



Research Article

Influential IT management trends: an international study

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Abstract

This paper is based on data collected as part of an 11-year authors' survey research on IT trends in different geographic regions, including North America, Europe, Asia, Australia, Africa, and Latin America. This study focuses on global similarities and differences in technology trends (e.g., management concerns, influential technologies, budgets/spending, organizational considerations) among geographies to gain insight into the challenges that IT and non-IT executives face today as well as provide an understanding of the impact these technologies have on the organization's long-term plans and investments. The results for the 11-year period show that the top five management concerns are: (i) IT-business alignment; (ii) business agility; (iii) business cost reduction/controls; (iv) business productivity; and (v) security/privacy. The five most influential technologies are: (i) analytics/business intelligence; (ii) cloud computing; (iii) ERP systems; (iv) CRM systems; and (v) security technologies. Taken together, these findings suggest that the alignment of IT and the business and leveraging IT to reduce business expenses and generate revenue are and will remain essential. The results also suggest that the role of the CIO is evolving and offshore outsourcing is on the rise. Budgets, hiring, and salaries are also increasing, albeit cautiously. This research provides important implications for IT managers to benchmark considerations such as organizational, sourcing, spending, issues/concerns, and technologies across geographies, and sheds light on a perspective on leveraging important IT trends to make thoughtful decisions about them over the coming years, and address current business challenges.

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Introduction

The Society for Information Management (SIM) has been conducting a survey of senior US IT executives since 1980 to help IT and business leaders understand and prepare for important issues and trends. Organizations around the world have used the findings of the previous surveys as a

barometer to prepare for the future; especially since 2010, when the lead author (who facilitated the SIM survey from 1999 to 2013) added the other global researchers and their network to include organizations located outside the United States.

There are a number of other IT trends surveys, but most concentrate on a specific geography, industry, size, or on a topic such as IT salaries. There are an increasing number of surveys covering various aspects of the IT industry (e.g., Ziff Davis Enterprise); while they are all valid and valuable, they typically cover a limited perspective (Li *et al.*, 2010), and do not usually extrapolate the trends into the future.

This paper presents the major trends found from the last ten years of the research teams' surveys from Europe, Asia, Australia, Latin America, Africa, and North America (the United States and Canada) (Luftman and Zadeh, 2011; Luftman *et al.*, 2012; Luftman *et al.*, 2013). The projections are largely grounded on the last 5 years with emphasis on new questions projecting the future based on responses from this year's (2014) IT executive respondents representing 2552 organizations.

Research methodology

The survey was available during the second-third quarters of 2014. Senior IT Executives from 2552 organizations located in North America (46%), Europe (31%), Asia (9%), Australia (6%), Latin America (5%), and Africa (3%) responded. Additional methodological information is provided in the Appendix. It is the amalgamation over the last 10 years of research data, and the new questions pertaining to the future that provide the foundation for identifying the important trends and projections.

The questions were grouped into the following four categories, which are discussed in this paper:

- (I) management concerns
- (II) application and technology investments
- (III) IT budget allocation
- (IV) IT organizational considerations

Each year IT executives were surveyed to identify the most important managerial concerns (from a list of 43 in 2014), and application and technology investments (from a list of 56 in 2014); the results are presented in Tables 1 and 2.

Participants were also asked questions to help understand the IT management trends in IT investments/spending/budgets, along with questions focusing on staffing and organizational considerations.

The top management concerns across the geographies were aggregated over the years (see Table 1) to provide the global top five management concerns and their trends that are elaborated on below.

Similarly the top five applications and technologies were aggregated, with stronger emphasis on the more recent data, to provide a list of the global top five applications and technologies that are presented in and elaborated on in the paper.

Top five IT management concerns and trends

The top management concerns (see Table 1) tend to evolve slowly except for concerns such as IT cost reduction (ranked 23rd overall in 2014) and business cost reduction (ranked 4th in 2014) which appear to be directly related to each region's short-term economic performance. Despite the prevailing global economic conditions, management concerns such as IT-business alignment appear consistently both globally and locally in the top management concerns.

Interestingly, business productivity (ranked 5th in 2014) and revenue generating initiatives (ranked 12th in 2014) have started to appear in similar rankings across all geographies. Indeed the pattern is emerging where an increasing number of management concerns rank similarly across all geographies. We expect as enterprises are more assimilated in the global market, their IT management concerns will become more consistent across geographies.

Alignment of IT and the business

Following the pattern of the past 30 years, alignment of IT and business has been close to the top of the list of top concerns since 2000 (Luftman *et al.*, 2013). Despite being in the spotlight for such a long time, it still remains a pervasive and

Table 1 Key management concerns

	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
Alignment of IT and/with the business	1	1	2	1	3	2	1	2	1	1	1
Business agility	2	2	3	2	2	3	13	17	7		6
IT time to market ^a	3										
Business cost reduction/Controls	4	3	1	4	1	1	7	4			
Business productivity	5	4	1	4	1	1	7	4			
Security/Privacy	6	9	8	7	9	9	8	6	3	2	3
Business continuity/Disaster recovery	7	8	6	5	3	6					
Time-to-market/Velocity of change	8	7	3	2	2	3	13	17	7		5
IT value proposition in the business ^a	9										
Innovation ^a	10										
Infrastructure capability	11	1									
Revenue generating IT projects	12	2	9	9	6	8	17				
Business process management	13	6	4	3	3	4	18	15	11	5	10
Globalization of IT	14	7	17	13	10	15					
Change management	15	13	11	11	11	14	6	7	3	2	3

^aNew: IT Time to Market, IT Value Proposition in the Business & Innovation.

Note: IT Cost Reduction is out of TOP 15 (first time!), is now 23; Bold value signifies the current year data.

Table 2 Top application and technology investments

	2014	2013	2012	2011	2010	2009	2008	2007
Analytics/Business intelligence	1	1	1	1	1	1	2	2
Application/Software development	2	5	4					
Data center/Infrastructure	3							
Cloud computing (SaaS, PaaS, IaaS)	4	2	2	3	5	17		
Enterprise resource planning (ERP)	5	4	3	2	3	3	14	6
Customer relationship management (CRM)	6	3	5	5	9	13		
Big Data	7	7	18					
Security/Cybersecurity	8	16	15	28	7	11	8	
Workflow tools	9	9	7	8	7	7		
Integration (previously EAI/EAM)	10	11	16	9	18	5	12	32
Networks/Communications	11	10	8	11	9	10	11	
Disaster recovery	12							
Collaboration tools	13							
Customer/Coporate protals	14	8	9					
Virtualization	16	15	17	7	12	7	2	
Legacy applications	17							
Employee portals	18	20	34	20	14	22		
Outsourcing IT	19							
Innovation/Disruptive technologies	20							
Continuity planning	21	13	11	14	4	6	3	4
Consumer-orientated devices	22	36						

Note: Bold value signifies the current year data.

persistent goal. The data shows that it remains the number one concern in North America, Europe, Latin America, Asia, and Africa, but slipped to 8th position in Australia in 2014. Alignment of IT and business has been considered an important area right from the beginning of the trends research. Initially, it was ranked 8th in 1980, and remained in the top 10 until 1994. After that, it remained in the number one position; except in 2012, 2010, 2009, and 2007 when it slipped either to the second or third position. It is expected by many pundits that it will continue to occupy the top spots in the coming years; hence, it is not a surprise that it has been ranked at or near the top of the list of concerns in all geographies. IT will continue to be seen as an integral enabler and driver of efficiency and effectiveness throughout the business, especially with the emergence of leveraging IT for revenue generating initiatives. Both IT and business processes are relatively mature on their own, but it is their alignment that holds the key to driving the businesses forward (Luftman et al., 2013).

