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Communications, Space &
Technology Commission

Internet of Things

IoT Demand In Saudi Arabia A Survey-Based Study

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Summary

The Internet of Things, or IoT, is defined as a network of devices that are autonomously able to sense, monitor, or interact with the surrounding environment, in addition to collect and exchange data. Global IoT spending is estimated at USD 685.64 billion in 2019 and is expected to reach USD 1.17 trillion in 2024¹. Various industry segments are at the early stage of adopting IoT solutions driven by technological advancement as well as initiatives undertaken by government agencies, such as the Saudi National Industrial Development and Logistics Program (NIDLP), which focuses on Industry 4.0, Smart City transformation driven by giga construction projects, and Smart Meter solutions being undertaken by utility service providers. Adoption of Industrial Use Cases (IUC) is expected to be the biggest IoT growth driver in the Kingdom over the next several years.

Based on the survey study, Saudi companies realize the business benefits of IoT solutions as well as the strategic impact on their revenue streams. By the end of 2022, 82% of medium and large organizations in the Kingdom are expected to adopt an IoT solution for their business. The top three drivers for adopting IoT solutions by businesses are; a) Improved production efficiency, b) Customer experience improvement, and c) Enhanced Security. Customer focus and cost efficiencies are among the key priorities driving IoT adoption in the Kingdom and early adopters are at different stages of IoT deployments. IoT deployments include more than thirty-two different use cases which have been implemented by the companies included in the survey study. The use cases with the highest adoption in the Kingdom are closed-circuit TV (CCTV), Fleet Management, Staff Identification, Digital Signage and Freight Monitoring. Primary benefits that have been observed by Saudi businesses include enhanced productivity, safety and security, improved asset utilization, real-time analytics, cost optimization and enhanced customer service. Nevertheless, IoT deployment are currently associated with; a) ongoing costs for the IoT solution deployed, b) complexity of the solution deployment, and c) security for the hardware and software. Enterprises are addressing these challenges by leveraging flexible payment methods, utilizing multiple vendors having expertise in IoT solution deployment and security service providers managing the hardware and software. Factors such as financial constraints, availability of both unique skillsets and standardized solutions are other significant inhibitors to adoption of IoT solutions in the kingdom.

IoT offers immense opportunities to the enterprises in the Kingdom, particularly for the manufacturing, automotive, transportation & logistics, retail, public sector and healthcare industries which have already started to utilize IoT solutions and are expected to further benefit from further adoption of IoT technologies. In terms of spending, the manufacturing sector is expected to constitute more than 20% of IoT spending in the Kingdom, primarily driven by the use of 5G and rollout of industrial IoT in the Kingdom. The IoT solution provider market in the Kingdom is forecasted to significantly grow over the next few years as all Saudi telecom operators expand their portfolio of IoT services offerings, and partnerships between global and local IoT service providers continue to grow.

1. IDC Worldwide Internet of Things Forecast Update.



IOT

1

OVERVIEW OF THE IOT INDUSTRY

1. Overview of the IoT Industry

There has been a great deal of interest in IoT potential by governments. The evolution of IoT technologies and the rapid growth of its applications and services increasingly drive IoT use cases. The public sector can benefit from multiple vertical uses such as monitoring and controlling the operations of key infrastructure elements, from energy and water treatment to rail transit and healthcare, which in turn will improve city management. “Smart city” will be one of many rewards IoT systems can provide. On the other hand, the private sector can also improve its operational efficiencies by utilizing IoT technologies leading to better national competitiveness and relative GDP growth. However, privacy, security, and ethical usage are serious concerns that necessitate governments to be central participants in determining how IoT develops in their respective countries.

In the Kingdom of Saudi Arabia (KSA), Communications and Information Technology Commission (CITC) has worked on assessing the potential growth of IoT industry in KSA and the economic potential of IoT interoperability in the country, and on how to best move forward in this critical area. Findings of CITC are presented in a series of reports as follows:



1 IoT Demand in Saudi Arabia



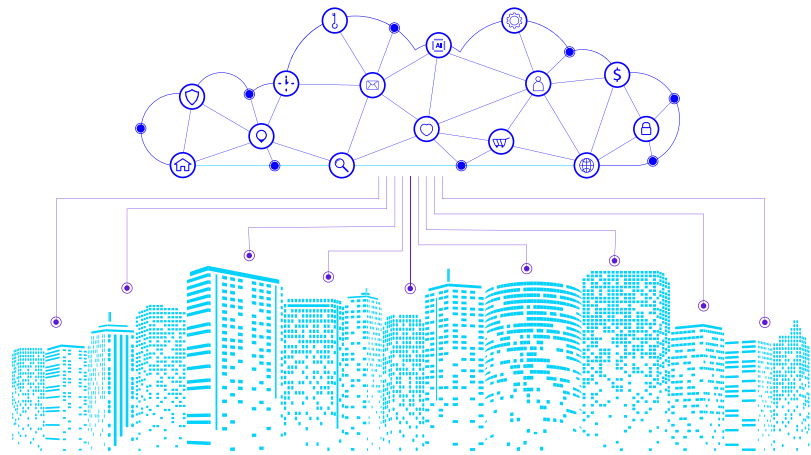
2 LPWAN Overview and Strategic Perspective



3 Overview of the IoT Global Regulatory Practices

In this report, a survey study is conducted to determine the inclination and impact of adopting IoT services on the Saudi companies. This study also discusses the main drivers for adopting IoT solutions by businesses in KSA.

1.1. What is the Internet of Things?



Multiple definitions exist for the Internet of Things (IoT). The International Telecommunication Union (ITU) defines IoT as “A global infrastructure for the information society, enabling advanced services by interconnecting things—physical and virtual—based on existing and evolving interoperable information and communication technologies.” [1]. Similarly, the GSM Association (GSMA) defines IoT as “the coordination of multiple machines, devices and appliances connected to the Internet through multiple networks.” [2]. The Institute of Electrical and Electronic Engineers (IEEE), highlights the key features of IoT in order to define the IoT concept such as “interconnection of things”, “connection of things to the internet”, “Uniquely identifiable things”, and “Ubiquity” [3, 4]. The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) defines IoT as “an infrastructure of interconnected entities, people, systems and information resources together with services which process and react to information from the physical world and from the virtual world”. ISO brings a simpler definition of IoT, which is, “a network of computerized and often wireless devices that allows us, as well as machines, to see, sense and even control much of the world around us, whether at the individual level or to wider, global scales” [5]. Moreover, and according to Ofcom regulator, IoT is defined as “the interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data” [6]. The adopted definition for IoT while conducting this study has been: a network of devices that are autonomously able to sense, monitor, or interact with the surrounding environment, in addition to collect and exchange data. The technology consists of an ecosystem of services, hardware, software and connectivity, all of which work collectively to provide businesses, organizations, and consumers with insights that help transform their operations and lives.

From all the above definitions, three main features of the IoT networks can be extracted to define the IoT industry. Those are: a) connectivity model of things, b) measurements of the physical world, and c) control or providing action in the real/physical world. Therefore, an IoT system collects data from the physical world via a sensor (or multiple sensors) and delivers the data to be processed (for example in the cloud). A subsequent action is then performed (either the associated IoT device or elsewhere) and the sense-process-act IoT cycle is closed. Within this context, it is necessary to differentiate IoT systems from Cyber-physical systems by the following facts: a) IoT systems are scalable to a large number of devices, and b) the plug-and-play nature of IoT systems for most use cases.

1.2. IoT in Saudi Arabia

The need to showcase swift Return on Investment (RoI) of smart initiatives and government's mega projects (such as Neom, King Salman Energy City, and Integrated Logistics Zone) drive the adoption of off-the-shelf IoT solutions in the Kingdom. Smart parking, lighting, signage and cleaning systems are expected to be the leading early winner applications whereas low-power wide-area network (LPWAN) and 5G deployments are adding traction to traffic control and crowd management use cases in the holy cities of Makkah and Madinah.

Adoption of IoT solutions by some of the enterprises in the Kingdom had resulted in early success in industry sectors of education, energy, environmental management, health care, open data, smart cities, smart manufacturing and is anticipated to reach its full potential over the coming years. Some of the major benefits that have been realized by IoT adopting organizations are: Enhanced Productivity, Safety and Security, Improved Asset Management, Real-Time Analytics, Cost Optimization and Enhanced Customer Service.



Enhanced Productivity: IoT devices can be of assistance to manufacturing business sectors to precisely assess demand and resourcefully manage a variety of production stages by enabling real-time tracking of machinery parts and in-hand raw materials.



Safety and Security: IoT devices using embedded wearables and sensors, employees in high-risk settings like heavy industries, mining, and real estate or construction can be constantly tracked and alerted against dangers.



Improved Asset Utilization: Tracking of assets such as equipment, machinery, tools, and others using IoT connected sensor are used for efficiently managing assets. IoT applications provide real-time insights using sensors and detectors to locate issues requiring immediate action.



Real-Time Analytics: Enterprise IoT applications provide real-time analytics which expedite discovery and resolution of enterprise-affecting issues to manage production and enable focusing on organizational productivity.



Cost Optimization: In manufacturing, IoT devices are used to track equipment and reduce downtime by foreseeing future failures in production lines. Enterprises can also save on overall energy expenditures and recover electrical efficiency. Additionally, smart building systems can track, monitor and be in command of redundant usage of electrical systems.



Enhanced Customer Service: IoT smart trackers enable fast and accurate shipment tracking. On the other hand, IoT-enabled equipment allows customers to easily process transactions (for example through Smartphones). IoT solutions can also be leveraged by utility service providers to detect and resolve issues using smart meters and smart grid technologies.

IoT offers immense opportunities to enterprises in the Kingdom [7]. Among the major industries where IoT has been partially deployed in Saudi Arabia—and where further potential is immense—are manufacturing, automotive, transportation & logistics, retail, public sector and healthcare.

