INSEAD

The Business School for the World®

Building Competitiveness and Business Performance with ICT

How investments in new technologies can make companies more competitive

A white paper produced in collaboration with AT&T

Contents

Acknowledgments

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Foreword

“ Information and Communications Technology are changing our world.”

Information and Communications Technology are changing our world. In an age of complex economic, societal and environmental challenges, those innovations, and how we use them, could hold the key to European success.

The EU’s Digital Agenda, launched in 2010, is about ensuring we can seize the digital benefits of the rapid technological change: so every European can access new opportunities; every business boost its bottom line; every public authority offer more effective, efficient public services. Overall, this can deliver the international competitiveness that Europe needs to stay ahead.

We already know that ICT and the Internet can enhance growth, competitiveness, and jobs. And new emerging innovations – like the cloud, mobile solutions, and collaboration tools – promise a yet greater productivity boost. But to emerge from economic crisis, companies and governments need to identify how technology can be most productive; and how it can best help Europe compete in a global race.

The fact is, we need to fully understand what emerging technologies mean for performance; and how to ensure that they bring most return for your euro. At the moment, it is more important than ever to get the most out of investment: whether public or private. So we need not just to make judicious decisions about new technologies, but also to build the environment where investment has the best chance of success.

That’s why this report by INSEAD, in collaboration with AT&T, is timely and welcome. It shows how businesses are jumping on board emerging technologies, the huge opportunities that appropriate ICT investment ICT can deliver, and the role that a sound public policy framework can play. I hope that the insights in this study will aid European business and governments as they confront these questions.

I know that these benefits can be hindered by complex and fragmented rules, high costs, or a lack of legal certainty and trust. And as European Commissioner for the Digital Agenda, I strive to ensure Europeans benefit from the best possible policy framework. For example:

- We are reforming European Data Protection rules, including to make them more fit for the cloud era;
- Our European cloud strategy will help build certainty and trust, consistently across our single market;
- We are cutting high roaming rates, including for data, and hence cutting the cost barriers to mobility solutions;
- Our “Grand Coalition” for digital jobs and skills will help public authorities, educational institutions, and the private sector work together to deliver the European ICT talent we need— and improve job prospects across the continent.

Whatever the nature of your organisation, I hope you find the insights in this report valuable. And I hope that, with these findings and with the right policy framework, we can together enjoy the economic and social benefits of a connected continent.

Neelie Kroes
Vice President of the European Commission

Introduction

Productivity – helping our customers around the world be more productive - is at the heart of what we do at AT&T.

We have spent a good deal of time exploring and trying to understand what makes some companies outperform others, and the role technology plays in that. In 2011 we explored the link between business output and IT investment levels, and we saw there was a clear correlation between the two.

This new and original research from INSEAD takes the debate forward and aims to answer the question, "How does a company get the most from its ICT investments?" For the first time, this report helps businesses answer that question.

As the report reveals, global investment in new information technologies such as cloud services, mobility and collaboration tools will accelerate over the next few years. We also know from our conversations with customers that businesses look to these new technologies to reduce costs, drive growth and improve productivity.

As the INSEAD research clearly shows however, it is not enough to just invest. Companies also need to strengthen their key enablers – the supporting environment in which these new technologies will be integrated. The most important of these is to prioritize achieving and sustaining a mature digitised platform – a combination of a standardized and shared ICT infrastructure, the internal business processes of a company and the data it generates. The message from the research for enterprises around the world is clear: put in place strong business enablers and double the probability of becoming productive and competitive; or persevere with weak business enablers and see no increase in the likelihood of better performance and in fact waste your investment in new technologies.

I have no doubt that the dangers of wasting investments in new technology is one which will resonate among business leaders and policymakers alike so I am delighted that this report goes some way to helping business leaders make the right ICT investment decisions.

We don't expect it to contain all the answers but we hope you find it useful and informative and that is helps take the debate forward. I invite you to participate in the discussion with us at www.corp.att.com/bemoreproductive or search for 'Be More Productive' to find our group at www.linkedin.com.

We hope you enjoy the report.

Andrew Edison

Regional Vice President for EMEA, AT&T

Executive Summary

For the first time we have identified statistical links between investments in new technologies and key business enablers to show what makes firms more competitive.

Firms are investing a greater percentage of their total ICT budget on mobility, cloud-based services and collaboration tools and this percentage is expected to grow.

Over the next two years, global investments in mobility, cloud-based services, and collaboration tools will increase significantly. The percentage of total ICT budgets dedicated to these technologies will grow as follows:

- Mobility is expected to increase from 14% three years ago to 24% two years from now (a growth of 71%);
- Cloud-based services are expected to increase from 11% to 26% (136% growth); and
- Collaboration tools are expected to increase from 15% to 20% (25% growth).

In Europe, investments in new technologies will continue to accelerate over the next two years. Survey data show the average investment in mobility as a percentage of the total ICT budget will increase from 12% three years ago to 20% two years from now (66% growth); cloud will almost double from 12% to 23% (92% growth), and collaboration will only rise slightly, from 16% to 17%.

In Asia-Pacific, firms are investing a much greater percentage of their total technology budgets in new technology, and expect to grow those investments more quickly. The average investment in mobility as a percentage of the total ICT budget will grow from 17% three years ago to 31% two years from now (82% growth); cloud will more than double from 12% to 30% (150% growth), and collaboration will increase from 18% to 26% (44% growth) – surpassing all other regions.

Although investing more in technology is important, our research finds it is insufficient for enhancing competitiveness.

The evidence shows that to be competitive and maximize the return on these investments in new technologies, businesses need to be better prepared on certain broad "key business enablers."

When firms have strong key business enablers and invest more in new technology, the probability of becoming competitive can double.

When firms with weak key business enablers make significant investments in new technology, they do not increase the likelihood of better performance and essentially risk wasting their investments in new technology.

The four key business enablers that support technology investment:

1. Business involvement in technology investment and management decisions;
2. Access to technology-focused talent;
3. Access to management-focused talent; and
4. Digitized platforms – the extent to which the technology, business process and data components are standardized, shared and integrated. We have called this "digital maturity".

Digitized Platforms

While investing in technology over time, a business tends to accumulate a host of applications and digitized business processes, along with added infrastructure and data. This accumulation eventually becomes the organization's digitized platform.

When the components of a digitized platform have been accumulated in a coordinated and orderly fashion, with technologies, processes and data standardized and shared across business units, the organization has a "mature digitized platform." But when this accumulation takes place in an uncoordinated and disorderly fashion, the organization has an "immature digitized platform."

A very strong, direct statistical link has been identified between digitized platform maturity, new technologies and competitiveness.

Firms that have mature digitized platforms and invest in new technologies can double the likelihood of being competitively agile compared to firms with immature digitized platforms that make similar investments.

For example, 74% of high investors in cloud with mature digitized platforms were competitively agile. In contrast, high investors with immature digitized platforms were no more likely to be competitively agile than low investors in cloud.

Firms should strengthen key enablers – particularly achieving and sustaining a mature digitized platform – to increase the likelihood of obtaining better performance from new technologies and to decrease the risks of wasting their ICT investments.

Firms with immature digitized platforms can significantly enhance their competitiveness by ensuring that investments in new technology go hand in hand with the organizational changes necessary to achieve and sustain a mature digitized platform.

Sustaining a mature digitized platform is challenging as it requires continuously balancing the immediate demands of business units and project teams with longer-term enterprise-wide demands. Firms with mature digitized platforms need to ensure investments in new applications are linked to enterprise-wide resources such as the digitized platform.

European policy makers can help firms mature an increasingly important aspect of their digitized platforms more rapidly by creating and harmonizing policies and regulations that facilitate the storage and flow of data in a stable, seamless, and secure way.

Policy makers can also help firms define, access and foster talent to make the most of their investments in technology by coordinating industry and universities to ensure demand for key skills is clearly defined and supply for key skills matches demand.

The findings in this report build on previous research from Oxford Economics, in collaboration with AT&T, which showed a link between investment and ICT and productivity growth. The report showed that there were differences in productivity growth between the US and countries in Europe and Asia, often due to the different regulatory environments in those countries. Put simply however, ICT drives productivity and growth in developed countries.

The Research Model and Glossary of Key Terms

Based on the results of a survey completed by over 225 technology leaders, representing firms from North America, Europe and the Asia-Pacific region and from a variety of industrial sectors, this report discusses the potential business value of three important technologies, namely mobility, cloud-based services, and unified communications and unified communications and collaboration platforms (collaboration tools). The work focuses on the factors – what we call "key business enablers" – than enable organizations to achieve higher returns on their investments in these three technologies.

Figure 1 represents the research model and the types of data that were collected. The model builds on the most relevant and latest academic literature about the relationship between technology and business performance. In addition to collecting survey data, several Chief Information Officers of leading European multinationals were interviewed. Throughout this report, their insights into how they use technology to enhance business performance and competitiveness are summarized in short case studies, titled **"Real Successes."**

Several key terms related to the research model are used in this report to describe the research findings. Below, they are summarized for easy reference. In subsequent sections beginning with the title "Definition," the terms are described in greater detail.

Three types of information and communication technologies (ICT)

Mobility refers to the usage of portable devices connecting to the Internet through mobile telephone networks. Portable devices refer to portable computers: notebooks, netbooks, laptops, Ultra Mobile PC-UMPCs, tablet PCs; as well as portable devices such as Smartphones and customized PDA phones.

Cloud-based services have the following characteristics: pay per use; external resource pooling; rapid scalability; flexibility; and ubiquitous network access. They include software-as-a-service; platform-as-a-service; infrastructure-as-a-service; and business-process-as-a-service.

Collaboration tools merge multiple tools including instant messaging, conferencing, email and unified messaging to team collaboration and voice calling with presence behind a single user interface – easily accessible from almost any device and from virtually anywhere – to increase personal productivity and business efficiency in ways no single tool ever could before. collaboration tools may consist of tele-presence, web conferencing, messaging, and voice.

High Investors and Low Investors

One of the key distinguishing variables that was examined was the percentage of the total ICT budget that a firm spent on each of the three types of technology: mobility, cloud-based services; and collaboration tools.

- High Investors in Mobility: firms that spent more than 10% of their total ICT budget on Mobility;
- High Investors in Cloud-based services: firms that spent more than 10% of their total ICT budget on Cloud-based services;
- High Investors in collaboration tools: firms that spent more than 10% of their total ICT budget on collaboration tools; and
- Low Investors: firms that spent less than 10% of their total ICT budget on a given type or types of technology.

It is important to note that investments in mobility, cloud-based services, and collaboration tools are not mutually exclusive, with some solutions involving one, two or even all three technologies.

Strong Business Enablers

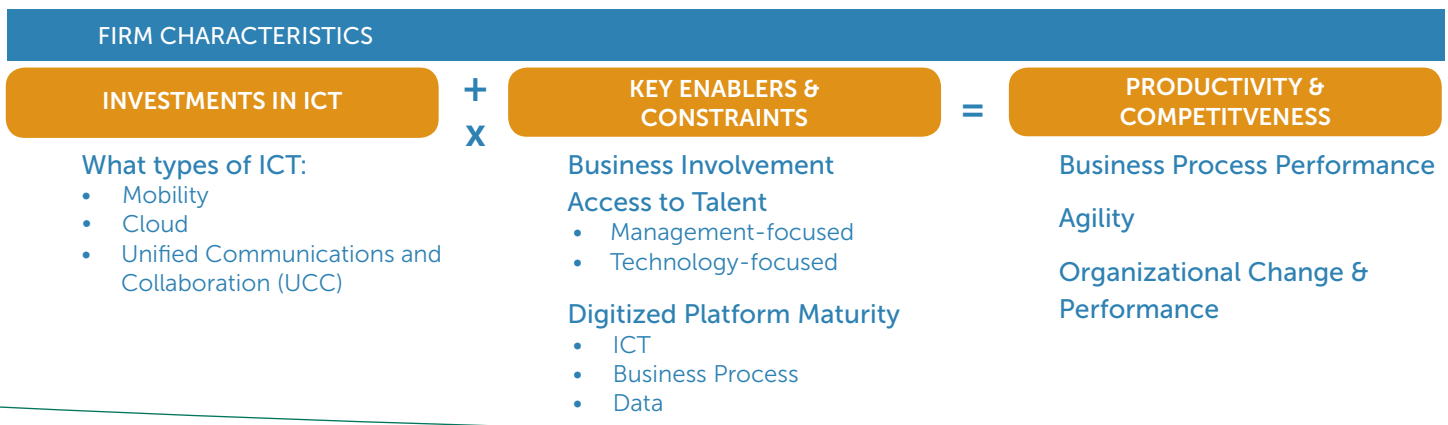
The research focused on four key business enablers. The results reveal that strong business enablers are critical to increasing the likelihood of high performance and mitigating the risks of wasting investments in ICT. The enablers are:

- Strong business involvement: firms with sufficient participation by business unit managers and senior executives in technology investment and management decisions;
- Sufficient technology-focused talent: firms with sufficient access to people who can perform well in predominantly technical activities;
- Sufficient management-focused talent: firms with sufficient access to people who can perform well in predominantly managerial activities; and
- Mature digitized platform: firms with efficient levels of standardization and sharing across their organization in terms of technology, business processes and data.

High Performers and Low Performers

At the end of the day, business leaders want to know what the best performing firms are doing and how they are outperforming their peers. The research focused on 20 performance indicators, representing three general aspects of business performance: business process performance, agility, and organizational change and performance. High performers are firms that perform better than average with regards to a single performance indicator or a set of performance indicators.

Figure 1: Survey data were collected on firm investments and uses of technology, key enablers, and a variety of performance indicators.



Finding

Uses of technology can become a double-edged sword

Organizations are continuously learning how to use technology to operate and innovate more effectively and efficiently. A few examples from an annual award recognizing Europe's best Chief Information Officers (CIOs) illustrate how organizations are using technology to enhance their performance.[1]

José Manuel Inchausti, CIO of MAPFRE, a leading insurance company in Spain and Latin America, introduced an integrated data platform to enable business units within MAPFRE to engage with customers through a variety of channels in a consistent and coordinated manner. In the process, Inchausti developed business and customer intelligence. Furthermore, smarter analysis of existing company data enabled Inchausti and his team to better understand why specific clients were unhappy with their insurance policies and as a result the business units were able to develop effective retention strategies.

At the Coca-Cola Company, Europe CIO Sabine Everaet and her IT team of 45 ICT specialists handle all non-outsourced ICT needs in Europe. For a global firm that generated revenues of more than EUR 46.5 billion in 2011, Everaet and her group are considered key business partners for identifying risks and interdependencies for complex programs, with a scope well beyond that of the classical IT projects. They earned their enhanced strategic roles only after improving ICT operations and enhancing key business processes.

However, uses of technology can become a double-edged sword—it can enable opportunities but can also introduce risks. Uses of technology enable organizations to connect and engage with their stakeholders in new and significantly faster and cheaper ways. As a result, organizations can have access to important resources without necessarily having to own them, for example, through business processes outsourcing. However in the process of connecting and engaging, uses of technology introduce new interdependencies that, if improperly managed, can lead to costly and inefficient operations and can ultimately reduce agility and hurt performance.

In 2009, when Pieter Schoehuijs became the CIO of Akzo Nobel, the largest decorative paints and performance coatings company in the world, the Dutch firm was suffering from uncoordinated ICT development.[2] With 15 separate business units, Akzo Nobel had "a very diverse systems landscape with literally thousands of systems on even more servers," Schoehuijs said. Instead of implementing a single instance of an enterprise resources planning (ERP) system across the entire firm, Schoehuijs decided to support six different systems to give individual business units greater agility. Said Schoehuijs, "When I joined three years ago, Akzo Nobel had 183 ERP systems. Today we have 96. And we've established roadmaps and strategy plans to go to six. Which means that in the last three years we have retired more than two ERP systems per month on average, and we are planning to continue to do so for the next four years."[3] By rapidly harmonizing both ICT systems and business processes, Schoehuijs has reduced Akzo Nobel's operation costs and enhanced the customer experience.