While many pundits/blogs espouse that after 30+ years alignment is *passé*, they typically suggest using other terms (e.g., integrated, fused, harmonized) and concepts that are synonymous to the ideas supported by alignment advocate. Alignment (or whatever word is preferred) will remain high on the list as IT and business evolve. It is more important to continue efforts to improve the IT-business relationship, than debate what term to use.

Business agility

Business agility and speed to market are essential for business growth in today’s competitive economy, especially as organizations continue to increase their use of IT for competitive advantage. Business agility was first introduced into the survey in 2003. It has been ranked among the top 10 IT management

concerns except 2007–2008 when it was ranked 17th and 13th. Business Agility was ranked 7th in 2003, 5th in 2005, and 7th in 2006. It has been ranked among the top three global management concerns since 2009; mostly at Number 2. Over the years, it has maintained the 3rd position in North America, 2nd in Europe, Asia, and Africa, and 1st in Australia and Latin America. This year, it is ranked 2nd in North America and Europe, 3rd in Latin America, while 7th in Asia. As organizations leverage IT to quickly reduce business expenses and increase revenues, Business Agility will remain an important concern for management. Business agility in concert with IT time to market/velocity of change (ranked 3rd in 2014), IT value proposition to the business (9th) is also indicative of the future impact that IT will have (is having) on revenues (which has fluctuated between 2nd and 17th over the last 7 years).

Business cost reduction/controls

Business cost reduction has been ranked among the top four management concerns across the globe since 2013. In previous trends surveys it was combined with business productivity; this year they are separate, albeit even independent they are both among the top management considerations. Business productivity was ranked among the top four concerns since 2007, except 7th in 2008. This year business cost reduction/controls is ranked: 2nd in Latin America, 3rd in Europe, 4th in Asia, and 9th in North America.

Cost reduction is considered the foundation of long-term sustainable competitive advantage especially during economic stagnation, and therefore this will continue to be highly ranked in all geographies. Leveraging IT to attain these cost reductions and improvements in productivity are essential to the success of organization and the future of IT. As organizations continue to increase their focus on leveraging IT for cost

reduction, improving productivity, and revenue generating initiatives, we will see a continued change in IT roles, spending, and organizational considerations.

Business productivity

There is general consensus on the importance of business productivity and cost reduction using IT, even though IT is still perceived within a majority of enterprises as an expense. While we have seen productivity slowly moving down the list, to reflect this change in business perspective, as previously noted they are both included in the survey and both are among the top management concerns this year.

Business productivity has been ranked in the top four management concerns for the past decade, except 2008 when it was ranked 7th. In 2014 it has been ranked among the top six management concerns across all geographies except Australia (ranked 32nd). The ranking of business productivity as a management concern shows a very erratic behavior, moving from 7th place in 2008 to 1st in 2009. Business productivity is rated among the top four management concerns across all geographies. We expect that it will continue to remain among the top 10 for the foreseeable future. Conversely, we anticipate IT cost reduction (ranked 23rd in 2014) to drop off the list in the coming years.

Security (previously combined with privacy)

Since 1980, security has been included with privacy. It was rated between 2nd and 9th since 2003. From 1980 to 1990 it was ranked between 12th and 19th position, except in 1985 when it was rated 6th. From 2003 to 2006, it was either 2nd or 3rd, and then 6th to 9th between 2007 and 2013 (Luftman and Zadeh, 2011; Luftman *et al.*, 2013). This year security is ranked 6th globally; 2nd in North America, 32nd in Europe, 30th in Asia, 38th in Australia, 15th in Latin America, and 31st in Africa. Security (like alignment) remains as a pervasive and persistent concern. Recent headlines like the NSA fall-out and the Sony Pictures breach exemplify the need for companies around the globe to continue investing in their security systems. Technologies such as Cloud and Mobile (Bring Your Own Infrastructure) exacerbate the continued focus on Security. It is expected that business continuity/disaster recovery (ranked 7th in 2014) and security will remain in the top 10. Security is also the 8th ranked technology in 2014 and ranked 4th overall in technology investments.

Top five applications and technology investments

Survey respondents were asked to rank the importance of applications and technology developments by selecting their top three from a list of 56 alternatives. Respondents were also asked to suggest new technologies, if it was not already on the list. Table 2 lists the top application and technology rankings over the last 8 years (time period for complete global data). Some of the top applications and technologies, such as analytics/business intelligence (BI), customer relationship management (CRM), and enterprise resource planning (ERP) are identified as very important across all geographies; they are shaping and reshaping businesses across the world. Although relatively 'old' technologies (CRM, ERP), some geographies are still struggling in their deployment, while others are expanding their use to meet the challenges of

the economy. The ranking of others, such as Cloud, and Mobile vary across the geographies. This is indicative of the different technological, infrastructure, economic, and human resource differences in those areas. The top five applications and technologies over the last eight years and their trends are discussed below along with future projections across the surveyed geographies.

Data center/infrastructure is a new area in the top five in 2014 and is ranked 2nd in North America, 4th in Asia, 1st in Australia, 3rd in Latin America, 29th in Europe, and 34th in Africa. This very divergent set of responses is likely due to the differences in the geographic focus on Cloud and more traditional architecture.

When considering the prominent SMAC (Social, Mobile, Analytics, Cloud) technologies, we find analytics consistently ranked 1st since 2009 (2nd in 2007–2008) and cloud among the top five since 2010. Social technologies while ranked low globally, can be subsumed with ERPs (5th), CRMs (6th), collaboration tools (13th), employee portals (18th) and workflow tools (9th). Mobile technologies are considered as consumer oriented devices (ranked 22nd).