Various industry sectors have already experienced early success in data driven innovation such as education, energy, environment management, health care, smart cities, smart manufacturing and e-government supporting Saudi Arabia's economic growth. In order to explore new revenue streams and business opportunities, telecom operators in Saudi Arabia have started to emerge as IoT service providers in recent years by providing a wide portfolio of IoT solutions leveraging their vast infrastructure and network coverage.

The Ministry of Communications and Information Technology (MCIT) in partnership with world-class technology experts have launched dedicated hubs driving implementations of latest technologies including Artificial Intelligence, Machine Learning, Internet of Things and Blockchain [8]. Government regulations are also driving the adoption of some IoT use cases in Saudi Arabia, such as the Ministry of Interior mandate for all commercial premises to be equipped with a smart CCTV Security and Surveillance system, the Ministry of Transportation mandate that all heavy duty and commercial vehicles be managed by a fleet management system and Saudi Electrical Company (SEC) using 10 million smart meters for consumers across KSA [9, 10].



SAUDI ARABIA IOT MARKET SURVEY STUDY

2. Saudi Arabia's IoT Market Survey Study

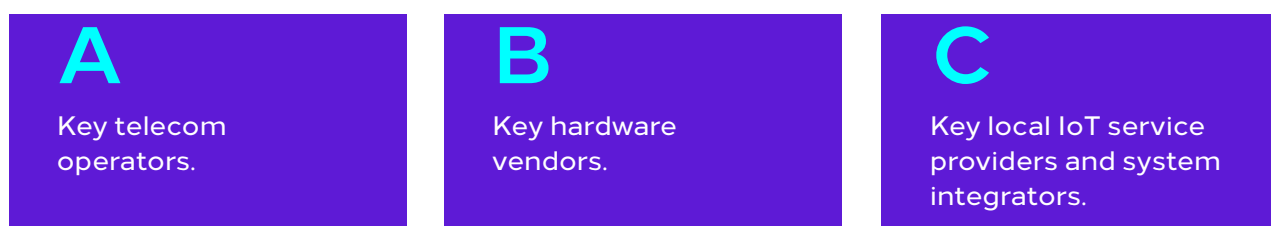
2.1. Supply-Side Survey

2.1.1. Survey Design and Methodology

In order to develop the understanding of current state of IoT in the Kingdom, CITC has conducted primary research among the service providers. This research study follows a qualitative technique of in-depth interviews. A discussion guide was developed which included topics covering, IoT services offered by the service providers, challenges faced and the outlook of the market in the Kingdom. In-depth interviews were conducted with key decision makers within the organizations responsible for portfolio of IoT services offered by the service providers.

2.1.2. Survey Participants

For a better understanding of IoT ecosystem in the Kingdom, In-Depth Interviews (IDIs) have been conducted with key market players. In order to represent different segments of the value chain, the key market players are classified as follows:



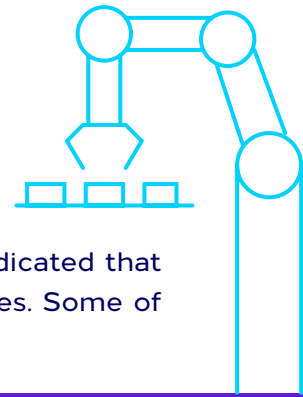
2.1.3. Survey Insight

Table 1 – Key Solutions and Verticals

Key Market Players by Type	Key Solutions	Key Verticals
Telecom operators	Fleet management, asset management, Point of Sale (POS), Medical imaging solution, smart energy, smart parking, smart metering, CCTV surveillance, and digital signage.	<ul style="list-style-type: none">• Transportation and Logistics• Financial and Retail• Healthcare• Smart Cities• Energy and Utilities
IoT service providers	People counting, smart parking, access control, RFID (Radio Frequency Identification), asset tracking, Fleet management, asset management, cold chain, fuel shipment monitoring, heavy equipment tracking (weight control), and smart waste management[11].	<ul style="list-style-type: none">• Transportation and Logistics• Financial and Retail• Buildings/Communities• Smart Cities
Hardware vendors	IoT platform (Wing/Kinetic), connectivity management, device management, IoT security solutions, IoT infrastructure, security, smart waste management, connected lighting, smart parking, smart environment, and fleet management.	<ul style="list-style-type: none">• Telecom operators• System Integrators• Medium and Large businesses
Local system integrators	Fleet management, smart mosque, smart buildings, remote patient monitoring, ATM monitoring, smart metering, brilliant manufacturing, environment monitoring.	<ul style="list-style-type: none">• Smart Cities• Industrial IoT• Energy and Utilities• Transportation and Logistics

Table 1 details the service and solutions provided by participants, which clearly shows an overlap between solutions of different service providers. This overlap is attributed to the complexity and wide range of implementation options for different IoT solutions. Moreover, it shows the overlap between the key industries, which drives the need for collaboration between service providers.

Service providers have discussed certain business challenges, and indicated that the IoT industry could benefit by addressing some of these challenges. Some of these challenges are summarized as follows.



Time to import devices: As it is clear that IoT devices are imported in large quantities, it would definitely help to enhance the speed of the overall ecosystem of manufacturing, clearance and import of IoT devices cycle.



Importance of highly qualified personnel: Installation of IoT sensors, configuration, maintenance, and other related tasks require specific skillset that ranges from technician to a senior engineer with certain expertise. Achieving this expertise requires collaboration from educational institutes and universities in the Kingdom.



Market Readiness/Awareness: There is clear variable levels of IoT awareness among different public and private organizations. This confusion is indeed created by the availability of wide technological approaches for implementing IoT solutions. The market requires awareness from the customer side—based on the service providers opinions—on the IoT solutions advantages.



Security: Most of business owners fear to have their information exposed to the internet. They are afraid to lose their data to competitors or to have their organizations attacked through channels and ports potentially exposed with the introduction of IoT solutions, which inhibits the IoT growth.



Standardization and Regulations: It is important for the companies to enter the market with clear standards. Hence, the service providers appreciate the current IoT regulation. Moreover, they are eager for new releases of IoT local and international standardization and regulation information.



Cost: Justifying return on investment (RoI) is a critical area for service providers to convince businesses to embark on the IoT journey. Service providers mentioned that the private sector still sees IoT as a luxury and is not interested to wait for a few years to see RoI. They also highlighted that RoI story is totally different than other areas such as FTTH, and with the lack of awareness, such emerging technologies do not create value proposition to everyone.

Most of the service providers mentioned that there has been a lot of efforts in the last few years in order to increase awareness, and especially with the growing government initiatives and vertical specific regulations (e.g. tracking obligation for all trucks), which will driving IoT adoption.

2.2. Demand-Side Survey

2.2.1. Survey Design & Methodology

A quantitative research approach was adopted by CITC to meet study objectives on IoT demand estimation. A survey has been conducted among medium and large size organizations of the Kingdom to understand the current state of IoT solution adoption, planning, driver and inhibitors. The survey was conducted using a structured questionnaire and the data was captured digitally using a pre-scripted survey link using tablets.

The study focused on medium and large size organizations across all vertical industries in order to ensure that the findings of the study reflect the Kingdom's overall industrial base. The selection of companies that participated in the survey was made using random sampling. In order to ensure regional coverage, businesses were randomly chosen in different commercial districts. Interviewers who selected businesses randomly on the basis of allocations assigned to them performed spontaneous walks-ins. Once the interviewers have profiled the company based on the selection criteria (administering the firmographic screening) and eligibility of the company, they would then request a meeting and interviewed the target respondents (face to face interviews).

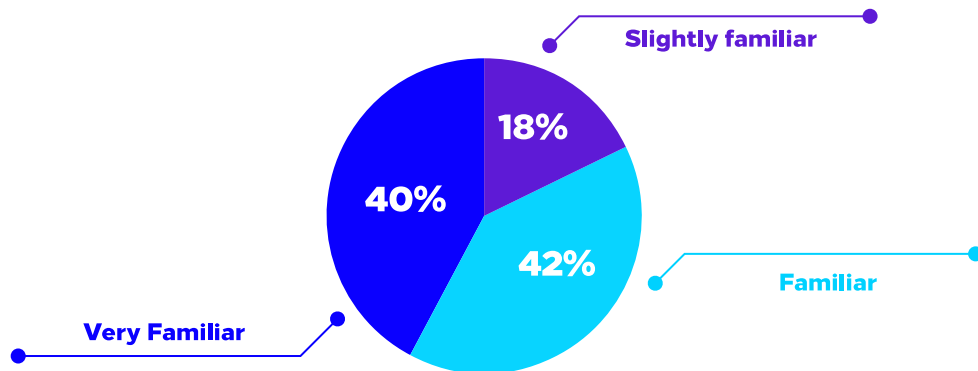
The target audience with whom the survey was conducted were ICT decision makers or influencers on decision making relating to their company's choices on the adoption and procurement of ICT products or services, such as cloud solutions, managed services, telecom services, IoT, etc. Target respondents were typically IT directors, heads of IT departments, Senior IT managers, etc. Once the target respondents were identified and met, the respondent profile was then assessed, i.e. it was verified that they were indeed the decision makers and were familiar with IoT, and the main interview would be administered. One of the key criteria for selection of the respondents was that they must have some degree of familiarity of Internet of Things.

Respondents who were not familiar with IoT technology have been excluded from the survey (see Figure 1 below). In cases where the target respondents were not available or busy, an appointment would be fixed for another time/day for the face to face interview with the decision maker.

Figure 1: How familiar would you say that you are with the term or concept of the internet of things?

