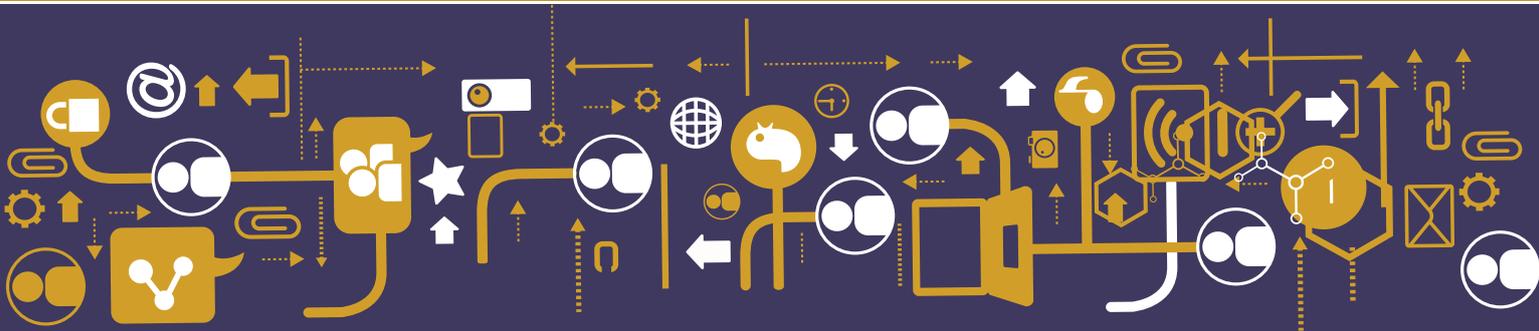




# ICT Report

ICT Investments in the  
Kingdom of Saudi Arabia





# CITC Publications 2015

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# Table of Contents

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<b>EXECUTIVE SUMMARY</b>	6
<b>1 ICT INVESTMENT LANDSCAPE IN SAUDI ARABIA</b>	9
1.1 THE IMPORTANCE OF A THRIVING ICT INVESTMENT LANDSCAPE	9
1.2 SAUDI ARABIAN ICT INVESTMENT TRENDS	9
<b>2 ICT INVESTMENTS AND THE DIRECT ECONOMIC CONTRIBUTION OF THE ICT SECTOR</b>	15
2.1 ICT SPENDING AND ICT INVESTMENT IN SAUDI ARABIA	15
2.2 DIRECT ECONOMIC CONTRIBUTION OF THE ICT SECTOR	18
<b>3 ICT INVESTMENT DRIVERS AND OPPORTUNITIES FOR FURTHER IMPROVEMENT</b>	19
3.1 LEADING ICT INVESTMENT DRIVERS	19
3.2 OPPORTUNITIES FOR FURTHER IMPROVEMENT	21
<b>4 FUTURE OUTLOOK</b>	24
4.1 THE SHIFT TO 3RD PLATFORM TECHNOLOGIES	24
4.2 THIRD PLATFORM TECHNOLOGIES SPENDING GROWTH IN SAUDI ARABIA	25
<b>5 AFTERWORD</b>	27
<b>APPENDICES</b>	28
APPENDIX A: METHODOLOGY	28
APPENDIX B: DEFINITIONS	29
APPENDIX C: ABBREVIATIONS	30



## EXECUTIVE SUMMARY

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The Kingdom of Saudi Arabia, already the 19th largest economy globally<sup>1</sup>, is in the midst of a period of strong economic expansion and is pushing to diversify its predominantly oil-based economy. In recognition of the transformational nature of information and communications technology (ICT), Saudi Arabia has placed great importance on diffusing technologies throughout the nation—across the public and private sectors and civil society. Indeed, one of the Kingdom’s strategic objectives as per its Ninth Economic Development Plan (2010–2014) is to evolve into a ‘knowledge economy’ in which ICT forms a necessary component.<sup>2</sup> The growing economy of the Kingdom requires well-directed investments into ICT if such an objective is to be attained.

This report provides key insights on the current ICT investment landscape, including leading drivers and opportunities for further improvement. In addition, it provides estimates for three widely accepted metrics that measure the impact of the ICT sector on the economy. These are ICT spending, ICT investment, and the ICT sector’s Gross Value Added (GVA). Finally, it presents an outlook of emerging technologies that will shape ICT investments in the country in the future.

The findings of the report are based on the research conducted by the Communications and Information Technology Commission (CITC) and includes surveys and in-depth interviews with over 430 Saudi companies, government entities, non-governmental organizations, and other stakeholders, as well as information from various secondary sources.

The key findings of the report are summarized below:

### **ICT Investment Landscape in Saudi Arabia**

- More than half of the Kingdom’s largest organizations have cited plans to further increase ICT budgets. This points to a healthy environment for ICT investment in the Kingdom. Among Saudi organizations, key strategic aims for ICT investments include

<sup>1</sup> World Bank, World Development Indicators, 2013.

<sup>2</sup> Saudi Ministry of Economy and Planning, Ninth Economic Development Plan (2010–2014), 2010.

improving operational efficiency, ramping up innovation, improving the alignment of ICT with business needs, skills development, and customer relationship enhancement. ICT investments have been increasing accordingly in the recent past based on these strategic aims.

- The specific technology initiatives being prioritized as investment targets by organizations in Saudi Arabia include datacenter build out, consolidation, and modernization projects—some of which make use of virtualization and cloud computing technologies, mobilization of enterprise applications, management of mobile devices/applications, and mobile security solutions, business intelligence and reporting tools, third-party delivered and managed services, enterprise resource planning (ERP) and customer relationship management (CRM) software, advanced security solutions, unified communications and collaboration (UC&C) platforms, and social enterprise technology, among others.

### **Economic Impact of the ICT Sector and its Measurement**

- The key metrics that provide a measure of the impact and vibrancy of the ICT sector in the Kingdom are ICT spending, ICT investments, and ICT gross value added (GVA).

- Saudi Arabia's ICT spending in 2014 totaled SAR 111.98 billion.<sup>3</sup> During the year, telecommunications services and hardware accounted for 65% and 23% of ICT spending, respectively, IT services for 8%, and software for the remaining 4%. Saudi Arabia is by far the largest ICT spender in the GCC; the Kingdom's 2014 ICT spending is larger than all other GCC nations combined.<sup>4</sup>

- In 2014, ICT investments in the Kingdom totaled SAR 17.83 billion. Packaged and in-house developed software accounted for the greatest share of ICT investments, at approximately 47%, totaling SAR 8.39 billion. This was followed by IT equipment investments at 26% share totaling SAR 4.58 billion. Communications equipment, totaling SAR 4.86 billion, made up the remaining 27% of ICT investments.<sup>5</sup>

- In 2014, the gross value added (GVA) of the Saudi ICT sector was estimated to be SAR 26.57 billion. The telecommunications sector accounted for 76% of the GVA, followed by the IT services sector at 12%. Hardware and packaged software, meanwhile, respectively accounted for 9% and 3% of Saudi Arabia's ICT GVA in 2014.<sup>6</sup>

### **Drivers for ICT Investments and Opportunities for Further Improvement**

- Among the key drivers for ICT investments in Saudi Arabia are: a strong economy, high political stability, a youthful population, and national policies that emphasize economic diversification. ICT investments in the Kingdom are also spurred by growing foreign direct investment (FDI) inflows, an expanding ecosystem of institutions that support ICT innovation and entrepreneurship, a thriving telecommunications sector and a vibrant IT services industry. Other factors supportive of the ICT investment environment include: widespread smart device adoption, expanding Internet usage and online engagement, growing scientific research and focus on intellectual property creation, and the consolidation of e-government services delivery under Yesser, to name a few more.

<sup>3</sup> CITC ICT Indicators Report, End of Q4 2014

<sup>4</sup> IDC Blackbook, Q3 2014

<sup>5</sup> CITC analysis

<sup>6</sup> Ibid.

- Some areas where additional focus could be provided in order to further improve ICT investment include: boosting access to highly-skilled technical and management staff, developing the ICT maturity of small- and medium-sized businesses (SMBs), fostering entrepreneurship and enabling access to financing, and facilitating greater coordination among key players in the ICT sector.

### **Future Outlook: The Shift to 3rd Platform Technologies**

• CITC envisages an even more central role for ICT within the Kingdom in the coming years, guided by visionary national policies, and evidenced by the increasing automation of industrial processes and government services, a steady expansion of the Kingdom's ICT sector, the greater intertwining and embedding of various technologies into national infrastructure, and the wider adoption of IP-enabled devices among the wider population, among many other stimulatory developments.

• As is the case globally, Saudi Arabia's ICT industry is experiencing a phase of 'technology hyper-disruption' driven by a select number of key technologies collectively known as '3rd Platform' technologies. ICT industry pundits expect that these technologies—cloud computing, mobility, big data and analytics, and social business/media—will form the base for the next wave of ICT investments in the Kingdom. Of these transformative technologies, it is expected that mobility and cloud computing will represent the strongest future ICT investment areas in the Kingdom.



# 1 ICT INVESTMENT LANDSCAPE IN SAUDI ARABIA

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## 1.1 THE IMPORTANCE OF A THRIVING ICT INVESTMENT LANDSCAPE

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Investments in information and communications technologies (ICT) have the potential to impact an economy in multiple ways. In government and private sector organizations, ICT investments lead to deepening of capital, and improvements in operational efficiency and labor productivity. Investments in national ICT infrastructure such as telecommunications networks enhances competitiveness of industries. The government's ICT investments in areas such as e-government services contribute to better citizen services and improve standards of living. Furthermore, investments can also provide platforms for innovation and new enterprise formation, which can contribute to employment creation.