Analytics/business intelligence

BI has been ranked 1st or 2nd for at least a decade and has remained the top technology investment since 2007, especially if combined with Big Data (ranked 7th). It has been ranked 1st in North America every year since 2007, and in Europe since 2010. It has claimed the top spot in every geography surveyed since 2010 except Asia where it has gone from the 1st place in 2010 to 2nd in 2011, and 3rd in 2012. This is precisely what we predicted in 2012 for this technology (Luftman *et al.*, 2013). For most organizations the question has become how to effectively leverage analytics tools to develop insights and enable effective and efficient decision making. These important investments have been increasing around the globe, even with the recession or the ensuing recovery.

The pace of increase in the volume of unstructured data (including IoT; Internet of Things) is more than that of new developments in analytics, and hence IT leaders continue to believe their organizations are data rich and insight poor (Luftman and Ben-Zvi, 2010b). In addition, recognizing the set of skills (e.g., data management, programming, statistics, tools, and industry/company/interpersonal) required to successfully leverage this technology, along with the limited number of candidates possessing these skills, it is not a surprise to anticipate business analytics/BI persistently high ranking. More recent is the recognition of the important skills required for non-IT executives to succeed in these initiatives; something that is recognized for all IT initiatives.

Analytics will remain the organization's most significant IT investment in the foreseeable future, especially as Asia and Australia get engaged; both geographies have rated this 10th and 13th, respectively, in this year's survey.

Given the sustained focus on Big Data/BI/business analytics, there has been significant debate regarding where it should be placed/report in the organization. A total of 37% of our respondents say that the executives for these initiatives should report directly to the CEO. 37% say they should report to the IT applications executives. Only 17% say it should report to the CIO, 4% to the senior marketing executive, and 5% to other business (non-IT) executives.

Cloud computing (SaaS, PaaS, IaaS, etc.)

Cloud Computing improved its global ranking from 17th in 2009 to 3rd in 2011, 2nd in 2012–2013, and 4th in 2014. The ability for cloud to provide a flexible infrastructure, reduce expenses, and to facilitate virtual/wiki-style network organizations cannot be ignored.

Last year cloud computing unexpectedly plummeted to the 7th spot in Asia (in 2013 it was ranked 2nd). The trend in Asia, as we predicted in 2012, is now proved to be analogous to the last year's one-time drop of the ranking in Europe. We believe the drop in Asia is due to limited-time and budget due to other issues (e.g., business analytics) rather than to a decrease in the importance of cloud computing in these regions.

Given the overall security considerations and the perception of further exposure with cloud, cloud service providers are investing heavily into security (CIO Review, 2014; Wilson, 2014). It is therefore expected that cloud computing and its related management concerns will remain high on the agenda of CIOs, at least in the short term. Our data has identified that 30% of organizations surveyed have more than 50% of their IT services allocated to cloud. Asia is in the lead with 41% of the responding organizations, followed by 31% from Europe and Australia; lagging behind are Latin America with 25%, Africa with 21%, and North America at 18%, albeit over 30% of the respondents allocate over one-third of their services to cloud services.

A total of 70% of our respondents believe that supporting IT infrastructure in the future will be done via outsourcing to cloud service providers. The largest growth in outsourced Clouds will be derived from:

- IaaS (Infrastructure) 22%
- PaaS (Platform) 9%
- SaaS (Software) 45%
- BPaaS (Business Process) 16%
- INFOaaS (Information) 6%

We anticipate that with impending shift in IT spending (discussed below as part of IT budget trends), flexibility, and security cloud technologies will continue to be among the top technology investments over the next 3–5 years.

Customer relationship management

CRM is ranked 3rd globally. Like ERP, CRM gained importance during the recession. This is further evidence that in difficult times it is not only important to decrease business expenses and increase productivity, it is also prudent to focus on retaining current customers, as well as obtaining new customers.

CRM has been ranked 6th overall globally this year; it was ranked 3rd in 2013, and 5th in 2011–2012. The data has revealed that CRM remains among the top 10 significant IT investment in all geographies; except in Latin America (11th), and Australia (29th). It has been, 3rd in Europe, 6th in North America, 6th in Asia, and 9th in Africa.

Since most, if not all, CRM tools have roots in the English language and culture, investment in CRM is vital in geographies where languages other than English are widely used. This is especially important in multi-lingual geographies such as Europe, Latin America, and Asia. Catering to such a diverse customer base is only made possible by extensive and very streamlined use of CRM tools to attain and retain customers. Over the last decade, CRM has become an integral part of any

business and a major priority for businesses to retain existing and attract new customers. Leveraging IT to enhance the customer experience (e.g., adopt digital demand creation, social media) will be seen as a key initiative for the foreseeable future.

Enterprise resource planning

With the strong focus on leveraging IT to reduce business expenses and improve productivity, it is no wonder why ERP has been ranked in the top six spots since 2003; except in 2008 when it was ranked 14th. However, while in 2014 it has been ranked 4th in North America and 1st in Latin America, it is rated only 15th in Asia, 17th in Europe, and outside of the top 30 in Africa and Australia; another large difference across geographies. It will continue to be in the top five lists as the focus on leveraging IT to reduce business expense and improve productivity persists and all geographies launch ERP initiatives. This is especially the case in Asia (particularly in India and China as governments) as they focus on integrating all government/banking and social applications.

Security

As discussed above, security is both the 5th most important management concern and the 5th most important technology. This is the only technical consideration that appears regularly on both the top management and top technology list of trends.

IT budget allocation

This section discusses the survey findings related to the overall allocation of IT budgets with a further discussion on staffing and compensation matters.

Overall budget allocation considerations

Changing economic conditions and dynamic new technology investments has brought major changes to IT budgets. Recent economic improvements, however small, are also visible in IT spending. In 2004 (3-years before the economic downturn) 51% of the respondents indicated that IT budgets increased; in 2007 (just before the start of the economic downturn) it was 61.3%. However, as the economy started slowing down in 2008, only 46% of the respondents reported an increased IT budget. The number dropped further to a mere 25% in 2009, but rose to 44% in 2010 and to 56% in 2011. After a very mild decrease in 2012 (40%), it has again been steadily increasing, albeit very slowly and cautiously, to 53% in 2013, and to 56% in 2014.

The majority of organizations project an increased budget in 2015 as compared to 2014. This year Africa (67%) lead the geographies, followed by Asia (63%), and Australia (60%); whereas North America (47%), Latin America (38%), and Europe (31%) lag behind. The non-changed budget in 2015 as compared to 2014 is seen highest in Europe (48%). With 25% of organizations indicating a reduced budget in 2015, Asia (4% indicating a reduced 2015 budget) emerged as the most optimistic region in 2014; Africa is 2nd (11% reducing budgets); Australia is at 20%, Europe at 21%, Latin America at 25%, and North America at 27%. The current trend suggests that the overall IT budget allocation will continue to change slowly and cautiously given the continued economy uncertainty.

