AITI

Authority for
Info-communications
Technology
Industry of Brunei Darussalam

BRUNEI DARUSSALAM
INFORMATION COMMUNICATIONS TECHNOLOGY (ICT)
BUSINESS REPORT 2022



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Message from the Chief Executive

Assalamualaikum Warahmatullahi Wabarakatuh

Alhamdulillah, it is with great pleasure that I present the Brunei Darussalam Information and Communications Technology (ICT) Business Report 2022, which has been conducted by the Authority for Info-communications Technology Industry of Brunei Darussalam (AITI) in collaboration with Universiti Teknologi Brunei (UTB).

This report serves to provide important insights into the current state of ICT access and use among businesses in Brunei Darussalam, particularly in the wake of the rapidly expanding global digital economy, which will undoubtedly create new opportunities and challenges for businesses. The role of ICT as an essential pillar support the achievement of the Third Goal of Wawasan Brunei 2035 ("A Dynamic and Sustainable Economy") has been highlighted in the Brunei Darussalam Economic Blueprint published by the Ministry of Finance and Economy (MOFE) in 2020.

Businesses in Brunei Darussalam have become increasingly connected, with 84% of businesses having internet access and more than 75% of businesses adopting internet-related activities. The demand for digital platforms and technologies to support social and economic activities became more visible as a result of the COVID-19 pandemic. At the same time, consumer expectations have also shifted in line with developments in the international arena.

This report also sheds light on how businesses have harnessed ICT to keep up with these demands, including the adoption of emerging digital technologies such as the Internet of Things (IoT), blockchain technologies and Artificial Intelligence (AI).

Unlocking innovation and technology adoption, however, are not without its challenges and businesses have to balance these with other pressing needs. As such, only 27% of businesses have leveraged on e-Commerce to sell products and services, which is largely concentrated on the local market. Additionally, there is still a digital divide between different industrial sectors. Thus, AITI continues to work closely with the relevant stakeholders to encourage ICT adoption and facilitate the development of a conducive digital ecosystem.

I hope that the diverse findings in this report will support the realisation of national aspirations by providing pertinent insights to policy makers, academia, researchers, entrepreneurs, industry players and society. Finally, I would like to express my deepest appreciation to all businesses that have participated in the survey and everyone else who has contributed to its successful completion.

Haji Jailani bin Haji Buntar
Chief Executive
Authority for Info-communications Technology Industry of Brunei Darussalam (AITI)

Executive Summary

Information and communication technologies (ICT) are increasingly important for the growth and diversification of Brunei Darussalam's economy. In today's world, access, usage and ownership of ICT and digitalisation are fundamental to unlocking new modes of operation and access to new market segments.

The Brunei Darussalam ICT Business surveys have been conducted by the Authority of Info-communications Technology Industry of Brunei Darussalam (AITI) since 2019. This 2nd edition set of publications provides an overview of the use of ICT among Brunei Darussalam's businesses, including shifts accelerated as a result of the COVID-19 pandemic, and measures indicators to characterise their current state of connectivity, online operations and technology adoption.

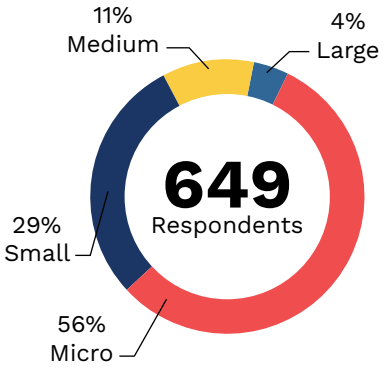
The reference and sampling period for the Brunei Darussalam ICT Business Survey 2022 was 16 May 2022 to 31 October 2022, with responses from 650 businesses across various sectors.

Among the key trends observed from the data collected are as follows:

- 71% of businesses provide internet access for its employees.
- 84% of businesses have access to the internet, with the primary internet subscription being Fixed Broadband (57%).
- 76% of businesses conduct online activities. At the moment business online activities are concentrated around sending and receiving emails (89%); seeking information / surfing the internet (88%); and 3) providing customer services (80%).
- Only 27% sell their products and services online. The top reason cited by businesses for not conducting online sales being the unsuitability of their products or services for online sale (49%).
- Physical payment or cash on delivery remains the preferred payment method among businesses (72%) but cashless payment methods are gaining traction with debit cards (58%), credit cards (46%) and third-party digital payment methods (PayPal, QuickPay, PayWave, Pocket, or others) (25%) being used.
- 97% of Bruneian businesses have adopted digital technology solutions, from a list of surveyed technologies. 74% have adopted digital technology solutions, above basic or general use applications such as Microsoft Office applications and Apple Store / Google Play Store.
- The COVID-19 pandemic served to accelerate the adoption of the following top digital solutions among businesses: online meetings using communication software (18%); digital currency and online payment (8%); Microsoft Office applications (5%); internal communication systems (5%); and Cloud storage services (5%).
- Presently, the main barriers to technology adoption are that business do not consider technology adoption as a main priority given the nature of their activities (56%), they have limited ICT knowledge and technical capability (45%) and insufficient budget to adopt digital solutions (40%).
- 10% have adopted emerging digital technology.
- However, businesses adopting digital technologies have leveraged a number of recent technology trends, particularly in cloud computing (66%), GPS and Location Tracking (30%) and Internet of Things (21%).
- At the moment, the sector with the highest level of digital adoption is the Transportation and Storage Industry (87% of business respondents in this sector), whereas the industry with the lowest level of digital technology adoption is the agriculture, forestry and fishery industry (36% of business respondents in this sector).
- However, the Human Health and Social Work industry has the highest level of emerging technology adoption (10% of businesses in this sector).

ICT Business Survey 2022 Key Findings

Survey Population



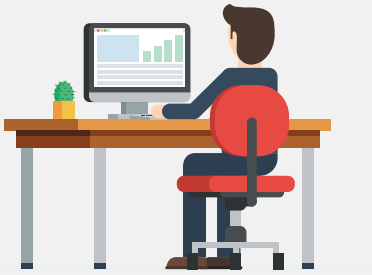
Connectivity and Access

71%
of businesses provide computer access for employees

84%
of businesses have Internet access



ICT Usage in Businesses



Internet activities

76%
have internet-related activities

Computer activities

88%
seeking information
surfing Internet

89%
sending and
receiving emails

80%
used as providing
customer services

Smartphone and tablet activities

72%
seeking information
surfing Internet

65%
provide customer services

62%
- sending and receiving emails
- online payment/Internet banking
- other financial services



