choices.



NOTE: Each CIO role was scored based on responses to a discrete set of questions. The average overall score for each role was plotted within the three performance categories (High-, Medium- and Low-growth). With a possible range of 0 to 10, actual scores fell between 3 and 7.

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*“A significant role of the CIO is to establish with senior executives that they not only need to focus on operations, but that they also need to bring innovation to their businesses.”*

Dr Warren Ritchie, CIO,  
Volkswagen Group of America

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## Make innovation real

### Improving as a Visionary

Many CIOs who are seeking to become more visionary shared examples of positive changes in their relationships with senior management. We heard enthusiastic comments about a tangible change in perception after CIOs began working more closely with other senior managers.

An Insurance CIO in Mexico said that now “the CEO is totally convinced” of the importance of IT’s role: “The CEO’s message to the Board is that IT is necessary to be better as a company”. A CIO in Dubai said: “IT should play a major role in making business colleagues more aware of its vitality to business operations”.

Visionaries also evoke excitement from the business through suggested innovations that differentiate the organisation. A Banking CIO in Italy works to address the “increased need to manage better process innovation” and the “importance of technological innovation”. A Consumer Products CIO in China has visionary plans that include “a focus on internal innovation, especially to support sales coverage”.

Communicating a clear view of top technical priorities is another powerful Visionary action. A Public Education CIO said: “I want to spend more time identifying technologies to support the business and structure of the organisation”. Recognising the need to educate the business about beneficial uses of technology, a Consumer Products CIO in South Africa said: “Business is not yet fully exploiting the business intelligence that is available”.



### Improving as a Pragmatist

To stretch as a Pragmatist, a CIO sets goals such as achieving higher productivity and helping the organisation become more flexible. A Consumer Products CIO in Australia cited the need to “differentiate by bringing new products to market better and faster than competitors”. A Financial Markets CIO said: “Right now, we do not have the flexibility we need, but we will improve”.

Greater flexibility is often a by-product of acquiring business or IT services from a third-party provider. Such options also allow organisations to concentrate instead on their real areas of expertise.

Partnering with outside parties frees up time to work on higher organisational priorities - thus allowing the CIO to devote greater attention where it is warranted. An Automotive CIO in Singapore described plans to “leverage external sourcing for efficiency, especially for commodities that offer a differentiating advantage from competitors. We will focus on core competencies and build on differentiators that will bring competitive advantage.”

The pragmatic CIO is very effective in managing business relationships across the enterprise and helps others do so as well. Organisations aim to expand collaboration with internal customers and external partners by deploying a growing array of tools across sites and countries. An Electronics CIO told us why: “Collaboration causes innovation”.

To strengthen global connectedness, CIOs across industries are considering web conferencing, collaborative planning, social networking and virtual worlds. An Automotive CIO in the United States said: “In particular, collaboration - and how we can do it better - is one of the things that keeps me up at night, particularly as we expand around the globe”.

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*“We need to improve the use of collaboration and partnering technology - use more technology like people are already using at home.”*

Peter Bakker, IT Manager,  
Van Lanschot Bankiers

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## *Insightful Visionary Able Pragmatist*

### **How can you stretch to make innovation real?**

Are you well-versed in how emerging technologies and innovative processes can address uncovered business needs in your industry?

In what ways will you partner with third parties to increase the time you devote to driving innovation within the business?

How can you expand the use of collaborative and communication tools to widen the knowledge networks of employees and partners?

Do you measure implementation results so that business colleagues not only understand the results, but are convinced and inspired as well?



# Raise the ROI of IT

## Improving as a Value Creator

For a CIO who wants to get better at creating value for the organisation, many options exist for information-led innovation. CIOs recounted many opportunities to improve how their companies use data. “We don’t treat data as an asset. We need to do a better job of handling our unstructured data,” said a Life Sciences CIO in the United States.

Naturally, CIOs expect their enterprises to profit from such efforts.

An Industrial Products CIO in Sweden said: “Business intelligence will be more important after our new ERP system is implemented - a goldmine of information”.

Savvy Value Creators do not merely respond to customer requests.