Base: 328

FAMILIARITY OF IOT TECHNOLOGY BY SURVEY PARTICIPANTS

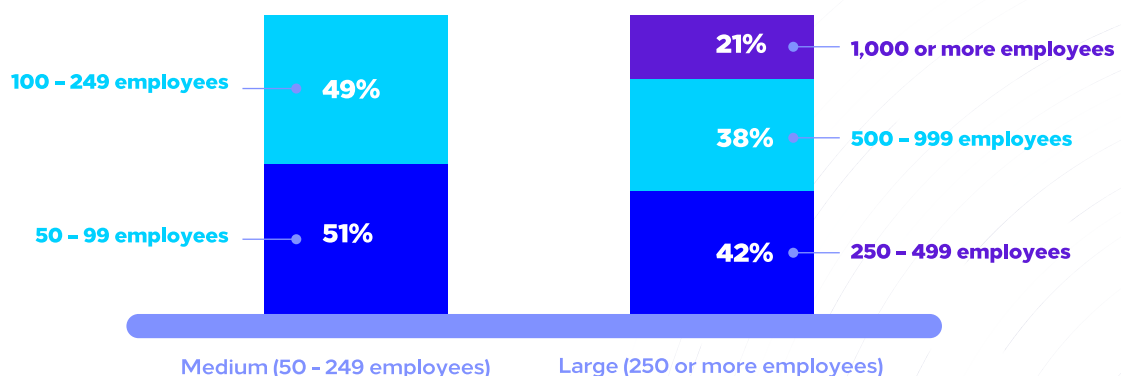


Considering the nature of IoT technologies and current stage of technology adoption in the industrial sector, only medium and large size organizations were included in the survey with following breakup of sample (i.e., as in Figure 2)

Figure 2: How many permanent (full time) employees are there in your organization in KSA (including all branches in the Kingdom)?

Base: 163 Medium, 165 Large

ORGANIZATION SIZE



Source: Monshaat

2.2.2. Survey Participants

The survey has been conducted with 328 organizations representing different industrial sectors of the country. Table 2 shows the number of samples for different industry sectors, with highest number of participants comes from manufacturing followed by information and communication technology sector.

Table 2 – The number of participations for different industry sector.

Sector	Sample
Agriculture, Fishing	8
Banking, Finance and Insurance	31
Construction/Contracting	32
Education	18
Government / Public Sector	14
Healthcare	24
Hospitality / Food Services / Entertainment / Leisure	26
Information and Communication Technology	33
Manufacturing	38
Oil and Gas / Mining & Quarrying / Utilities	17
Professional/Business & Personal Services	27
Trade (Wholesale and Retail)	28
Transportation, Storage and Logistics	32
Total	328

2.2.3. Survey Insights

2.2.3.1 Deployment Plans of IoT Solutions

When the surveyed demand-side companies asked regarding their current and future IoT solutions, the response was overwhelmingly positive. The results of the survey are shown in Figure 3 and grouped into three different parts:

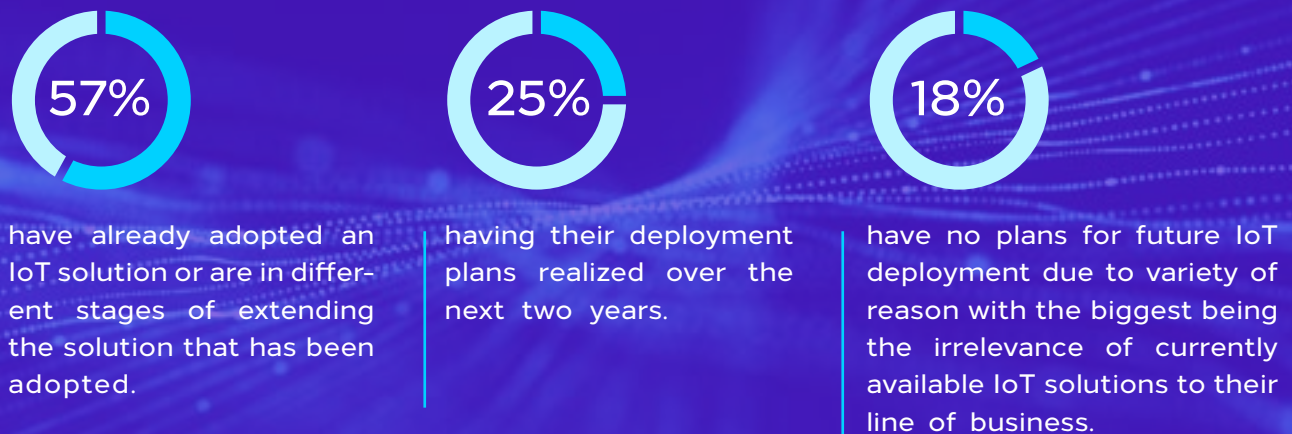
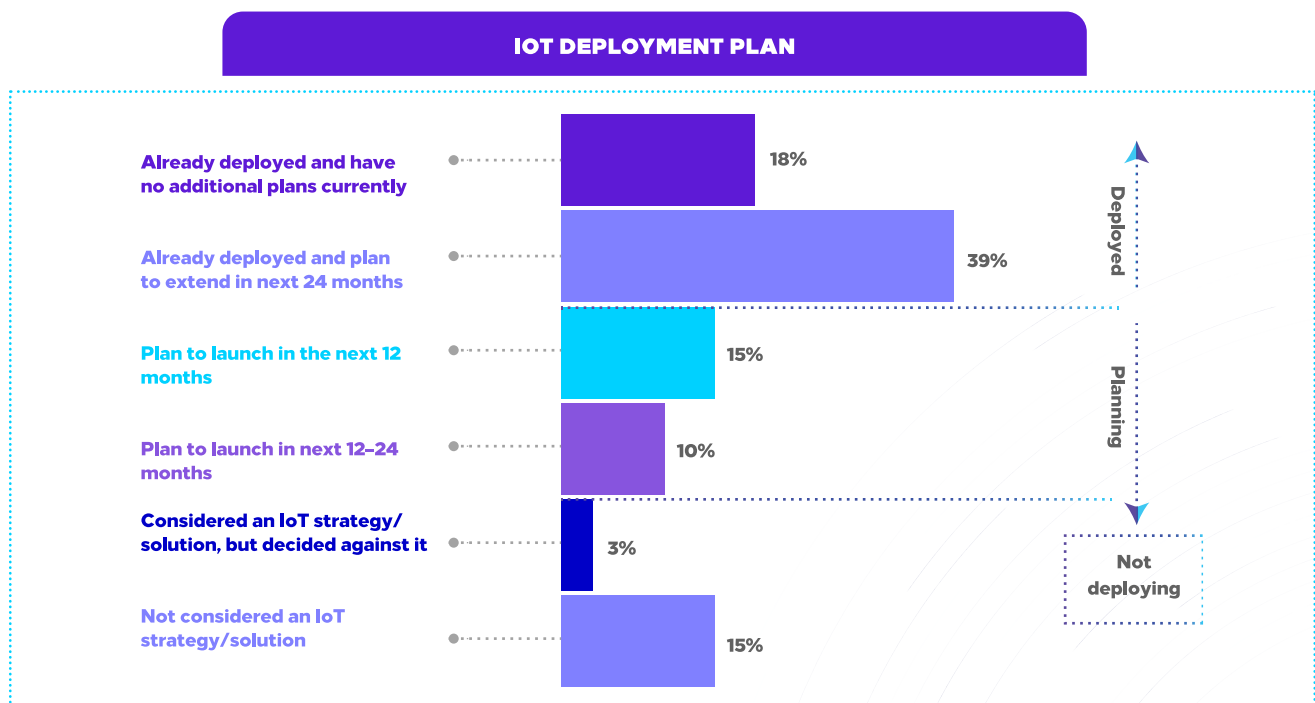


Figure 3: What are your company's plans for the deployment of IoT solution? The connection may be wired (e.g., via Ethernet) or wireless (e.g., via cellular, WiFi, or NFC).

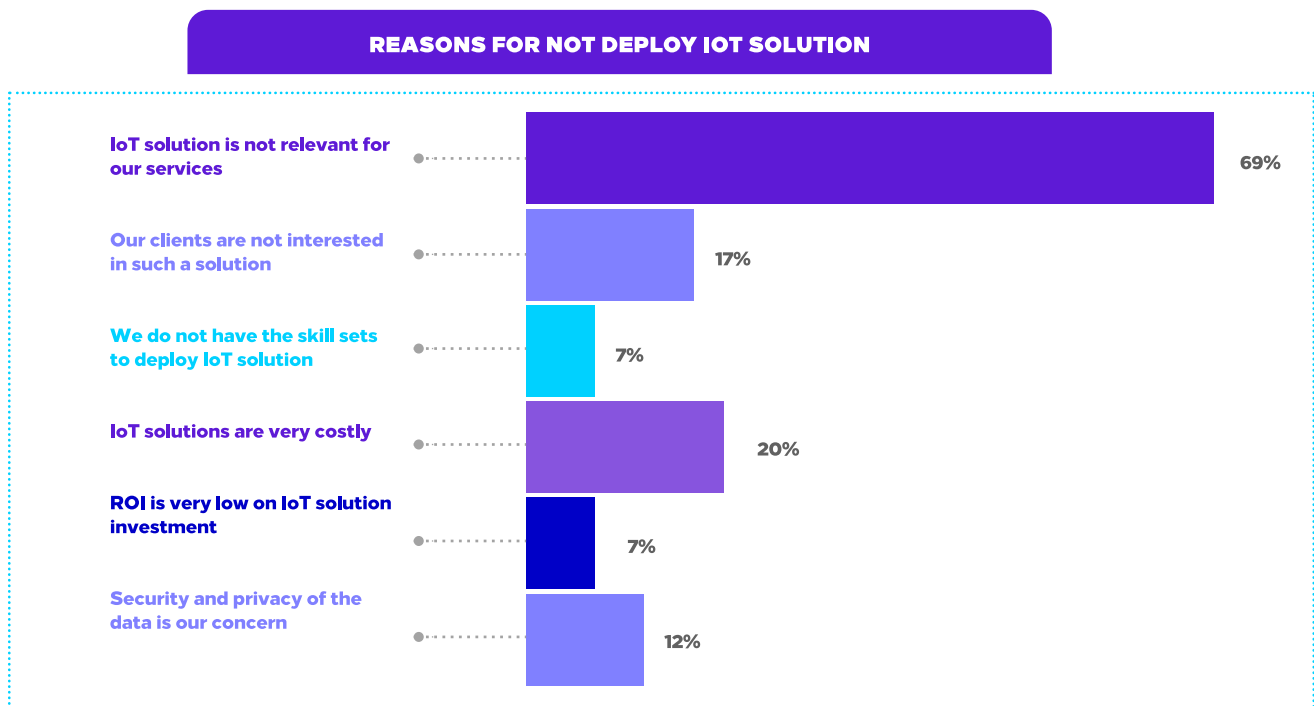
Base: 328



Among the top reasons provided by companies that are not currently adopting IoT solutions in their industry is that, 69% of them think that the currently available IoT solutions are deemed irrelevant to their services, as shown in Figure 4. This can be remedied by increasing awareness of how IoT can be integrated with different services.