Online Presence

51% have a corporate website

42% participate in e-commerce

37% has presence through a mobile application

56% use social media

Payment Methods for Online Sales



72% cash on delivery

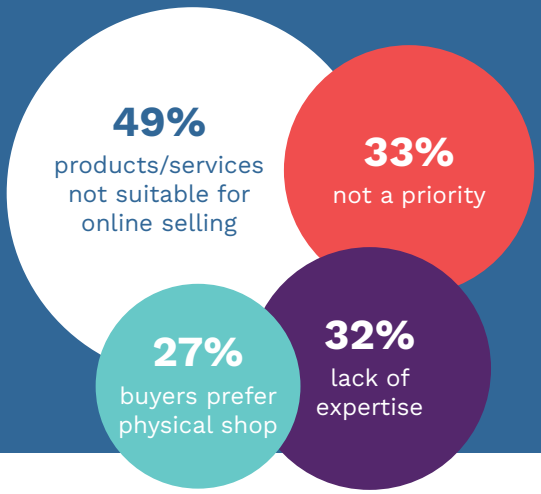
58% debit card

46% credit card

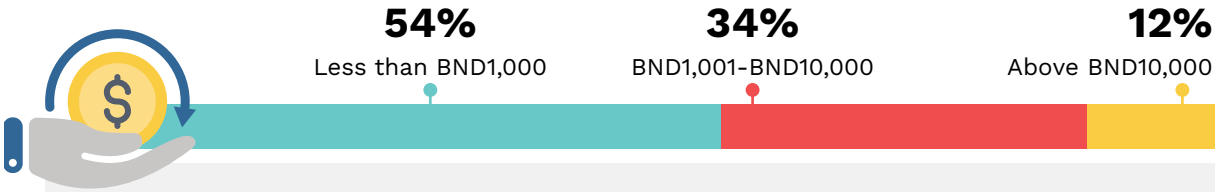
25% third-party payment

19% others (cheque, etc)

Reasons for not conducting online sales



Business Expenditure on Digital Technologies



Section 6

Digital Technology Adoption and Digital Transformation Strategies

97% **businesses adopting technology**

74% have adopted more than basic applications

10% have adopted Emerging Technologies



Barriers to ICT adoption

56% ICT use is not main priority

45% limited ICT knowledge and technical capability

40% insufficient budget to adopt digital solutions



Top Adopted Technologies

66% Cloud Computing

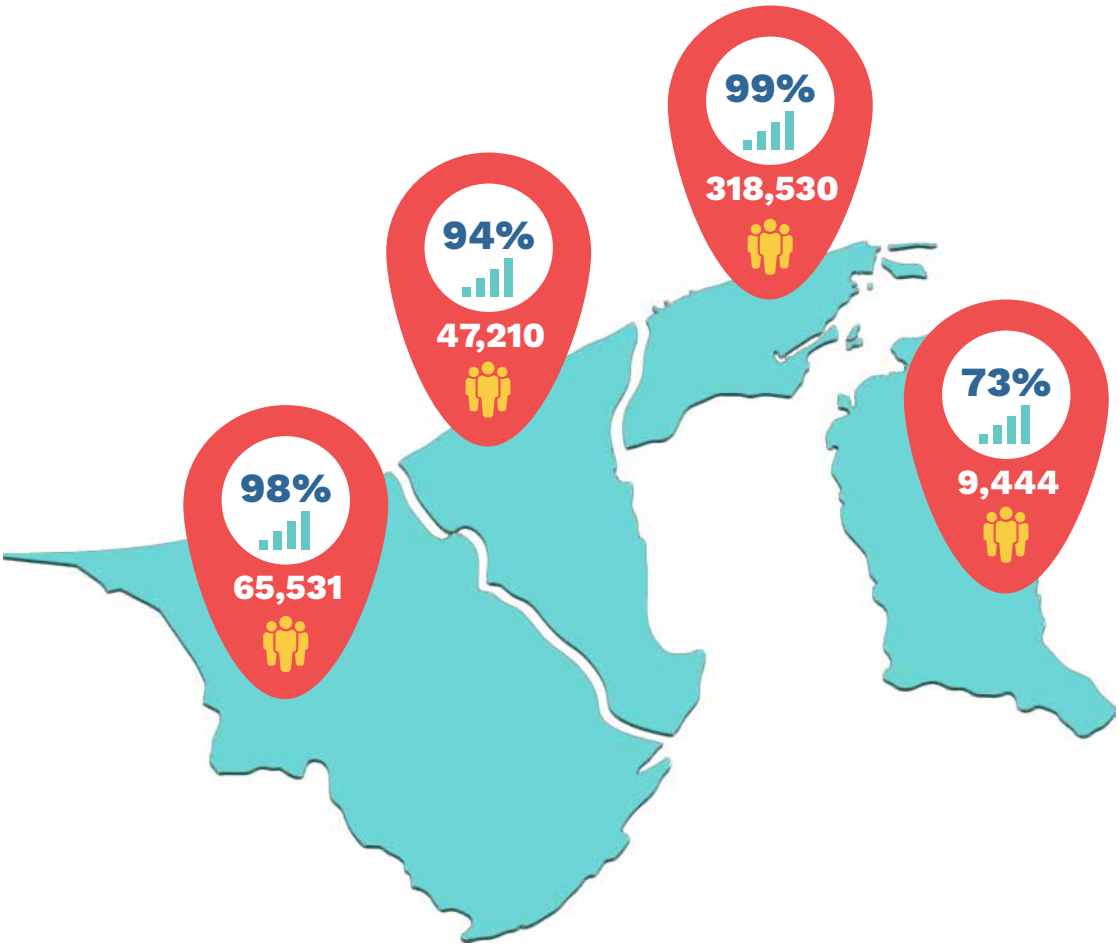
30% GPS and Location Tracking

21% IoT

1 Introduction

Information and Communication Technologies (ICT) are at the core of the digital economy. Digitalisation of the economy is transforming the ways in which goods and services are delivered and consumed. There is growing evidence suggesting that ICT- linked knowledge, innovation and ongoing technological changes are strong determinants of productivity, growth differentials as well as the ability of countries to benefit from globalisation. As such, the pivotal role of ICT in national economic growth agendas has been highlighted in order to fulfil the goals of Wawasan Brunei 2035. As the engine of economic growth, businesses have been urged to pursue digitalisation and digital transformation to enhance operations and tap into new business opportunities.

By the end of 2022, the ICT sector Gross Domestic Product (GDP) accounted for B$ 478.3 million or 4.3% of the nation's total GDP. National 3G and 4G Mobile network coverage spanned 99% of the population, and 94% of homes had Fibre to the Home (FTTH) coverage.



The Authority for Info-communications Technology Industry of Brunei Darussalam (AITI), in collaboration with Universiti Teknologi Brunei (UTB), conducted the Brunei Darussalam ICT Business Survey 2022 to provide a means of measuring and monitoring the state of connectivity and ICT use among businesses.

The survey was conducted from May till October 2022, with participation from 649 businesses.