Given such prospective benefits it is not surprising then that governments, including Saudi Arabia's, are actively seeking to create an environment conducive to ICT investment. Clearly stated within the goals of Saudi Arabia's 9th Development Plan (2010–2014) is the aim to “continue the Kingdom's efforts in laying the foundations of a knowledge economy that can keep pace with, attract, and adopt developments of knowledge and technology worldwide.”<sup>7</sup>

This chapter outlines key trends relating to the Saudi Arabian ICT investment landscape.

## 1.2 SAUDI ARABIAN ICT INVESTMENT TRENDS

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### **ICT Investment Expectations**

The adoption and usage of ICT in Saudi Arabia has continued to witness tremendous growth. The Kingdom's strong economic growth is driving increased business activity and investment inflows, amid continued national infrastructure build-out, and government service footprint expansion. As part of the drive to diversify the economy, a number of key initiatives are being pursued, including the development of economic cities, a major expansion of transport infrastructure across the country, and the transformation of the education and healthcare sectors. The Saudi government attaches great importance to ICT development and the recent years have seen an unprecedented commitment on the part of the government to achieving international leadership in the provision of electronic services. Currently, there is substantial focus on the implementation of the second stage of the Saudi e-government initiative, and many government entities are planning to integrate their electronic services portfolios with Yesser, the national e-government authority.

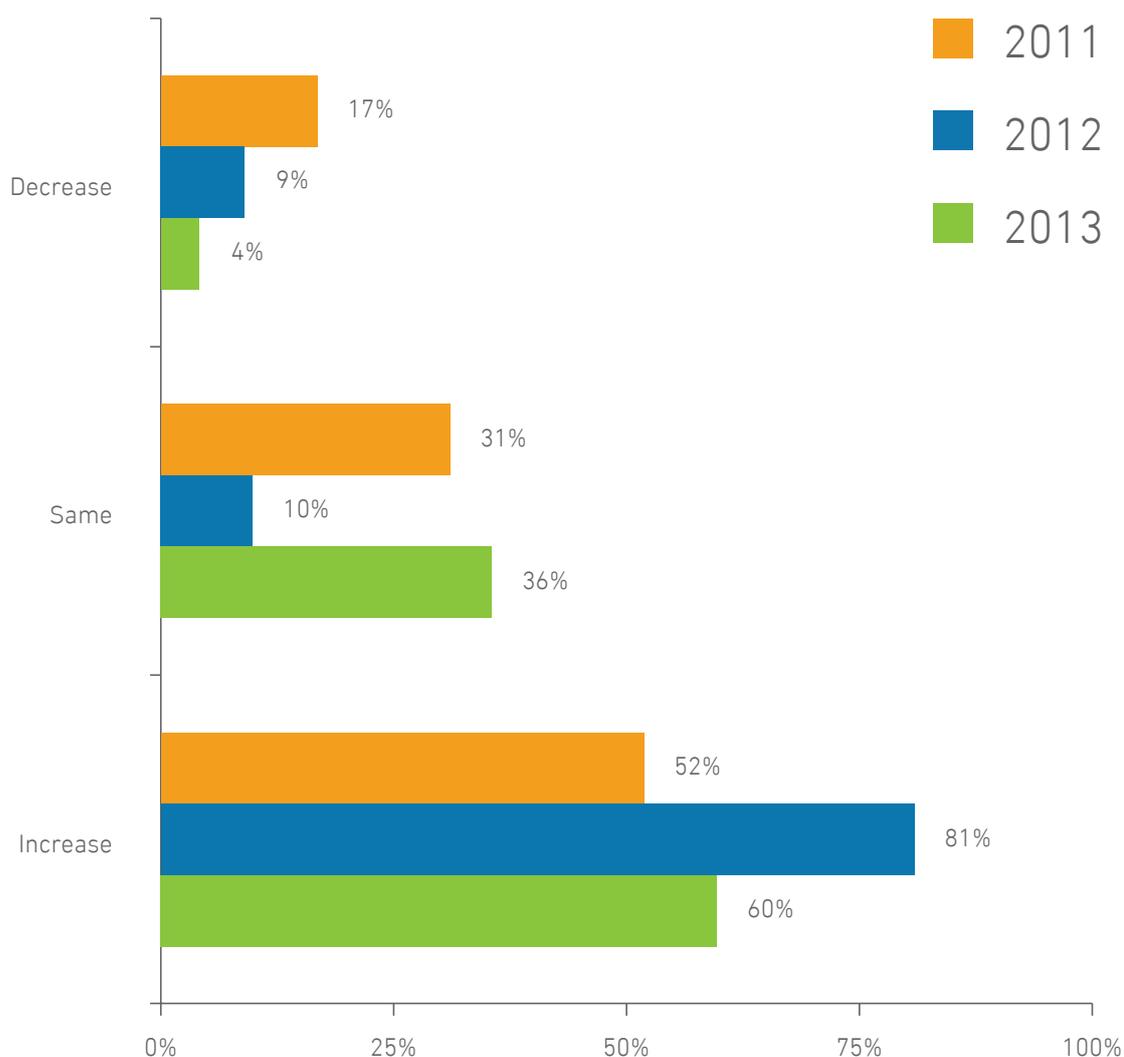
The ICT sector itself has developed rapidly, thanks to increased investments among businesses and the government, as well as growing consumer spending on ICT devices and services. For instance, CITC data indicate that Saudi consumer demand for wireless

<sup>7</sup> Saudi Ministry of Economy and Planning, Ninth Economic Development Plan (2010–2014), 2010.

connectivity and mobile broadband have skyrocketed. Mobile broadband penetration has surged from 9.7% in 2010 to 94.5% in 2014.<sup>8</sup> This growth in penetration and usage was possible due to the substantial investments made by Saudi's telecommunication services providers over the years in the national telecommunications infrastructure. The providers have invested in a wide range of information technology equipment, communications equipment, and software in order to cater to the growing demand. These investments have enabled them to offer more and better services to customers and improve their average revenues per customer. At the same time, the investments have improved the overall network readiness of the Kingdom, and this in turn, has improved competitiveness.

Additionally, budget allocation for ICT among large organizations is expected to rise. More than half of the Kingdom's largest organizations say that they are witnessing increases in their ICT budgets over the past few years (Figure 1).

Figure 1: The Saudi CIO's View on the Direction of Change in Total ICT Budgets<sup>9</sup>



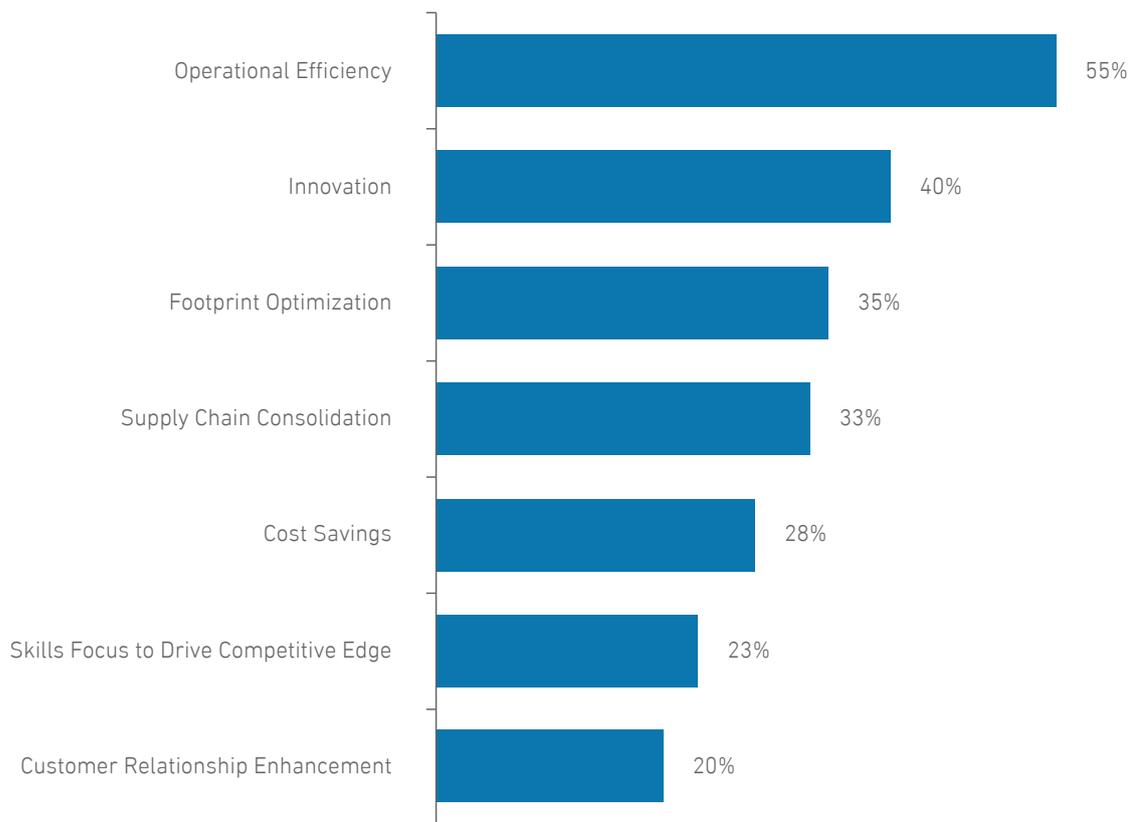
8 CITC ICT Indicators Report, End of Q4 2014

9 IDC Saudi Arabian Enterprise CIO Survey, n=49 (2013), n=74 (2012), n=55 (2011)

## Strategic Aims for ICT Investments

Improving operational efficiency and injecting greater innovation into organizations are the most oft-cited strategic aims for ICT investment for Saudi organizations. Another aim is enhancing business performance, either by expanding the physical footprint across the Kingdom, or by revamping logistics and supply chain processes. Developing skills is also a key strategic priority, as is the focus on improving the customer/citizen experience (Figure 2).

Figure 2: Strategic Aims of ICT Investments<sup>10</sup>



A large number of organizations interviewed during this study highlighted a strong push within to improve the utilization of technology to enhance operational efficiency. There is a growing understanding of the potential role of ICT as an enabler of improved productivity and efficiency, particularly within large organizations.