This research report strives to understand how successful firms can take advantage of new technologies while mitigating any risks associated with such investments.

[1] Fonstad, N. (2012). 2012 IT Enabled Leadership Report.
[2] By 2011, each business unit generated 1bn EUR on average, for a total of 15.7bn EUR.
[3] Fonstad 2012: p. 19.

Finding

Investments in new technology represent a growing percentage of the ICT budget

Research indicates that firms are investing a greater percentage of their total ICT budget on mobility, cloud-based services and collaboration tools and over the next two years, this percentage is expected to grow. Globally, the percentage of total ICT budgets dedicated to these technologies will grow as follows:

- Mobility is expected to increase from 14% three years ago to 24% two years from now (a growth of 71%);
- Cloud-based services are expected to increase from 11% to 26% (136% growth); and
- Collaboration tools are expected to increase from 15% to 20% (25% growth).

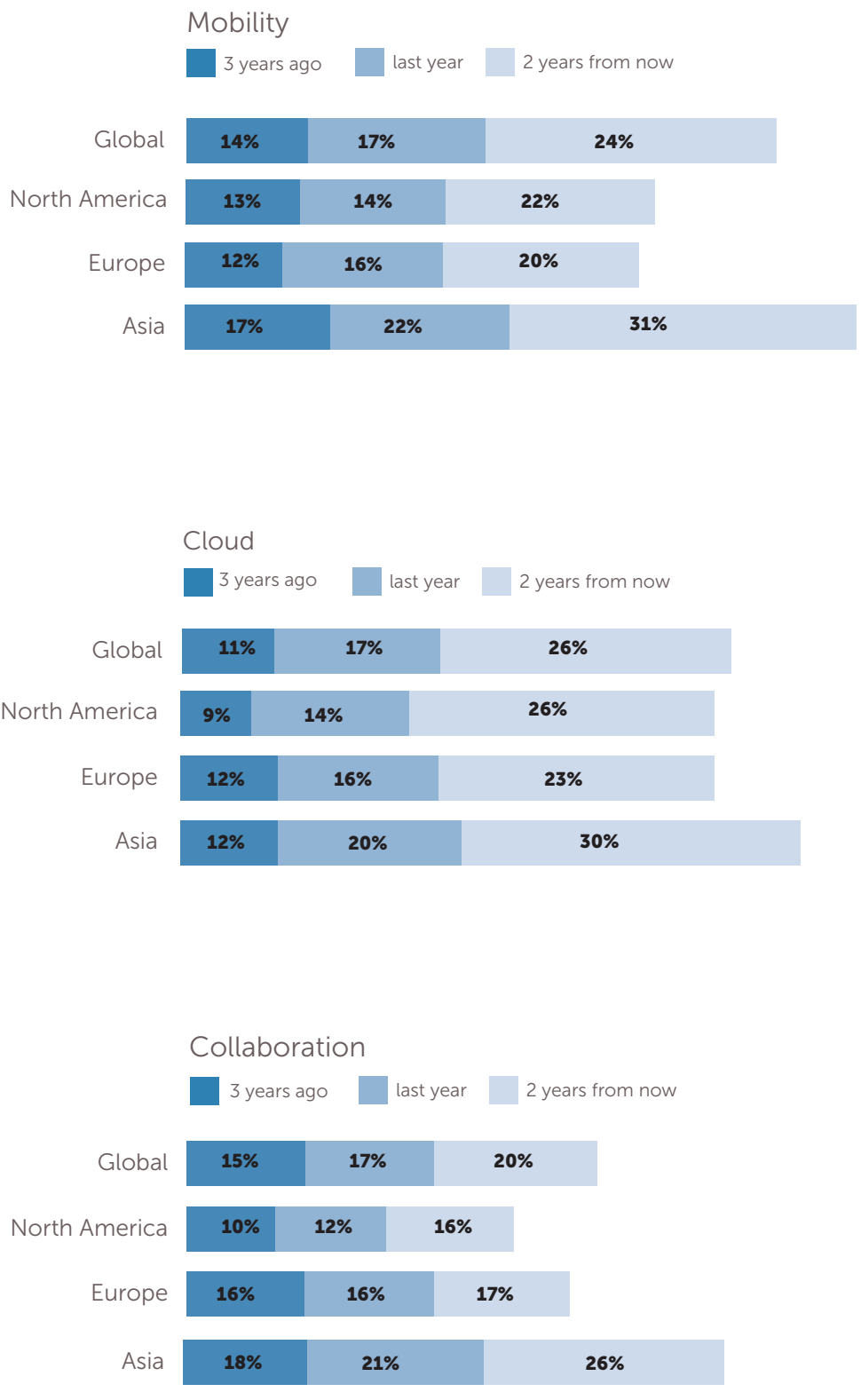
Regional growth rates are also different, probably reflecting the health of regional economies and the extent to which firms have to deal with legacy systems.

In Europe, investments in new technologies will continue to accelerate over the next two years. Survey data show the average investment in mobility as a percentage of the total ICT budget will increase from 17% three years ago to 20% two years from now (66% growth); cloud will almost double from 12% to 23% (92% growth), and collaboration will rise slightly, from 16% to 17% (6%).

In the Asia-Pacific region, where national economies are experiencing a boom and firms on average have relatively newer infrastructures, firms are investing a much greater percentage of their total technology budgets in new technology and are expected to grow those investments more quickly than in other regions. The average investment in mobility as a percentage of the total ICT budget will rise dramatically from 17% three years ago to 31% two years from now (82% growth); cloud will grow from 12% to 30% (150% growth), and collaboration will increase from 18% to 26% (44% growth) – surpassing all other regions.

In terms of anticipated investments in mobility and cloud-based services, North American firms, on average, have lagged behind European and Asia-Pacific firms. North American firms, however, are expected to catch-up to European firms over the next two years.

Figure 2: Average % of ICT budget allocated to mobility, cloud-based services and collaboration tools by region, over three periods of time.



Real Success

European policies designed to foster ICT-enabled competitiveness

As part of this research project, several policy experts were asked to highlight what they believed were the most significant policies in the European Union (EU) that were making it easier for businesses to create value from mobility, cloud-based services, and collaboration tools. What follows is a synthesis of the most popular choices.

Policy makers in Europe are engaged in a number of efforts that facilitate the use of all three technologies. Dr. Georg Serentschy, CEO of Telecommunications and Postal Services, RTR-GmbH, Austria and BEREC Chairman 2012, emphasized "that the European Commission plays a vital role in fostering the development of new technologies and in encouraging member states to make ICT one of their policy priorities." For example, the 7th EU Framework Programme for Research and Technological Development dedicates a majority of its funds to ICT projects. In doing so, the EU has facilitated the creation of new forms of communication and collaboration and has made progress in cloud-based applications and storage. Horizon 2020, the future research program of the EU, will continue to pick up these topics and focus on further development in the field of cloud computing.

EU policy makers know that European firms can operate and innovate effectively and efficiently when infrastructures, such as broadband, and policies related to working digitally are harmonized across the region. For example, Amalia Sartori, Italian Member of the European Parliament in the Group of the European People's Party and Chairwoman of the Industry, Research and Energy Committee in the European Parliament, and her colleagues are working to establish a ubiquitous and capable infrastructure to be used as a platform by businesses and consumers. Said Sartori, "Our intent is to make high-capacity communications, fixed and wireless, available to everyone, everywhere." To accomplish this, European policy makers have introduced a series of policies, such as the Roaming Regulation (focused on lowering roaming prices for both voice and data across the EU, for all users); the Electronic Signature Regulation (aimed at creating a solid basis of trust for commerce) as well as regulations related to cyber security and electronic services.

Several policy experts noted the importance of the European Union's Cloud Computing Strategy, which was presented by Neelie Kroes, Vice President of the European Commission, in September 2012.

- Bill Kenard, US Ambassador to the EU and former Commissioner of the FCC, said "the Strategy outlines ambitious actions to ensure a more speedy deployment of cloud computing in Europe and is a good framework for future action."
- Sabine Verhayen, Member of the European Parliament in the Group of the European People's Party (Christian Democrats), Germany said the "Strategy will create a single, seamless space for digital content. It just doesn't make sense to have a cloud fragmented by 27 sets of rules. The cloud has huge potential. In Germany alone it is estimated that over the next five years the cloud could generate €200 billion and 800,000 jobs."
- Mario Valducci, Italian Member of Parliament from People's Freedom Party and Chairman of Transport, Postal and Telecommunications Committee at the Italian Chamber of Deputies said creating "a single set of rules for cloud computing, will greatly help businesses throughout the EU succeed. Nearly all business use cloud computing, even if they do not realize it. With the new Strategy, businesses should not fear moving data from one cloud provider to another, something that is regularly cited as a problem."
- Antonio López-Istúriz White, Spanish Member of the European Parliament and European People's Party (EPP) Secretary General, highlighted a specific aspect of the strategy, the European Cloud Partnership (ECP). "The objective of ECP is to stimulate public sector adoption of cloud computing services in Europe; the ECP will bring together public authorities and industry consortia to implement pre-commercial procurement activities to identify common cloud computing requirements, to develop specifications for IT procurement and to procure reference implementations. Cloud uptake is essential for Europe both economically, in terms of driving digital growth for Europe, as well as allowing Europe to remain competitive on the global stage and socially, as it allows end-users to access innovative services.

Recent research has modeled job growth associated with adoption of cloud-based services in several countries.[4]

Another important area where European policy makers have succeeded coordinating efforts and resources to help businesses and citizen is in the area of skills. As Sabine Verhayen noted, "Without a high level of digital literacy we will not be able to reap the benefits of the digital age in Europe nor will we achieve the inclusive society. The EU has a goal then to make 'every European digital' by 2020. Only by taking action can we remove the forecasted shortfall of 700,000 ICT professionals in Europe in 2015." This topic is discussed further in Key Implications for Policy Makers.

Although it is ultimately the responsibility of firms to develop key business enablers and figure out how best to reap the rewards from their ICT investments to enhance their competitiveness, policy makers have an important role to play in promoting the digital agenda. Said Amalia Sartori, "It is of course a matter for business to develop attractive services and content. The role of EU policy should be to create an even playing field, allowing a wide variety of competing offerings, and to avoid unnecessary restrictive rules. However, it's not necessarily our task to go further by adapting policies to either favour or hinder particular business models such as cloud computing. The development of offerings and their take-up will be decided by the mechanism of supply and demand on the marketplace."

Research results in this report confirm this market approach, that firms will have the opportunity to develop business models driven by their particular ICT investments and strengthened by the business enablers that are appropriate for them.

[4] For employment effects of cloud adoption, see also report developed by Jonathan Liebenau, Patrik Karreberg, Alexander Grous and Daniel Castro. (2012). "Modelling the Cloud: Employment effect in two exemplary sectors in the United States, the United Kingdom, Germany and Italy." LSE-Enterprise, the business services and knowledge transfer unit of the London School of Economics.

Definition

High Performers

The research focused on 20 performance indicators, representing three general aspects of business performance: agility; business process performance, and organizational change and performance. What follows is a more detailed explanation of each aspect.

Agility

Agility refers to how quickly and effectively an organization responds to local opportunities or threats. Agility is driven by technology – in terms of improving relations with customers, sensing opportunities or threats, and creating, delivering and supporting a solution to an opportunity or threat. For example, an ICT solution could arise out of the need to quickly add functionality to critical IT applications based on local end-user requests. Executives are under great pressure to make their organizations more agile with use of technology. Part of the pressure comes from local business units taking at face value expectations that often accompany new technology investments, including claims that technology will enable them to get things done faster, easier, cheaper, and better. As a result, local business units put pressure on their IT groups to draw on the most recent technology to quickly develop new products and services specific to their customers in a particular sector and geographic area. While IT groups want to draw on the latest and most relevant technology to quickly develop solutions to local demand, they also try and avoid repeating the mistakes of the past, such as creating "infrastructure spaghetti", which can lead to a high rate of project failure.

The most significant results that were identified during the analysis of the survey data were regarding firm agility. By studying the investments in technology and the key business enablers, INSEAD eLab was able to compare and contrast those firms having a high degree of agility against those firms having a low degree of agility. As a result, and given the prime importance of agility to business leaders, this report focuses on results largely related to agility.

The most significant results that were identified during the analysis of the survey data were regarding firm agility. By studying the investments in technology and the key business enablers, INSEAD eLab was able to compare and contrast those firms having a high degree of agility from those firms having a low degree of agility. As a result, and given the prime importance of agility to business leaders, this report focuses largely on results related to agility.

Business Process Performance

Survey participants were asked to rate their organization's performance in each of the following business processes as compared to the industry average (1=well below industry average ... 5=well above industry average).[5]

- Supplier Relations (inbound logistics): Forge closer links with suppliers; monitor quality; monitor delivery times; gain leverage over suppliers; negotiate pricing;
- Customer Relations (outbound logistics): Respond to customer needs; provide after-sales service and support; improve distribution; create customer loyalty;
- Production/Operations (including processes such as IT, HR, finance, and legal): Improve throughput; boost labor productivity; reduce costs; improve flexibility and equipment utilization; streamline operations;
- New Product and Service Development: Embed IT in products; increase pace of development and R&D; monitor design costs; improve quality; support innovation;
- Sales and Marketing Support: Spot market trends; anticipate customer needs; build market share; improve forecasting accuracy; evaluate pricing options.

Organizational change and performance

Survey participants were asked to rate their organization's performance in the following aspects of organizational change:

- Introduction of new methods of organizing work responsibilities and decision making, team work, decentralization, integration or de-integration of departments, education and training systems;
- Introduction of new methods of organizing external relations with other firms or public institutions to include first use of alliances, partnerships, outsourcing or sub-contracting.

Survey participants were also asked to rate their organization's performance using the following metrics of organizational performance.

- Capabilities to anticipate market changes;
- Return on Investments (ROI);
- Return on Assets (ROA) (i.e., ratio of profit to total assets);
- Ratio of operating income to assets (OI/A);
- Net margin.

[5]Adapted from Tallon, P. and Pinsonneault, A. (2011). "Competing perspectives on the link between strategic information technology alignment and organizational agility: Insights from a mediation model." MIS Quarterly Vol. 35 No. 2 pp. 463-486/June 2011

Finding

Simply focusing on ICT investments is misleading

Survey results reveal that in several cases, depending on the type of technology, either cloud, mobility or collaboration tools, and the type of performance metric, related either to agility, business process performance or organizational change and performance, firms that invest a greater percentage of their total ICT budget in a specific technology appear more likely on average to be high performers.

For example, firms that invested more than 10% of their total ICT budget in cloud-based services, called here "high investors in cloud," significantly increased the likelihood of being high performers across all three general types of performance.

Figure 3 summarizes several key findings. The height of each bar changes depending on the type of business performance that was investigated. On the horizontal line, two different groups consisting of low investors and high investors in each of the three types of technology appear (not shown are those firms that did not invest in cloud-based services).

The key findings in Figure 3 represent only a part of the total picture and should not be taken out of context from the rest of the report. In particular, the correlation between investments in technology and performance can be offset by mitigating factors. The analyses of survey results, for example, reveal that those firms which are high investors in technology, could be either very high performers or very poor performers.

Figure 3: In several cases, firms that invest more in a specific technology appear on average to be more likely to be high performers.

Key: The width of the bars corresponds to the percentage of survey participants that belong to a specific investor group.