Figure 4: What are the reasons for your organization not considering IoT solution deployment?

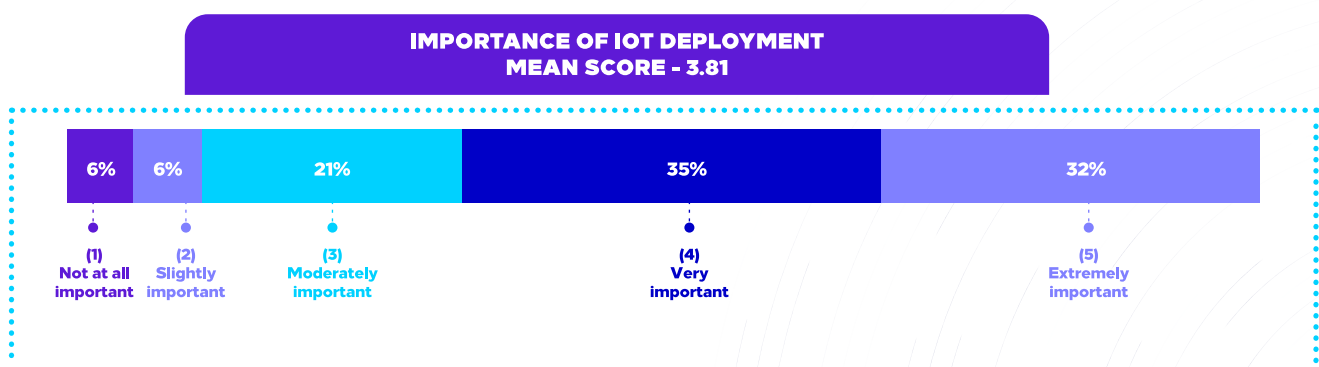
Base: 59



On the other hand, IoT solution importance is being realized by the organizations as they consider it to play a significant role in their organization's future as indicated by the overall mean score of 3.81 on a five-point rating scale. 32% of organizations consider it to be extremely important as Figure 5 shows. Among various industry verticals, Education, Health and Trade (Wholesale/Retail) lay a higher importance of the technology compared to other industry verticals.

Figure 5: On a scale from 1 to 5, how important do you think the Internet of Things is, or could potentially be, to your company?

Base: 328

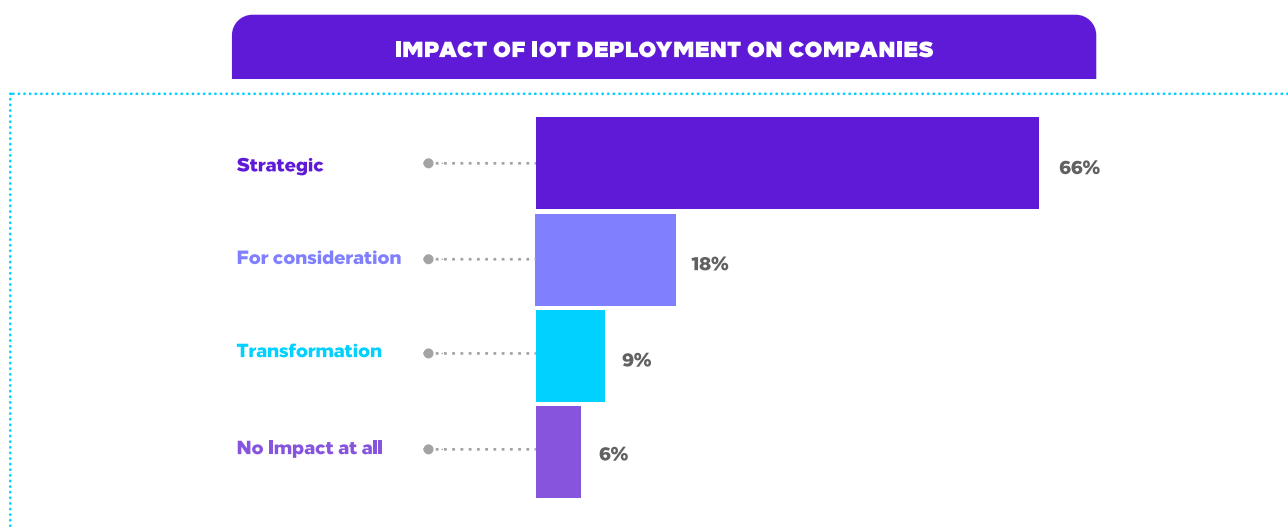


2.2.3.2 Business Impact of IoT Solutions and Key Drivers for Solution Implementation

The impact of IoT deployment for companies is strategic in nature (66%) and is perceived to provide a competitive advantage by means of cost reductions, effectively meeting the needs of customers and improved productivity. For some of the other companies the impact is more of transformative in nature (18%) as IoT helps companies introduce new services and products and ultimately improve business revenues. Figure 6 clarifies the expected type of business impact IoT would have on the surveyed organizations.

Figure 6: What business impact do you think the “Internet of Things” will have on your organization?

Base: 328



Strategic: It will help my organization compete more effectively with the products and services it currently offers, to reduce costs, and to improve productivity

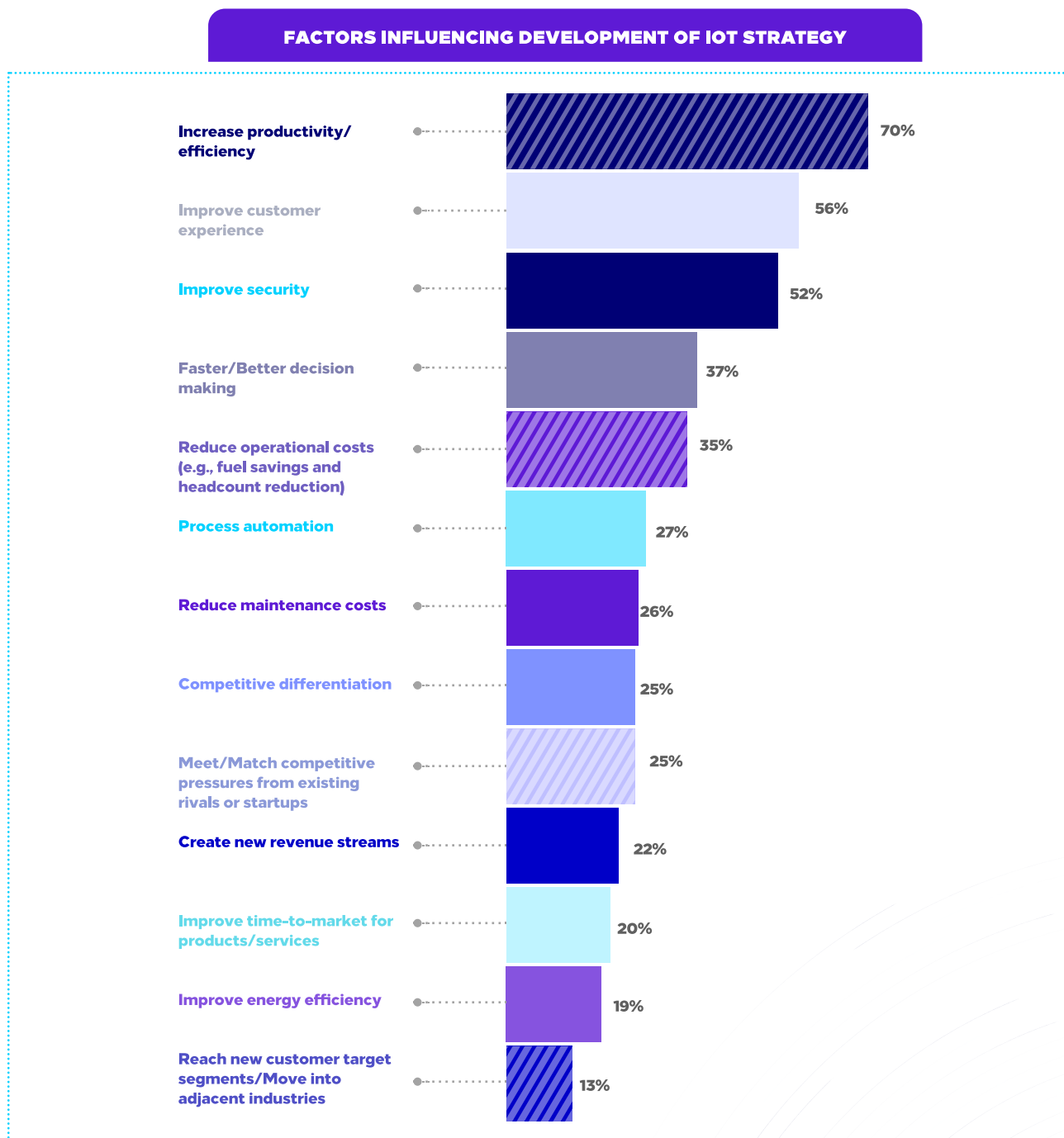
Transformational: It will help my organization shift into new product and/or service areas and generate additional revenues

For consideration: It is something to pilot and trial, but it is not significant

The top three factors due to which organization are investing and / or planning to invest in IoT deployments include: productivity efficiency increase, customer experience improvement and security for companies, as Figure 7 shows.