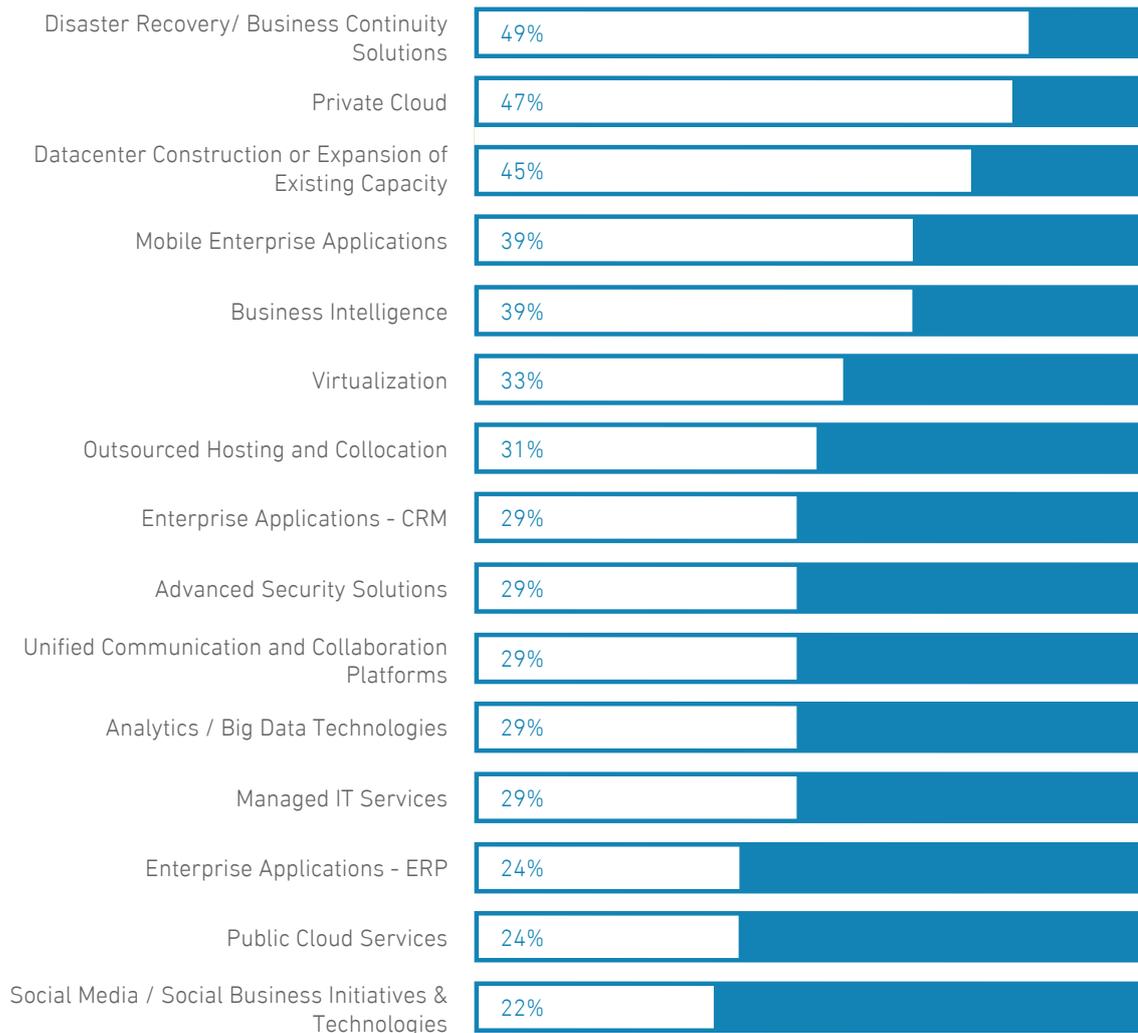
The ongoing expansion in business operations within the private sector—as in the case of banks launching new retail branches—and the public sector—as in the launch of new government services or the optimization of existing ones—is stretching the capacity of the ICT departments to not just ‘do more with less’ but also to innovate and ‘do new with less’. Many Saudi organizations intend to improve the alignment of ICT with their strategic operational needs. This is leading to investments in a wide range of ICT solutions such as virtualization, business continuity and disaster recovery technologies, enterprise application software, mobility solutions, and IT security, among others. Many organizations are also focusing on building their ICT skills through recruiting, and training and development.

<sup>10</sup> 2014 CITC Saudi Arabia ICT Workforce Skills Survey, n=160

## ICT Investment Targets

ICT decision makers in Saudi Arabian organizations often cite datacenter, business continuity/disaster recovery, and private cloud computing as the most important areas of ICT investment. They also place a high priority on mobile enterprise applications, business intelligence, virtualization, and hosting and collocation services, among others (Figure 3).

*Figure 3: ICT Technologies, Solutions, and Services Being Considered for Investment (percentage of respondents)<sup>11</sup>*



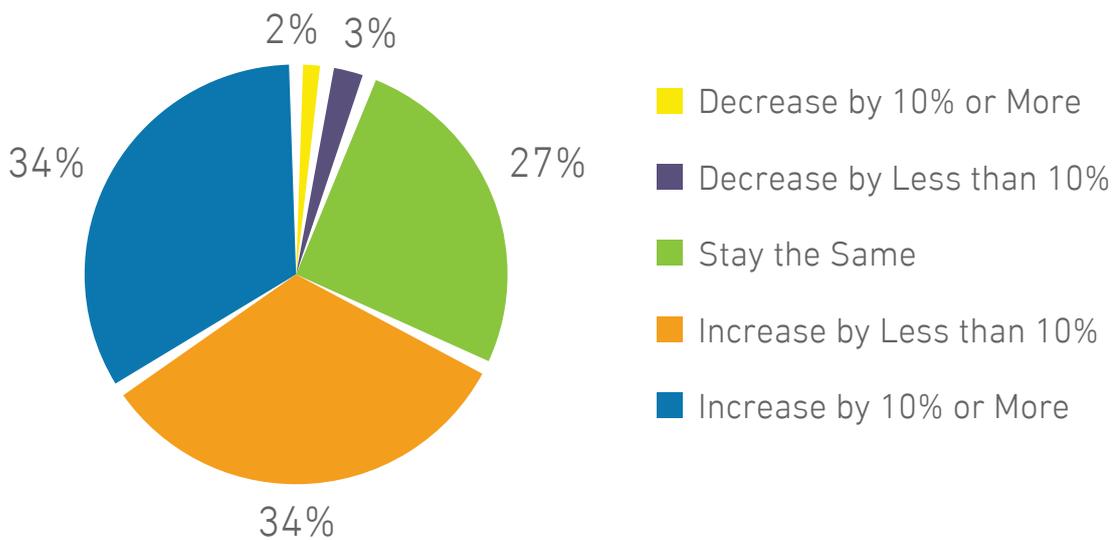
A wide range of large organizations, from financial institutions and government entities, to energy companies and telecommunications service providers, are looking to invest in improving the resiliency and robustness of ICT infrastructure. In some cases these investments will be directed towards establishing or upgrading the capabilities of datacenters or implementing disaster recovery capabilities, while in others it might involve the consolidation of distributed or disparate infrastructure. While many organizations are still evaluating the adoption of virtualization solutions, those that have successfully implemented them are now ready to invest in cloud computing infrastructure, focusing mainly on the private cloud model.

<sup>11</sup> 2013 IDC Saudi Arabian Enterprise CIO Survey, n=49

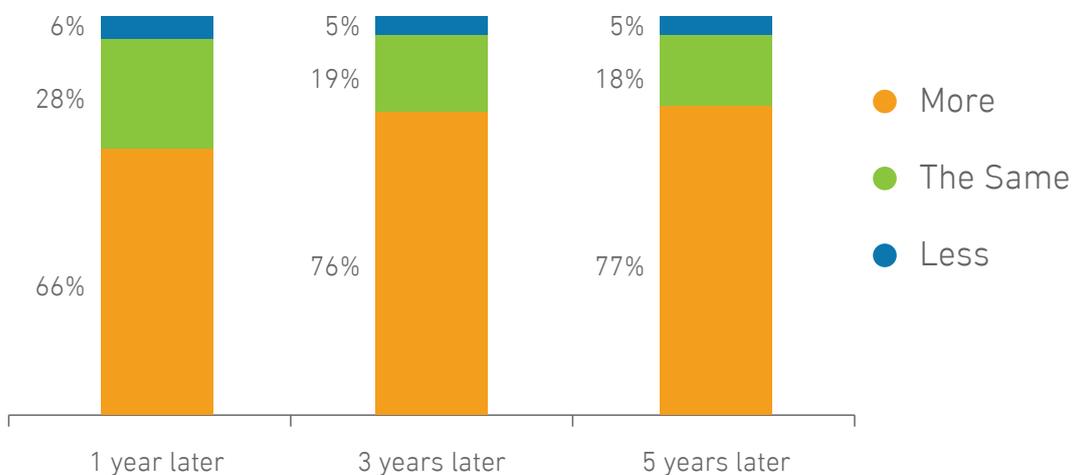
Enterprise mobility is also expected to be a top-of-mind investment priority for many organizations in both the public and private sectors. A large majority of ICT decision makers expect to see an increase in the proportion of their mobile workforce within the next 12 to 18 months, and are therefore making plans to increase their organizations' ICT budget allocations for wireless and mobile solutions over the coming years (Figure 4).