Cloud

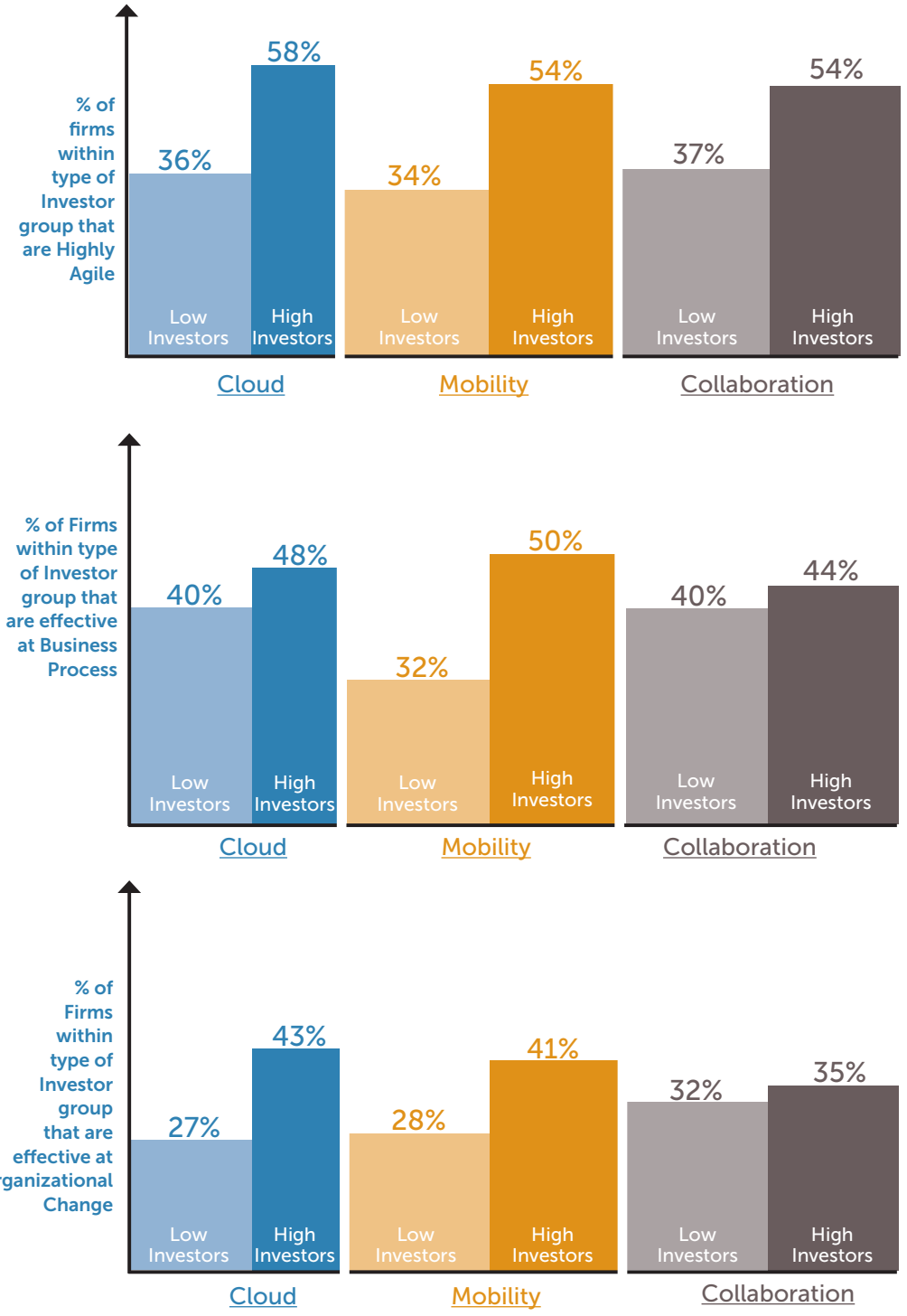
46% of participants were Low Investors; **30%** of participants were High Investors; **24%** of participants were non-investors in Cloud-based services (not shown)

Mobility

51% of participants were Low Investorsin Mobility; **49%** of participants were High Investors in Mobility

Collaboration

51% of participants were Low Investorsin UCC; **49%** of participants were High Investors in Collaboration



Definition

Definition of two key business enablers: Sufficient access to technology-focused talent and management-focused talent

Research shows that effective organizations employ leaders with T-shaped portfolios of skills. In such leadership roles are CIOs and chief enterprise architects along with managers responsible for either building internal relationships between IT departments and business units or building external relationships with service providers. Very simply, leaders having a T-shaped portfolio of skills are both business-savvy and technology-savvy. More precisely, leaders with a T-shaped portfolio of skills demonstrate either a vertical set of skills or a horizontal set of skills or both:

- Vertical set of skills: Represents expertise or "deep knowledge" in specific areas such as science; engineering; technology, or social sciences;
- Horizontal set of skills: Represents "transversal skills" related to negotiation, critical thinking, design and systems thinking, business and entrepreneurship, all of which enable collaboration across a variety of boundaries.

In the survey, firms were asked to what extent they had access to sufficient people to meet their demand to perform eight general sets of activities. Depending on which sets of activities they are responsible for, managers will need to have a strategic understanding of some areas of expertise and a practical understanding of other areas of expertise. In particular, firms need to have sufficient access to two broad pools of talent: technology-focused talent and management-focused talent. Both are important types of business enablers.

Below are definitions of each of the eight activities, divided according to which pool of talent they fall under:

Technology-focused talent consists of people who can perform well predominantly technical activities such as:

- Solutions architecture: Services related to ensuring data, applications and systems are sufficiently integrated and standardized to support business operations. These include: Systems Architecture; Data Analysis; Human Needs Analysis; Systems Analysis; Data Design; Human Computer Interaction/ Interface (HCI) Design; Systems Design; IT/Technology Infrastructure Design and Planning.
- Solution development and implementation: Services related to creating, testing, integrating and implementing software solutions. These include: Systems Development; Software Development; IT/Technology Solution Testing; Systems Integration; IT/technology systems installation, implementation and handover.
- Information management and security: Services related to information management and security activities within an organization. These include: information management; IT security management; IT disaster recovery.
- IT services management and delivery: Services related to management of service delivery and the delivery itself of IT services, systems and assets to an organization to support business functions. These include: IT service operations and event management; Service Help Desk and Incident Management; Problem Management; Application Management/Support; IT Management And Support; Availability Management; Capacity Management; Service Level Management; Measuring and reporting.

Management-focused talent consists of people who can perform well predominantly managerial activities such as:

- Business development, sales and marketing: Services related to consulting business managers on developing business markets, brands and values, and communicating these to the marketplace. These include: consultancy provision; strategic business development; brand and value proposition development; sector marketing and lead generation; market intelligence and research; market communications; sales management and operations; etc.
- Business process management: Services related to conducting business process analysis. These include: designing/ redesigning business processes; managing the implementation of business change; designing/redesigning organizations; and ensuring benefits realization.
- Program and project management: Services related to ensuring projects and programs are completed successfully. These include: project inception and scope management; project planning and scheduling; project execution, monitoring and control; and project completion, acceptance and review.
- Global sourcing management: Services related to defining and operating a sourcing strategy. These include: Management of suppliers and supplier performance; Procurement of external IT resources, such as people, software, hardware, and licenses.

Finding

High performers match investments in technology with strong managerial and technical skills

Research results show that on average, firms that have strong business enablers and are high investors in technology have a significantly greater chance of being high performers than firms that are either low investors or, more importantly, have weak business enablers and are high investors.

These findings are of particular relevance because all of the firms that were surveyed said they expect to invest more in all three types of technology over the next three years. Hence, the critical role played by key business enablers could help firms increase their chances of enhancing performance from their future investments in technology and likewise reduce their risks of wasting those investments.

In Figure 4 below, "Increasing the value of investments in technology with strong technology-focused talent," research results found ample evidence to show that firms which matched their investments in cloud-based services with sufficient technology-focused talent almost doubled the probability of being competitively agile. In contrast, those firms which did not match their investments in cloud-based services with technology-focused talent were statistically no better off than those firms that made little or no investments in technology.

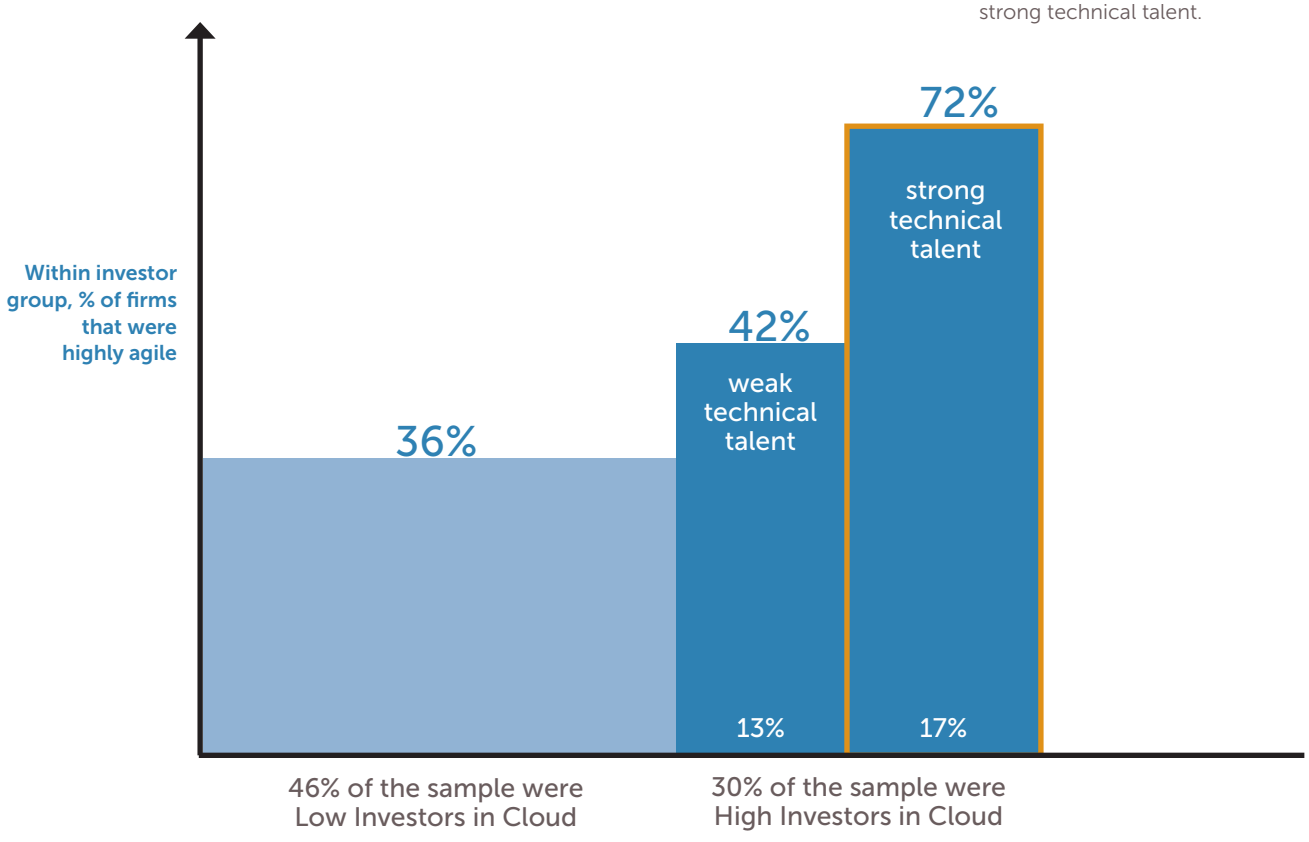
The different groups consist of low investors in cloud and high investors in cloud. Not shown were 24% of non-investors in cloud-based services. Within the high investor group, there are two important sub-groups: the high investors with sufficient technology-focused talent and high investors with insufficient technology-focused talent. The height of each bar corresponds to the percentage of firms within a group that were high performers.

The benefits of having sufficient technology-focused talent: 17% of the total survey sample consisted of high investors in cloud-based services that also had high technical skills. Of the firms in this group, 72% were highly agile. In other words, firms in this group were 70% more likely to be competitively agile than those high investors in cloud-based services that struggled to access technology-focused talent.

The risks of having insufficient technology-focused talent: High investors in cloud-based services with insufficient technology-focused talent represent 13% of the total survey sample and 44% of high investors in cloud-based services. Survey findings reveal that these high investors were statistically no more likely to be highly agile than low investors in cloud-based services. In essence, firms that were investing more in cloud-based services to enhance agility yet had insufficient access to technology skills were at risk of wasting their investments on cloud-based services.

Figure 4: Increasing the value of investments in technology with sufficient technology-focused talent.

Key: 46% of those surveyed were low investors in cloud-based services, while 30% were high investors in cloud-based services and the remaining 24%, not shown, did not invest in cloud-based services. 36% of the low investors in cloud-based services were highly agile, regardless of whether they had weak or strong technical talent. However, 13% and 17% making up the 30% that were high investors in cloud-based services had weak technical talent and strong technical talent, respectively. Of the 13% with weak technical talent, 42% were highly agile whereas of the 17% with strong technical talent 72% were highly agile. Hence, it really pays for high investors in cloud to employ strong technical talent.



Real Success

KONE: Using technology to ensure customers get to where they want to go

With a workforce of 38,000, KONE provides elevators, escalator and automatic building door solutions to more than 250,000 customers who demand a smoother flow of people in their buildings all over the world. It is a challenge that the family-owned company KONE (pronounced KOH-neh) has committed itself to since its founding in Espoo, Finland more than 100 years ago. Indeed, the current Chairman of KONE's Board of Directors is Antti Herlin, a descendant of Harald Herlin who bought the company in 1924.

In 2011, KONE had annual net sales of EUR 5.2 billion and employed 35,000 employees. KONE's operating environment continued to be affected by the worldwide economic downturn, which reduced new construction activity in Europe and North America and likewise slowed down the modernization of elevators in aging buildings. However, sales of new equipment in Asia-Pacific has been growing steadily for the company and as a result new equipment sales, which accounted for 46% of its total sales, grew to EUR 2.4 billion in 2011, an increase of nearly 4% compared to 2010.

Providing Mobile Support to KONE Technicians

With over 15 years of experience in high-technology business, KONE CIO Kati Hagros runs a fully centralized IT department with about 280 IT employees located in 25 countries. "IT is clearly seen as a strategic function because all development programs nowadays have an IT element and nothing moves here without us, to put it in very pragmatic terms," said Hagros.

One of the biggest challenges facing the CIO is providing mobile support to over 20,000 KONE technicians who are out in the field at any one moment in time either installing or maintaining equipment. Said Hagros, "When KONE sends a person to a site to install an elevator or maintain one, they need to have a personal digital assistant or telephone with them, so that they know what time to be there, to have the right materials on-site, and to report back. This has been, for years, a critical part of KONE's business model. How does IT provide the KONE people on-site at the right time and with the right information? There are a lot of mobility aspects there."

In addition to supporting internal staff, Hagros' team builds and maintains online services for the company's customers, such as property developers and facility managers. Customers can for instance track equipment maintenance through a web portal, explore elevator designs via a mobile app or generate three-dimensional models online to help with their planning. Hagros' team also installs system-to-system integration so customers can leverage data from KONE's equipment for decision-making and optimization.

Moreover, the IT department has developed selected tools for a key group of stakeholders, the architects who design the buildings in which KONE equipment is integrated. "We believe that this kind of defining, planning and co-creating the designs with the architects is something that will pick up more and more," said Hagros.