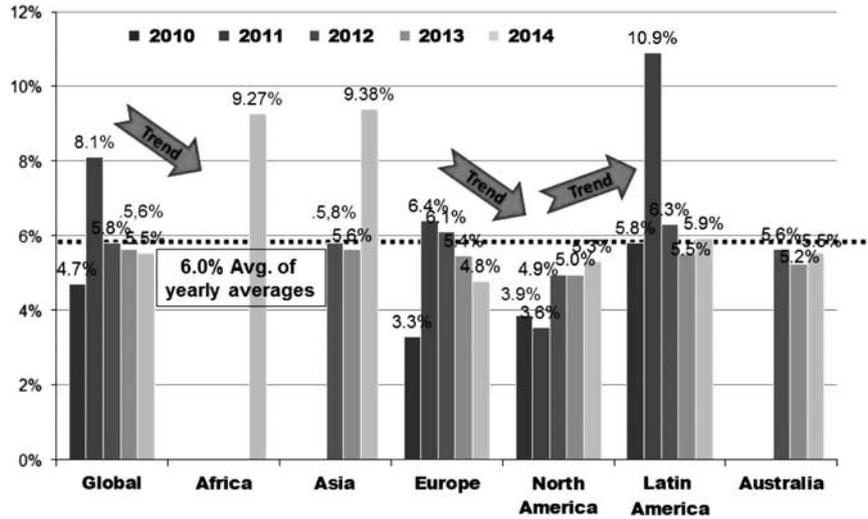


Figure 1 Historical movement of IT budget as a percentage of corporate revenue.

Organizations have started to focus on changing their investment in infrastructure by moving as much as possible to cloud, as discussed above, but at the same time continuing to invest in cost reducing initiatives (including productivity improvements) via ERPs and CRMs, and revenue generating initiatives (via analytics and CRM).

In addition, while the ratio of IT budget to corporate revenue (see Figure 1) has slightly dropped over the last 5 years (averaging 6.0). The first consideration is that the actual spending on IT has increased while the increase in many corporate revenues has been greater. However, the overall decrease in budget as percentage of revenue is almost completely caused by Europe. In North America the budget as percentage of revenue is increasing slightly but still below the overall global average. Having noted this important caveat, changes in IT budgets (increase or decrease) show pronounce fluctuation throughout the recession and has recently started to stabilize. The leader (with the largest IT budget as a percent of revenues) is Asia (9.38), followed by Africa (9.27); next are Latin America (5.9%), Australia (5.5%), North America (5.3%), and Europe (4.8%).

The trend for the allocation of IT budgets (see Table 3) when assessing spending on people versus spending on things shows that the allocated budget for people are decreasing 10% and the allocated budget on things has been increasing since 2009. The people versus things ratio was consistent at about 60% versus 40% except in the year 2013 where it was 55% versus 45%. The result of the 2014 survey shows that the allocation of the budget between people and things is now 50:50.

The increase in the budget for things is about equal (approximately 12% each) for in- house domestic, in-house offshore, outsourced domestic, and outsourced offshore. Perhaps more noteworthy are the changes in spending patterns over the years. Human resources accounts for the largest portion of IT budgets, accounting for about 60% of IT budgets when consulting and outsourced staff are included. Spending on infrastructure, namely hardware, software, and networking, accounts for about 40% of the total IT budget, out of which 25% was spent in outsourced infrastructure. With further reductions to the human resources portion of IT

budgets planned for 2015, both domestic and offshore outsourcing are expected to increase (it increased from 3% in 2008 to 8.5% in 2014), while in house and offshore staffing is expected to decrease. The trend seems to be spending less on human resources and more on things and an increase in outsourcing. It is also clear that over 80% of IT spending is domestic.

Table 4 lists the ranking for the internal IT metrics used. The trend is to use measurements that demonstrates IT value to the business. Survey respondents also conveyed their preferences for demonstrating IT value:

- Analytics/metrics up front 11%
- Business cases/portfolios 21%
- Business understanding IT 38%
- Governance Process 11%
- Shorter project intervals (agile) 14%

While metrics such as availability, on time, on budget, and satisfaction are helpful to manage IT operations, they are not what is required to effectively validate what IT's true value contribution is to the business.

IT staffing and compensation considerations

Figure 2 shows the trend for IT salaries between 2008 and 2015. It is evident that salary increases were drastically curbed as the recession hit (2008–2011). Since 2011, however, the trend has reversed; until 2013 with the reduction in increases (and increases in reduction) from 2013 and projected for 2015. This might be the clearest indication yet that the recession is cautiously coming to an end.

In a more positive sign that the recession is ending, IT staff have started to move more freely between jobs (see Figure 3). Staff turnover has averaged just under 6% since 2006. It was at 5.8% in 2006, rising to over 6.4% and over 7.1% in 2007 and 2008, but as the recession hit employees stayed where they were, sending staff turnover down to 5.2% in 2009, and hovering around the 5.2–5.6% for the following 4 years. In 2013, however, staff turnover increased to over 6.6% the second highest in the last 8 years and now slightly down to 6.17% in 2014.

Table 3 Allocation of IT budget (people/things)

	2015 Projected	2014	2013	2012	2011	2010	2009	Average people v. things
PEOPLE								
Employees/Internal Staff: Domestic	19.5%	17.1%	30.4%	21.0%	31.0%	43.0%	39.0%	
Offshore	10.9%	9.9%	4.2%	11.0%	5.0%	3.0%	4.0%	
Outsourced Services/Contractors:								
Domestic	6.8%	16.9%	8.7%	10.0%	9.0%	7.0%	8.0%	
Offshore	7.1%	10.5%	3.9%	8.0%	3.0%	5.0%	4.0%	
Consulting Services	6.1%	6.6%	7.2%	10.0%	11.0%	10.0%	12.0%	
Does this look like a trend?	50.4%	61.0%	54.4%	60.0%	59.0%	68.0%	67.0%	59.2%
THINGS: HARDWARE, SOFTWARE, FACILITIES								
In-house - domestic	12.7%	15.9%	28.3%	22.0%	30.1%	32.0%	33.0%	
In-house - offshore	11.9%	5.4%	3.7%	2.0%				
Outsourced - domestic	12.8%	7.3%	10.5%	13.0%	10.9%			
Outsourced - offshore	12.2%	10.4%	3.2%	3.0%				
Does this look like a trend?	49.6%	39.0%	45.6%	40.0%	41.0%	32.0%	33.0%	40.8%
Domestic	83%	85%	76%					

Table 4 Internal IT metrics used

	2014	2013	2012
Availability (Up time)	1	—	—
Customer satisfaction (internal IT customers)	2	3	5
Value of IT to the business	3	—	—
Satisfaction of internal IT customers (e.g., portals, social, mobile)	4	—	—
Projects delivered on time	5	1	1
Innovative/new ideas	6	8	7
Help-desk performance	7	—	—
Business cost reduction/control	8	—	—
Workforce reduction	9	—	—
Projects delivered on budget	10	2	2

The change has also been observed in Internal Full Time Employees in 2014 as compared to 2013. Globally, 26% of our respondents indicated that 2014 will have more full time employees compared to 2013, whereas 35% conveyed that it will be a decrease, and 40% believe that it will remain unchanged. A total of 86% conveyed that 2014 is less than 2013 in Australia, 73% in Africa, 44% in Asia, 27% in Europe, 23% in North America, and 22% in Latin America. Overall, the number of full time employees will be less in coming years globally where North America will have more full time employees as compare to rest of the world.