Figure 4: The Expected Surge in Enterprise Mobility Investments<sup>12</sup>

**Do you expect your organization's current mobile workforce to increase in size over the next 12 - 18 months?**



**Does your organization plan to spend more, less, or the same on wireless or mobile in the next one, three, and five years?**

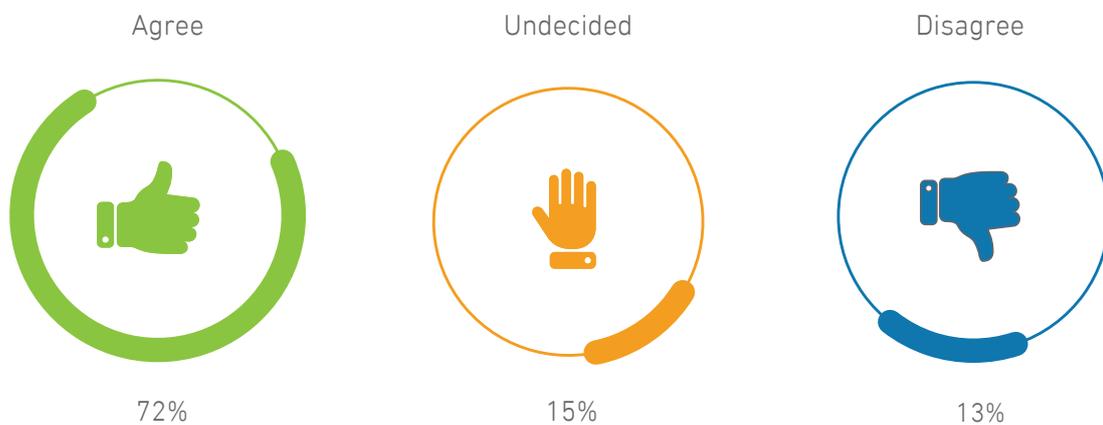


<sup>12</sup> IDC Enterprise Mobility Trends and Priorities in Saudi Arabia: 2013 Survey Results, n=91; Note: Mobile workers are defined as those individuals who spend at least 20% of their work time away from primary workplaces.

Many organizations also have the intention of ramping up their investments in business intelligence and reporting tools, including those with query reporting, advanced analytics, spatial information analytics, content analysis, and enhanced dashboard customization capabilities (Figure 5). The demand for enterprise resource planning (ERP) and customer relationship management (CRM) software is also anticipated to grow further among large enterprises due to the expansion of business requirements and the need for additional licenses. Increasing adoption of ERP and CRM solutions among small- and medium-sized businesses (SMBs) will spur demand even further.

*Figure 5: Increasing Need for Real-Time Data Access Driving Demand for Business Intelligence Technology Solutions<sup>13</sup>*

**Do you agree or disagree with the following statement?  
 “Business and departmental heads are seeking real time access to intelligent data and this is driving our business analytics strategy and investments”**



Furthermore, organizations in the Kingdom are looking to adopt unified communications, collaboration, and enterprise social technologies. Investment areas include the replacement of legacy private branch exchanges (PBXs) with IP PBX platforms. With regard to unified communications and collaboration (UC&C) technologies, there has been a rise in investments in multitenant IP Centrex and dedicated hosted IP PBX. Adoption of enterprise IP-based voice technologies drives the rapid adoption of other UC&C technologies, with a focus on mobility, business process integration, videoconferencing equipment, social enterprise software, and collaborative applications in general.

The frequency and sophistication of ICT security attacks, compounded by the emergence of advanced persistent threats, are only expected to increase globally. Organizations in the Kingdom are therefore looking to adopt advanced security and vulnerability management solutions that can give them an end-to-end view of the integrity of their network and other information assets. The key areas of investment include network monitoring solutions, vulnerability scanning, and event management solutions.

The exponential growth in the demand for ICT infrastructure such as server space, storage, and computing capacity is forcing some to consider outsourcing. Owing to the increasing operational requirements and difficulties in gaining access to the necessary skills, organizations are evaluating the services of third-party ICT service providers for the management of their ICT operations. They are also looking to host various applications or co-locate servers with datacenter services providers.

<sup>13</sup> 2013 IDC Saudi Arabian Enterprise CIO Survey, n=49

## 2 ICT INVESTMENTS AND THE DIRECT ECONOMIC CONTRIBUTION OF THE ICT SECTOR

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Investments in ICT have helped to drive improvements in national labor productivity, and thereby boost economic growth. Research by the World Bank found that a ten-percentage-point increase in broadband Internet penetration rates led to a corresponding increase of 1.21 percentage points in average annual Gross Domestic Product (GDP) growth rates for developed countries, and an increase of 1.38 percentage points for low and middle income countries.<sup>14</sup> Likewise, studies by reputable institutions such as the Brookings Institution, Ohio University, University of Munich, and the Imperial College of London have all noted a positive multiplier effect of ICT investment on GDP growth.<sup>15</sup>

In recognition of this transformational nature of ICT, Saudi Arabia has placed great importance on the diffusion of ICT across various sectors of the economy. As such, it is essential to measure the level of ICT spending and investment in the country. To quote the renowned performance-improvement guru H. James Harrington, “Measurement is the first step that leads to control and eventually to improvement. If you cannot measure something, you cannot understand it. If you cannot understand it, you cannot control it. If you cannot control it, you cannot improve it.”

ICT spending encompasses external expenditure by individuals, government and businesses on ICT hardware, packaged software, and telecommunications and IT services.<sup>16</sup> ICT investments are a subset of ICT spending that factor into gross fixed capital formation. ICT investments include acquisition of information technology equipment, communications equipment, and software by organizations—but not by individuals and households—provided such technology is used in production for more than one year and can be physically isolated.<sup>17</sup> It is true that investing in something implies spending money on it; however, the measurement of ICT investment assumes that such expenditures are being made with a higher purpose or an expectation of a return.

In addition to ICT spending and ICT investment, a third metric that is widely used to measure the impact and vibrancy of the ICT sector is the ICT gross value added (GVA). The GVA indicates the ICT sector’s contribution to the economy.<sup>18</sup>

### 2.1 ICT SPENDING AND ICT INVESTMENT IN SAUDI ARABIA

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#### ICT Spending

ICT spending encompasses expenditure by consumers, as well as public and private organizations on all ICT hardware, packaged software, and telecommunication and IT services.<sup>19</sup> In all, ICT spending in Saudi Arabia totaled SAR 111.98 billion in 2014, effectively making the Kingdom the largest ICT spending nation within the Gulf Cooperation Council (GCC) — and larger than all other GCC countries combined (Figure 6).

<sup>14</sup> World Bank, Information and Communications for Development: Extending Reach and Increasing Impact, 2009.

<sup>15</sup> International Telecommunications Union, Impact of Broadband on the Economy, 2012.

<sup>16</sup> IDC Blackbook, Q3 2014

<sup>17</sup> OECD Factbook, Economic, Environmental and Social Statistics, 2013.

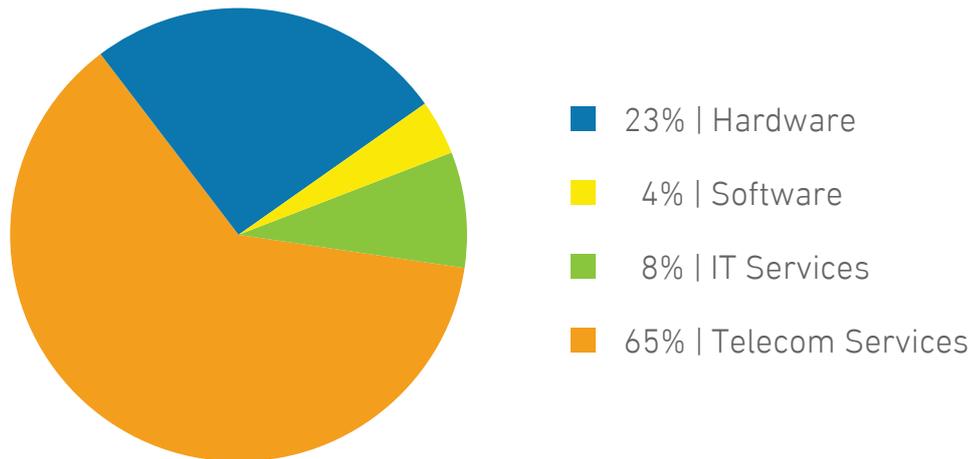
<sup>18</sup> OECD Factbook: Economic, Environmental and Social Statistics, 2011.

<sup>19</sup> IDC Blackbook, Q3 2014

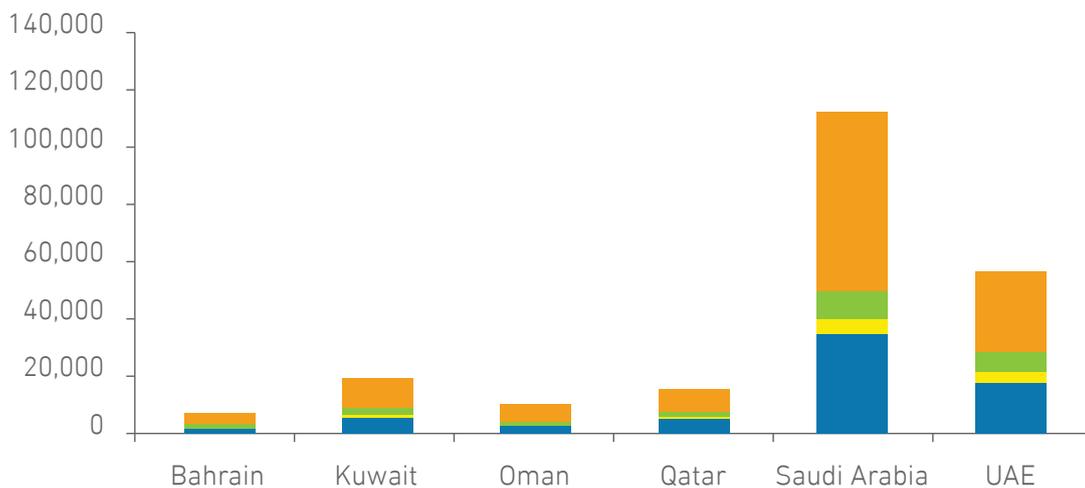
Of this, telecommunications services and hardware accounted for 65% and 23% of ICT spending, respectively, while IT services accounted for 8%, and packaged software for the remaining 4%. As such, it can be said that ICT spending in the Kingdom is currently characterized by relatively heavy spending on telecommunications services and hardware, and comparatively lower spending on packaged software and IT services.