Adopting a Standardized Platform

In planning for the future, Hagros is developing a unified communications system that will be technology and platform agnostic for both the office staff and the technicians on the field. Up to now, most KONE technicians took a company-issued PDA into the field with them to communicate back to KONE headquarters. This approach will be changing with the arrival of the open-PDA model, which enables technicians to use their own office tablets and smart phones. Furthermore, the performance requirements facing these technicians have become more demanding, partly because KONE is growing fastest in markets where network availability and internet service are spotty. "We are installing elevators in the middle of nowhere, literally, construction sites somewhere in central China," Hagros said, "so we have to adapt to that all the time."

While communication technologies and devices become less controlled, Hagros puts even tighter control on the core processes and master data. In this effort, Hagros has won the support of the KONE Executive Board and the global business owners. Said Hagros, "it comes back to having strong global governance. In order to have consistent processes and data and run standardized platforms, we sometimes had to compromise the local needs and user experience."

Taking a Realistic View of the Cloud

While Cloud services have been used for already years at KONE, Hagros knows "that cloud-based services are not the answer for all services. Hagros has been satisfied, for example, with the data services provided to KONE's global sales people for the past five years. However, Hagros said she was shuttering cloud-based providers of specific human resource services. Said Hagros, "the availability and performance were below the level of our global scale of operations, so we are going back to more traditional applications."

Going forward, Hagros has just launched a program to update the next level of collaboration tools, including document management, unified communications, and interactive collaboration workplaces. Said Hagros, "We pay a lot of attention to safety and service skills and now we are putting a lot of emphasis also on training our people how to use these collaboration tools. We see them directly contributing to our employee competence development and engagement."

Selecting applications is however not the most important task for Hagros. She spends most of her time discussing business problems, analyzing business cases and realizing benefits of IT through strong network of process owners and key users. Said Hagros, "All IT programs are directly linked to KONE strategy and linked to five corporate level development programs owned by business process owners. Strong business governance combined with fully centralized platforms is the winning combination."

Real Success

Ferrovial: Selective uses of cloud-based services lead to enhanced performance

Ferrovial, the Spanish infrastructure group, showed a 1.4% increase in profits during the first nine months of 2012, as its growing international operations were able to offset the continuing weakness in the Spanish market. Net profits at the world's leading private developer of transport infrastructure and services increased to €488.5 million in the first three quarters of 2012, while sales increased 2.5% to €5.65 billion. For the full year 2011, Ferrovial had a net profit of €1.27 billion on sales of €7.45 billion. As a result of its sound financial position, Ferrovial obtained an "investment grade" rating (BBB-), with stable outlook, from both credit rating agencies Standard & Poor´s and Fitch in 2011. This rating will enable the company to access the capital markets, if necessary.

In 2012, Ferrovial was organized around four areas of activities: Services (three business units: Cespa is focused on waste management; Amey on infrastructure management and public services; and Ferroser, one of the largest facility management operators in Europe), Toll Roads (Ferrovial manages almost 3,000 kilometers of roads throughout the world, such as Canada's 407 ER), Construction, and Airports (Ferrovial is the world's number one airport operator, operating such airports as Heathrow in the UK and Antofagasta airport in Chile). Ferrovial had operations in over 15 countries and a total workforce of about 70,000 employees.

Introducing cloud-based services at Ferrovial

Appointed as CIO in April 2008, Federico Florez's title is now "Chief Information and Innovation Officer." Florez recently transferred two key yet non-core functions, Human Resources and Purchasing, onto the cloud. In so doing, the graduate of INSEAD's Advanced Management Program was able to reduce costs more than expected, as the cloud approach had a price tag that was less than 15% of the classical approach.

Measured by time, the savings were also dramatic. "We implemented 70,000 employees onto the same HR system in the cloud in only six months' time," said the award-winning CIO. "A classical implementation of this project would have normally taken more than 18 months' time, and so we saved the company one full year on this project. And time is a cost for me, because I would have had to allocate internal and external resources during that year."

Flórez achieved these quick wins by observing a simple but hard-to-follow rule: not to be misled into believing that cloud service providers have no limits to their offerings. "We adapted ourselves to the services in the cloud and not the other way around," said Flórez. "I made it clear that I only wanted solutions that did not need to be changed or adapted. I wanted solutions as they were, I did not want to change them, even for software testing."

Another factor that facilitated the selection and move of the functions into the cloud was that Ferrovial had already spent several years standardizing, centralizing, and outsourcing these functions. Upon joining in 2008, one of the first challenges Flórez tackled was increasing the efficiency of technology within Ferrovial. With too much heterogeneity in technology and skills across the company to be efficient and meet the competitive demands of a global organization, Flórez decided to create an ICT-based platform for innovation and agility. "We are a global company and need to be able to provide global services," Flórez said.As a member of both the Executive Management and Chairman of the Innovation and Purchasing Committees, Flórez ensured that the process of standardizing and centralizing skills and technology was closely linked to the company's business strategy. Flórez also presented his ICT strategy plan to the Board of Ferrovial to ensure he had their support.

With the support of Ferrovial's Board of Directors, Flórez and his team increased the quality of services by establishing service-level agreements, clarifying which project solutions would be developed, and introducing business-sensible metrics to improve and engage with non-ICT colleagues. At Ferrovial, where most senior managers have studied engineering, having metrics enables the CIO to convince other senior managers of the benefits of specific ICT solutions.

Flórez and his team also studied the business processes across Ferrovial and likewise examined the ICT systems that could best support these processes. From this exercise, they realized they did not have to perform all the business processes internally. They identified commodity processes and services that seemed to be the most promising candidates for outsourcing, such as e-mail, payroll and human resources, some purchasing processes, network services, and even some ICT infrastructure services. This enabled Flórez to save resources on operations and maintenance and invest a greater percentage of the ICT budget on innovation.

Last year Flórez, now CIIO (Chief Information and Innovation Officer), was asked to lead a new corporate-level initiative called the Global Procurement Committee. Its aims are to ensure the continued coordination and control of global procurement activity in Ferrovial. "We did the same for purchasing as we did for HR," said Flórez. "We put all the purchasing process in the cloud and the implementation was extremely quick."

Definition

Key Business Enabler: Strong business involvement

Strong business involvement reflects the extent to which business unit managers and senior executives are sufficiently involved in ICT investment and management decisions.

Although firms spend, on average, 46% of their total ICT investments on ICT infrastructure, most business executives consider infrastructure investments a "black hole" that eats up resources from the applications they want developed "now." This lack of understanding of ICT infrastructure investment causes problems in firms where technology is integral to business operations and where business units are expected to share ICT assets. In such firms, non-ICT executives do not participate in important ICT investment decisions and their ICT infrastructures are not transformed into mature digitized platforms for agility.

Since 2011, INSEAD eLab has been participating in an annual survey of CIOs to understand how CIOs and their ICT groups prioritize their time during the preceding year across four areas of activities: managing ICT services; working with non-ICT colleagues; managing enterprise-wide business processes; and working with external customers and partners. From their responses, the following three distinct types of CIOs and ICT groups have been identified: technology-driven; business process-driven; and client-driven. For all three types of CIOs, the amount of time working with non-ICT colleagues was on average 30%, and for all three types of ICT groups, the amount of time working with non-ICT colleagues was on average 20%. Both in fact represent significant time commitments.

Indeed, engaging with non-ICT colleagues is essential to ensure strong business involvement in ICT investment and management decisions. As several CIOs of successful organizations have made clear, strong business involvement does not necessarily mean that CIOs have to take on more responsibilities. While some CIOs such as Federico Flórez of Ferrovial (pages 15 and 25) or Filippo Passerini of Procter & Gamble (p. 28) increase their engagement with non-ICT colleagues and take on more responsibilities for shared services organizations and innovation across the enterprise, other CIOs limit the expansion of their responsibilities.

During her tenure as CIO of Neptune Orient Lines, Choy Peng Wu earned the ICT Leader of the Year award in 2012, organized by the Singapore Computer Society; Wu also won the IDC-Enterprise Innovation Asia/Pacific CIO of the Year award in 2011. Currently CIO of Singtel, Wu attributes an important part of her success as a CIO to setting the right expectations regarding the responsibilities of ICT teams and the business units. "IT is a business enabler," explains Wu. "At the end of the day, it is the responsibility of the business to operate more efficiently."

In her case, Wu spends fully half of her time engaging with business colleagues, making sure that every part of the business understands what other parts are doing and how ICT systems interface and integrate across different business functions. "They can always count on IT to help them be successful," Wu said. "The role of IT is to be aligned with the business, help facilitate business processes, and support the organization in making the right decisions. Yet, IT must also challenge the business."

Benefiting from a lean global ICT, Neptune Orient Lines draws on a light-weight governance structure to operate efficiently and engage with the business. An important key mechanism is its steering committee, in which Wu participates along with the rest of senior management to make strategic and major investment decisions. Other mechanisms include an ICT working committee, which is chaired by Wu and facilitates cross-functional ICT projects, and regular meetings with application suite owners who are typically business vice presidents and directors. These executives represent their area of business and meet regularly with their ICT equivalent to manage and address demand from the business.

[5] Adapted from Fonstad (2012); for more detailed information on how Neptune Orient Lines uses ICT to enhance its business performance, refer to 2012 IT-Enabled Leadership Report (link to http://www.insead.edu/facultyresearch/centres/elab/research/documents/2012ITEnabledLeadershipReport_000.pdf)

Finding

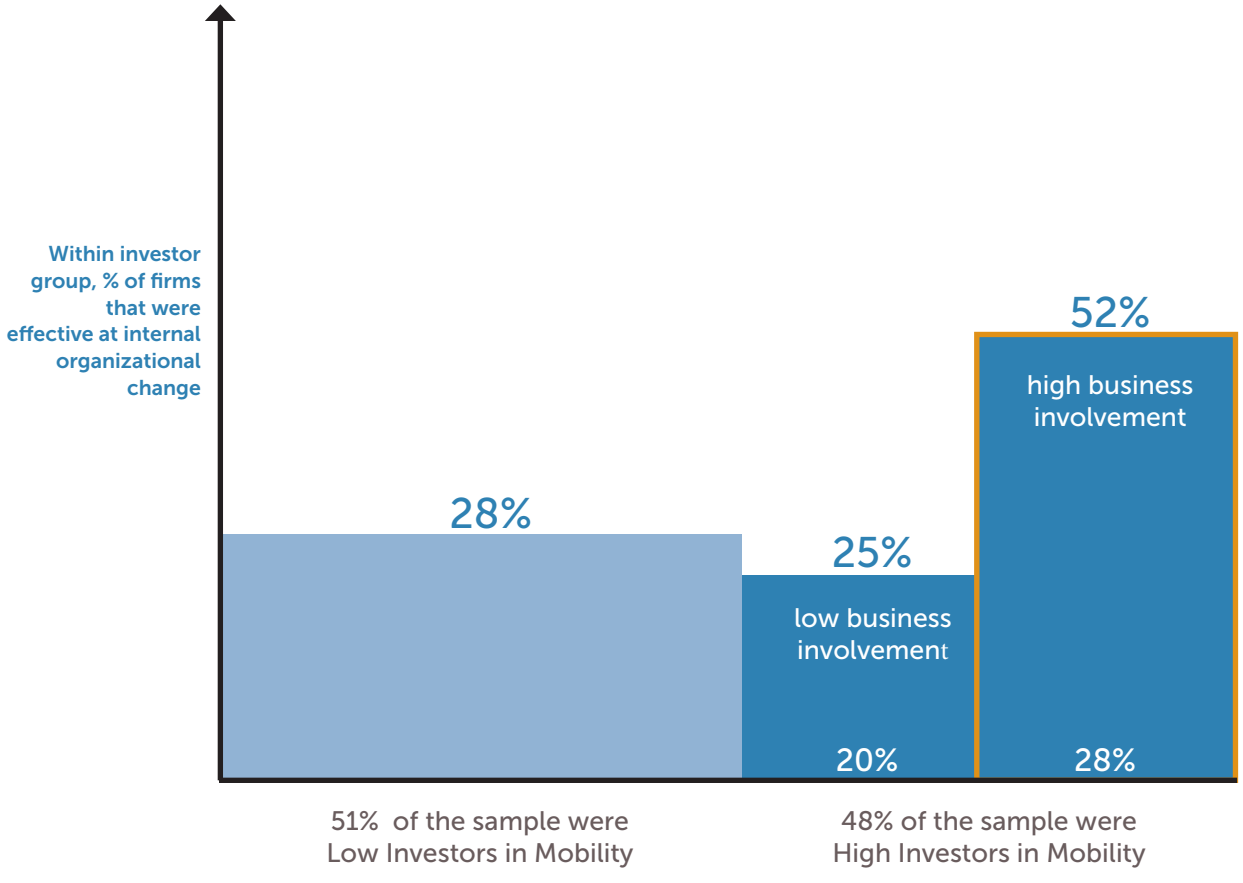
High performing firms involve business managers in ICT investment and management decisions

Analysis of the survey results reveals that most high-performing firms that have made significant investments in technology have involved business unit managers and senior executives in ICT investment and management decisions. One of the common factors of the success stories described throughout the report is that key IT responsibilities are shared between ICT and non-ICT managers. As a result, their organizations perform better.

Figure 5 describes the cases of firms that invest in mobility and are especially effective at introducing new ways of working internally. Many organizations invest in mobility as a means of either introducing more flexible work or improving customer service, as for example in the case of KONE which invested in mobility to enhance repair and maintenance services. Survey results reveal that high investors in mobility that also have strong business involvement are more than twice as likely to effectively introduce new ways of working. In contrast, high investors in mobility with low business involvement were no better off in terms of achieving new ways of working internally than those firms that spent less on mobility. Clearly, introducing new ways of working requires support from ICT and non-ICT senior management. Involving the business in ICT investment and management decisions is an important way to ensure that investments in ICT will be matched by the necessary internal organizational changes.

Figure 5: In terms of using mobility to support new ways of working, strong business involvement complements investments in mobility.

Key: 51% of those surveyed were low investors in mobility, while 48% were high investors in mobility. 28% of the low investors in mobility were effective at change, regardless of whether they had low or high business involvement. However, 20% and 28% making up the 48% that were high investors in mobility had low business involvement and high business involvement, respectively. Of the 20% with low business involvement, 25% were effective at change whereas of the 28% with high business involvement 52% were effective at change. Hence, it really pays for high investors in mobility to have high business involvement.



Definition

Key Business Enabler: Mature digitized platforms

The maturity of a firms' digitized platform describes the extent to which a firm has reached an efficient level of standardization and sharing across the organization with regards to technology, business processes and data. Maturity refers to the extent to which individual local project solutions are developed in ways that are considerate of the interests of other existing individual local project solutions and even the interests of future solutions. Solutions should also respect enterprise-wide standards.

INSEAD eLab research shows that those firms that have achieved and sustained a mature digitized platform have overcome serious challenges along the road to maturity. Each request for a new IT project must be managed in such a way that the request addresses both the specific and immediate needs of the local business unit demanding the new project. The request must also address the enterprise-wide needs of the firm in the long term.

Furthermore, when the IT group of a firm develops a new solution in response to a request from a local business unit, the group typically creates a unique solution with a technology component that supports a particular way of doing things, such as a business process. During a typical year, an IT group may develop hundreds of solutions in response to as many local demands, with each solution having technology, business process and data components. Over time, these components can accumulate into the firm's digitized platform.

The key question is, are these individual project solutions developed in a manner that is coordinated? For example, if the components do not follow a minimal set of standards, then the answer is no. In this case, the firm ends up with what is commonly referred to as "infrastructure spaghetti." Pretty soon, the "infrastructure spaghetti" slows down new application development and increases the costs and risks of operating and maintaining existing applications. Firms that make "infrastructure spaghetti" time and time again end up with immature digitized platforms. On the other hand, firms that have reached an efficient level of standardization and can share technology, business processes and data across their organizations – these firms have successfully developed mature digitized platforms.