These CIOs are proactive in defining solutions, such as being prepared for end customers who seek new channels. For customer interactions, CIOs say they need better integration and transparency. An Industrial Products CIO in Spain “makes tools and information available via the web to distributors around the whole world”.

An Energy and Utilities CIO in the United States has both internal and external customers with high expectations in this regard: “Customer relations will require near-realtime information and the ability to change quickly, which will require innovation. For example, our customers care about near-realtime feedback on price.”

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*“Without technology to support product development, our products would be too expensive for the consumer. And our physical distribution is constantly improving due to technology and supply chain investments.”*

Jesper Erichsen, CIO, Arla Foods Amba

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### Improving as a Cost Cutter

It's a given - a successful CIO needs to reduce IT costs for the business. But how is this focus on cost-cutting sharpened even further?

Standardisation of business processes is one tried-and-tested approach to saving money. For example, Shell Oil internally promotes its internal process improvement approach known as "ESSA: eliminate, simplify, standardise and automate".<sup>9</sup> These four sequential steps help to first identify and do away with unnecessary processes. Those deemed essential are then simplified and standardised as much as possible. Finally, some of the standardised processes are chosen for automation.

Many CIOs in our study plan to lower the costs of business processes. A Chemicals and Petroleum CIO in Japan articulated an overarching goal: "We try to make fixed costs variable". Leaner processes are one key objective mentioned by a Life Sciences CIO in India: "With lean IT, agile business processes and unique offerings to partners, we are confident that we will be a preferred company in our market".

A Consumer Products CIO listed the growing demand for process standardisation as just one of many functional requirements in the company's current operating environment, which is characterised by "increased mobility, globalisation and external connections within IT". A Media and Entertainment CIO in the Netherlands sums up his intent this way: "My ambition is to make business processes faster and cheaper".

As part of a continuing focus on cutting costs, an Electronics CIO in Japan expects to work towards a more flexible infrastructure: "There is a tremendous change underway in technology: for example, cloud computing. We are entering an age in which we do not have to own the assets."

## *Savvy Value Creator* *Relentless Cost Cutter*

### **How can you stretch to raise the ROI of IT?**

In what ways can you work with the business to extract the maximum financial return from the current IT portfolio?

Do you actively reach out to the business to jointly capture relevant information and do you suggest new ways it can provide value?

How can you leverage competitors' experiences to further optimise business and IT processes?

If you were your own successor, what are the top three things you would do to generate a 20 percent increase in performance from your IT investments?



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*“Business and technology executives work together day to day, often involving business strategy. We are creating the future of our company by integrating business needs with technology.”*

Joseph Simon, SVP, CIO, Viacom

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## Expand business impact

### Improving as a Business Leader

For those CIOs who wish to become more active as Business Leaders, spending time on certain activities makes a difference. Many CIOs spoke to us about objectives to improve the alignment of business and IT. We heard many examples of progress underway in “earning a voice at the table”, as well as many plans for strengthening those bonds in the coming years.

An Automotive CIO in Belgium said: “We are in transition to better align business and IT. In the past, IT provided what users wanted. Today, IT proposes new solutions to the business.” The situation is similar for a Retail CIO in India: “We are becoming more of a business enabler and partner”. And a Consumer Products CIO told us: “We are now working with the business, instead of waiting for requirements”.

Looking ahead, CIOs shared expectations of driving new business initiatives and influencing the culture together with their peer executives. An Aerospace and Defence CIO in France said senior management will judge 2009 IT performance based on “the capability to evolve the IT organisation to better align with enterprise strategy”.

In working closer with the rest of the organisation, CIOs contribute to better business models. “Business will be more dynamic in the future, so we need to do a better job connecting the business vision to IT projects. We are much better now at documenting how IT projects bring business value,” said a Chemicals and Petroleum CIO in the United States.

### Improving as an IT Manager

The IT Manager role is quite comfortable for most CIOs. Yet it, too, can typically be improved. CIOs are making plans to improve skills within the IT organisation in different ways. “The present IT organisation needs to be strengthened in both business and IT literacy,” said a Travel and Transportation CIO. A CIO in Germany told us: “Technology and people skills are strongly related to each other. Required skills include Web 2.0 and portals, as well as managerial skills, social competence and knowledge of international cultures.”