1.1 Objectives

The objectives of the Brunei Darussalam ICT Business 2022 survey are:

- To collect data and provide meaningful indicators on the adoption of ICT among businesses in Brunei Darussalam;
- To identify and analyse the gaps and issues relating to the adoption of ICT among businesses in Brunei Darussalam;
- To understand the progress and evolving trends of ICT in Brunei Darussalam, including those related to emerging technologies.

1.2 Methodology

The Brunei Darussalam ICT Business 2022 Survey was fully conducted online from 16 May 2022 to 31 October 2022 during the COVID-19 pandemic, in order to address restrictions and challenges arising during the period. Lack of face-to-face interaction with the businesses has resulted in more time taken to encourage participation in the survey and to gather a larger number of responses.

Sampling was randomised across registered businesses of all sizes in Brunei Darussalam and distributed to businesses whose contact information was publicly available. Businesses would participate on a voluntary basis, with the survey being filled by a representative or employee of the business.

The total number of participating businesses was 649, with 65% producing complete responses. Given the number of incomplete responses, it is important to note a degree of variance in responses is expected.

1.3 Concepts and Terminology

Industrial Sector Classification

The surveyed businesses were re-categorised according to economic activity categories outlined in the Brunei Darussalam Standard Industrial Classification (BDSIC) 2011 as follows:

Sector	Industry
Agriculture	Agriculture, Forestry and Fishery
Industry	Mining and Quarrying (upstream and midstream Oil and Gas activities fall into this category)
	Manufacturing
	Electricity and Water Supply
	Construction

Services	Wholesale and Retail Trade
	Hospitality, Tourism, Accommodation and Food Service Activities
	Transportation and Storage
	Information and Communication
	Financial and Insurance Activities
	Real Estate Activities
	Professional, Technical, Administrative and Support Services
	Education
	Human Health and Social Work Activities
Other	Others*

* For the purpose of this survey “Others” denotes economic activities that fall outside of the listed industry activities as indicated by the survey respondents.

Definition of Start-Up

Based on the new national definitions introduced by the Ministry of Finance and Economy as of 11 November 2023, a Start-Up is a registered business entity which has been operating for not more than 5 years and has a business model designed to be highly scalable usually by leveraging on technology to create innovative products and/or services.

Digital Technology Classification

For the purpose of analysis for this report, digital technologies surveyed among businesses were divided into three categories: Basic, Advanced and Emerging Technologies.

Category	Digital Solutions
Basic	Multimedia Application
	Microsoft Office Applications
	Google Play Store/Apple App Store
	Social Media for Advertising and Marketing
	Communication and Collaboration Portal/Online Facilities within Organisation
	Online Meetings Using Communication Software
	Project Management Tools and Application
	Cloud Storage Services
	Computer Graphic
	Computer Aided Design or Manufacturing
	Retail Application
	Financial Management System or Accounting Software

Advanced	Sales and Marketing Application
	License Management
	Human Resource Management System
	Inventory Management System
	Enterprise Resource Planning
	Customer Relationship Management System
	Data Analytic Tools
	Production Automation System
	Automated Material Handling System
	Digital Currency and Online Payment
	Internal Communication System
	Logistic and Supply Chain Management System
	Operational and Client Management Software
	Real Time Process Control and Monitoring System
	Environmental Control System
	Procurement System
Emerging	Blockchain Technology
	Any other new or emerging technology [Internet of Things (IoT), Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR or others]

2 Demography

2.1 Companies' Duration in Operation

The majority of participating businesses have more than 10 years of operation. Start-ups represent 18% of the participating businesses.

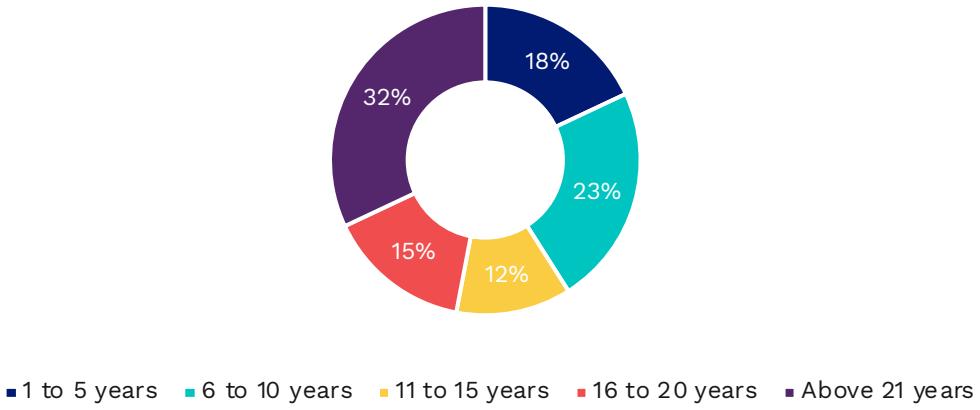


Figure 1: Number of years in business

2.2 Type of Organisation

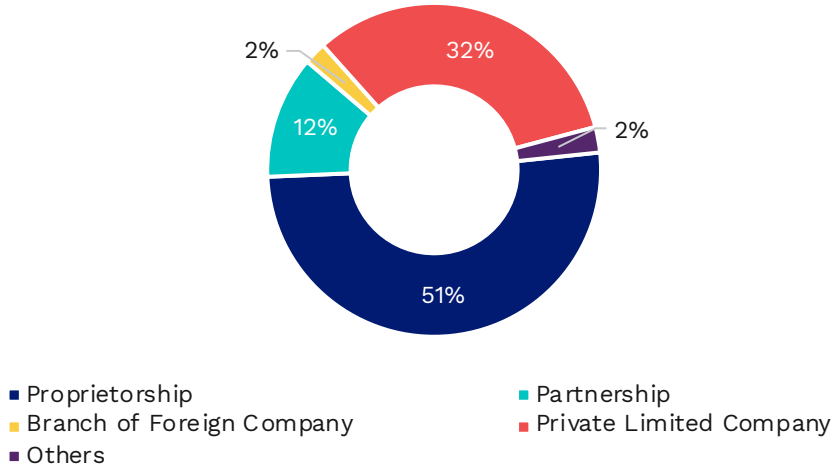


Figure 2: Type of company

2.3 Type of Sector or Industry



Figure 3: Business respondents by sector, from top sectors participating in survey