To shed more light on the critical question of platform maturity, the survey asked participants a series of questions regarding their ICT infrastructure platform, such as its degree of technology standardization; the business process platform, such as the degree of standardization of administrative and operational business processes; and the data platform in terms of sharing data both within the firm and with key partners. Specifically, respondents were asked the following question:

On a scale of 1 (strongly disagree) to 5 (strongly agree), rate the extent to which your firm has reached an efficient level of standardization and sharing across the organization along the following five dimensions.

- Information and Communication Technology
- Administrative processes (e.g., HR, finance, purchasing)
- Operational processes (e.g., supply chain, sales, customer service)
- Sharing data (e.g., product, customer, partner) internally
- Sharing data (e.g., product, customer, partner) externally

Finding

Digitized platforms are associated with the most significant benefits and risks

Data on over 20 different types of performance indicators were analyzed. For each performance indicator and for several combinations of performance indicators, high-performing firms were compared with low performing firms to see if there were any significant differences in terms of their investments in ICT and of the strength of key business enablers.

Overall, the research findings underscore the importance of endowing investments in ICT, which are often driven by immediate needs and local interests, with investments in key longer-term and enterprise-wide business enablers, such as business involvement and both technology-focused and management-focused talent.

Nonetheless, in terms of scope and impact, the research findings reveal that the most valuable business enabler to invest in is a mature digitized platform. Figure 6 depicts both the overall scope and impact of having strong key business enablers.

In terms of scope, firms with mature digitized platforms experienced significantly greater benefits with regards to 88% of the performance indicators, whereas the beneficial impact of the other enablers were evident in just over 25% of the performance indicators.

In terms of impact, within the performance indicators that improved with stronger business enablers:

- Firms with strong business involvement improved the likelihood of being strong performers by 63% relative to firms with weak business involvement;
- Firms with strong access of technology-focused talent improved the likelihood of being strong performers by 72% relative to firms with insufficient technology-focused talent;
- Firms with strong access to management-focused talent improved the likelihood of being strong performers by 63% relative to firms with insufficient management-focused talent, and:
- Firms with strong access of mature digitized platform improved the likelihood of being strong performers by 96% relative to firms with an immature digitized platform.

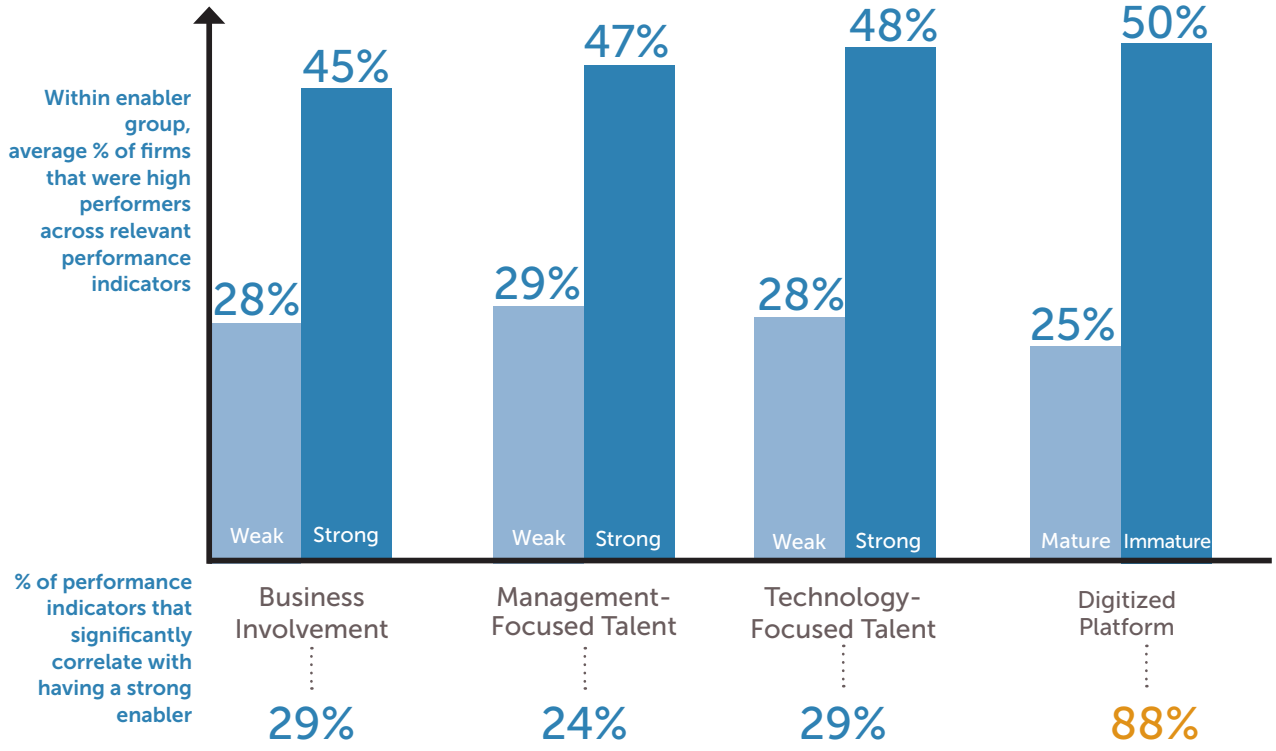
In terms of impact, firms with mature digitized platforms increased the likelihood of high performance by 96%, whereas firms with other strong business enablers increased the likelihood of high performance by 63% or 72%.

Clearly, it is beneficial to have all four business enablers. However, if a firm has to prioritize which enabler to develop first, the research strongly suggests that it should prioritize achieving and sustaining a mature digitized platform.

What follows in this report are more specific results highlighting the value of a mature digitized platform against the risks of an immature digitized platform.

Figure 6: Firms with strong enablers are more likely to be high performers; Nonetheless, in terms of impact and scope, the most valuable enabler to invest in is by far a mature digitized platform.

Key: Above the light blue bars are average percentage of firms that are high performers and have weak enablers. Above the dark blue bars are average percentage of firms that are high performers and have strong enablers. Below the y-axis are the percentage of performance indicators that significantly correlate with have a key business enabler.



Finding (Cont.)

Digitized platforms are associated with the most significant benefits and risks

Figure 7 demonstrates that highly agile firms distinguish themselves by empowering their investments in cloud-based services with the establishment of a mature digitized platform. Like the performance bars in Figure 4 (p. 13), the performance bars below show that on average high investors in cloud-based services are more likely to be highly agile than low investors in cloud-based services.

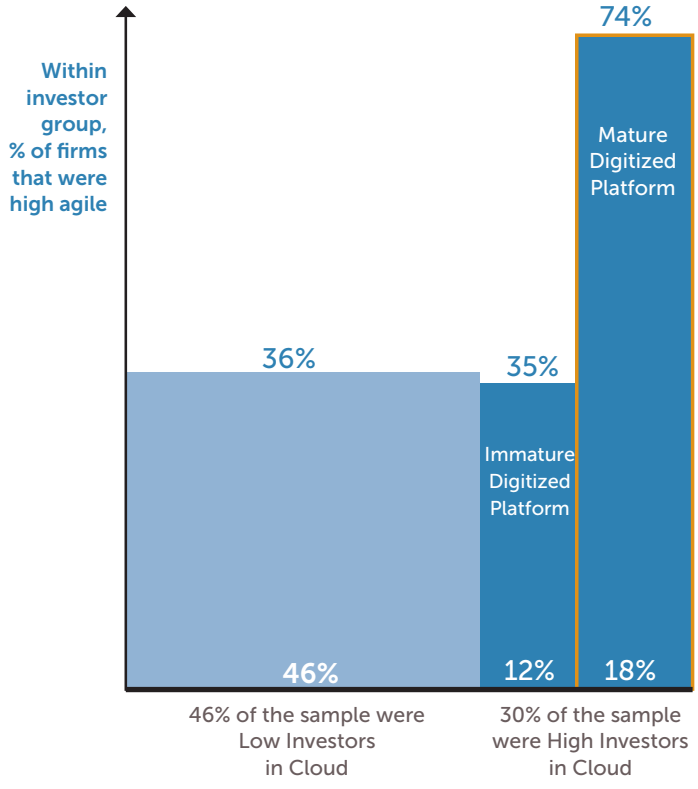
However, when the group of high investors in cloud-based services, representing 30% of the total sample, is examined more carefully, what becomes clear is that the likelihood of a firm being highly agile firm varies tremendously. Within the group of high investors in cloud-based services, there is a group of high investors that on average are very likely to be highly agile, representing 18% of the total sample; yet there is also a group that has a very low likelihood of being agile, representing 12% of the total sample. The key difference between these two groups of high investors in cloud-based services is that the group of high investors that has the highest likelihood of being competitively agile consists of firms with a mature digitized platform, whereas the low performing group of high investors consists of firms with immature digitized platforms.

Together, these groups illustrate the benefits of having a mature digitized platform and the risks of having an immature digitized platform.

- Benefits: The group consisting of firms that are high investors in cloud-based services and that have a mature digitized platform is statistically twice as likely to be highly agile than the group consisting of firms that are low investors in cloud-based services. Most firms in the group of high investors are likely to be highly agile, whereas most firms in the group of low investors are not likely to be highly agile.
- Risks: The group of firms that are high investors in cloud-based services and that have an immature digitized platform is statistically no more likely to be highly agile than the group consisting of firms that are low investors in cloud-based services. In short, for this group of high investors, the additional investments in cloud-based services did not translate into greater agility.

Figure 7: The most agile firms distinguish themselves significantly by investing both in ICT and mature digitized platforms

Key: 46% of those surveyed were low investors in cloud-based services, while 30% were high investors in cloud-based services and the remaining 24%, not shown, did not invest in cloud-based services. However, 12% and 18% making up the 30% that were high investors in cloud-based services had an immature or a mature digitized platform, respectively. Of the 12% with an immature platform, 35% were highly agile whereas of the 18% with a mature digitized platform 74% were highly agile. Hence, it really pays for high investors in cloud to have a mature digitized platform.



Size of each investor group (% of total sample); Non Investors in Cloud (24%) are not shown

These results provide additional support to the general thrust of the report that having a mature digitized platform is not only beneficial for using ICT to build business performance, it is necessary to avoid wasting investments in ICT.

Figures 8 and 9 present research results showing that, from the perspective of high performers in business operations, the two business operations in which strong performance most clearly correlates with investments in mobility are Productions/Operations and New Products and Services. Even in the case of high performers in business operations, research results reveal the benefits of having a mature digitized platform outweigh the risks of having a weak one. Thirty percent of the sample consisted of firms that were high investors in mobility and had a mature digitized platform. Within this group of high investors, 65% were high performers in Production/Operations as well as in New Products and Services. At the same time, 19% of the sample consisted of firms that were high investors in mobility and yet had an immature digitized platform. Within this latter group of high investors, only about a third of firms were high performers with regards to either Production/Operations or New Products and Services. Stated differently, almost a fifth of participating firms were high investors in mobility, yet in terms of Production/Operations or New Products and Services, they were on average no more likely to be high performers than the firms that had invested less in mobility.

Figure 8: Firms that invest both in mobility and mature digitized platforms are most likely to have competitively strong Productions/Operations.

Key: 51% of those surveyed were low investors in mobility, while 48% were high investors in mobility. However, 18% and 30% making up the 48% that were high investors in mobility had an immature or a mature digitized platform, respectively. Of the 18% with an immature platform, 33% were strongest in production/operations whereas of the 30% with a mature digitized platform 65% were strongest in production/operations.

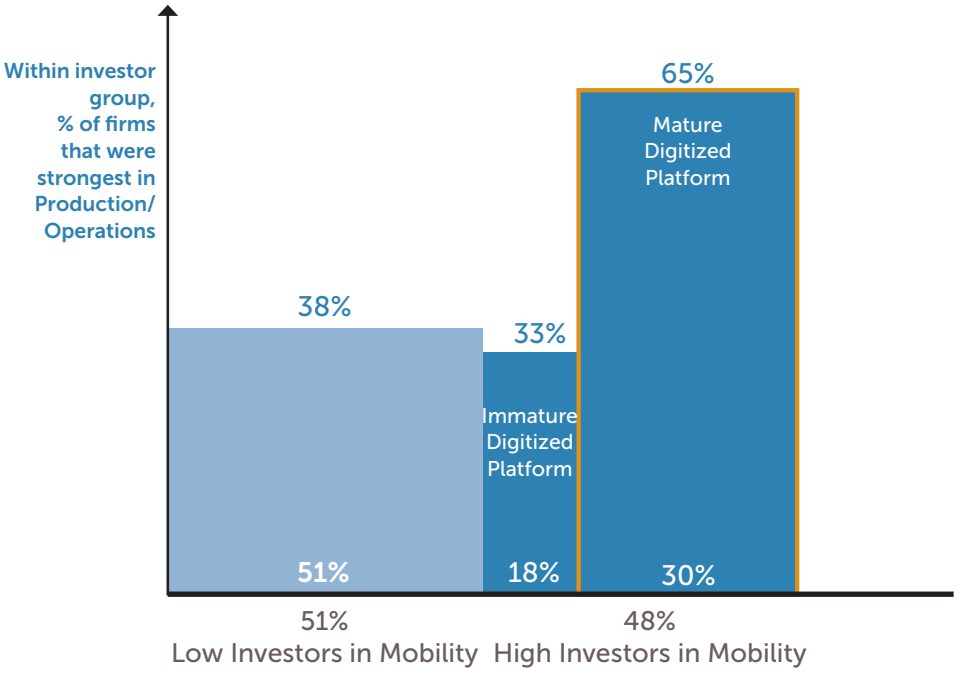
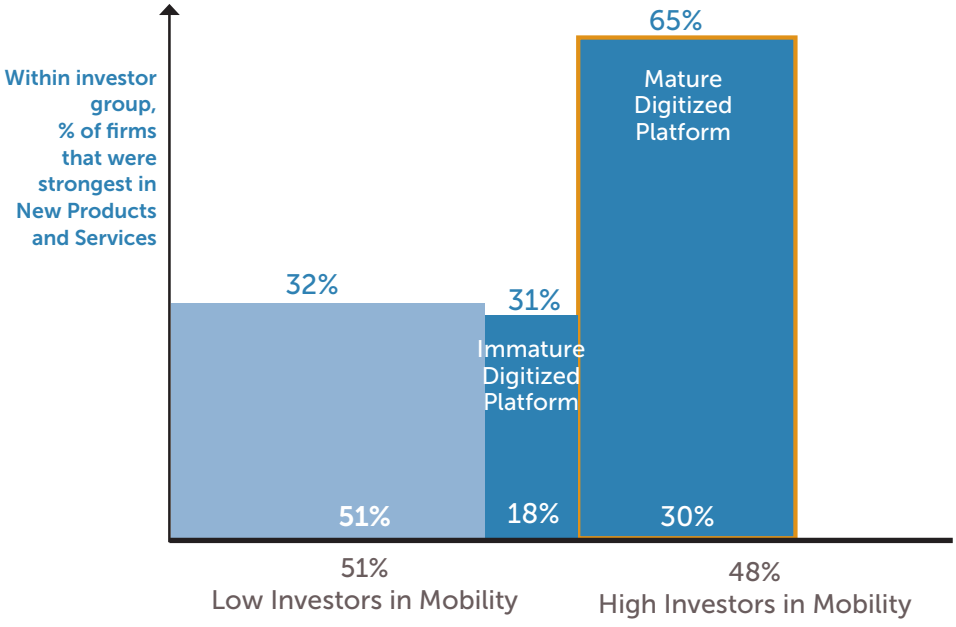


Figure 9: Firms that invest both in mobility and mature digitized platforms are most likely to have competitively strong New Products/Services.