Figure 7: What are the main factors that influenced or would influence your organization to create a strategy for, or invest in "Internet of Things"?

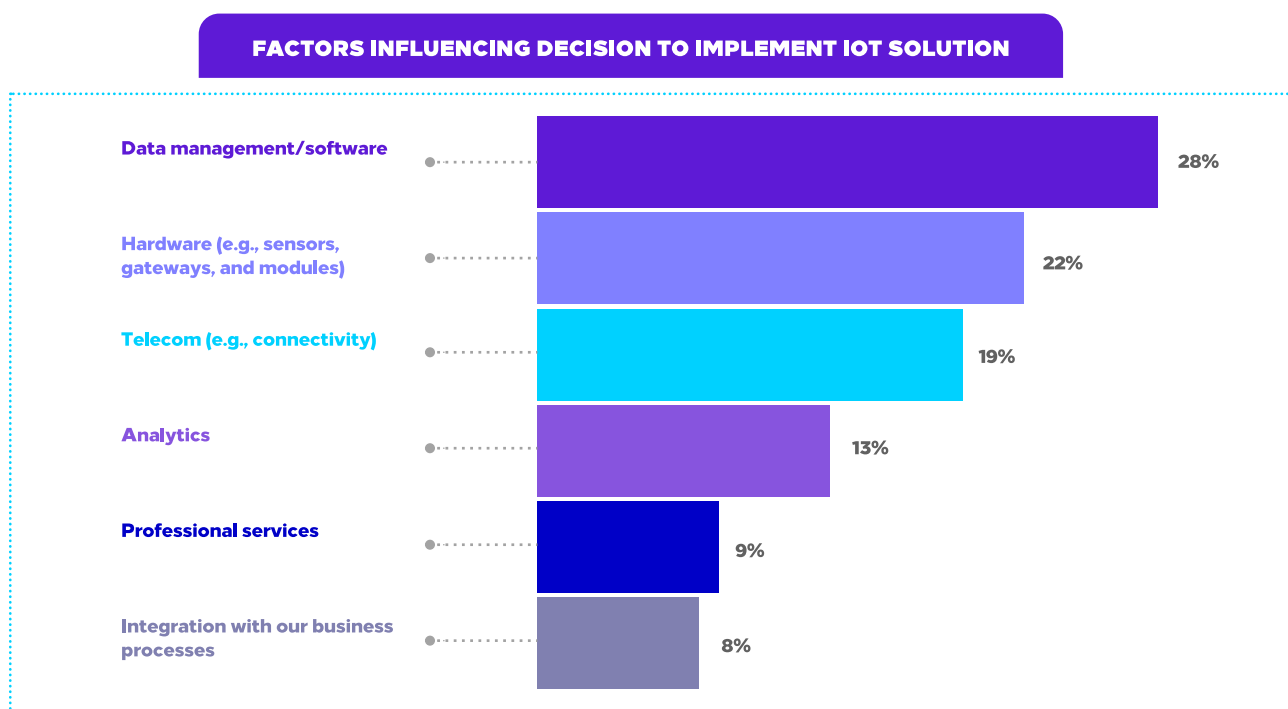
Base: 328



A standard IoT solution requires integration of Hardware, Connectivity, Data Management, Analytics and Professional Services provided by integration service providers. For 28% of the companies, data management is considered to be the most important aspect of the IoT solution that is being considered for deployment. Figure 8 shows what influences the decision of adopting an IoT solution at a company according to the survey.

Figure 8: What do you think is the most important part of an Internet of Things solution, which has the biggest influence on decisions to deploy the technology?

Base: 328



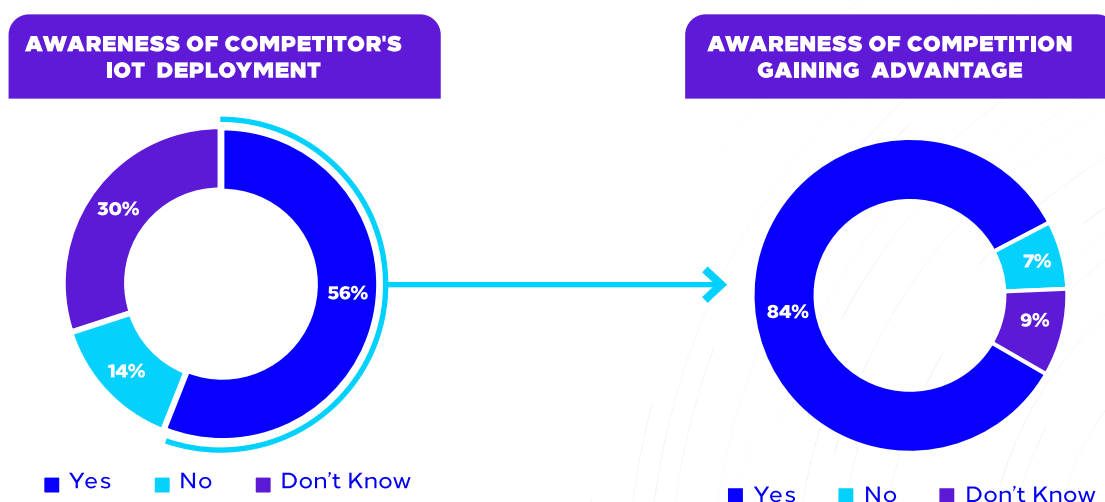
One of the major reasons for companies to invest in IoT solutions is to gain a competitive advantage. Therefore, adoption of a solution is also influenced by competitors' IoT deployments. Companies are aware of the competitors' IoT deployments and are realizing the advantages gained by the same competitors as shown in Figures 9 and 10.

Figure 9: To the best of your knowledge in the market, are your main competitors adopting IoT solutions within their organizations, or providing any IoT-enabled services/solutions?

Base: 328

Figure 10: And do you think their use of IoT, or by providing IoT solutions, is giving them a competitive advantage over other organizations in the Kingdom, that are not using or providing IoT?

Base: 185



2.2.3.3 IoT Solutions Usage in Companies

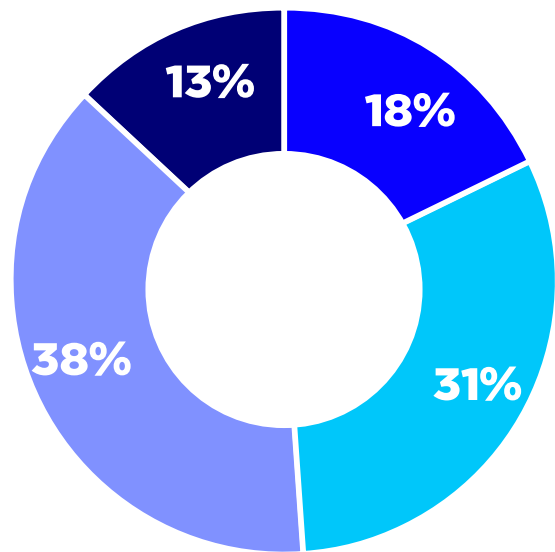
Companies deploying IoT solutions use them for a wide range of functions. Business Operation is one of the key functional area where IoT solutions are being utilized by companies followed by utilization of IoT solutions for data collection and analytics as detailed by Figure 11.

Figure 11: How are IoT solutions currently being used in your company?

Base: 188

IoT SOLUTION USAGE IN COMPANY

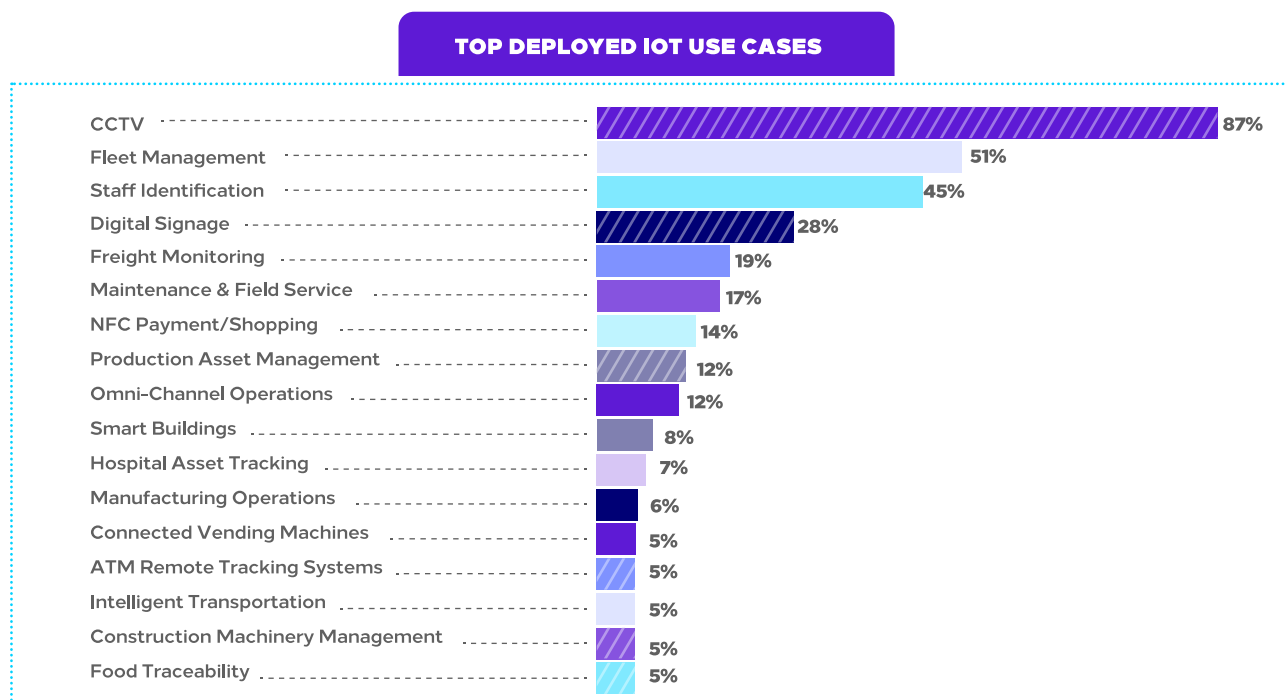
- Only collection of data
- IoT is leading to new business models and additional revenues, as well as automating and enhancing business operations
- Collection and analysis of data, but with no direct effects on business yet
- Collection and analysis of data, with a direct impact on the automation and enhancement of business operations