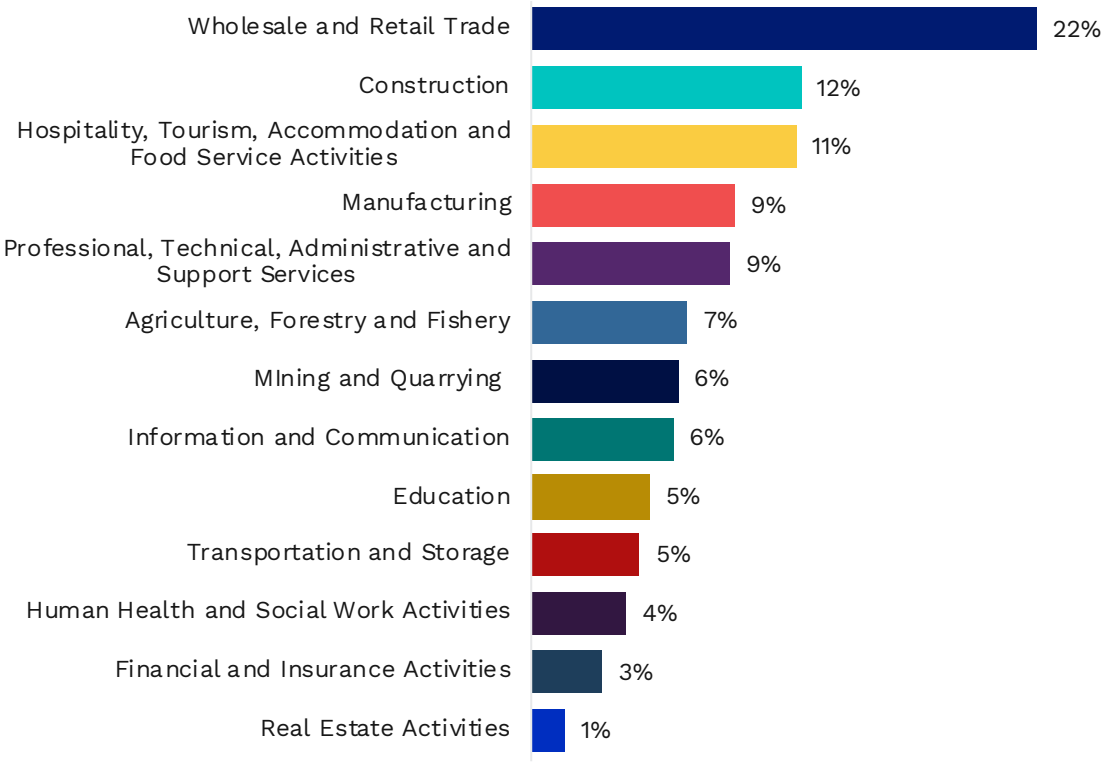


Figure 4: Business respondents by type of industry, from top industries participating in survey

2.4 Company Size

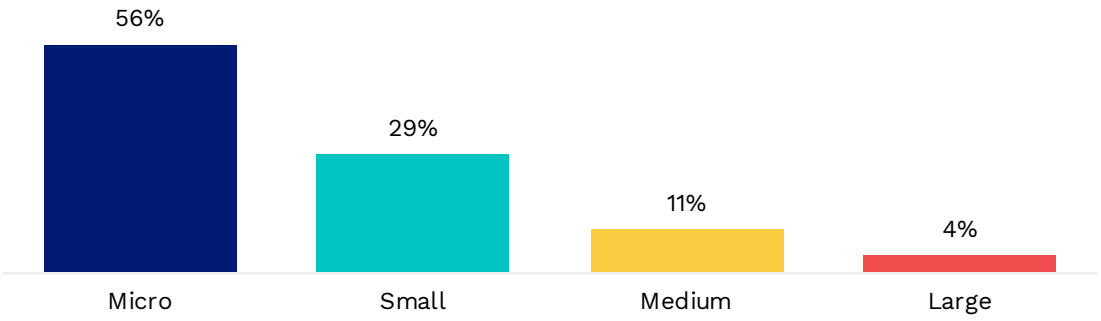


Figure 5: Company Size

2.5 Annual Revenue

Given that majority of the businesses participating in the survey are micro and small enterprises, a high percentage (40%) have an annual revenue of less than $50,000. 46% of the businesses have annual revenue of $50,000 - $1 million.

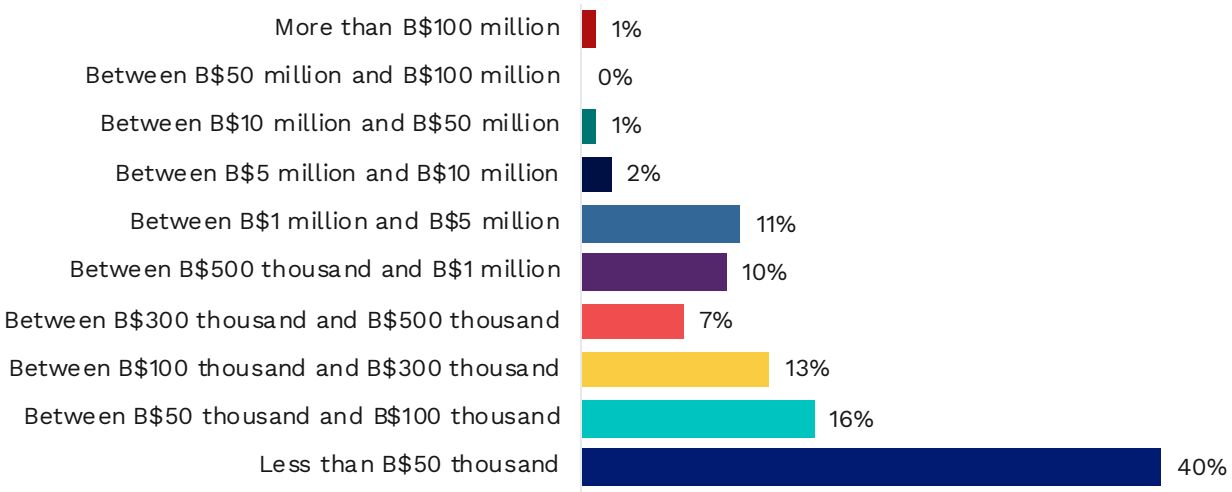


Figure 6: Business' annual revenue

2.6 Average Number of Employees



61%
Average number of local employees

39%
Average number of foreign employees

Figure 7: Average number of employees

2.7 Number of ICT Skilled Employees

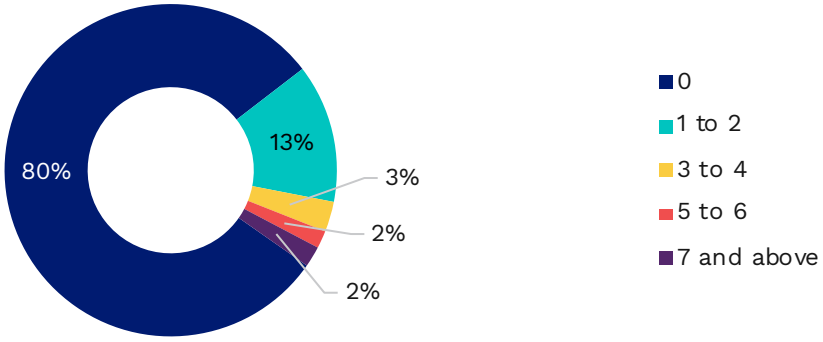


Figure 8: Number of ICT skilled employees

80% of the businesses do not have formally trained ICT-skilled employees. This may be due to the nature of business where ICT may not be a priority.