The overall average IT budget allocated for IT training/education since 2009 is 4.52%; it is a number that fluctuates a few percent each year. Latin America allocated

the most in 2014 (6.67%), followed by North America (3.95%), Asia (3.02%), Africa (2.35%), Europe (2.12%), and Australia (1.25%). Each geography spent over 1% less in 2014 than in 2013, except for Latin America (up 0.02%).

A pervasive and persistent complaints from IT leaders are that their people do not have the right competencies and that they have job openings but cannot find people with the right skills. While the next section discusses the skills required for CIOs, we conclude this section by discussing the skills identified for mid-level and entry-level IT employees. As previously presented, the advent of SMAC technologies is having a significant impact on enterprises around the globe. These changes are driving commensurate changes in IT's role and the demand for qualified IT professionals at

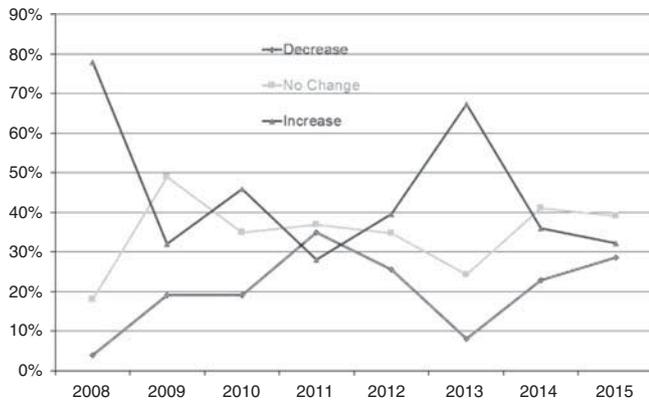


Figure 2 Trend of change in actual total IT salary.

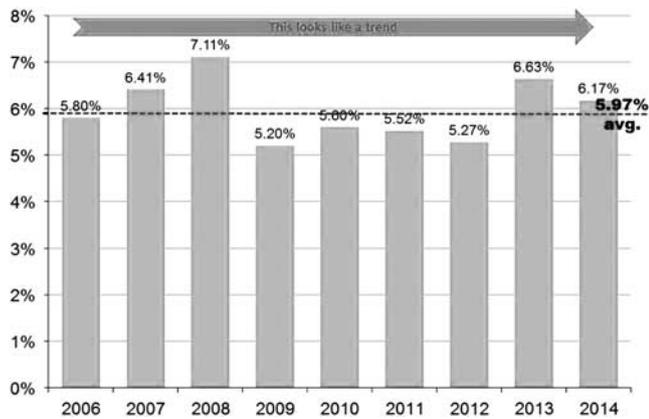


Figure 3 IT staff turnover rate.

all levels with an appropriate balance of technical, management, leadership, industry, and interpersonal skills. They differ across geographies based on the respective degree of importance placed on introducing many of the required changes.

The global top five skills identified for mid-level hires are:

Collaboration/teamwork: North America and Latin America were ranked as number 1; where Asia was 5th, Europe 6th; Australia 14th, and Africa 20th.

Business analysis: Was ranked 2nd by Australia, 3rd by Europe, 4th by Asia, 7th by North America, 7th by Africa, and 31st by Latin America.

Technology architecture: Africa and Asia ranked it number one, where Europe has it 5th, Australia 11th, Latin America 14th, and North America 18th.

User relationships: Europe has it ranked 1st, Africa 4th, Asia 14th, Australia 15th, North America 19th, Latin America 32nd.

Oral communications: Was ranked 2nd in Latin America, 5th in North America, 8th in Asia, 14th in Europe, and 16th in Australia.

Rounding out the top 10 skills for mid-level candidates are change management, functional area (industry) knowledge,

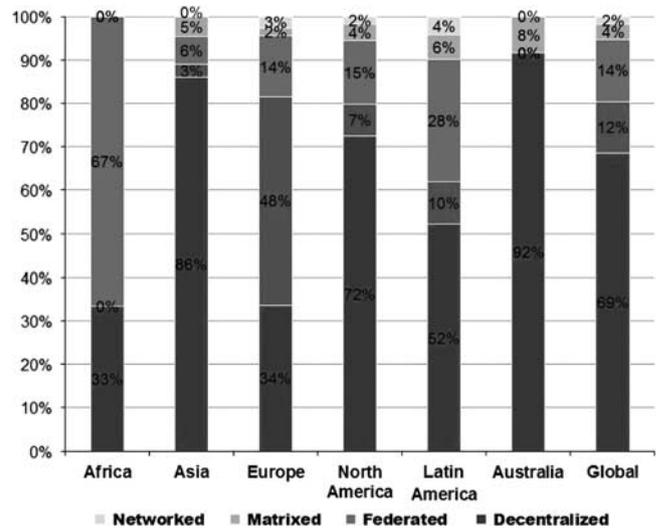


Figure 4 IT organization structure in the surveyed geographies.

people/relationship management, accounting/finance, and problem solving.

The global top five skills identified for entry-level hires are:

technical knowledge – was ranked 1st by every geography except Asia where it was ranked 2nd.

problem solving – was ranked 2nd by Europe, 3rd by North America, 4th by Latin America and Africa, and 5th by Asia and Australia.

collaboration/teamwork – was ranked 2nd by North America and Latin

America, 4th by Australia, 9th by Asia, 10th by Europe, and 18th by Africa iv. functional area/industry knowledge – was ranked 3rd by Asia, Europe, and Latin America, 4th by North America, and 5th by Africa.

technology architecture – was ranked 1st by Asia, 2nd by Africa, 8th by Europe, 13th by Australia, 15th by North America, and 17th by Latin America.

Rounding out the top 10 skills for entry-level candidates are business analysis, oral communications, user relationship management, systems analysis/design, and analytics/statistics.

IT organization considerations

This section discusses the survey findings related to IT organizational structure, CIO trends, and IT Outsourcing.

IT organization structure

As previously discussed, the IT organization can have a major impact on the performance of the company. A total of 84% of our survey respondents suggested that enterprises will still have an IT organization in the future. IT organization structure refers to the degree to which it is centralized, decentralized, federated, matrixed, or networked (Luftman et al., 2012).