Key: 51% of those surveyed were low investors in mobility, while 48% were high investors in mobility. However, 18% and 30% making up the 48% that were high investors in mobility had an immature or a mature digitized platform, respectively. Of the 18% with an immature platform, 31% were strongest in new products and services whereas of the 30% with a mature digitized platform 65% were strongest in new products and services.



Finding

The benefits and risks of digitized platforms are especially salient for firms based in Asia-Pacific

Thirty-four percent of survey participants were firms based in the Asia-Pacific region, and well over half of these firms were based in India and China, the two BRIC economies which have shown a remarkable period of rapid growth. In our survey, Asian-Pacific participants distinguished from firms in other geographic regions in two ways: First, with regards to their allocations of investments in technology; and second, their access to technical talent.

Asian-Pacific firms take a more balanced approach to strategy, whereas European and North American firms are more focused on cutting cutting and controlling operational costs.

Participants were asked to describe their organization's strategic focus by showing how they would allocate 100% of their total ICT budget across the following three strategic foci.

- Product Leadership and Innovation;
- Customer Intimacy; and
- Operational Excellence.

Figure 10 depicts strategy allocations across the regions. These results are consistent with the economic environments conditions of each region.

Asian-Pacific firms are spending a greater percentage of their total ICT budget on new applications and external services

Figures 11 and 12 show how the rapid growth of most Asian-Pacific economies is reflected in their portfolio of ICT investments. In contrast to firms based in Europe and North America, where economic conditions are significantly more challenging, firms from Asia-Pacific anticipate spending almost half of their total ICT budget on new application development (Figure 11). Moreover, Asian-Pacific firms expect to increase significantly their spending on external service providers, reflecting the greater access firms have to service providers in the region (Figure 12).

Figure 10: Average % total strategy allocated to one of three strategic foci.

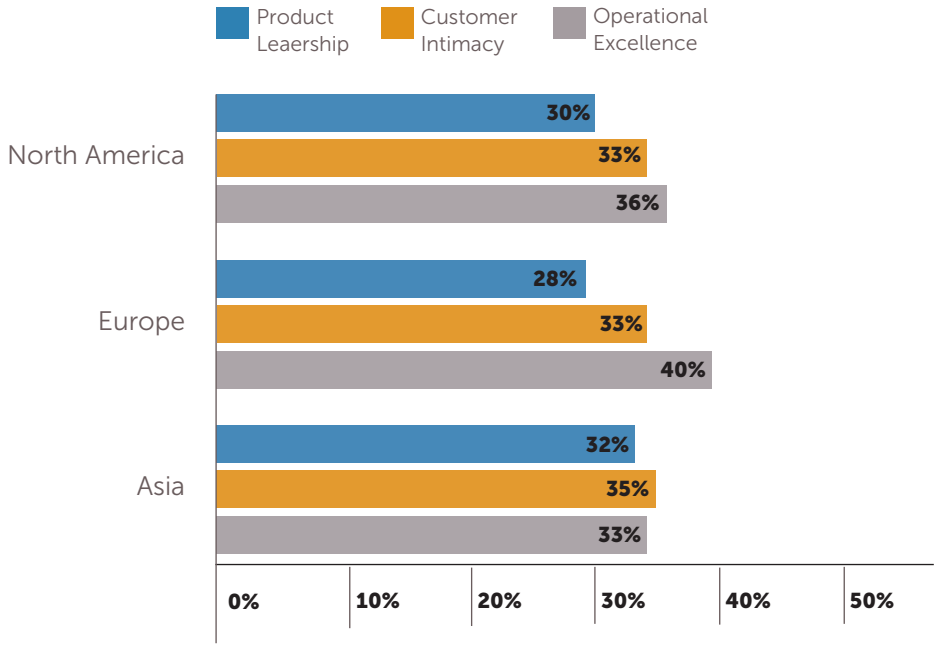


Figure 11: Average % of IT Budget allocated to new application development, by REGION.

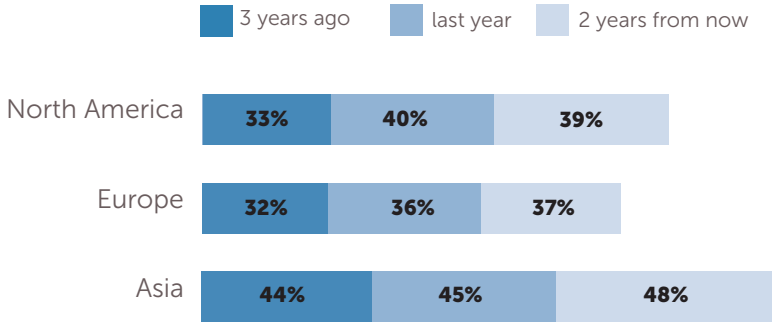
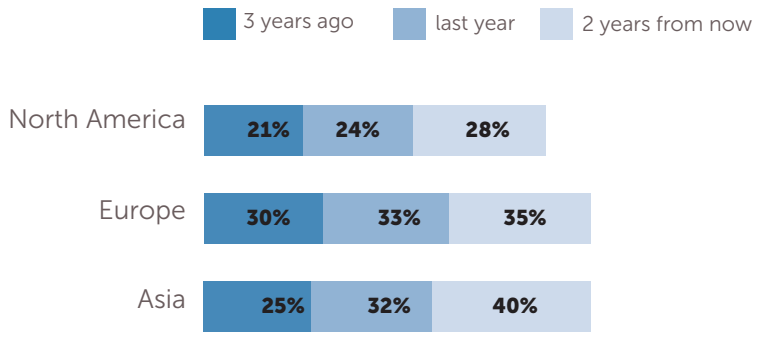


Figure 12: Average % of IT Budget allocated to External Service Providers, by REGION



[6] More specifically, 34% were from China; 27% from India; 6% from Australia; 6% from Japan; and 6% from Singapore. The remaining 21% were firms from other parts of the region.

Overall, complementarities hold across regions.

While the survey revealed important differences between firms from Asia-Pacific and firms from Europe and North America with regards to the average percentage of the total ICT budget spent on items such as emerging technologies including cloud, mobility and collaboration tools, new applications, and outsourcing, it showed little or no statistical differences between regions with regards to the complementarities between investments in ICT and key business enablers. There was, however, one notable exception.

One less hurdle to competitiveness for Asian-Pacific firms: Greater access to technically-focused talent.

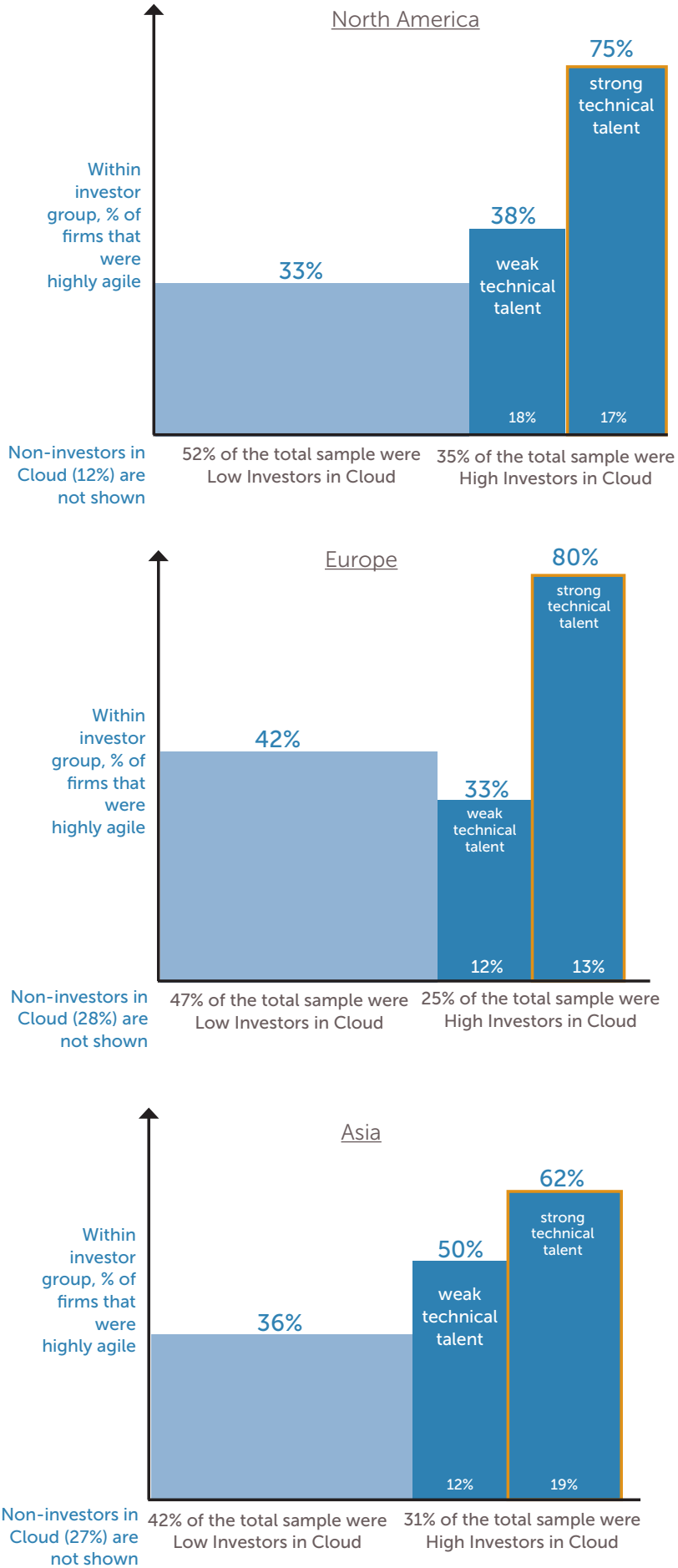
In contrast to firms from other regions of the world, access to technical talent did not significantly enhance the likelihood of high performance for high investors from Asia Pacific. Put another way, Asian high investors in cloud with weak technical talent were almost as likely to be competitively agile as those with strong technical talent. What does this say? That the impact of technical talent on competitiveness – both as a risk and an enabler – is not as great in those regions that have greater access to strong technical talent. Conversely, high investors in North America and Europe put a higher premium on strong technical talent simply because they have less access to the ICT skills required to turn their investments into rewards.

Revealed in the survey, a greater percentage of high investors have sufficient access to technically-focused talent in Asia-Pacific than in Europe and North America (62% versus 50%). In addition, the supply of technically-focused talent is greater in Asia-Pacific because of a number of factor endowments: the depth of tech-savvy graduates from top-ranked schools, the technology spillover effect, the growth of highly competitive economic sectors and aggressive salaries.

Whether a firm has weak or strong technical talent will vary depending on the resources that are available. In areas where there is a large supply of technical-focused talent, demand will be more discerning and selective. In areas where there are significant gaps between demand for and supply of technically-focused talent, such as Europe and North America, demand on average will be less selective. In these circumstances, firms that are struggling to find technical talent will be happy with talent that is good enough, whereas firms in areas with a strong supply will only be happy with the best.

Figure 13: Regional differences of the impact of technically-focused talent.

The width of the bars corresponds to the percentage of survey participants that belong to a specific investor group.



Real Success

Coca-Cola Europe: Global Tools, Rapid Local Responses

The world's powerful beverage maker, the Coca-Cola Company owns, licenses and markets more than 500 non-alcoholic beverage brands, primarily sparkling beverages but also a variety of still beverages, such as waters, enhanced waters, juices and juice drinks, ready-to-drink teas and coffees, and energy and sports drinks. It also owns and markets a range of billion dollar brands, such as Coca-Cola, Diet Coke, Fanta and Sprite. The company is grouped in five regions Eurasia and Africa, Europe, Latin America, North America, Pacific, each divided into bottling operations and corporate.

In 2011, the Coca-Cola Company had net operating revenues of $46.54 billion compared to $35.12 billion in the previous year, an increase of 26 percent. Also in 2011, Coca-Cola topped Interbrand's ranking of the 100 Best Global Brands for the 13th consecutive year. The estimated brand value of Coca-Cola, which celebrated its 126th anniversary, is now $77.8 billion. This brand awareness translates in massive sales. The average number of 8-ounce servings per person of Coca-Cola was 92 servings in 2011, and in Belgium it was 340 servings consumed per person.

Leveraging the Cloud to enhance communications

Having five geographic operating groups and employing 146,200 associates globally, the Coca-Cola Company employs in its Europe corporate organization 2,600 associates and in its Europe bottling operations 11,300 associates. Within corporate, Europe Group CIO Sabine Everaet employs 45 IT specialists, while outsourcing most of the technology and applications maintenance and support.

Driving a lean IT organization, Everaet has realized significant productivity gains by developing local solutions that leverage the standardized ICT technology, business processes and data that are available across the global organization. For example, her group recently decided to move to cloud-based standard tools for both internal collaboration and engagement with external stakeholders. One tool provides a social media environment where internal teams, which are widely dispersed throughout Europe, can collaborate across different areas of expertise, such as functional, product, geographic, and customer. Everaet's teams use another cloud-based tool from the same external service provider to collaborate and engage with a variety of external stakeholders. "We are using cloud-based tools to register inquiries, complaints, interactions with all our stakeholders, consumers, bloggers, opinion leaders, etc.," Everaet said. "The beauty of these tools is that they integrate with social networks so that we can easily augment the data we gather from consumers on the net." Everaet adds, "from a business perspective, we are able to deliver applications in three months rather than over two years – that is a huge difference for our business today because the space is evolving and we need to respond to demand rapidly."

Global Apps, Local Deployment

Everaet benefits from having as her boss a global CIO primarily invested in the corporate strategy, and from whom she can draw certain global tools. However she does not make the classic error of relying too heavily on a top-down corporate approach whereby global applications are automatically deployed locally. "I draw on global applications where locally relevant, such as for functions like HR, Finance, and Procurement, etc.," she explained, "In other cases, when there is nothing available globally that covers what we want to do locally, we take the lead and develop applications in an integrated and scalable way, respecting the global enterprise architecture,"

In collaboration with the global CIO, Everaet has found the right balance between a globally centralized and standardized approach and a locally controlled and tailored focus. "Not all global options are relevant to local businesses. Business intelligence, dash-boarding and digital marketing have to be locally responsive." A critical success factor for maintaining the right balance between local and global that Everaet highlights is that all locally tailored solutions are done so with the consent of global leadership. Another critical success factor is to ensure that any solution developed for one country is consistent with global standards so that the solution relates to Coca Cola's enterprise architecture – either as compliant or as an exception) and is scalable globally. As Everaet explains, "I've got the clear mandate from the Group President that whatever is built for a country here must be scalable beyond Europe as well."

Recently, the global CIO hired a new chief of enterprise architecture who is specifically focused on innovation and new technology that can be applied in a rapidly changing environment. He is based in Silicon Valley, to ensure that he is connected into the area's famous ecosystem of ICT innovation and entrepreneurship. He quickly built on the company's global relationship with its strategic partner of cloud-based services, enabling Everaet to solve problems faster. For example, when a major retail client in the UK required an e-commerce tool Everaet and her team were able to work closely with the global enterprise architect and provide the client a solution quickly.

In shifting her resources from the back office to the marketing, sales and bottling leadership space, Everaet said she "has seen a big need in having a local architect work on everything in the front office and facing the European market." At her request, her local architect has already started to build a new proactive consumer call center in Europe that is completely connected with the social networks.

Having Key Local Skills

Going forward, Everaet wants to enrich the skills of her entire IT team by enabling them to slip easily into the role of high-level business-ICT relationship managers. By doing so, her team will ensure an alignment between ICT and the rest of the organization. "You need to have people in-house who can keep track of emerging technologies and who are well-connected to eco-systems of innovation," Everaet said. "They need to understand how these technologies are being used by the most innovative companies."