Study respondents were also clear about the ongoing need for top-notch IT support, including secure access to trusted data. A CIO in Indonesia said: “IT service and the infrastructure to facilitate organisational capabilities should be better than ‘good’”. A Government CIO in the United States told us: “Transparency in government is important - reliable data and secure data are a must”. In Japan, a CIO said: “We need to make product information available to internal and external customers, and improve our service level”.

Even while dedicated to excelling at current IT services, a strong IT Manager makes time to plan for new initiatives. An Automotive CIO told us: “Green IT will become part of our corporate identity. The IT department has to become as green as our company’s products. This is a major initiative for the future.”

A Media and Entertainment CIO in Brazil had a long list of short-term plans to enhance competitiveness, including “self-service portals, mobility solutions, virtualisation, flexible sourcing, risk management, compliance and human capital development”.

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*“Many things have become critical that we never expected. For example, e-mail was never designed or architected to be mission critical, but it is.”*

Bobby German, CIO, National Aeronautics and Space Administration

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## *Collaborative Business Leader Inspiring IT Manager*

### **How can you stretch to expand business impact?**

Do you leverage business relationships throughout the enterprise to expand your scope of responsibilities beyond the IT organisation?

How can you start the ongoing dialogue between the business and IT that also drives shared objectives and measurements?

Are you a role model with state-of-the-art expertise in at least one IT domain?

Do you have a flexible, comprehensive plan to enhance business and technology skills throughout the IT organisation?

Is your IT organisation passionate about protecting and improving the quality of enterprise data?





## Managing dual roles in the future

CIOs acknowledged the constant tension of integrating actions that sometimes seem oppositional. But despite the multiple forces in play, our findings show that CIOs have discovered ways to focus on what matters most to them and their organisations. The collective voice of more than 2,500 CIOs worldwide points to key actions to help CIOs attain the primary goals of making innovation real, raising the ROI of IT and expanding business impact.

### *Make innovation real*

To envision and enact innovation, CIOs integrate the roles of Insightful Visionary and Able Pragmatist. Key actions related to this goal are:

- Push business and technology integration
- Champion innovation
- Extend CIO influence
- Enable the corporate vision
- Make working together easy
- Concentrate on core competencies.

### *Raise the ROI of IT*

To achieve a higher return on IT investments, CIOs blend the roles of Savvy Value Creator and Relentless Cost Cutter. Key actions to achieve this goal include:

- Make the data “sing”
- Reach customers in new ways
- Enhance integration and transparency
- Standardise to economise
- Centralise the infrastructure
- Keep cost reduction a top priority.

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*“The value of the IT operation is not in doubt. The CIO enhances the organisation by providing long-term vision and achieving productivity improvement.”*

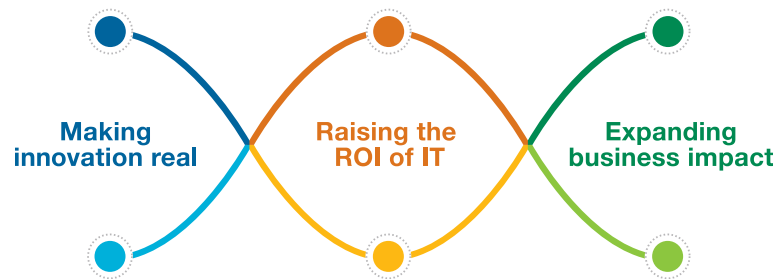
Hideo Miyazaki, Group Advisor, Sunstar

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### *Expand business impact*

To strengthen ties with the business, CIOs merge the roles of Collaborative Business Leader and Inspiring IT Manager. Key actions relevant to this goal are:

- Know the business
- Get involved with business peers in non-IT projects
- Present and measure IT in business terms
- Cultivate truly extraordinary IT talent
- Lead the IT forces
- Enhance the data.



Over time, we expect CIOs to regularly assess how much emphasis is appropriate on each of the three pairs of roles. Our profiles offer CIOs a more structured approach to identify where they want to increase their focus and how to do it. Whichever roles you choose to emphasise, we look forward to working with you.