In reviewing the IT organizational structures since 2006, it is evident that the percentage of federated structure has been steadily declining in all geographies. The percentage of enterprises with a federated IT structure has gone from 34% in 2012 to 20% in 2014, a surprising finding given the

demonstrable benefits of federated (see below). On the other hand, there has been a marked increase in the percentage of organizations with centralized IT structure, from 62% in 2012 up to 69% in 2014. Decentralized is at 12% in 2014, while matrixed (4%) and networked (2%) organization structure made a small presence in the 2014 survey. The breakdown of IT organization structure in different geographies is presented in Figure 4.

Even though a federated (or hybrid) structure can realize the benefits from both centralized and decentralized structures and has been found to facilitate IT-business alignment maturity, the percentage of organizations with this structure is virtually unchanged over this period (Luftman et al., 2010).

Africa is the leader with 67% of the organizations federated, followed by Latin America with 40%, North America with 15%, Europe with 14%, Australia with 8%, and Asia with 6%. None of the Australian or African respondents indicated having a decentralized organization structure. We suspect that the differences are the result of cultural disparities. Crowd sourcing, e-sourcing, wiki, and virtual organizations are synonymous terms leveraged by a new generation of workers, applying technologies like cloud. Therefore, we anticipate that IT organizational structure will continue to evolve towards more Hybrid and networked structures.

Of our respondents 36% conveyed that the IT application development staff organization will be centralized, 27% would be networked, while decentralized and federated were each selected by 11%, and 15% said that it would not part of the IT function; 70% of our respondents conveyed that the infrastructure will be outsourced to a cloud service provider.

The most important change to IT in the future will be driven by their contribution/value to the business (selected by 62% of respondents). This was followed by changes in governance (15%), and technology (11%). Participants believe that the best way to demonstrate IT value is through improvement in the business understanding of IT (38%), followed by effective business cases/portfolios (21%), shorter project intervals (14%), improved governance processes (11%), and analytics (11%). The most important IT management skills for the NON it executive of the future is for them to have a better understanding of IT governance (28%) and IT trends in leveraging IT (28%). This is followed by effective sponsor and champion roles (20%), CIO/CTO roles (17%), and HR/Sourcing and organization structure improvements (5%).

CIO trends

CIO reporting and the role of the CIO

As the majority of CIOs time is spent in dealing with non-technical issues, and IT is evolving to devote more of its initiatives on reducing business expenses and productivity, and revenue generating initiatives, the roles of IT an CIOs has continued to evolve, albeit vary between the geographies surveyed.

Previous research has shown that, on average, organizations in which CIOs report directly to the CEOs have higher alignment maturity than those reporting to non-CEO executives (Luftman et al., 2010). The percentage of CIOs reporting to the CEO has kept rising from around 30% in 2007 to the peak of almost 60% in 2011 (see Figure 5). It has since, however, dropped to about 38% in 2014. On the other hand the percentage of CIOs reporting to CFOs (25%) and

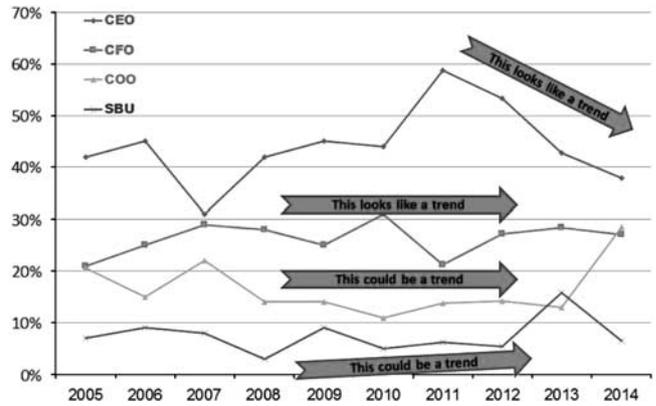


Figure 5 To whom CIO or equivalent reports: 2005–2014.

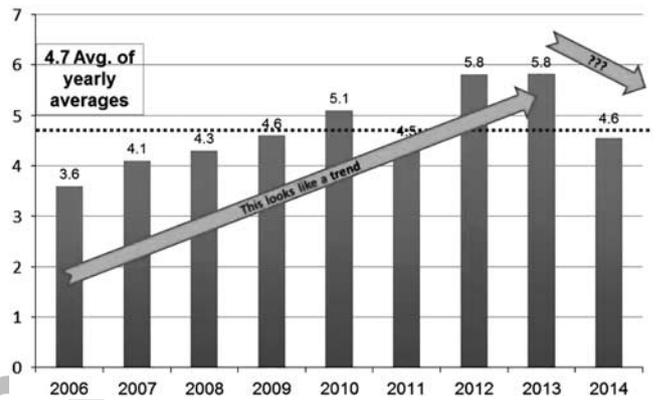


Figure 6 Time in current position (in years).

COOs (15%) have remained within a relatively narrow band since 2005. Even though the majority of CIOs in all geographies report to CEOs, the decline in this important marker is cause for concern over the long run as it might point to a changing role of CIO position, and perhaps the overall IT organization. The percentage of CIOs reporting to the CEO is the highest in Latin America (49%), North America (42%), and Europe (40%); it is lowest in Australia (6%). The trend shows an emerging increase in CIOs reporting to COOs (Chief Operating officer) and SBUs (Strategic Business Units).

Historically IT has been seen as a cost center and more often CIOs used to report to CFOs. The changes emerging in CIO reporting suggests that this pattern will fade in the next few years as organizations look past the recession and towards future growth opportunities fueled by, or at least enabled, by IT. Clearly as more infrastructure is outsourced, and more applications are brought directly under the business units, along with the changes above, this could also be an indication that the role of the CIO might erode over time.

CIO tenure

The average CIO tenure has been steadily on the rise since 2006 (with a slight dip in 2011) through 2012–2013 where it was 5.8 years (see Figure 6). In 2014 it dropped markedly

Table 5 Last position before CIO or equivalent

	Global	Africa	Asia	Europe	North America	Latin America	Australia
IT, same organization	35%	16%	56%	42%	28%	48%	25%
IT, outside organization	44%	50%	28%	16%	62%	4%	37%
Non-IT, same organization	7%	17%	8%	14%	3%	24%	25%
Non-IT, outside organization	14%	17%	8%	28%	7%	24%	13%
Outside organization	58%	67%	36%	44%	70%	28%	50%
Same organization	42%	33%	64%	56%	30%	72%	50%
IT position	79%	66%	84%	58%	90%	52%	62%
Non-IT position	21%	34%	16%	42%	40%	48%	38%

down to 4.6 years. Respondents' from Asia (1.9 years) and Africa (2.7) indicated a low number of years; while Australia was highest (6.8 years) followed by Latin America (5.5 years), North America (5.3), and Europe (5.2).