IoT deployments include more than 32 different use cases which have been implemented by the companies included in the survey. The uses which have been deployed by more than 5% of the companies are shown in Figure 12. The chart shows that CCTV represents the highest deployment (87%) among the companies followed by fleet management (51%) and staff identification (45%).

Figure 12: Which of the following IoT solutions has your company already implemented?

Base: 188



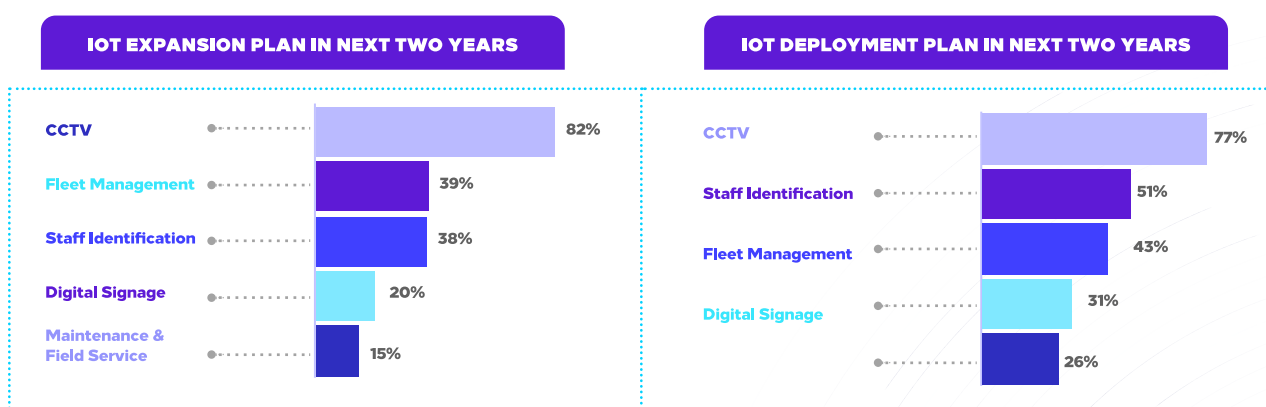
Adoption of various IoT use cases is higher among larger size companies across most of the verticals of industry. Outlook for IoT deployment also looks very positive as companies are planning to expand their current deployment by 39% within next two years and deploy new use cases by 25% in the next two years, as we have seen in Figure 3. To elaborate, Figures 13 and 14 detail the IoT solutions that companies are planning to either expand or deploy in the next two years.

Figure 13: Which of the following IoT solutions is your company planning to extend in the next 2 years?

Base: 127

Figure 14: Which of the following IoT solutions is your company planning to deploy within the next 2 years?

Base: 81

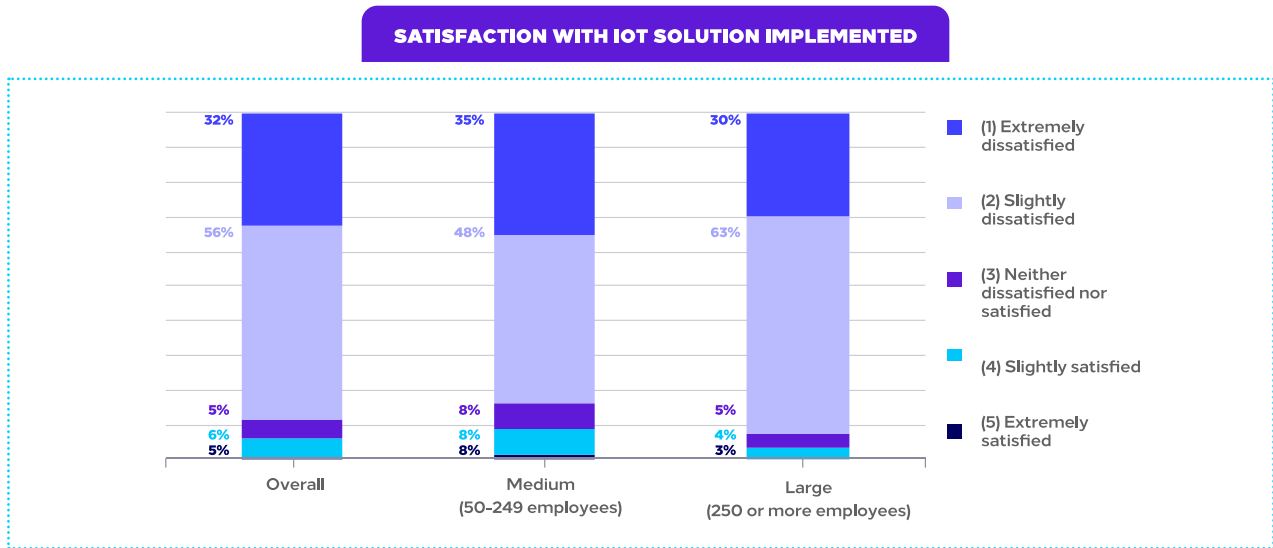


Among the top five use cases for both expansion and new deployments; CCTV is the focus for the companies followed by Fleet Management, Staff Identification and Digital Signage. With various mega construction projects underway, Smart Buildings is another use case which is under consideration for deployment over the next two years.

As shown in Figure 15, companies which deployed IoT solutions are quite satisfied overall (4.14 mean score on 5-point rating scale) with their implementation. Satisfaction is significantly higher among larger size companies.

Figure 15: How satisfied are you with the IoT solutions you have currently implemented?

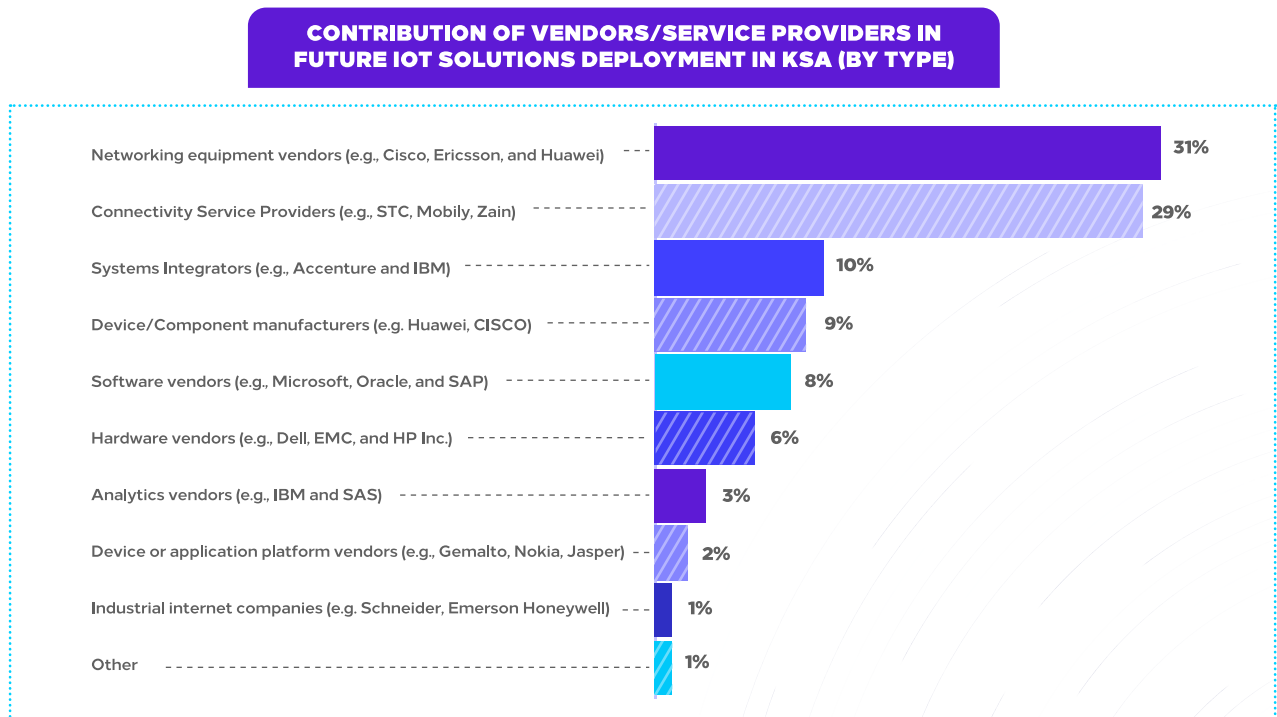
Base: 188



IoT deployment requires a multitude of vendors to deploy various parts of the IoT solutions and companies feel network equipment vendors will be playing a critical role in the future followed by connectivity services providers, as depicted in Figure 16.