2.8 Number of Branches

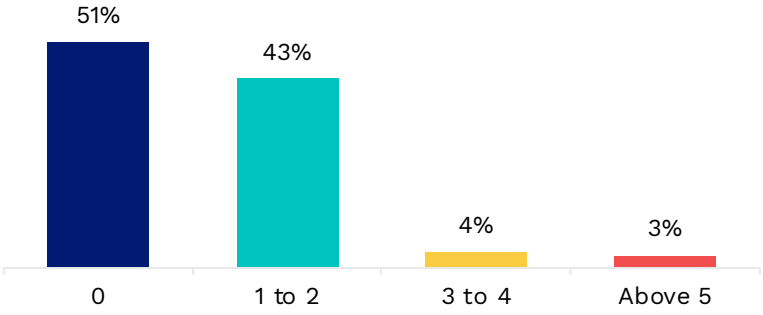


Figure 9: Number of branches

3 Computer Access

3.1 Employee Access to Computer

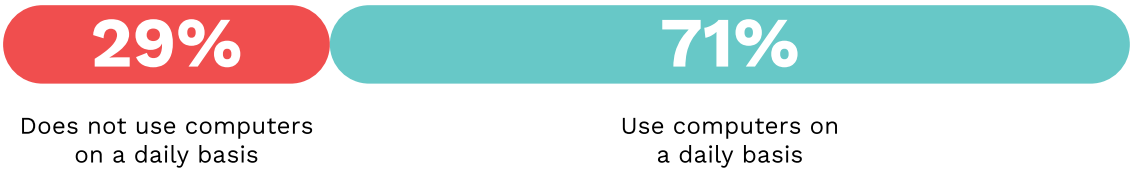


Figure 10: Percentage of businesses whose employees use a computer for daily business activities

71% of the businesses reported that their employees use a computer to perform business activities on a daily basis.

3.2 Percentage of Employees Using Computers for Business Activities

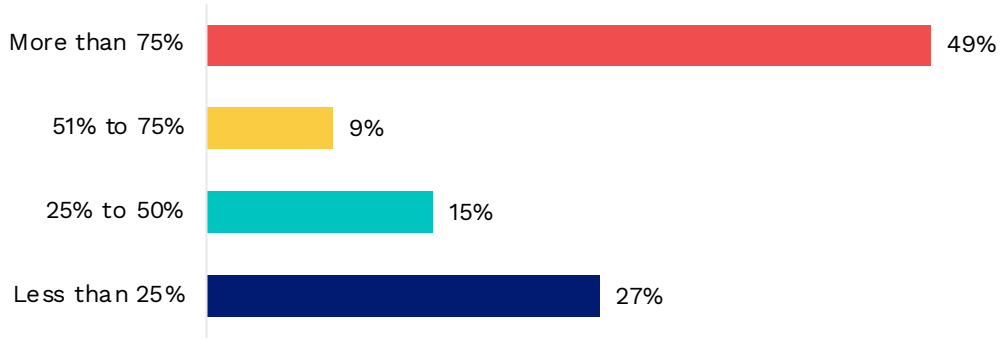


Figure 11: Percentage of employees using computers for business activities

Nearly half (49%) of the businesses indicated over 75% of their employees have access to computers for business activities. In total, 73% of the businesses indicate 25% and above of their employees have access to computers for their business activities.

3.3 Computer Access by Industry

The industries with the highest rate of access to computers are: 1) Financial and insurance activities (100%); 2) Professional, Technical, Administrative and Support Services (98%); and 3) Information and Communication (97%).

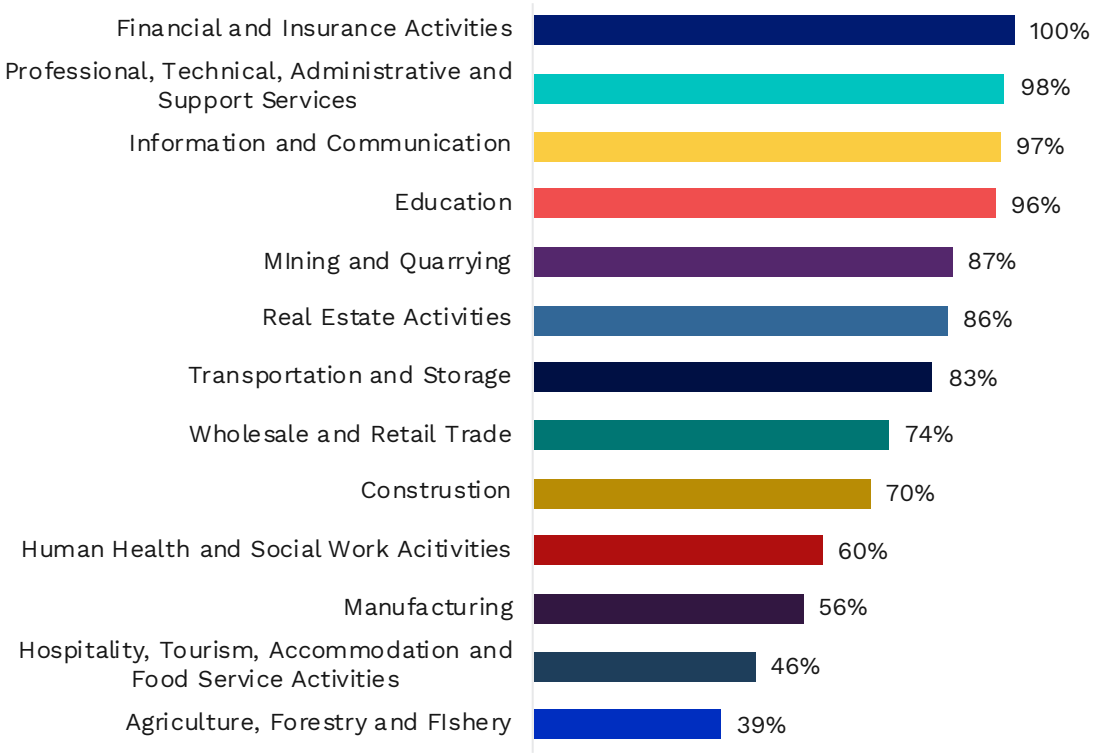


Figure 12: Proportion of businesses using computers for business activities, by industry

4 Internet Access

4.1 Access to the Internet



Figure 13: Access to the internet

Most businesses (84%) have access to the Internet which indicates that it is essential for most businesses to subscribe to internet services to perform their business activities effectively.