Figure 6: 2014 ICT Spending in Saudi Arabia<sup>20</sup>

**ICT Spending in Saudi Arabia by Technology, 2014 (Total = SAR 111.98 Billion)**



**2014 ICT Spending in GCC Countries (In SAR Millions)**



**ICT Investment**

As per the Organization for Economic Co-operation and Development's (OECD) definition, ICT investments have three components: Information technology equipment (computers and related hardware), communications equipment, and software, which include the acquisition of packaged software, customized software, and in-house developed software. Such equipment and software are considered to be investments if they are used in production for more than one year. Expenditure on ICT is considered to be an investment only if the products can be physically isolated. Accordingly, ICT that is embedded within equipment is not considered to be an investment but rather an intermediate consumption. ICT investment accounts for acquisition by the public and private sectors, but excludes any acquisition by the household/consumer segment.<sup>21</sup>

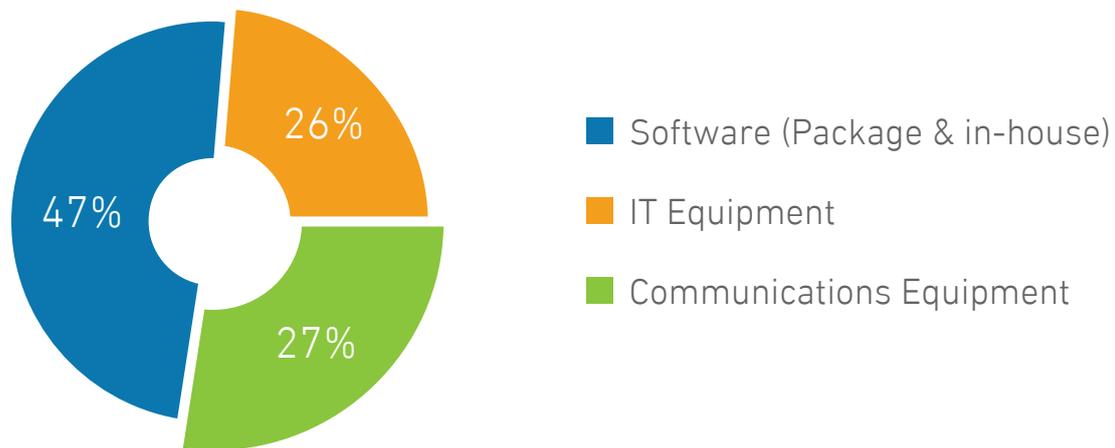
<sup>20</sup> CITC ICT Indicators Report, End of Q4 2014, and IDC Blackbook, Q3 2014

<sup>21</sup> OECD Factbook, Economic, Environmental and Social Statistics, 2013

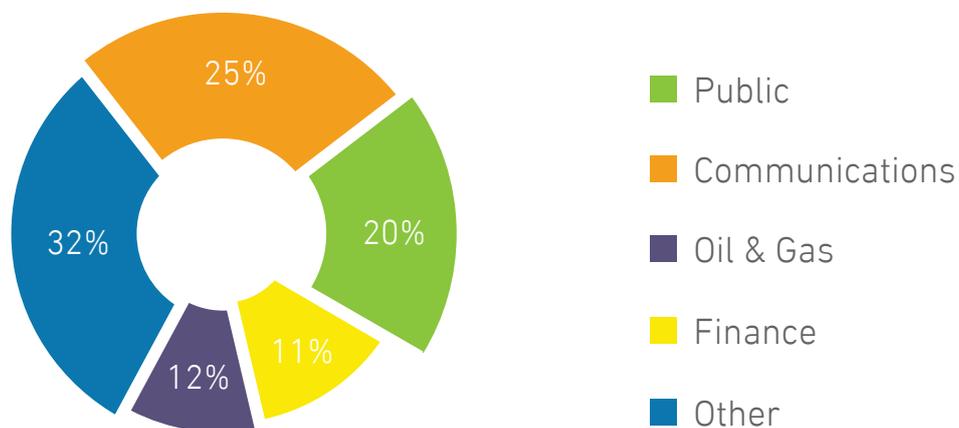
CITC has isolated those portions of ICT expenditure related to ICT investments as per the OECD's categorization. In 2014, ICT investments in the Kingdom totaled SAR 17.83 billion. Packaged and in-house software accounted for the greatest share of total ICT investments, at approximately 47% totaling SAR 8.39 billion. This was followed by IT equipment investments at 26%, totaling SAR 4.58 billion. Communications equipment, totaling SAR 4.86 billion, made up the remaining 27% of ICT investments in the Kingdom during 2014. In 2014, the largest industry sectors investing in ICT within the Kingdom were the communications services sector (25%), the combined public sector—made up of central and local government, education, and healthcare verticals—(20%), the oil and gas sector (12%), and the finance sector (11%). Combined, these industry sectors accounted for over two-thirds of all ICT investments made in Saudi Arabia during 2014 (Figure 7). In 2014, overall local ICT investments amounted to SAR 618.45 per capita.<sup>22</sup>

Figure 7: 2014 ICT Investments in Saudi Arabia by Technology and Industry Vertical<sup>23</sup>

**ICT Investments in Saudi Arabia by Technology, 2014  
(Total = SAR 17.83 Billion)**



**ICT Investments in Saudi Arabia by Industry Vertical, 2014  
(Total = SAR 17.83 Billion)**



<sup>22</sup> IDC Blackbook, Q3 2014, and World Bank Data Indicators. 2014.

<sup>23</sup> CITC analysis

## 2.2 DIRECT ECONOMIC CONTRIBUTION OF THE ICT SECTOR

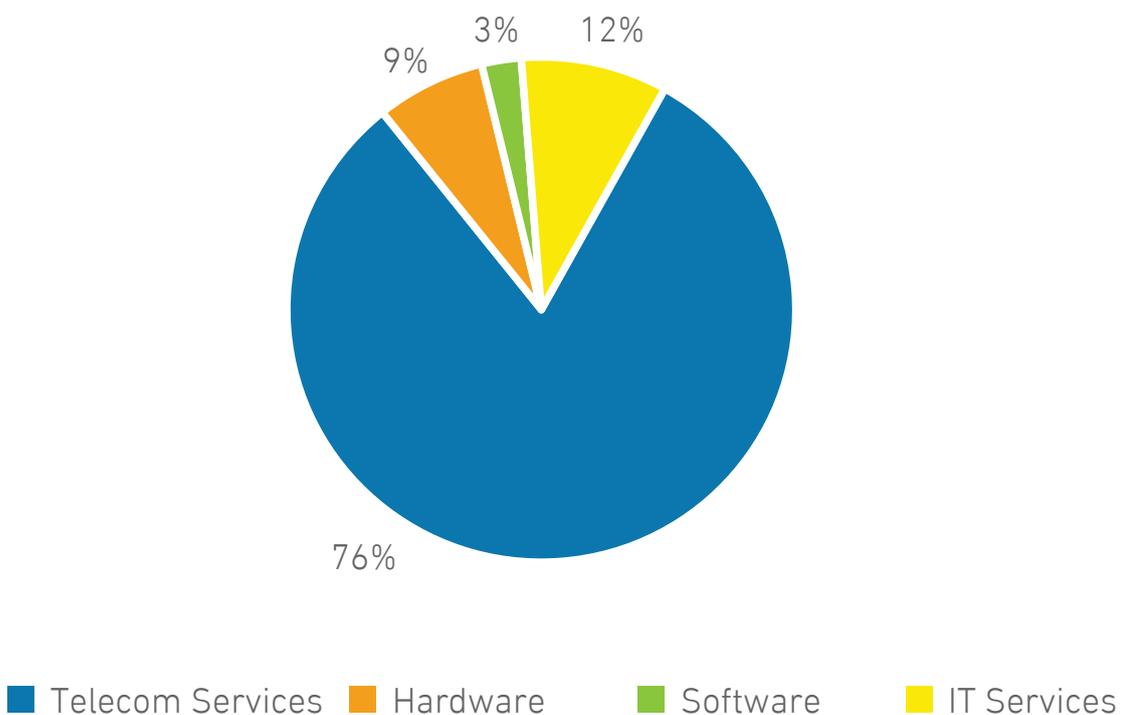
A widely utilized and standardized metric that is used to determine the direct contribution of the ICT sector to the economy is its gross value added (GVA). GVA is roughly the same as GDP, but whereas GDP is the key economic metric used to measure all economic activity within a geographical area over a given period, GVA applies to the contribution of a single component sector of the economy. The main components of GVA are most clearly described by the OECD as the sum of gross operating surplus, employee compensation, and other taxes less other subsidies on production.<sup>24</sup> In essence, GVA measures the income paid to workers in the form of employee compensation, as well as the income paid to owners of its capital in the form of profits.

Accordingly, to calculate GVA, the gross operating surplus as well as the ratio of employee compensation to overall revenues for major ICT service providers and vendors in Saudi Arabia is estimated. The estimates are based on publicly available data such as annual financial statements, as well as data and estimations generated on the Kingdom's leading ICT vendors, including hardware vendors, independent software vendors, and IT services providers. Estimations of other taxation and subsidies on ICT production have been excluded from the calculation due to its limited applicability to the Kingdom.

In 2014, the GVA of the Saudi ICT sector totaled SAR 26.57 billion. The most significant contributor to ICT gross value added was the telecommunications services industry (76%), followed by the IT services industry (12%). Meanwhile hardware and software accounted for 9% and 3% of Saudi's ICT GVA in 2014, respectively (Figure 8).