Figure 16: Which of these types of vendors/service providers do you think would be most likely to become the leader of the internet of things market in the Kingdom?

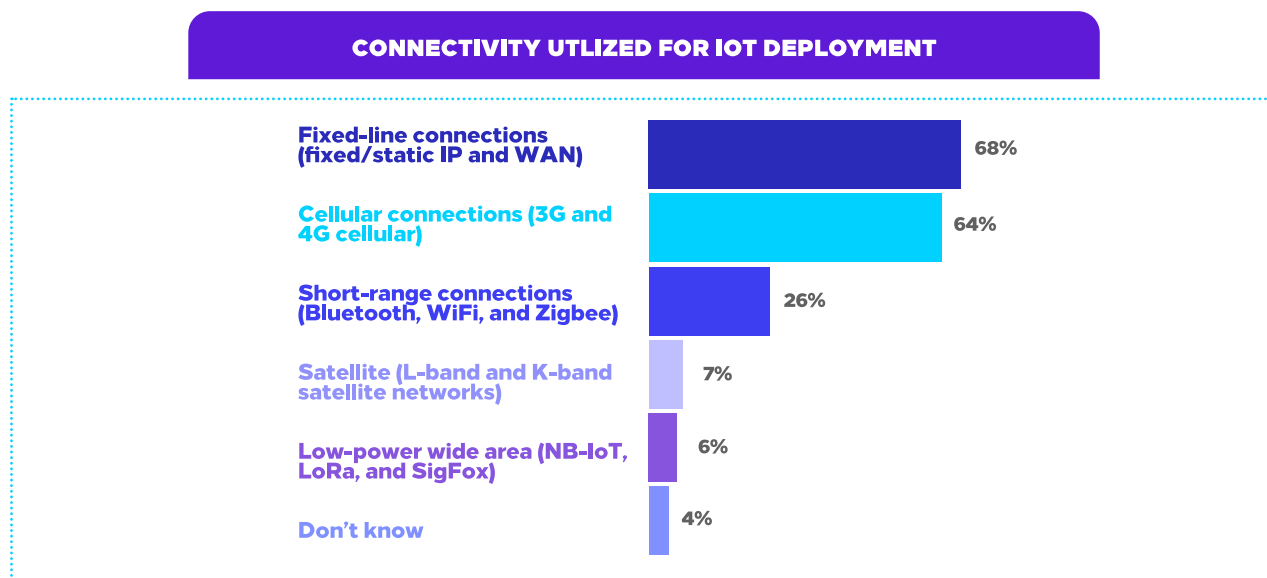
Base: 328



Choice of connectivity for IoT solutions is usually driven by the geographical proximity. Among surveyed companies, fixed line connectivity is mostly used, followed by cellular connectivity, then other short range technologies such as WiFi, as detailed in Figure 17.

Figure 17: What type(s) of connections is your company currently using or planning to use for IoT solutions?

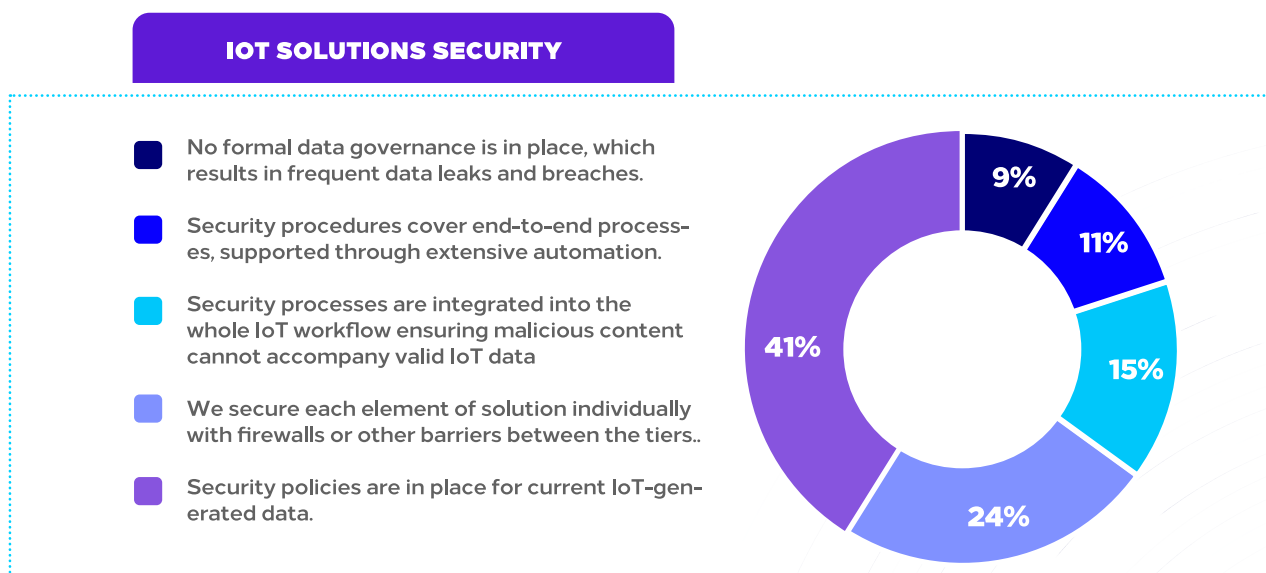
Base: 328



Securing Hardware and Software in IoT deployments was one of the key areas where companies faced challenges. Various governance models of security have been put in place for securing hardware and software associated with IoT solutions. Figure 18 shows organizations' approach to IoT security.

Figure 18: Regardless whether your organization has already deployed IoT or not, which of the following best describes your organization's approach to IoT security?

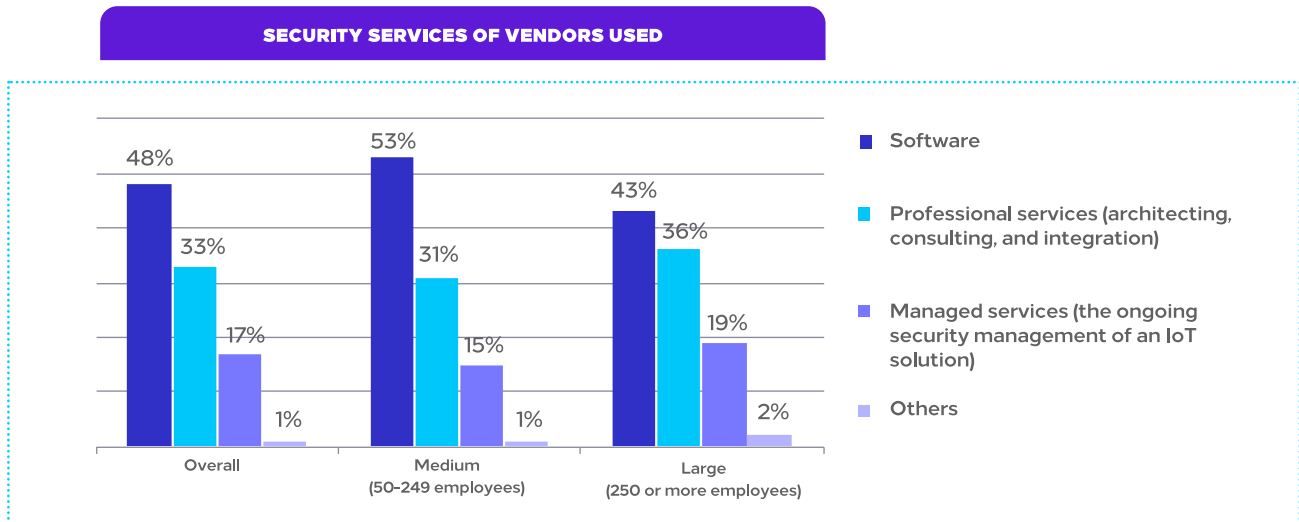
Base: 328



Driven by have high concerns with regards to security of hardware and software of IoT solution, companies are leveraging expertise of vendors who are specialized in security domain. As illustrated in Figure 19, IoT software security (48%) is the biggest area for which external vendors services are utilized. Further analysis of data indicates that the need for software security services is slightly higher among the medium size organization (53%) compared to large size.

Figure 19: With which element of IoT security do you most need help with, from any external providers? Or which element do you expect that you would need the most help with, from external providers?