However, for those that do not have internet access, among the reasons cited are as follows:

- Due the nature of business, they prefer walk-in orders, conduct direct business-to-business sales, nature of work is more focused on physical work on-site (e.g. installation, maintenance and repair work, hair saloon work, tailoring work) or it is not a business requirement at this stage;
- Limited internet speed in their respective location;
- Computer use is for administrative tasks not requiring internet access;
- Business is small-scale and does not require internet access;
- No expertise;
- Preference for face-to-face interactions.

4.2 Internet Access by Industry

The industries with internet access for business activities are: 1) Information and Communication (100%); 2) Mining and Quarrying (including upstream and midstream oil and gas) (97%); and 3) Education (96%).

The difference between proportions of businesses accessing the internet and using computers for business purposes indicates that a number of industries may be accessing the internet through devices other than computers. The industries whose internet access is higher than their computer access are: 1) Information and Communication; 2) Mining and Quarrying; 3) Construction; 4) Human Health and Social Work Activities; 5) Wholesale and Retail; 6) Transportation and Storage; 7) Hospitality, Tourism, Accommodation and Food Services Activities; 8) Agriculture, Forestry and Fishery; and 9) Manufacturing.

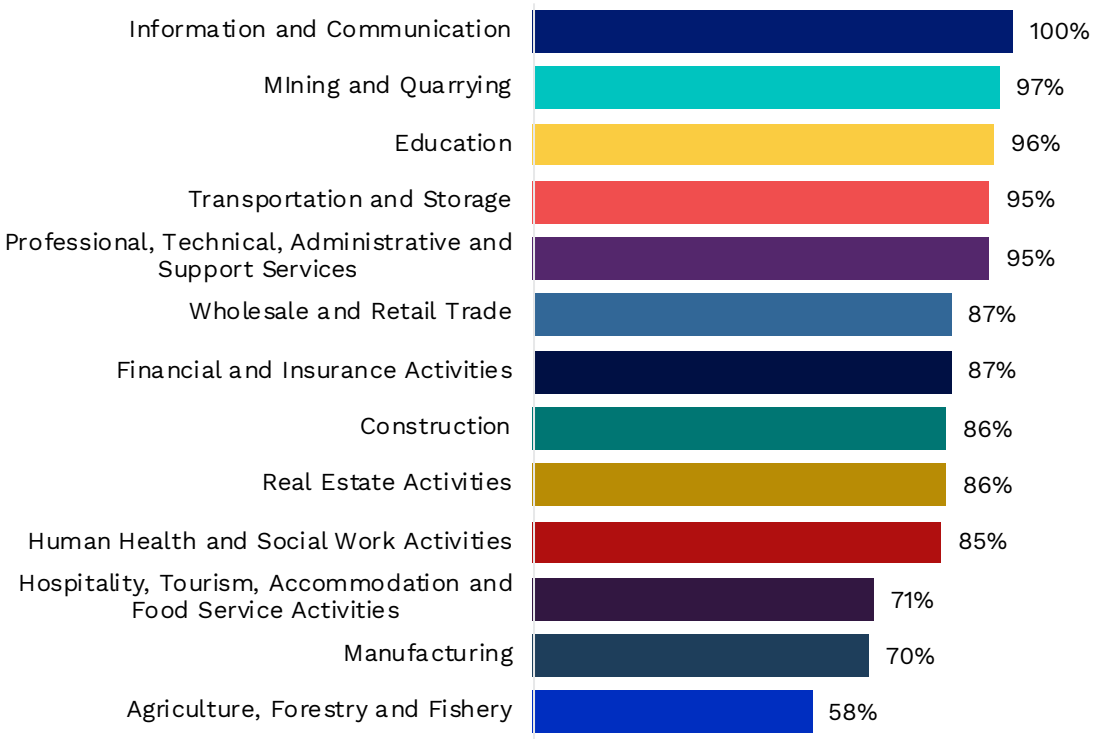


Figure 14: Proportion of businesses using internet for business activities, by industry

4.3 Internet Subscription

57% of the businesses subscribed to fixed broadband services while 30% subscribed to an internet leased line. Relatively few businesses subscribed to fibre to the home (FTH/HSBB) (26%) and mobile broadband (26%) services.

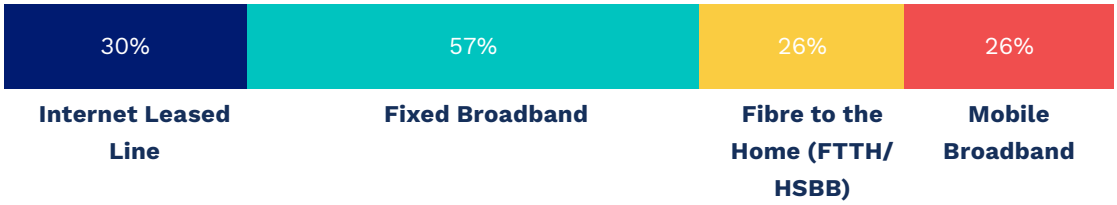


Figure 15: Internet subscription

4.4 Monthly Expenditure for Internet Subscription

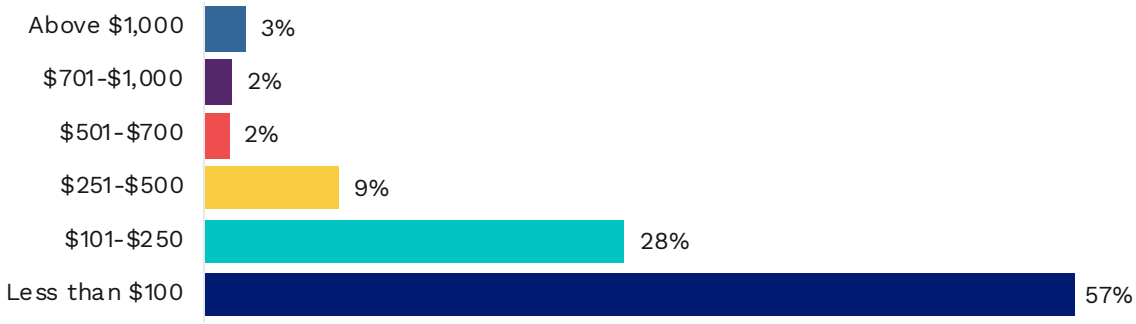


Figure 16: Monthly internet subscription

The majority of the businesses (57%) spend less than $100 per month on their internet subscription, which seems to be sufficient for their daily business activities. Less than 20% of the businesses spend more than $200 per month on their internet subscription.