Figure 8: 2014 Saudi Arabia ICT Sector Gross Value Added<sup>25</sup>

### ICT Gross Value Added (GVA) in Saudi Arabia by Technology, 2014 Total = SAR 26.57 Billion



<sup>24</sup> OECD Factbook, Economic, Environmental and Social Statistics, 2011.

<sup>25</sup> CITC analysis

# 3 ICT INVESTMENT DRIVERS AND OPPORTUNITIES FOR FURTHER IMPROVEMENT

This chapter examines the key drivers and inhibitors affecting ICT investments in the Kingdom. Drivers and inhibitors are often two sides of the same coin: if a driver is underdeveloped, it becomes an inhibitor.

## 3.1 LEADING ICT INVESTMENT DRIVERS

### Regional Economic Powerhouse with a Youthful Population

Saudi Arabia has a population in excess of 30 million people,<sup>26</sup> of which 50.6% are less than 25 years old.<sup>27</sup> It is the Middle East's largest economy and the 19th largest economy in the world.<sup>28</sup> The Kingdom holds one-quarter of the world's proven oil reserves and is also one of the fastest-growing economies worldwide, with per capita income forecast to rise from \$25,000 in 2012 to \$33,500 by 2020.<sup>29</sup> Due to its current state of expansion and a demographic profile that ensures a steady supply of new entrants into the labor force, the Saudi economy will require substantial investments in ICT going forward.

### National Policy

Various national policy documents state a need for greater integration of ICT into the economy. For instance, the National Communications and Information Technology Plan (NCITP) established seven long-term goals for the future role of ICT in the Kingdom, which include "raising the productivity of all sectors, disseminating electronic governmental services in business, social, and health, and encouragement of teleworking through the optimal utilization of ICT".<sup>30</sup> Likewise, the Kingdom's Ninth Development Plan (2010–2014) also places a strong emphasis on the need to further invest in areas that support "deepening the process of horizontal and vertical expansion of the economic base, through acceleration of growth in promising fields in non-oil production and service sectors".<sup>31</sup> The envisioned outcomes of the plan include a high-quality, safe, and reliable ICT infrastructure at reasonable cost nationwide, ensuring the security of the information of ICT users, developing the Kingdom's ICT skills base capacity, and building a national ICT industry.

### Foreign Direct Investment

As part of the Kingdom's commitment to further growing and diversifying its economy, the Saudi Arabian government continues to increase its openness to foreign investment. As of 2010, Saudi Arabia has received SAR 640 billion in Foreign Direct Investment (FDI) stock. The IT sector (i.e., excluding telecommunications services providers) accounted for 3.3%, or SAR 21.08 billion, of all FDI stock in the country.<sup>32</sup> Across all sectors, strong FDI inflows provide a positive boost to ICT investment in terms of infrastructure, software, services spending, and salaries. Moreover, foreign entities operating in the Kingdom eventually transfer skills and knowhow to the domestic market, which can stimulate ICT investments even further.

26 Saudi Arabia Central Department of Statistics and Information, Key Indicators, 2014.

27 Saudi Arabia Central Department of Statistics and Information. Key Indicators: Demographic Research Bulletin 1428, 2007.

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32 Saudi Arabian General Investment Authority, Annual Report of FDI into Saudi Arabia, 2011.

## **Liberalized Telecommunications Sector and Vibrant Competition in a Value-Added ICT Services Environment**

Significant progress has been achieved in telecommunications reform in the Kingdom, starting with the corporatization of STC in 1998. The process continues to the present day, with the issuance of two mobile virtual network operator (MVNO) licenses in 2014. The liberalization of the telecommunications market has led to a drop in tariffs and an increase in penetration rates. Riding this wave of phenomenal telecommunications growth, the Saudi Arabian telecommunications market now provides an effective platform for the delivery of value-added ICT services. The lines between different types of providers are blurring. Indeed, telecommunications operators, Internet service providers, and systems integrators are all playing in the outsourcing, managed, and datacenter services market by focusing on value-added services and becoming managed and datacenter service providers in their own right. More competition has meant more choices in the market, which is increasingly leading providers to improve their pricing models and deliver higher quality services. All these are having a positive impact on ICT investment.

## **Expanding Ecosystem of Incubators, Venture Capital Funds, and Other Supporting Institutions**

While access to business loans and financing through equity markets are still often cited as sore points by would-be entrepreneurs in the Kingdom, there has been a strong improvement in venture fund accessibility in recent years. As a reflection of this, Saudi Arabia has improved its position in the World Economic Forum's ranking of countries on venture capital availability from 38th place in 2008 to 25th in 2013.<sup>33</sup> Beyond venture capital funds, there is now also wider access to other related institutions that support the ICT investment and entrepreneurship ecosystem, including incubators, industry-specific training programs, entrepreneur clubs, and business networks.

The King Abdulaziz City for Science and Technology's (KACST) BADIR Program for Technology Incubators remains at the forefront of supporting high-potential technology entrepreneurs in the Kingdom with four fully functional incubators. BADIR (the Arabic word for 'to initiate') is now also joined by a host of other public, private, and not-for-profit entities that aim to boost access to the requisite entrepreneurship building blocks. For instance, the Saudi Industrial Development Fund launched the Kafalah program in order to encourage local commercial banks to finance potentially viable SMBs that are unable to provide the guarantees or accounting records that are typically needed to secure funding. During the fiscal year 2013, the Kafalah program approved 2,515 guarantees totaling SAR 1.28 billion.<sup>34</sup> Indeed, the ecosystem of such programs and institutions is now at a stage where there is a need to improve coordination between support efforts, increase institutional efficiency, and expand reach.

## **Widespread Smart Device Adoption and Online Engagement**

The use of smart mobile devices has become almost ubiquitous in Saudi Arabia. As per CITC's ICT Report: Mobility in Saudi Arabia 2015, 82% of mobile users have access to smart devices, and among these, 47% use both smartphones and tablets. Much like the rest of the world, smart device usage in Saudi Arabia is driven by the young tech-savvy population that has a high affinity for being connected. CITC's survey found that 91% of individuals between the ages of 15 and 35 use smart devices, compared with 56% of individuals 45 years of age and higher.<sup>35</sup> Widespread device uptake, along with 'anytime-anywhere connectivity' and access to a wide range of applications, entertainment, and

33 World Economic Forum, The Global Competitiveness Report, 2014.

34 Saudi Industrial Development Fund, Small & Medium Enterprises Loan Guarantee Program Achievements, 2014.

35 CITC ICT Report 2015: Mobility in Saudi Arabia

social interactions, are leading both the public and private sectors to initiate various investments to provide their constituents, customers, and employees with optimal online experiences that are tailored for smart devices.

### **Growing Publication of Research Literature and Patent Activity**

According to a KACST-commissioned study of literature publication and patent activity by research institutions in the Kingdom, Saudi Arabia published fewer than 1,000 research papers annually during the 1980s. This rose to about 1,500 items annually during the 1990s and remained at that level until around 2007. Since then, however, Saudi Arabia has achieved the highest percentage of growth in literature publication output during the last decade among G20 members. Its 6,978 papers in 2012 accounted for 6% world share, up from less than 2% of world output in 2000. The overall trend of academic patent activity in the Kingdom is also sharply upward, with activity increasing from a static level of between 10 and 15 new inventions annually during the 1997–2005 period to close to 120 patents by 2010.<sup>36</sup> The ICT sector internationally has continued to evolve over the years due to the ability of forward-looking organizations and individuals to harness innovation and technological patents, both in-sourced and done in collaboration with public sector research organizations, universities, and the wider industry. That R&D effort is increasingly spanning the globe and becoming more interdisciplinary, which offers countries that are rapidly increasing its patent activity, like Saudi Arabia, a means to boost ICT investments for intellectual property generation-related activities.

### **Expansionary Government Budget and e-Government Domain Leadership by Yesser**

The Saudi Arabian government has been promoting an expansionary fiscal policy to drive growth. This spending will have a knock-on effect on ICT investment in the country. Within the public sector, Yesser, the centralized guidance and management agency tasked with managing national e-government initiatives, has also contributed to increased ICT investment. From its development of a world-class shared infrastructure, namely the Government Service Bus (GSB), Government Secure Network (GSN), and the Saudi Government Portal, to its support and championing of electronic service delivery initiatives within the government, The Yesser e-Government Program has played a central role in defining a unified vision and action plan, devising a coordinated yet decentralized approach, and developing shared standards and practices to serve public sector institutions. In part due to Yesser's efforts, the Kingdom has advanced in the United Nations' international e-Government Development Index ranking, now placed 36th out of 193 countries, after being 41st in 2012, and 58th in 2010.<sup>37</sup>

## **3.2 OPPORTUNITIES FOR FURTHER IMPROVEMENT**

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### **Boosting Access to ICT skills**

As investment in ICT grows, so too does the need for specialized technical and managerial skills. Saudi Arabia's ICT sector is characterized by shortages in a number of ICT skill categories. Between 2015 and 2017, the greatest gap in terms of the availability and demand for ICT professionals is expected to lie primarily within professions such as ICT helpdesk and support staff, software and application developers, telecommunications engineers, systems engineers, and project managers.<sup>38</sup>

<sup>36</sup> King Abdulaziz City for Science and Technology, KACST-Thomson Reuters Research Performance Indicators Report, 2011.

<sup>37</sup> Nations Department of Economic and Social Affairs, United Nations e-Government Survey, 2014.

<sup>38</sup> 2014 CITC Saudi Arabia ICT Workforce Skills Survey, n=384

Although the pool of Saudi Arabian ICT professionals has steadily grown over the past decade, the gap between the supply of ICT skills and the demand for them remains wide. Results from a 2014 ICT skills study by CITC indicate that the ICT workforce in the Kingdom currently stands at approximately 165,000 skilled individuals. Over the next three years, in excess of 47,000 new ICT jobs will be created; however, not all of these positions will be filled by the over 18,000 Saudi nationals entering the ICT workforce. Over the next three years, the cumulative gap in the ICT workforce is expected to stand at approximately 29,000 individuals.<sup>39</sup> Boosting access to high-demand ICT skills is an opportunity to contribute to wider job creation, thereby improving ICT investment levels, and increasing the competitiveness of the overall economy in the long-term.