In addition, she wants to empower IT specialists so that they can engage with the business side. Said Everaet, "I am really encouraging my guys to work with the business units, work with senior management of the bottlers, work with corporate, understand what the dynamics are, see things from their perspective, learn to connect the dots, and come away with a holistic view."

Everaet believes that the business cannot always know what it wants without her technology support. Thus instead of performing the classical requirement-gathering duties, her project managers are trained to provide leadership to the business side on "what we believe is going to be important in the future supported by new technology."

Real Success

Ferrovial: How investments in collaboration tools opened opportunities for open innovation

Taking communications to the next level

It's been hard work for a man who likes the simple things in life. When Federico Flórez joined the company four years ago, Ferrovial had 15 service providers handling communications reaching out to some 500 companies and 3,000 constructions sites, all of which were spread across 40 countries. Communications was "impossible" with so many different contracts and requirements in each country. "We were like artists trying to consolidate spaghetti," Flórez said.

Furthermore, finding a single provider who could integrate the company's communication systems into a unified communications and collaboration platform in all its markets seemed to be a near impossible task. In 2010 Ferrovial signed a long-term strategic deal with a telecommunications service provider that had a strong global presence through its own business units or via partnerships with local providers. The strategic partner, explained Flórez, "followed our established procedures to control the cost and performance of the network. We were successful because the cost decreased more than we expected, so we were very happy."

A choreography of new services emerges

By strengthening the unified communications and collaboration platform, Ferrovial and its strategic telecommunications partner have developed a choreography of new services that they pitch to customers in cities and municipalities. For example, they offer services to private and public users whose mobile devices can be harnessed to capture data from all sorts of urban things, such as buildings, trash dumpsters and a host of ordinary facilities. Infrastructure tools they offer include internal and external data and the internal local area networks that manage communications.

"When offering facilities maintenance services to a city to operate and maintain its buildings and grounds, we now include communications applications to improve the performance of their energy efficiency," said Flórez. "We will look for leaks of energy, for the performance of energy, for a better use of the energy, and to do that, we can establish communications using sensors such as RFID detectors."

Centralizing the infrastructure and building employee skill sets

Although Ferrovial has only four data-processing centers today, Flórez remembers a time when he had to cope with a huge number. "When we hit 100 DP centers, I decided to centralize the infrastructure with an external provider," said Flórez, referring to HP. "The only way I were able to do this was to have an infrastructure as a service, completely as a service, and also to be flexible in costs and demands."

The multi-year process of transforming and maturing Ferrovial's digitized platform, including standardizing and centralizing its ICT systems and key business processes, has enabled Ferrovial to develop a much better understanding and control of its processes - to such an extent that it could identify and outsource key processes and engage in more strategic relations with its service providers.

In addition, Flórez succeeded in addressing the key issue of knowledge management while improving the skills of his employees. "There is another advantage here, all of our employees had to adapt to and learn from the new process and performance-analysis tools. The skills, education, and knowledge that my employees have now are used to control and maintain the services we need for Ferrovial."

Key Implications for Business Leaders

Firms will spend a greater percentage of their total ICT budget on mobility, cloud-based services, and collaboration tools over the next two years, according to the research results. More importantly, both the statistical findings from the survey and the real success stories highlight the importance of having strong key business enablers while underscoring the risks of having weak enablers. When firms that have weak key business enablers make significant investments in ICT, they are at great risk of wasting their investments. The research findings also credibly show that competitiveness – especially in terms of agility – is not so much a result of which ICT a firm invests in, but is more the result of how a firm complements its investments with key business enablers. From these research findings, at least three key recommendations emerge.

Recommendation #1:
Senior management – IT and non-IT – should jointly assess the strength of key business enablers.

As firms increasingly rely on information and communication technologies to operate and innovate, the entire senior management team will want to share responsibility for making certain these investments are adding significant value towards the organization's strategic objectives. Without the support of senior management, a mature digitized platform is going to be more difficult to achieve and much harder to sustain. If some non-ICT senior managers do not understand the business value of the key enablers and their relation to ICT investments, a dialogue could be opened between them and the Chief Information Officer. This discussion could also take in the board of directors, thus leading to a point where all decision makers are clear on the value of the key business enablers and supportive of strengthening them before making significant investments in technology. The research results in this report ought to resonate with senior management, as they reveal in case after case that firms taking an ICT free-rider approach are taking unnecessary risks.

An important start to strengthening management involvement is by conducting joint assessments of the key business enablers – especially an organization's digitized platform. This assessment will require clarity regarding which enterprise-wide synergies an organization wants to achieve, such as:

- Deriving cross business unit synergies from integrating and standardizing technologies in order to achieve economies from shared IT infrastructure);
- Business processes in order to achieve economies from common business processes and refocus business units on value-added processes; and
- Big data to develop a single view of customers common across business units.

Any assessment will also require clarity and commitment with regards to how the organization should operate to achieve and sustain both enterprise-wide synergies and effective and efficient responses to opportunities and threats at the local level of business units.

Once senior management has gained greater visibility on the operating model, it is then in a better position to assess the organization's digitized platform. By examining the following questions together, non-IT senior managers and the CIO could help trigger a valuable discussion with regards to what enterprise-wide synergies should the organization prioritize and the best operating model that corresponds to these priorities, and whether or not the organization's existing operating model is sufficiently mature While the research demonstrates the value of a mature digitized platform as a key business enabler, it also sheds light on the critical factors that firms have used to achieve and sustain a mature digitized platform successfully. This is no easy task. Traditional approaches to developing new applications have led to so-called "spaghetti" platforms – ICT infrastructure spaghetti, business-process spaghetti, data spaghetti, or all of the above.

Recommendation #2:
Strengthen key enablers – particularly a mature digitized platform – to increase the likelihood of obtaining better performance from new technologies and to decrease the risks of wasting their ICT investments.

Question #1: What enterprise-wide synergies does your firm want to prioritize?

Question #2: Is your firm a low or high investor in ICT?
High investors are firms that invested more than 10% of their total ICT budget in a specific type technology – e.g., mobility, cloud, or unified communications and collaboration.

Question #3: Is your firm's digitized platform immature or mature?
On a scale of 1 (strongly disagree) to 5 (strongly agree) rate the extent to which your firm has reached an efficient level of standardization and sharing across the organization along the following five dimensions.

- Technology ____
- Administrative processes (e.g., HR, finance, purchasing) ____
- Operational processes (e.g., supply chain, sales, customer service) ____
- Sharing data (e.g., product, customer, partner) internally ____
- Sharing data (e.g., product, customer, partner) externally ____

Total ____

(A mature digitized platform is one that has a total of 17 or higher.)

[7] For more on defining operating models and achieving digitized platforms, read Peter Weill and Jeanne Ross (2009). "IT Savvy" Harvard Business Press and Enterprise Architecture as Strategy: Creating a Foundation for Execution, by Jeanne Ross, Peter Weill and David Robertson, Harvard Business School Press, 2006

Key Implications for Business Leaders (Cont.)

In traditional approaches, the IT group is seen as an "order taker," where at the project-team level, the IT group reacts simply to the demands of their local business colleagues. Solutions for local business initiatives often consist of nimble project teams developing solutions tailored to specific local needs. In the short-term, these teams often achieved locally defined "success." However, over the long-term, when their solutions were developed without coordination via company-wide ICT governance, these solutions provided little help in achieving company-wide goals. Worse yet, when the local project teams were not sufficiently engaged with both enterprise-level and business unit-level ICT decision-making bodies, disparate ICT solutions accumulated, creating IT spaghetti. In the long term, this spaghetti eventually constrains the effectiveness and efficiency of local project teams, leading to a vicious circle.

Moving towards a virtuous circle

Firms with immature digitized platforms can significantly enhance their competitiveness by ensuring that investments in new technology go hand in hand with the organizational changes necessary to achieve and sustain a mature digitized platform. To achieve a mature digitized platform, ICT leaders should promote the standardization of technology, business processes and data so that they can shared across business units.

Fonstad and Roberston (2006) have shown that companies can achieve and sustain mature digitized platforms while simultaneously responding to urgent requests from business units to implement dozens or even hundreds of solutions for local projects. Fonstad and Roberston have developed an ICT engagement model to describe these successful approaches. An ICT engagement model is defined as a system of governance mechanisms bringing together key stakeholders to ensure that projects achieve both firm-wide and local objectives. An ICT engagement model consists of the following three general components:

- Company-wide ICT Governance: Decision rights and accountability of company-level stakeholders and business unit-level stakeholders to define firm-wide objectives and encourage desirable behavior in the use of technology.
- Project Management: Formalized project management processes, with clear deliverables and regular well-defined checkpoints, that encourage disciplined, predictable behavior for project teams.
- Linking Mechanisms: Processes and decision-making bodies that connect project-level activities to the overall ICT governance.

In an effective IT engagement model, as projects evolve from conception to post-implementation, they pass through a series of engagement mechanisms (e.g., funding boards, prioritization committees, enterprise architecture reviews, and exceptions-handling processes) that are linked with governance mechanisms that support enterprise-wide objectives. By bringing together stakeholders from different organizational levels and functions, this set of governance mechanisms will enable them to learn from each other, align their interests and coordinate solutions to projects that address immediate local business needs and broader enterprise-wide goals.

Recommendation #3: Sustain a mature digitized platform

Firms with mature digitized platforms will always have a significant amount of work in front of them. Sustaining a mature digitized platform is an ongoing struggle, especially as a greater number of managers become more aware of the possibilities of technology. While charged with realizing long-term and enterprise-wide synergies, the IT group of an enterprise must simultaneously continue to implement hundreds of IT solutions for new business projects and maintain current operations.

Linking mechanisms such as enterprise architecture exceptions-handling process and post-implementation reviews that involve IT and non-IT managers from the corporate to the project team levels have shown to be especially effective for both controlling and learning from projects. Although most proposed projects can be addressed with solutions that complement the digitized platform, there may be exceptions. An effective exceptions-handling process enables firms to learn from exceptions, as they essentially become controlled experiments, rather than "shadow IT" projects. In some cases, a project solution that was granted an exception is eventually changed to complement the standards of the digitized platform. However in other cases, the project solution may prove to be so effective that the standards of the digitized platform are modified. In this way, the digitized platform remains relevant to the demands of the business. Finally, by accumulating technology, business processes and data in a coordinated way, a mature digitized platform avoids the accumulation of an irrelevant and constraining legacy. That's the way it should be.

Real Success

P&G: Taking business innovation to the Sphere

In celebrating its 175th anniversary this year, the Procter & Gamble Company has achieved a milestone that very few companies can equal. What better way to celebrate its legendary past than to deliver excellent results: In the fiscal year ending 30 June 2012, P&G had sales of $83.68 billion, an increase of three percent. It has achieved this success in part by its so-called 40/20/10 focus — focusing resources on the 40 largest and most profitable businesses, on its 20 largest innovations, and on the 10 most important developing markets. (Source: Annual Report 2012)[8]

P&G organizes its 127,000 employees and 300 brands into two Global Business Units (GBUs), Beauty and Grooming and Household Care. Because of the enormous amount of transactions the company makes around the world — P&G averages about four billion transactions per day in more than 180 countries — the company's CEO Bob McDonald has staked out a strategy to "digitize" the company's processes from end to end. Said McDonald, "Our goal is to standardize, automate and integrate systems and data so we can create a real-time operating and decision-making environment. We want P&G to be the most technology-enabled company in the world." (Source: Annual Report 2010)

Providing shared services

To this end, P&G promoted Filippo Passerini as its CIO in 2003, when he started a massive effort to standardize and centralize both ICT and other services across the company. Within his role as CIO, Passerini is President of Global Business Services (GBS), whose 7,000 employees provide more than 170 business services including IT, finance, facilities, purchasing and employee services as well as business building solutions. Although mainly supporting the two GBUs, GBS provides technology, processes and standard data tools to the company's Market Development Organization to better understand the business and better serve customers. (Source: GBS Factsheet)

Since 2003, GBS has reduced by a third P&G's costs as a percentage of its sales, which has translated into more than $900 million in cost savings over the past nine years. To squeeze this kind of deep reduction out of the business was not an overnight rush job.

Undertaking transformation in phases

Upon arrival in the CIO's office, Passerini first transformed the GBS into a progressive business model whereby shared services were run as businesses. Having completed this first phase, Passerini introduced an agile business model in 2006, pushing IT-led innovation across the company and its work flows. Since 2010, Passerini has flattened the GBS organization and scaled its capabilities to help the company identify its core priorities dynamically. (Source: GBS Factsheet)

It has been only after this three-stage process of turning GBS in a mature digitized platform that the operational benefits have been able to flourish. By providing strong IT and business leadership, Passerini has rolled out a number of world-class innovations such as Business Spheres and Decision Cockpits.

Fostering a business analytics culture

Used by 58,000 P&G employees, Decision Cockpits provide them with a single shared version of real-time data, a visual one-stop shop illustration of the business status and trends. Rather than distributing data across multiple databases in multiple ways, Decision Cockpits has standardized and centralized data and in so doing has reduced significantly the cost and complexity associated with creating reports and duplication of data. Furthermore, end-users across all brands and business units can design their own portal to view control charts, drill-down capabilities, automatic alerts and on-the-fly analyses. Decision Cockpits also promotes better visibility across the supply chain. (Watson, 2012)

Business Spheres, a patent-pending application, is used by P&G's executives to make decisions in real time. At P&G's world headquarters in Cincinnati, Ohio, is the original Business Sphere. It is in reality an oval-shaped executive conference room containing two huge concave screens, 2.4 meters tall and 9.75 meters wide.

This studio-like screening room is where CEO Bob McDonald and other executives huddle on a weekly basis to make business decisions affecting P&G's global empire. Surrounded by these two pulsing screens showing data points flickering away, the top leaders are able to better focus on the exceptions to their rules and decide where company interventions are necessary, while taking advantage of choice business opportunities.

Aligning IT with business core values

To make this striking innovation come to fruition, Passerini merged business analytics with visual graphics and has continued to invest heavily in these two very different fields of research activities. In 2011, the award-winning CIO — InformationWeek named Passerini 2010 Chief of the Year — unveiled the Business Sphere to immediate success. (Murphy 2010) A proprietary tool, it draws P&G management's notice only to the exceptional information, that which indicates a significant deviation of actual results from the expected results. By focusing on the exceptions, executives can make realistic forward-looking projections. (Watson, 2012)

Critical to the success of Passerini's Business Sphere is its alignment with P&G's sharp focus on core businesses and developing markets. For example, when CEO Bob McDonald and his executive committee meet each week, one data slice that pops up on the huge screen are the Top 50s. These are combinations of products and country markets, such as Brazil hair care or USA pet care, that are in the company's 50 largest, making up about 60% of sales. Data visualizations will show at a glance if sales or market share are moving materially. (Kalakota, Ravi 2012)

In addition, Passerini wants to include business analytics experts at all Business Sphere meetings, so that they can deliver analysis of the data shown visually on screens. At a time when P&G is cutting costs and eliminating 1,600 non-manufacturing jobs, the number of company staff with expertise in a business analytics is expected to increase fourfold. (Murphy 2010) The analysts can help executives at Business Sphere meetings by giving them valuable insights about the visual data to make the right decisions. So thrilled is P&G that it has installed Business Spheres at 50 business facilities around the world. This will enable better collaboration for the company as it plants new seeds for growth lasting perhaps another 175 years

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[8] Murphy, C. (2010). "Procter & Gamble CIO Filippo Passerini: 2010 Chief Of The Year." Information Week. December 04, 2010. Downloaded from http://www.informationweek.com/global-cio/interviews/procter-gamble-cio-filippo-passerini-20/228500182 on 13 Nov. 2012.
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Kalakota, Ravi (2012) "Procter & Gamble – Business Sphere and Decision Cockpits." 28 February 2012. Downloaded from http://practicalanalytics.wordpress.com/

Key Implications for Policy Makers

The journey that Procter & Gamble has taken to enhance business competitiveness and achieve and foster such a strategic business analytics culture (described on the previous page) underscores the importance of strengthening key business enablers. This is all the more important for firms as they create, collect and analyze data, and highlights the growing importance of data as a critical part of their digitized platforms. Although ensuring firms match investments in technology with strong key business enablers is primarily the responsibility of business leaders, governments and policy makers can enhance the environment in which new technologies proliferate on many fronts.