Continue the conversation at [ibm.com/cio/uk/ciostudy](https://ibm.com/cio/uk/ciostudy)

## Acknowledgments

*We would like to thank the 2,598 CIOs across the globe who generously shared their time and insights with us. Special appreciation goes to the CIOs who allowed us to include quotes from their interviews to highlight major themes throughout this report.*

We would also like to acknowledge the contributions of the IBM team that worked on this Global CIO Study:

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And the hundreds of IBM partners and executives worldwide who conducted the in-person CIO interviews.

## The right partner for a changing world

At IBM, we collaborate with our clients, bringing together business insight, advanced research and technology to give them a distinct advantage in today's rapidly changing environment. Through our integrated approach to business design and execution, we help turn strategies into action. And with expertise in 17 industries and global capabilities that span 170 countries, we can help clients anticipate change and profit from new opportunities.

## About the IBM Institute for Business Value

The IBM Institute for Business Value, part of IBM Global Business Services, develops fact-based strategic insights for senior business executives around critical industry-specific and cross-industry issues. This Global Chief Information Officer Study is part of our ongoing C-Suite Study Series.

# Notes and sources

- 1 CIOs we interviewed in the following countries were counted in the Rapidly Developing Markets category: Argentina, Australia, Bahrain, Brazil, Cameroon, Chile, China, Colombia, Croatia, Czech Republic, Ecuador, Egypt, Gabon, Georgia, Ghana, Guinea, Hong Kong, Hungary, India, Indonesia, Malaysia, Mexico, Morocco, New Zealand, Nigeria, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Russia, Saudi Arabia, Singapore, Slovenia, Slovakia, South Africa, Taiwan, Thailand, Tunisia, Turkey, Uruguay, Venezuela and Vietnam. The Western Europe category includes CIOs from: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Luxembourg, Monaco, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. The North America category consists of CIOs from: Bahamas, Canada, Cayman Islands, Jamaica, Trinidad/Tobago and the United States.

Our CIO respondents represented 19 industries. The Communications sector includes: media and entertainment; telecommunications; and energy and utilities. The Distribution sector includes: agriculture; airlines; consumer products and wholesale; food, beverages and tobacco; life sciences and pharmaceuticals; mail, package and freight delivery; professional services; railroads; real estate; retail; transportation and logistics; and travel and tourism. The Industrial sector includes: aerospace and defence; automotive; chemicals and petroleum; computers and office equipment; electronics; energy (production and refining); engineering and machinery; forest and paper products; industrial products; and network and other communications equipment. The Financial Services sector includes: banking; financial markets; and insurance. The Public sector includes: education; government and public services; and healthcare payers and providers.

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## For further information

For more information about this study, please send an e-mail to the IBM Institute for Business Value at [iibv@us.ibm.com](mailto:iibv@us.ibm.com) or contact one of the IBM leaders below:

<i>Americas</i>	<b>Rich Esposito</b>	<a href="mailto:raespos@us.ibm.com">raespos@us.ibm.com</a>
<i>Asia Pacific</i>	<b>Nipun Mehrotra</b>	<a href="mailto:nmehrot@in.ibm.com">nmehrot@in.ibm.com</a>
<i>Japan</i>	<b>Geoff Vickrey</b>	<a href="mailto:GEOFF@jp.ibm.com">GEOFF@jp.ibm.com</a>
<i>Northern Europe</i>	<b>David K. Henderson</b>	<a href="mailto:david.k.henderson@uk.ibm.com">david.k.henderson@uk.ibm.com</a>
<i>Southern Europe</i>	<b>Louis Guelette</b>	<a href="mailto:louis_guelette@be.ibm.com">louis_guelette@be.ibm.com</a>
<i>IBM Institute for Business Value</i>	<b>Peter Korsten</b>	<a href="mailto:peter.korsten@nl.ibm.com">peter.korsten@nl.ibm.com</a>



**IBM United Kingdom Limited**

PO Box 41  
North Harbour  
Portsmouth  
Hampshire  
PO6 3AU  
United Kingdom

**IBM Ireland Limited**

Oldbrook House  
24-32 Pembroke Road  
Dublin 4

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