### **Encouraging Greater ICT Adoption among Small and Medium-Sized Businesses (SMBs)**

Small and medium businesses (SMBs) play an important role in the economic development of both developing and advanced countries by making significant contributions to national employment and gross domestic product (GDP). In high-income countries, for instance, SMBs account for nearly 62% of national employment and 64% of GDP. In developing countries, on the other hand, SMBs contribute to approximately 45% of employment and up to 33% of GDP.<sup>40</sup> The fact that the economic contributions of SMBs appear to increase alongside a country's development level indicates that SMBs might themselves act as a driver of economic growth.

This stands as a compelling opportunity for the Kingdom, where SMBs account for over 91% of total enterprises, and where SMBs and the rest of the private sector contribute 33% towards the Kingdom's GDP. SMB's modest contribution to GDP in Saudi Arabia could be ascribed to the immensity of the oil and public sectors, which serve as the main catalysts for economic activity.<sup>41</sup> Moreover, at present, many Saudi SMBs lag behind their larger enterprise counterparts in terms of their maturity of management and production techniques, as well as their ICT investment levels.<sup>42</sup> According to IDC, SMBs in the Kingdom accounted for 49.2% of all Saudi Arabian enterprise ICT spending in 2013.<sup>43</sup> Greater adoption of technology by SMBs into their operations can play a supporting role in increasing their productivity levels, increasing their contribution to national economic diversification, as well as further driving ICT investments in the Kingdom.

### **Further Expanding Access to Financing**

Great strides have been taken by both the private sector and the Saudi government in expanding access to finance which have proven to be beneficial to ICT investments. In particular, the Kafalah credit guarantee scheme and the greater number of angel investors and venture funds in the Kingdom have been noted as an important form of support.<sup>44</sup> Notwithstanding these gains, there is the opportunity to further increase access to financing, particularly among would-be entrepreneurs and SMBs. According to the International Monetary Fund (IMF), loans to SMBs account for just 2% of lending by banks in the Kingdom, in comparison to 5% in other GCC nations, 15% in non-GCC Middle East and North Africa (MENA) countries, and 25% in high-income OECD economies.<sup>45</sup> Among the factors contributing to limiting access to financing among ICT companies in the Kingdom are a lack of a distinct classification category for ICT-related businesses, and limited industry know-how in intellectual property evaluation—through which such entities might raise funds from potential investors or obtain loans from financial institutions.

39 Communications and Information Technology Commission, ICT Report on the State of the ICT Workforce in the Kingdom of Saudi Arabia, 2015.

40 International Finance Corporation, Knowledge Series in MENA: Issue 1, 2013.

41 Opening Speech by His Excellency the Governor of Saudi Arabian Monetary Agency Dr. Muhammad Al-Jasser to the "Small and Medium Enterprises", Symposium Organized by the Institute of Banking, 2010.

42 Based on CITC's face-to-face interviews with ICT investment industry stakeholders in Saudi Arabia, 2014

43 IDC Middle East and Africa ICT Vertical Market Tracker, Q3 2014

44 Based on CITC's face-to-face interviews with ICT investment industry stakeholders in Saudi Arabia, 2014

45 International Finance Corporation, Overcoming Constraints to SME Development in MENA Countries and Enhancing Access to Finance, 2013.

## Strengthening Coordination among Players Facilitating Increased ICT Investments

As discussed previously, there are now a growing number of ongoing programs initiated by various institutions in the Kingdom that aim to encourage greater investment in ICT. These cover a broad range of organization types, including public, private, not-for-profit, and academia, as well as various forms of assistance, including venture financing, incubation, skills training, industry networking, business development support, and the like. While each organization is trying to achieve a worthwhile initiative in its own right, there exists an opportunity to increase the levels of communication and coordination across the various initiatives for the benefit of their intended recipients and in broader support of strengthening investments into technology.



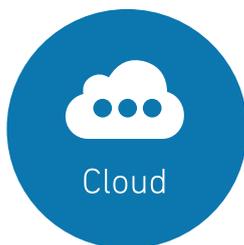
# 4 FUTURE OUTLOOK

Saudi Arabia is continuing to build upon its ICT foundations. As public and private organizations invest in a wide range of solutions to enrich the Kingdom's economy and improve the quality of life, CITC envisages an even more central role for ICT within the Saudi economy and society in the future, guided by its existing visionary national policies, and evidenced by the wider automation of industrial processes and government services, a steady expansion of the Kingdom's ICT sector, the greater intertwining and embedding of various technologies into national infrastructure, and the wider adoption of IP-enabled devices among the wider population, among many other stimulatory developments.

## 4.1 THE SHIFT TO 3RD PLATFORM TECHNOLOGIES

As with other countries around the world, Saudi Arabia's ICT industry is experiencing a phase of 'technology hyper-disruption' linked to a shift to new technology platforms built on mobility, cloud services, social technologies, machine-to-machine communications, and Big Data and analytics solutions. Even as Saudi enterprises explore the viability of these ICT solutions, collectively known as 3rd Platform technologies, ICT industry pundits expect these will eventually mature and form the base for the next wave of ICT investments.

For instance, IDC predicts that by 2020, almost half of ICT spending worldwide will be driven by 3rd Platform technologies and new solutions built on them. Today, 3rd Platform technologies and ancillary services are growing collectively at close to 15% per year worldwide - substantially higher than the 0.7% annual rate of growth of the rest of the ICT industry.<sup>46</sup> It is therefore expected that these technologies will form the core of future ICT investments.



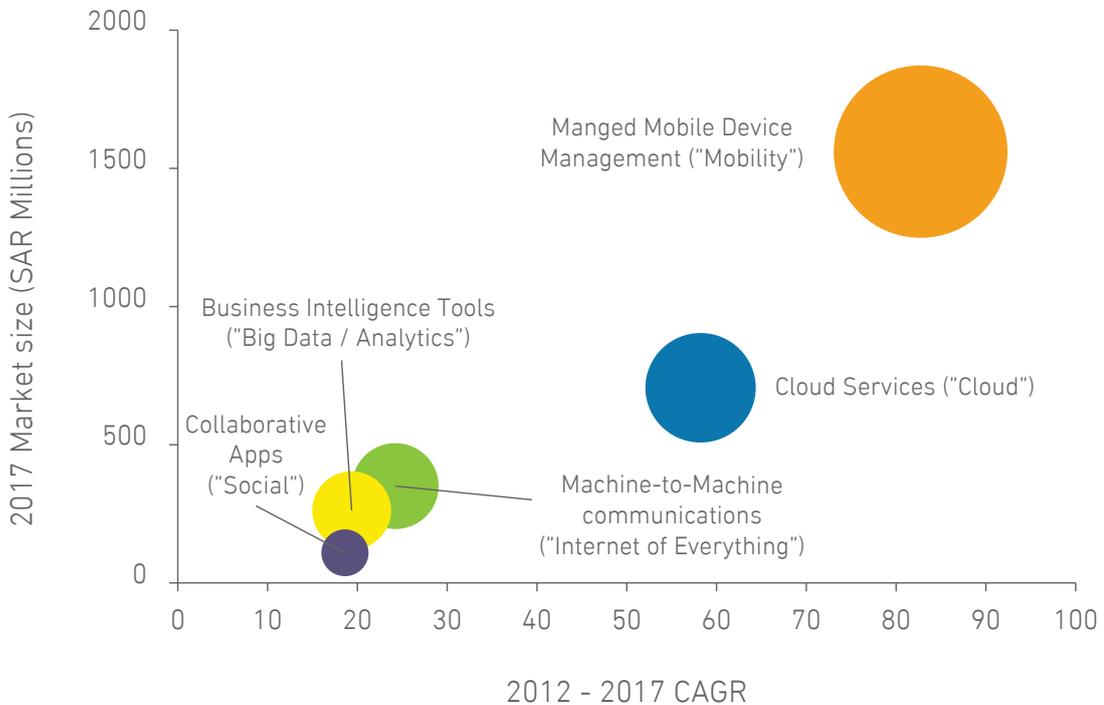
<sup>46</sup> IDC, Predictions for 2014: Battles for Dominance and Survival on the 3rd Platform, 2013.

## 4.2 THIRD PLATFORM TECHNOLOGIES SPENDING GROWTH IN SAUDI ARABIA

Based on the expected size of market spending and growth forecasts, mobility and cloud solutions—represented by mobile applications and content, mobile device management, cloud services, and machine-to-machine communications solutions—represent the strongest future 3rd Platform investment areas in the Kingdom. These technologies will be followed in terms of their growth opportunities by Big Data and analytics (represented by business intelligence tools) and, finally, social technologies (represented by collaborative applications).<sup>47</sup> Further details on these disruptive technologies are outlined below:

*Figure 9: 3rd Platform Technologies Expected to Drive Saudi Arabia's Future ICT Industry Growth<sup>48</sup>*

**Spending on Key 3<sup>rd</sup> Platform Technologies, 2012 - 2017 (in SAR Millions)**



### Mobility Solutions

Mobility technologies enable the management of mobile devices, networks, and applications, and also provide platforms for the development and mobile-enablement of applications. While enterprise mobility is largely focused on business use cases, mobility is also transforming the way consumers interact on a day-to-day basis with each other and with the government. To represent the growth opportunity expected within this domain, mobile device management (MDM) solutions, which are defined as software applications used to manage the components and requirements of mobile devices including smartphones and tablets, are expected to witness a CAGR of 82.7% between 2012 and 2017.<sup>49</sup>

<sup>47</sup> IDC, Global Software Taxonomy, 2013.

<sup>48</sup> IDC, Saudi Arabia 2012 Third Platform Technology Market Analysis and 2013–2017 Forecast, 2013.