4.5 Level of Internet Usage

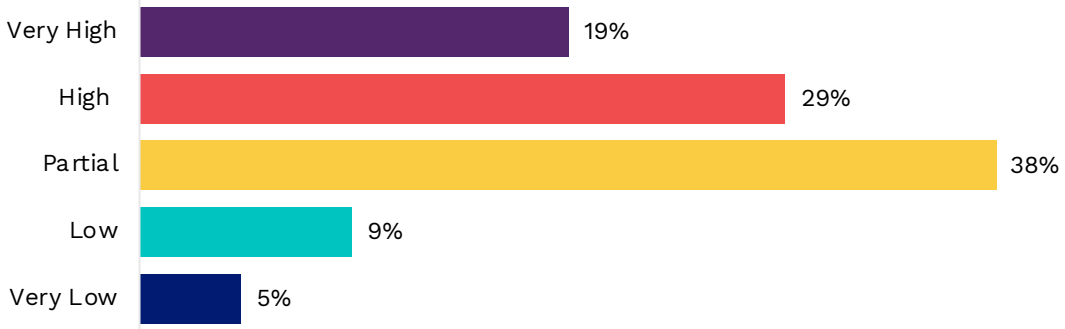


Figure 17: Percentage of Internet usage

Nearly half (48%) of businesses indicated that their internet usage is high or very high. 38% of businesses partially use the internet for their business operations, while only 14% of businesses have low to very low usage.

4.6 Quality of Internet Speed

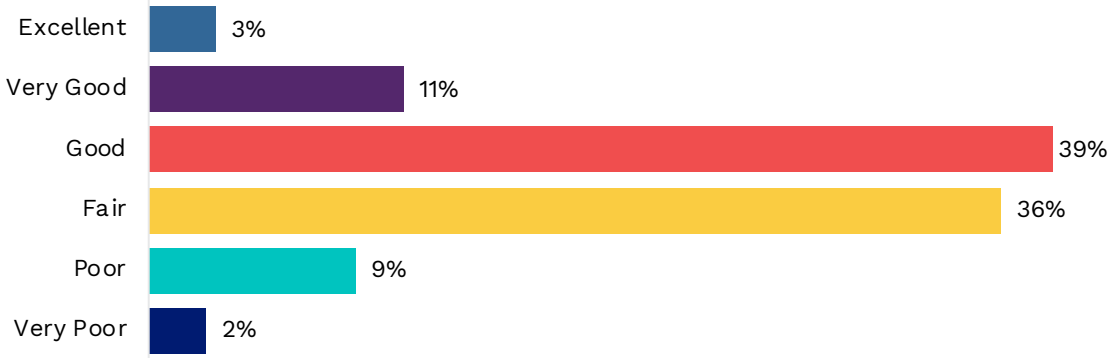


Figure 18: Percentage of Internet speed quality

More than half of the respondents (53%) indicated that the quality of Internet speed ranges from good to excellent. Slightly more than a quarter (36%) rated the quality of internet speed as fair while only a very small percentage (11%) rated the quality of internet speed to be poor.

4.7 Evaluation of Monthly Expenditure on Internet Subscription

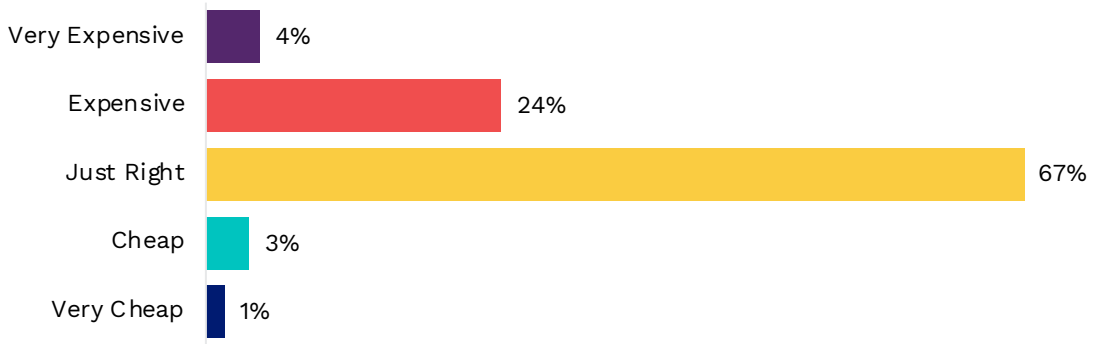


Figure 19: Percentage of monthly Internet expenditure

The majority of the businesses (67%) rate their monthly Internet expenditure to be 'just right'. More than quarter (28%) rate their monthly expenditure on their internet subscription to be either 'expensive' or 'very expensive'. Very few claim that their monthly internet expenditure is 'cheap' (3%) or 'very cheap' (1%).

5 ICT Usage in Businesses

5.1 Overall Digital Technology Adoption Among Businesses

97% of businesses indicated that they have adopted at least one form of digital technologies surveyed, and 10% have adopted emerging digital technologies.

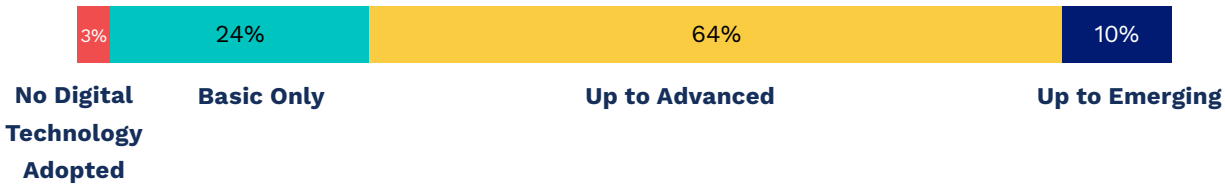


Figure 20: Digital technology adoption by category (%)

Table 1 Surveyed Digital Technologies and Categories of Digital Technologies

Basic	Advanced	Emerging
▷ Multimedia Application ▷ Microsoft Office Applications ▷ Google Play Store/ Apple App Store ▷ Social Media for Advertising and Marketing ▷ Communication and Collaboration Portal/ Online Facilities within Organisation ▷ Online Meetings using Communication Software ▷ Project Management Tools and Application ▷ Cloud Storage Services ▷ Computer Graphic ▷ Computer Aided Design or Manufacturing ▷ Retail Application ▷ Financial Management System or Accounting Software	▷ Sales and Marketing Application ▷ License Management ▷ Human Resource Management System ▷ Inventory Management System ▷ Enterprise Resource Planning ▷ Customer Relationship Management System ▷ Data Analytic Tools ▷ Production Automation System ▷ Automated Material Handling System ▷ Digital Currency and Online Payment ▷ Internal Communication System ▷ Logistic and Supply Chain Management System ▷ Operational and Client Management Software ▷ Real Time Process Control and Monitoring System ▷ Environmental Control System ▷ Procurement System	▷ Blockchain Technology ▷ Any other new or emerging technology [Internet of Things (IoT), Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR), or others]

5.2 Digital Technology Adoption By Industry

The highest level of digital technology adoption is in the Transportation and Storage industry (87%), whereas the industry with the lowest level of digital technology adoption is the agriculture, forestry and fishery industry (36%).