Two policy areas are especially relevant to the research results. The first is data privacy and security. Policy makers can help firms mature an increasingly important aspect of their digitized platforms more rapidly, by creating policies and regulations that facilitate the storage and flow of data in a stable, seamless, and secure way.

Second is access to talent. Policy makers can help firms access badly needed talent to make the most of their investments in technology. They can do so by fostering a coordinated talent approach that informs, among others, corporations and universities. Policy makers can ensure that demand for key skills is well defined and that supply for these key skills also matches the demand. Both areas are discussed in greater detail below.

Create harmonized policies and regulations regarding data security and privacy to help firms mature their digitized platforms more rapidly.

The research findings reveal that emerging information technologies, when combined with the right enablers, foster the competitiveness of companies. However, new digital technologies bring new risks. Many companies are expressing concerns about the security of data in cloud-based services, particularly since the physical infrastructure in a cloud computing environment is shared among a number of users. In some instances, intellectual property may be at risk, which ultimately hurts firm innovation and the economy at large. Moreover, organizations that handle sensitive data, such as financial and health care services, may face heightened legal and regulatory risks to the extent they transmit such data across various networks and store it with unrelated entities. Therefore, policies on data privacy and security have a great influence on how firms use cloud-based services and how they go about developing the data aspects of their digitized platforms.

Ensure that technology does not outpace information policy by creating harmonized policies across different dimensions. Since cloud-based services depend on Internet access, major policy issues are raised regarding dimensions such as reliability of service, privacy, data security concerns, and property rights. A significant barrier to standardizing and sharing data, particularly if data is created, collected or shared through cloud-based services, is the regulatory spaghetti concerned with data privacy and security rules.

In terms of privacy, it is important that policymakers define what cloud providers can and cannot do with users' data of both individuals and companies (e.g. using the data for marketing campaigns and data mining). In terms of data security, governments can act either by using legal enforcement against cyber-crime or by creating regulatory measures that generate the right economic incentives for investing in data security.

Harmonize policies and regulations across countries. Cloud computing, for instance, is a global service, crossing the frontiers of multiple governments. Corporate users of cloud-based services must ensure that the ways they are managing data, including the ways their external service providers manage data, are in compliance with the laws and regulations of the countries they operate in. Hence, global firms that want to digitize, standardize and share business processes across their worldwide business units are very cautious about which processes can be provisioned with cloud-based services. CIO Federico Flórez, for example, was extremely cautious about which business processes Ferrovial would transfer to the cloud.

In terms of data security, a high priority on the ICT agenda, no overall EU cyber-security strategy is currently in place, although efforts are moving in the direction of harmonization (the proposal to establish a European Cybercrime Centre, which is to become a focal point in Europe's fight against cyber-crime, is but one example). However, the EU should continue to ensure it is not acting alone in such harmonization since coordination with other jurisdictions is also important.

William Kennard, US Ambassador to the EU and former FCC Chairman, said the "US-EU Safe Harbour Agreement, in place since 2000, continues to be an effective framework to bridge regulatory differences in EU and US approaches to data protection. Differences between the EU and US future data protection legislation should not be allowed to hurt EU-US trade and should not prevent businesses from developing their activities on both sides of the Atlantic. This is a truly historic opportunity for the US and EU to create an interoperable data privacy framework – an essential building block for a transatlantic digital single market."

Encourage information sharing with and between stakeholders. A critical weakness of any attempt to legislate or regulate aspects such as data security is that specific measures may be outsmarted by new attack technologies quickly. For that reason, it is important that businesses and governments adopt the notion of "best practices", which can be developed on an ongoing, adaptive basis.

Continue coordinating firms and universities to ensure demand for key skills is well defined and supply for key skills matches demand.

The research results presented in this report underscore the urgency and importance of recent efforts in Europe to build the supply of e-skills. The real successes of CIOs and ICT teams featured throughout this report are examples of how some firms figured out how to use technology to do more with less. Their stories underscore the importance of defining, accessing and fostering management-focused talent and technology-focused talent to transform and thrive amidst austerity. For several of the featured firms, part of their efforts have included getting involved with networks of ICT professionals, governments and universities to develop common definitions of what talent they need and how to improve school curriculum to ensure graduates are offered the appropriate training to become future business leaders.

European policy makers are increasingly aware of the importance of building the e-skills of the general population and are introducing policies to foster the e-skills of all citizens. According to Jørgen Abild Andersen, Director General Telecom at Danish Business Authority and Chairman of the Information, Computer and Communications Policy Committee at OECD, "When we improve the skills of the population, we also create demand for digital services

Key Implications for Policy Makers (Cont.)

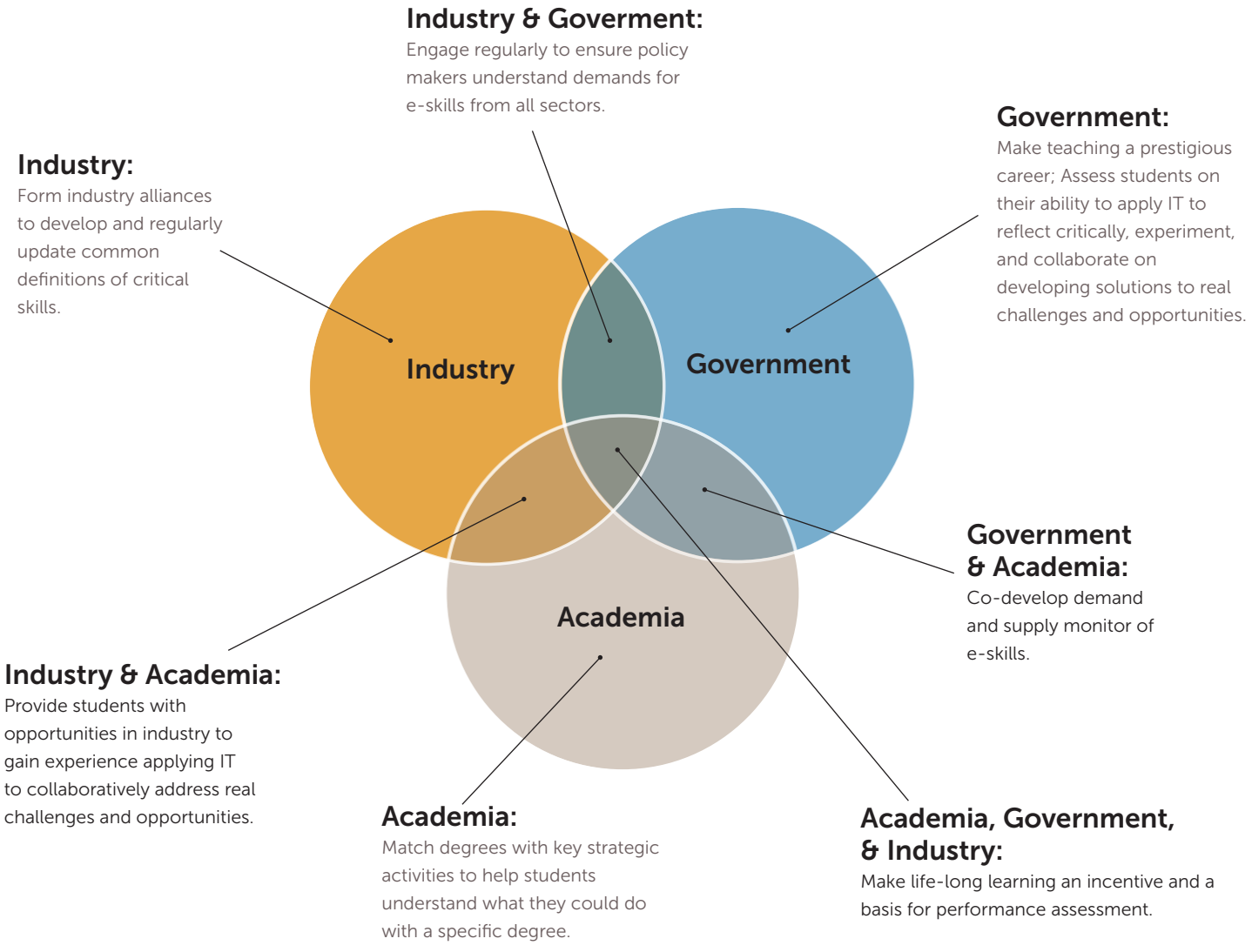
with all the benefits that they bring with them. For example, ICT-skills are necessary for the population to use e-government services. Recently, a critical mass of business and political leaders across Europe have publically argued for the strategic value of e-skills. Moreover, a growing number of organizations have been calling for funding and initiatives to strengthen the supply of e-skills as a fundamental part of efforts to strengthen operations, innovation and competitiveness. On 19 April 2012, for example, at the European Chief Information Officer of the Year Awards ceremony in Brussels, EU Commission Vice President Neelie Kroes, responsible for the Digital Agenda, launched a "Grand Coalition of ICT Jobs." Noting that growing demand for e-skills is not being met by supply, Commissioner Kroes called for leaders from business, government and education to work together to "map out the ICT skills we need: and ensure we can fill them."

To synchronize e-skills building efforts in the EU and implement the recommendations of the European e-Skills Forum, the EU Commission supported the development of the e-CF in coordination with a wide variety of ICT stakeholders. The aim of the framework is to establish a common understanding for ICT competences in Europe. It articulates the knowledge, skills and competences as needed and applied in the ICT workplace and that can be used by the public sector, including educational and social partners. In particular, the European e-Competence Framework provides a reference point for ICT users in order to develop their general skills and for managers in the industry to use in long-term strategy planning.

E-skills are also viewed as a critical ingredient for reducing unemployment – especially youth unemployment. At the 10th annual European Business Summit, held on 26 and 26 April 2012 and dedicated to "Skills for Growth," José Manuel Barroso, President, European Commission, noted that fostering new skills is a key pillar of Europe 2020, Europe's growth and jobs strategy. To this end, over EUR 76 billion of the European Social Fund have been allocated to promote awareness of the value of e-skills.

The EU hosts the annual European e-Skills Week. Several policy experts applauded the success of e-Skills Week. Antonio López-Istúriz White, for example, noted "Drawing together more than 1,800,000 participants across the EU and beyond, the European e-Skills Week events programme was delivered through a remarkable joint effort by industry, education and training institutions, governments, public entities, associations and NGOs.

Figure 14: Building future IT-enabled leaders is the shared responsibility of multiple stakeholder groups.
Source: Fonstad and Lanvin (2010). Strengthening e-Skills for Innovation in Europe. European Union.



Next Steps

To remain relevant and competitive in today's digital economy, most firms have no choice but to invest in information and communication technologies. As they do, organizations must also figure out what it takes to take control of technology – both in terms of what it takes to enhance performance with technology and what it takes to mitigate any risks from their growing uses of and dependencies on technology. In the process, it is easy to focus on all that is changing and lose sight of what remains constant. The insights from this research are intended to help business leaders, policy experts, and academics learn about what critical success factors are really new and which remain constant.

For business leaders and policy experts, recommended next steps are described in dedicated sections in the preceding pages.

For academics, the findings offer important new areas for future research. With the collection of additional data, two related research questions to explore in greater detail immediately come to mind:

- How are firms achieving and sustaining strong key business enablers that complement investments in technology?
- Are there significant differences by sector and by region – especially when considering an even broader set of geographic areas (e.g., Latin America) and sectors?

INSEAD eLab looks forward to feedback from and discussions with business leaders, policy experts, and academics on these important topics, and in the process, to helping organizations and countries excel with technology.

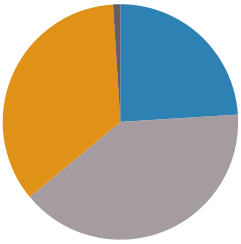
Appendix

About this research

This research was based on data from over 225 surveys completed by ICT leaders representing firms from North America, Europe and the Asia-Pacific region and from a variety of industrial sectors. The survey was administered with the support of GLG Research.

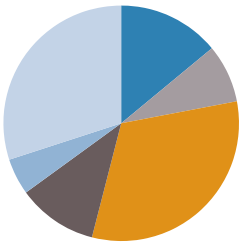
Each completed survey was tested to ensure high quality of responses. For example, if a firm said that for all 3 time periods, they spent 100% of their ICT budget on application development, then that firm was discarded. The results in this report are based on the cleaned set of completed surveys. Please note, for specific questions and analyses, the sample size will vary as not all participating firms qualified (e.g., not all firms invested in cloud-based services).

Figure A1 : Participating firms distributed across three regions



North America	24%
Europe	40%
Asia-Pacific	35%
Other	1%

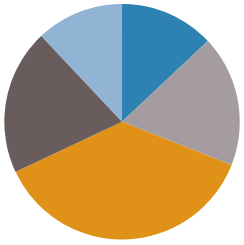
Figure A2 : Results are derived primarily from large firms



Less than 250 employee	13%
250-999 employees	18%
1,000 – 9,999 employees	37%
10,000 – 49,999 employees	20%
> 50,000 employees	12%

Most participants (87%) represent large firms (i.e., firms with 250 or more employees). About a third of participating firms (32%) represent firms with 10,000 or more employees.

Figure A3 : Overall, participating ICT leaders represent a variety of sectors, particularly ICT services (32%)



Finance and insurance activities	14%
Human health services	8%
ICT services	32%
Manufacturing	11%
Wholesale and retail trade	5%
Other	30%

Overview

In an effort to use information and communication technologies (ICT) to enhance performance and competitiveness, firms have at their disposal an overwhelming and ever-expanding set of options with regards to what technology to invest in and what enablers to strengthen in order to make sure they get value from their investments in technology. How do high-performing firms distinguish themselves in terms of their investments in technology and key enablers? This report aims to help business executives focus on what matters most by presenting research findings developed by INSEAD eLab. The research, produced in collaboration with AT&T, involved the collection and analysis of survey data from over 225 ICT leaders from North America, Europe and the Asia-Pacific region. The report consists of research findings that identify what investments in technology (such as cloud-based services, mobility, and unified communications and collaboration platforms) and what key business enablers distinguish high-performing firms. INSEAD eLab researchers have found that high investors with strong business enablers, such as sufficient business involvement in technology investment and management decisions, access to both management-focused and technology-focused talent, and most important, a mature digitized platform, increase significantly the likelihood of high performance. In contrast, high investors with weak business enablers risk wasting their investments in technology; on average, they perform no better than low investors. The report also profiles companies which are using technology to achieve significant business value as well as policy makers who support organizations to that end.

About INSEAD eLab

As one of the world's leading and largest graduate business schools, INSEAD brings together people, cultures and ideas from around the world to change lives and transform organizations. INSEAD eLab is INSEAD's center of excellence in the global digital economy. A key objective of INSEAD eLab is to strengthen links across academia, business leaders and policy makers by:

1. Drawing on a variety of global resources to develop research insights that are academically rigorous and relevant to private and public sector leaders; and
2. Providing leaders with regular opportunities to learn from each other and collaborate more effectively.

Information on INSEAD eLab including research reports, can be found at: www.insead.edu/elab

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