Base: 269



2.2.3.4 Challenges for IoT Development

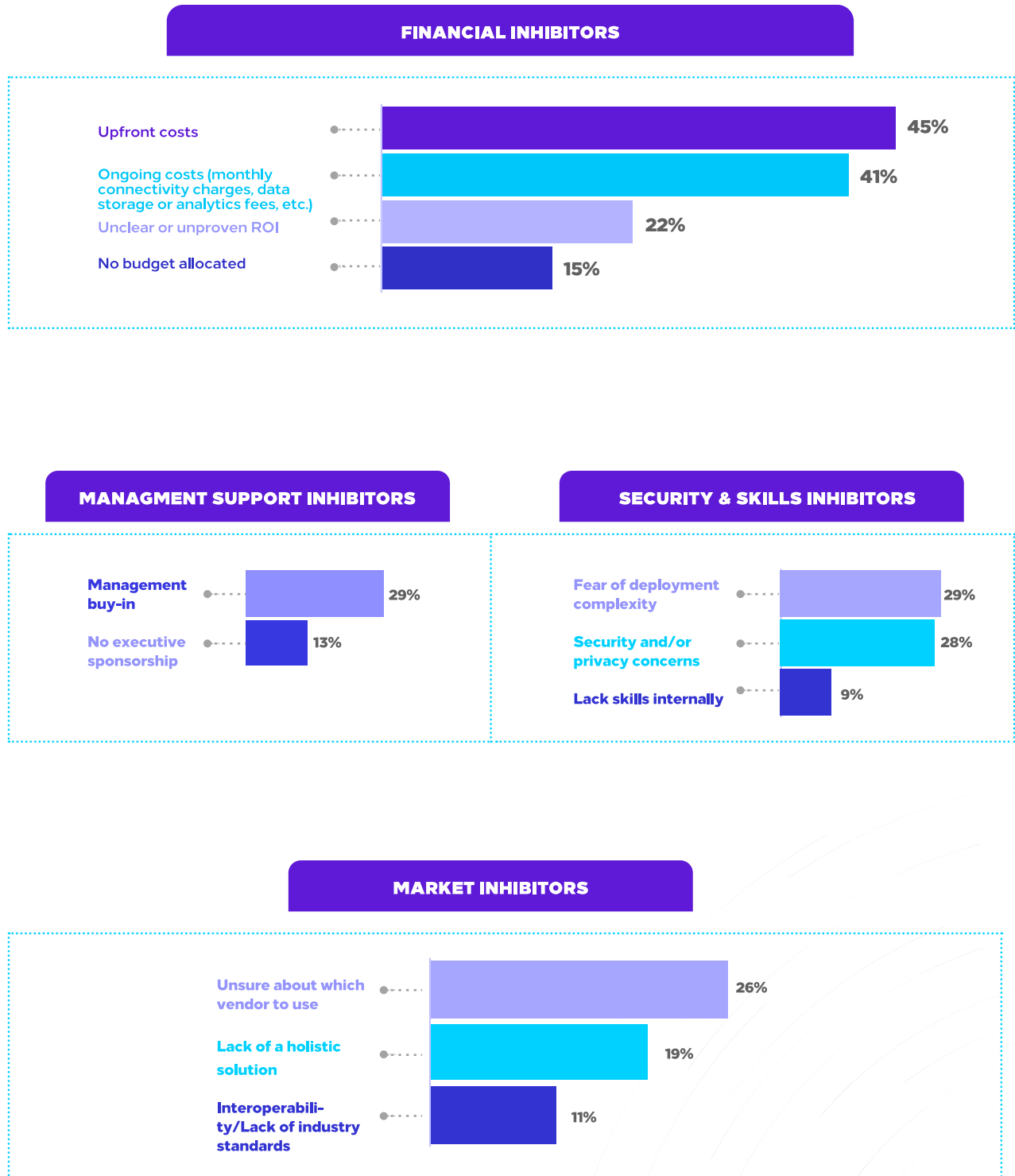
Saudi companies operating in various industrial verticals are adopting technological advancements in their business operations and are rapidly undergoing digital transformation. Various programs by government entities are facilitating the transformation process across both private and public sectors. However, companies are facing multiple challenges which are inhibiting the adoption of IoT. These inhibitors can be classified into two broad categories of Internal and External inhibitors.

Internal inhibitors faced by organizations constituted of finance, management support, security, privacy and skill-set, whereas external inhibitors are related to selection of vendors and availability of standardized solutions. Figures 20 shows that the main internal inhibitors are upfront costs (45%), management buy-in (29%), and fear of deployment complexity (29%).

On the other hand, the primary external challenges that prevent companies from deploying IoT solutions in the next two years are being uncertain about which vendor to use.

Figure 20: And what do you think are obstacles or challenges that may hinder deployment of an internet of things solution at your organization in the next two years?

Base: 328

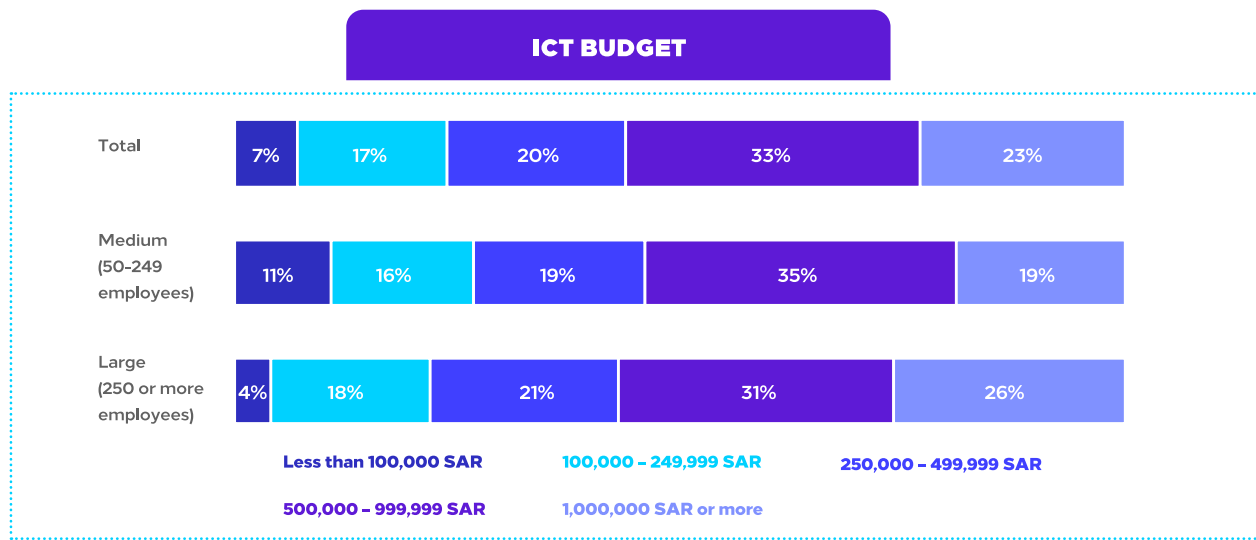


2.2.3.5 ICT Budgets

ICT budgets varied based on the size of organizations. Overall, 33% of the organizations surveyed have ICT budgets between SAR 500,000 to SAR 999,999. 10% of organizations refused to provide their ICT spending details for the survey, More insights are illustrated in Figure 21.

Figure 21: How much is your company's total ICT budget (in SAR) for last year (2019)?

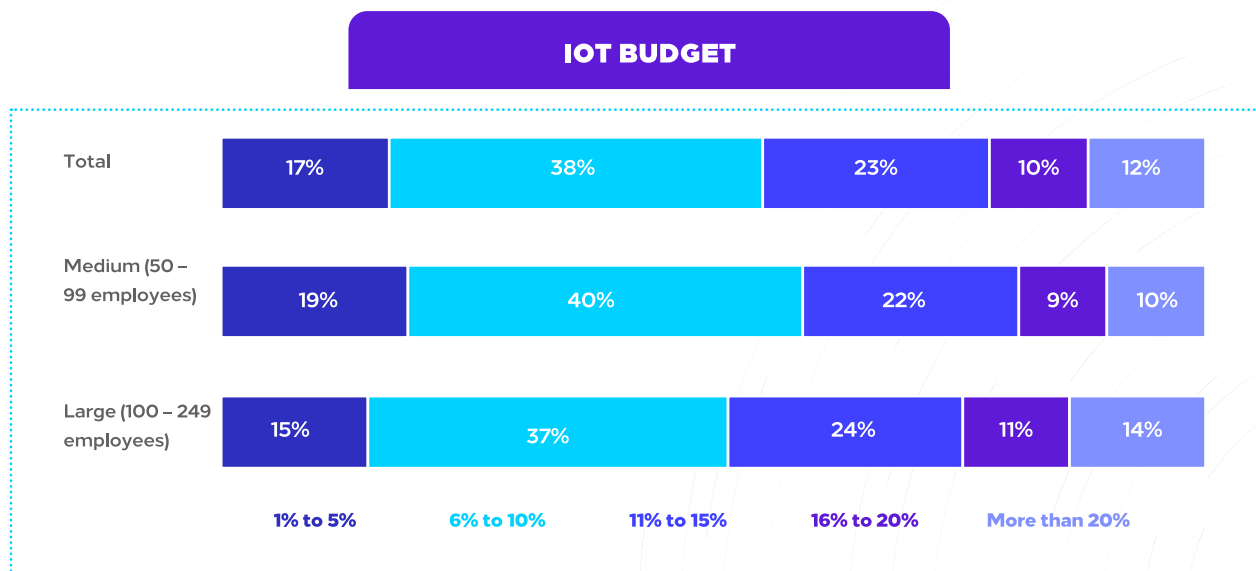
Base (Total): 296, *Excludes don't know/refused



On average, companies allocated 12% of their ICT budget for IoT deployments. However, there are no significant differences observed among medium and large size organizations in terms of IoT budget allocation, as illustrated in Figure 22.

Figure 22: Based on your best estimate, what percentage of your company's total ICT budget is allocated to, or is expected to be allocated towards IoT Solutions?

Base (Total): 269





3

STUDY INSIGHTS

3. Study Insights

This study presented a general overview of IoT market in the Kingdom of Saudi Arabia. It addressed the impact and main challenges of adopting and deploying IoT solutions that companies might face. Different participant segments from key market players and private companies in the Kingdom were involved in the study. Most of the companies perceived the impact of IoT deployment as strategic, and it would provide a competitive advantage to them. On the other hand, the study derived that the top three factors motivating companies to invest in IoT deployment include improving production efficiency, fostering customer experience, and enhancing security.

Despite the fact that IoT deployment for companies has not been smooth, as they have encountered challenges during the planning and implementation stages, in general, IoT adoption in KSA is expected to grow in the near future. In 2023, 82% of medium and large organizations in the Kingdom will probably have adopted an IoT solution for their business. The survey demonstrated that IoT deployments include more than 32 different use cases, which have been implemented by the companies. Currently, CCTV represents the highest deployment (87%) among the companies followed by Fleet Management (51%) and Staff Identification (45%).

Companies expressed specific concerns and challenges started with IoT upfront cost being the highest financial concern (45%), followed by the fear of implementation complexity (29%), and the lack of management willingness (29%) to adopt IoT solutions.

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