<sup>49</sup> IDC, Managed Services Opportunity in the Kingdom of Saudi Arabia, 2012 Analysis and 2013–2017 Forecast, 2013.

## **Cloud Computing**

In simple terms, cloud services are considered to be business or consumer products, services and solutions delivered and consumed in real-time over the Internet. Cloud-based solutions are usually shared standardized services that are scalable and accessible via the Internet. They also employ usage-based pricing models and standard user interface technologies. Given the growth in end-user demand and the commensurate increase in cloud computing service provider activity, IDC forecasts strong growth for cloud services within the Kingdom, equating to a CAGR of 57.7% over the period extending through 2017.<sup>50</sup>

## **Machine-to-Machine Communications**

Machine-to-Machine communications (M2M) refers to technologies that allow both wireless and wired systems to communicate with other systems with similar capabilities. M2M is an emerging domain in the field of telecommunications. Recent research conducted by IDC within the Kingdom indicates that less than 20% of enterprises currently use M2M solutions.<sup>51</sup> However, demand for M2M applications in the domain of security/surveillance, consumer electronics control, data collection, telematics, and fleet management solutions, will contribute to an upswing in M2M spending, resulting in a CAGR of 24.0% over the forecast period extending through 2017.<sup>52</sup>

## **Big Data and Analytics**

Big data technologies can be described as technologies and architectures designed to economically extract value from very large volumes of a wide variety of data, by enabling high-velocity capture, discovery, and analysis. There is a growing demand amongst large enterprises for business intelligence solutions; with more and more devices being embedded with sensors, big data technologies will become critical to compile the information received and aid decision making and analysis. Illustrating the strong demand expected within this technology domain, business intelligence solutions demand is forecasted by IDC to increase at a CAGR of 19.3% over the period extending through 2017.<sup>53</sup>

## **Social technologies**

Social technologies include all social-driven workflows, both internal and external. It covers both social media used by organizations and enterprise social platforms. Enterprise social network adoption has increased within Saudi Arabian organizations leading to improved collaboration between employees, customers, and partners/suppliers. To illustrate the growing demand for social technologies in Saudi Arabia, ICT investments into collaborative applications is forecasted by IDC to increase by a CAGR of 18.6% over the period extending through 2017.<sup>54</sup>

50 IDC, Saudi Arabia Cloud, Hosted, Managed, and Outsourced Services Market, 2012 Analysis and 2013–2017 Forecast, 2013.

51 IDC, 2013 EMEA Enterprise Communications Survey, n=85

52 IDC, M2M Opportunity in Kingdom of Saudi Arabia, 2012 Analysis and 2013–2017 Forecast, 2013.

53 IDC, Arab Middle East and North Africa Enterprise Application Software Market 2013–2017 Forecast and 2012 Vendor Shares, 2013.

54 IDC, Saudi Arabia Unified Communications and Collaboration 2012 Analysis and 2013–2017 Forecast, 2013.

## 5 AFTERWORD

Saudi Arabia has attained a prominent position within the Middle East in terms of its ICT investment profile. Saudi Arabia's annual ICT spending is larger than that of all other GCC countries combined.<sup>55</sup> The Kingdom has seen a tremendous boost in ICT infrastructure adoption: wireless connections per capita in Saudi Arabia are among the best in the world, and mobile broadband adoption continues to grow rapidly from virtually zero penetration five years ago. Strong gains have also been made across a wide number of ICT-relevant areas, ranging from a more liberalized telecommunications sector and vibrant competition in value-added ICT services, to the profusion of e-government services and a growing ecosystem of public, private, and not-for-profit institutions supporting technology entrepreneurs and small businesses.

And yet as the 19th largest economy in the world,<sup>56</sup> and guided by the long-term vision established in its national development and technology plans, Saudi Arabia can aim even higher. The Kingdom can capitalize on its positive momentum and build upon its foundations by encouraging even greater investment into ICT. Given the global trend of enabling operations with the support of technology, Saudi Arabian organizations are expected to increasingly consider and adopt ICT solutions as a means of executing on their operational requirements—be it to improve linkages with remote employees, partners and suppliers; automate core business processes; or launch and expand various citizen-oriented services, among many other stimuli. And beyond simply 'keeping the lights on', ICT investments will also be looked upon to offer innovative solutions that address current issues and anticipate new opportunities.

As noted by the OECD,<sup>57</sup> decisions with respect to investing in ICT often depend on the favorable balance of a wide range of factors, including technology acquisition and operation costs, the ability of entities to absorb new technologies based on the availability of a suitably qualified skills base, the acceptance of organizational change, and the capability to innovate. In addition, a liberalized regulatory regime and market competition also play a key role. An environment that minimizes the risk of actualizing investments would be more likely to lead a firm to invest in ICT.

Reflecting its keen interest in further boosting ICT adoption and spread across all sectors of the economy and thereby contributing to national labor productivity and economic growth, as well as a host of other positive spillover effects, the Saudi Arabian government remains highly committed to further developing the ICT industry and stimulating ICT investments in the Kingdom.

<sup>55</sup> IDC Blackbook, Q3 2014

<sup>56</sup> World Bank, World Development Indicators, 2013.

<sup>57</sup> Organization for Economic Co-operation and Development, The Economic Impact of ICT Measurement: Evidence and Implications. 2004.

# APPENDICES

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## APPENDIX A: METHODOLOGY

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In order to understand the current ICT investment landscape in Saudi Arabia, evaluate its foremost drivers and opportunities for improvement, determine the size of ICT investments and its gross value added to the economy, and evaluate the future technology areas that will drive ICT investments going forward, CITC conducted extensive primary and secondary research.

### **Primary Research**

CITC conducted in-depth interviews with senior-level individuals at 25 selected Saudi entities representing the following major stakeholders groups: government entities and associations that play a role in ICT investments, public and private venture financing organizations, ICT vendors and service providers, and end-user organizations and companies. These interviews provided qualitative insights into the current Saudi ICT investment landscape, various investment drivers, and key opportunities for further industry improvement, as well as informing the qualitative commentary discussed throughout the report.

In addition, a survey of 413 private companies and government organizations was conducted to assess the primary challenges they face, ICT investment priorities, as well as details related to ICT skills gaps in the workforce.

### **Secondary Research and Modeling**

CITC undertook an in-depth and wide-ranging secondary research and examined a number of existing studies on the state of ICT investments in Saudi Arabia, as well as international sources documenting various aspects of the topic. For its modeling of ICT investments and gross value added, CITC utilized existing data and, where relevant, utilized the methodologies used by IDC, OECD, and the World Bank, and leveraged publicly available data, such as annual financial statements, as well as data and estimations arising from its interaction with ICT vendors in the market.

## APPENDIX B: DEFINITIONS

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**Gross value added:** Also known by its acronym, GVA. It is an economic measure of the value of goods and services produced in an area, industry or sector of an economy. Gross value added provides a value for the amount of goods and services that have been produced, less taxes and the cost of all inputs and raw materials that are directly attributable to that production.

**Hardware:** Any technological equipment used in the processing of information in the form of data (input, process, output, communication, and storage). It includes computer systems (client and server devices), system peripherals (printers, handheld devices, and other add-ons), storage hardware, and network equipment.

**ICT investments:** The acquisition of equipment and computer software that is used in production for more than one year, and which includes three components: information technology equipment, communications equipment, and software.

**IT Services:** The provision of labor-based services, which assist individuals and organizations in the implementation, management, and operation of computer systems, peripherals, storage, network equipment, and software.

**Packaged Software:** Programs or code sets of any type commercially available through sale, lease, or rental or as a service. Packaged software includes application software, system infrastructure software, and application development and deployment tools. Packaged software also includes the implicit value of software included in a service that offers software functionality via a different pricing scheme.

**Smart Devices:** Tablets and smartphones, almost always with touchscreens and able to run applications featuring graphic interfaces, on-device processing, and rich media.

**Telecommunications Services:** The delivery of voice and data networking capabilities via access to the network infrastructure operated by service providers. Typically, this takes the form of subscription and usage fees paid by individuals and organizations to telecommunications operators for access to fixed-line and wireless network services. This can include traditional voice services, Internet access, and mobile connectivity services.

**Telematics:** The use of wireless devices to transmit data in real-time back to an organization. Typically used in the context of automobiles, whereby installed or after-factory boxes collect and transmit data on vehicle use, maintenance requirements or automotive servicing.

**Unified Communications:** Technologies featuring the integration of real-time communication services, such as instant messaging, user presence information, telephony, video conferencing, desktop sharing, data sharing, call control and speech recognition, with non-real-time communication services, such as voicemail, e-mail, SMS and fax.

**Venture Capital:** Capital invested or available for investment in a new or expanding business perceived to have relatively higher levels of risk along with excellent growth prospects, which are secured by a substantial ownership position in the business. Venture capital is known to have been a key source of funding for many ICT high-growth companies in their early stages.

## APPENDIX C: ABBREVIATIONS

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**CITC:** Communications and Information Technology Commission

**CAGR:** Compound Annual Growth Rate

**CRM:** Customer Relationship Management software

**ERP:** Enterprise Resource Planning software

**FDI:** Foreign Direct Investment

**GCC:** Gulf Cooperation Council

**GDP:** Gross Domestic Product

**GVA:** Gross Value Added

**ICT:** Information and Communications Technology

**IMF:** International Monetary Fund

**IP:** Internet Protocol

**KACST:** King Abdulaziz City for Science and Technology

**M2M:** Machine to Machine communications

**MVNO:** Mobile Virtual Network Operator

**NCITP:** National Communications and Information Technology Plan

**OECD:** Organization for Economic Co-operation and Development

**PBX:** Private Branch Exchange

**SAGIA:** Saudi Arabian General Investment Authority

**SMB:** Small and Medium-sized Business

**TCO:** Total Cost of Ownership

**UC&C:** Unified Communications and Collaboration



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