The survey also asked respondents to indicate what their (or their CIO) previous job was before becoming a CIO (see Table 5). Fifty-eight percent of the organizations said that their CIO had been hired from outside the company. This has been consistent since 2010, albeit better than what it was before 2010. The important insight is that the odds of getting a CIO position in one's current company is not very favorable. In a related note, having an IT background is still considered important in obtaining a CIO job.

While there is a dip in 2014, do not expect to see a significant change in the future, albeit as previously conveyed and further discussed below, we do anticipate changes in the role of the CIO.

CIO time on activities

CIOs continue to spend most of their time dealing with non-technical issues (see Figure 7). Interestingly, the CIO time spent in almost every category in 2014 is around the average of the category from 2007 to 2012, except for relationship management with the business, where the CIO time spent has been declining from 23% in 2007 to 15% in 2012, 13.3% in 2013, and 10.1% in 2014. Relationship management is highest in North America and Europe, however this shows a drastic reduction compared to 2011.

Drilling down to each of the geographies, there are some mixed messages. For example, due to the relatively less mature infrastructure in Asia and Latin America, we expect IT leaders in those geographies to spend more time on technical issues than their counterparts in the United States and Europe. However, IT leaders in the United States have been spending more time on software development than their peers in any other geography. At the same time, they also have been spending more time managing relationship within the business than any of their peers elsewhere. On the other hand, US CIOs have been spending less time on IT governance than CIOs in other geographies.

IT governance considerations is essential for any organization to make effective IT- business decisions. This year CIOs spent 8.7% of their time on IT governance compared to 10% of their time in 2013. The percent of time that CIOs spend on

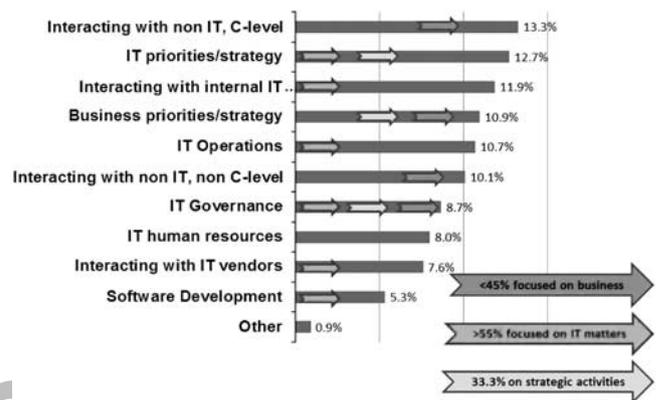


Figure 7 How CIOs spend their time.

governance has been 10–11% since 2007 (when the question was first introduced). Overall, less than 45% of the CIOs time focused on business areas, and 55% focused on IT matters. 33.3% of the time is focused on strategic activities.

We suspect that these are the results of differences in the geographic environment, and perhaps differences in how enterprises are evolving the CIO role. The reducing percentage of IT leaders who report directly to the CEO and the increase in IT outsourcing strengthens the argument that the role of CIOs is changing. We believe as IT plays a more significant role in reducing business expenses, in improving productivity, and in delivering revenue generating initiatives, the role of the CIO will be less focused on IT and more on business.

CIO Skills

While the skills required for entry-level and mid-level IT professionals was previously discussed, the skills identified for CIOs (or head of IT) are described here. Overall, like with mid-level and entry-level professionals, they differ across geographies; albeit they have remained relatively stable over the years. The top five skills for CIOs are:

Leadership – has been and remains the top skill in North America and Europe; it was ranked 5th in Africa, 11th in Latin America, 14th in Asia, and 31st in Australia.



Change management – was ranked 1st in Africa, 2nd in Latin America, 5th in Asia, 6th in Latin America, 9th in Australia, and 16th in North America.

Business analysis – was ranked 2nd in Europe, 5th in Asia, 65th in Latin America, 7th in Africa, 9th in North America, and 14th in Australia.

Budgeting – was ranked 3rd in Latin America, 7th in Europe, 11th in Asia, 12th in North America, and 13th in Africa and Australia.

Oral communications – Asia ranked it 2nd, North America 5th, Latin America 7th, Europe 9th, Australia 15th, and Africa 29th.

Rounding out the top 10 CIO skills were user/relationship management, accounting/finance, collaboration with others, emotional intelligence, and decision making.

The most important skills for CIO of the future will be knowledge of applying IT to business 50%, followed by leadership 24%, and interpersonal communication 14%. Our respondents indicated that the future skills of the CIO will be largely more business (50%) and more business and technical (42%). We anticipate that the desired skills set will converge on leadership and communications in the future.

The biggest mistake a CIO can make is reported to be in their ability to be effective business communications/partners (identified by 39%), followed by inadequacy in demonstrating value (identified by 36%). HR, people and sourcing was selected by 10%, IT processes was only 2%, and Technology and vendor relationship was 7%.

The most effective form of communications with internal business (non-IT) executives is for CIOs to leverage informal discussions/meetings (69%), followed by IT Briefings (23%), board meetings (4%), and governance meetings (2%).

The most important skills for the head of IT application services of the future will be knowledge of applying IT to business (55%), followed by interpersonal communications (18%), and leadership (11%). The most important skills for the CTO (head of IT Infrastructure) of the future will be knowledge of applying IT to the business (53%), followed by technology awareness (21%), interpersonal communications (14%), and leadership (10%). The future skills of the CTO will be more business and technical (20%) and more technical (16%), while 37% of the respondents believe there will not be a need for CTOs in the future. The above is indicative of the different roles that these IT leaders will play in the future.

IT sourcing

IT leaders globally have long been looking to outsourcing as a vehicle to reduce costs as well as to fill skills gaps (Luftman and Ben-Zvi, 2010a; Luftman and Zadeh, 2011; Luftman et al., 2013). The recession accelerated this, evident in the overall increase in outsourcing in all geographies between 2008 and 2010. Offshore outsourcing took a dip in 2011 before rising in 2012. It dropped in 2013 from 11% to 7.1% and then increased to 8.5% in 2014. IT leaders are still looking into outsourcing to reduce costs, but due to various complications in offshore outsourcing (not the least of which is security concerns discussed earlier), they are favoring onshore outsourcing to offshoring. The only

offshoring area that shows an increase is offshoring internal IT staff.

The largest global offshore outsourcing destination (as selected from our respondents) is India with 45%, followed by Brazil with 26%, and the Caribbean with 18%; followed by China (5%), Colombia (3%), and Mexico (3%). India is the dominant country for offshore outsourcing across all geographies with Asia (49%), Europe (47%), Africa (45%), North America (42%), and Australia (40%). We anticipate that India will continue to maintain its position as global offshoring leader, albeit they might be doing it with/from geographies closer to their client.

A total of 75% of the surveyed organizations conveyed that in the future their IT infrastructure will be performed by outsourced cloud service providers. The largest growth in outsourced clouds will be derived from SaaS (45%), followed by IaaS (Infrastructure at 22%), BPAas (Business Process at 16%), PaaS (9%), and INFOaaS (6%). The most important consideration in the future for selecting services provider (outsourcing vendors) will be communication/partnership/culture (16%), followed by price (7%), governance (6%), technical/service skills/expertise (5%), and financial stability (1%).

Concluding remarks

So what does all of this really mean? In essence:

IT is reshaping global markets while reshaping itself as it becomes the business.

With the enduring economic uncertainties prevailing, and the dramatic changes across every industry being enabled/driven by IT, organizations are continuing to focus on leveraging IT to swiftly reduce expenses and, more recently to increase revenues. SMAC (Social, Mobile, Analytics, and Cloud) technologies are clearly transforming the industry. While IT appears to be quite resilient, with IT budgets, hiring, and salaries on the rise, upon closer analysis, these increases continue to evolve cautiously. This guarded trend has brought increased attention to reducing IT budgets through IT infrastructure spending (especially Cloud) and innovative sourcing models.

Are we seeing the end of the CIO role and position as we have known it? We are clearly seeing the role of the CIO and the overall IT organization undergoing a significant transformation. It is those organizations and individuals who are best prepared that will prosper in these exciting times.

There are pundits and blogs espousing that the end of IT is near. Rather than dispute the existence of IT in the future, the important question to consider is what will CIOs or indeed IT will have in the future.

Not only is IT not going away any time soon, the role of IT is more important than ever. IT is going through a renaissance that requires the role of the CIO and IT organization, as well as how the business and IT organizations collaborate, to transform.

IT has evolved from a group supporting back office processes, to enabling front office processes, to driving business innovation. IT is moving from an organization focusing on metrics/SLAs and expenses to analyze itself, to an organization that is delivering demonstrable business value through cost reduction, to an organization that is providing distinctive revenue increases. IT has evolved from

having technical initiatives motivated by pure technology or business desires to being responsive to customer/client needs. These are significant shifts from what we have experienced in the past.

These fundamental changes in technology and how they are applied by the business are shaping the future of IT. Naturally not all organizations or geographies can respond in the same way; different scenarios will enable or inhibit these changes, albeit the data demonstrates that there are more similarities than differences. In general, organizations need to recognize that competitive advantage that is facilitated by IT is clearly on the rise.

IT organizations, with effective leaders, have an opportunity to position themselves at the heart of corporate strategy. The key to this positioning is the people having the appropriate balance of technical, business/management, industry, and interpersonal skills to meet the challenge that lie ahead.

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Jerry Luftman's experience combines the strengths of practitioner, consultant, and academic. His proficiency in business-IT alignment and IT trends, 18 books, published research, consulting, mentoring, and teaching/speaking engagements exemplify Dr. Luftman's expertise and leadership. After a notable 22 year career with IBM, he had an exemplary career

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APPENDIX

Research methodology

This research has evolved from the lead authors coordination of the SIM survey from 1999–2013. It is an empirical investigation that applied the survey method as a way to gather data from organizations around the globe. The survey targeted CIOs or senior IT executives of large and medium-sized organizations to collect firm-level data related to various aspects of the IT organization.

This research examines data from the 11 years of the IT trends survey, which were conducted annually between 2004 and 2014. Beginning in 2008, this survey has been extended from organizations based in North America to organizations located in Europe, Asia, Australia, Latin America, and Africa. A significant strength of this study is in its ability to identify important trends by comparing survey data from previous years.

The same online survey (translated as needed for the respective respondents) was applied across the geographies. The questionnaire has evolved from the lead authors SIM IT trends survey, which has been conducted since 1980. SIM’s surveys before 2000 focused exclusively on the top management concerns. Since then, the survey has been extended to pursue more specific insights regarding key IT issues of the day.

Over the 11-year period covered by this study, IT executives were surveyed to identify the most important managerial concerns and application and technology investments, along with other important IT organization considerations such as role of the CIO, organization structure, budgets, sourcing, staffing and salaries. The top management concerns across the geographies were aggregated over the years (see Table 1) to provide the global top five management concerns and their trends that are elaborated on in the paper. Similarly, the top five applications and technologies were aggregated, with stronger emphasis on the more recent data, to provide a list of the global top five applications and technologies that are also presented and elaborated on in the paper.

In 2014, the final data set for this study consists of responses from 2552 organizations (1175 in North America, 801 in Europe, 226 in Asia, 152 in Australia, 132 in Latin America, and 66 in Africa). The 2014 survey was similar to previous ones in methodology and process. The questions were based on previous surveys, with questions modified based on previous results, and suggestions from respondents and researchers (academic and industry). Additionally, some questions were updated and new questions were added based on: (i) other IT trends surveys; (ii) input from board members of sponsoring organizations; and (iii) the authors’ experience.

Comparisons over 11 time periods

The results are based on data from multiple years of the same survey with slight changes (e.g., new IT developments/management concerns). The quantity of the data is sufficient ($n > 100$) for total researched organizations globally in the 11-year period of this study. From a geographical perspective, the quantity of data is sufficient in the years of research for the geographies North America, Europe, Asia, and Latin America. For the geographies Australia and Africa the response has not been above $n = 100$ in all years of research (for Africa, 2014 is the first year of research with $n = 66$).

In the successive years, a simple random sampling has been used in the population of IT related employees at different enterprises. For the data gathering over the years the members of known IT communities have been requested to respond to the survey. For example, the SIM population in North America and the communities of CIOnet within Europe. Although these communities changed over time, these changes are limited. Using simple random sampling comparisons can be made using contingency factors such as geography and industry to identify differences and trends. In publications (Luftman et al., 2009, 2011, 2012, 2013) several perspectives with regard to the contingency factors have been published and show that geography and industry create differences in the research results. For example, the industry financial sector invests on average more on IT than the industry manufacturing. These investments create differences within industries can cause differences in the global responses. Over the years, the response per industry is similar using the same communities.

Calculating the rankings

Within the research, several rankings are made (e.g., rankings of IT management concerns, IT investments, internal IT metrics). The ranking calculation is similar for all rankings addressed in this paper.

For the different rankings the respondent were requested to select their top three. On the basis of the responses, weighted counts have been made per item. The highest ranked is the most chosen concern, IT investment, or internal IT metric. Below is an example of questions related to management concerns (partly, from a list of 43 in 2014).

Please select your top three (3) management priorities/concerns

<i>Most Important to your organization (please select three)</i>	<i>Most Important or worrisome to you (please select three)</i>
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Alignment of IT and/with the business
Business agility /Flexibility
Business continuity

While the authors recognize that over the years the respondents across the geographies are not the same, hence impacting the academic rigor for this research, the overall data collected and observed trends provide industry and researchers with an important set of trends that can assist in preparing for the future.