The industry adopting the most emerging technology is the Human Health and Social Work industry (10%).

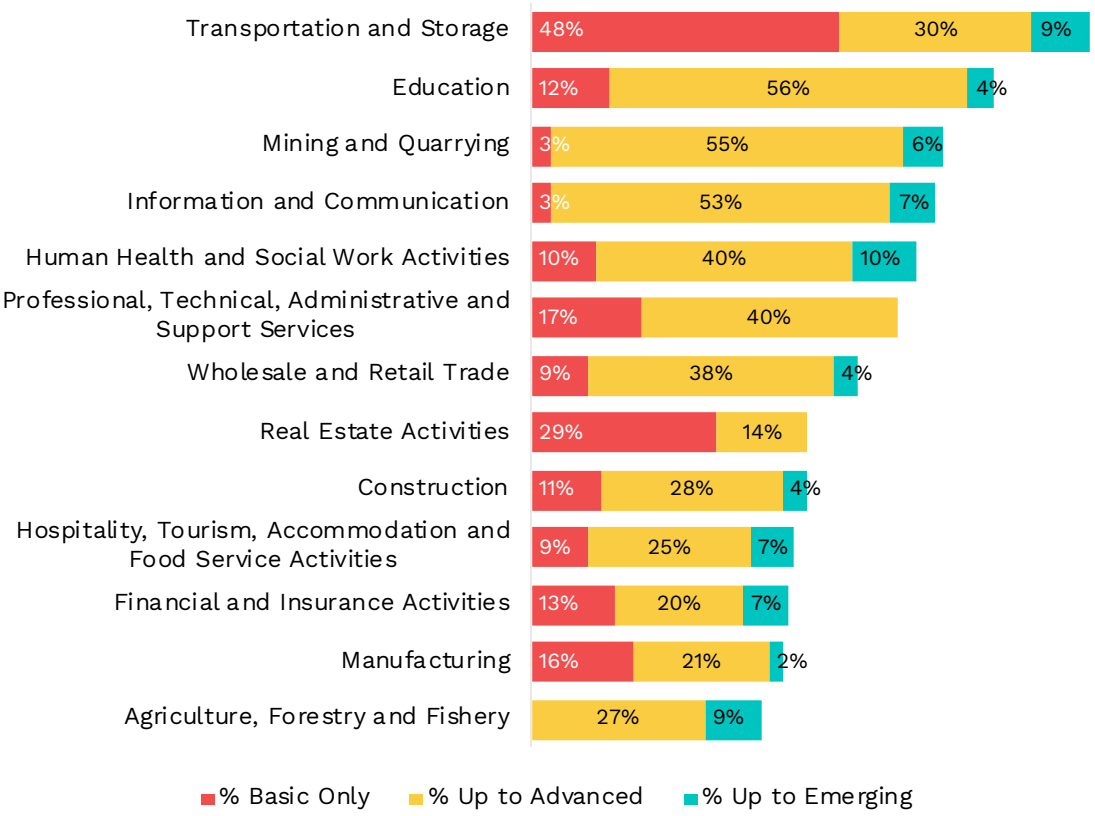


Figure 21: Industry digital technology adoption by category (%)

5.3 Adoption of Information Systems/Applications for Digital Solutions

5.3.1 Basic Digital Technology Adoption

The most adopted Information Systems / Applications in the Basic category are Microsoft Office Applications (64%), Cloud Storage applications (40%) and Financial Management Systems / Accounting Software (33%).

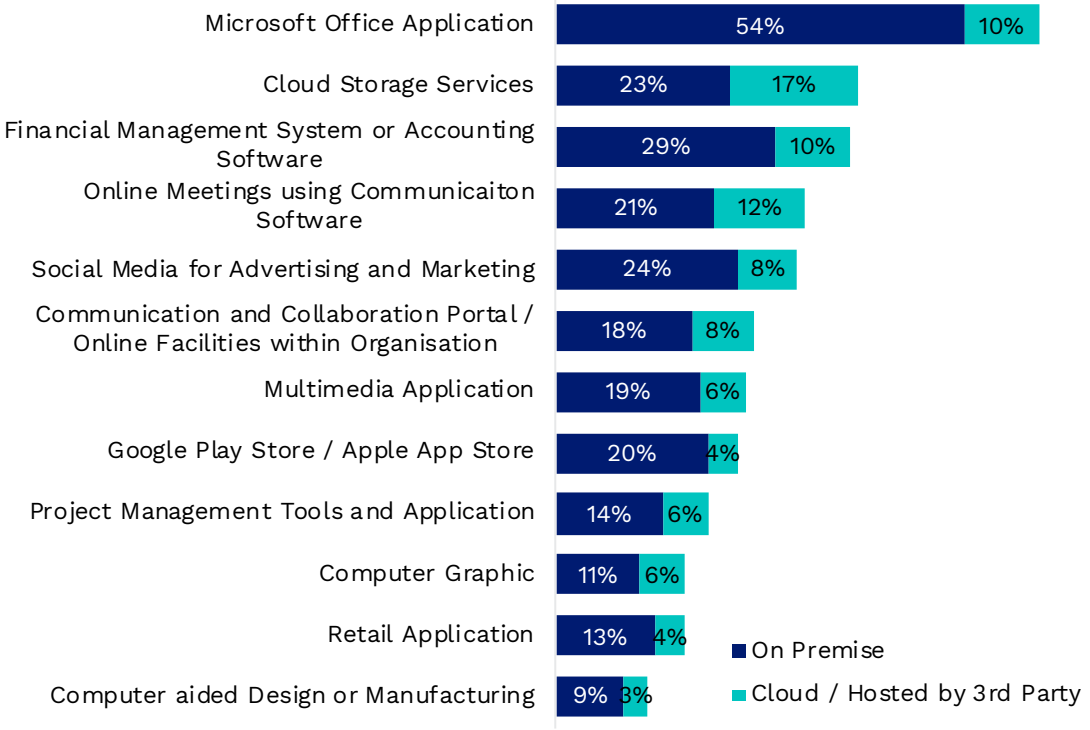


Figure 22: Basic digital technology adoption

5.3.2 Advanced Digital Technology Adoption

The most adopted Information Systems / Applications in the Advanced category are Inventory Management Systems, Internal Communication Systems and Digital Currency and Online Payment.

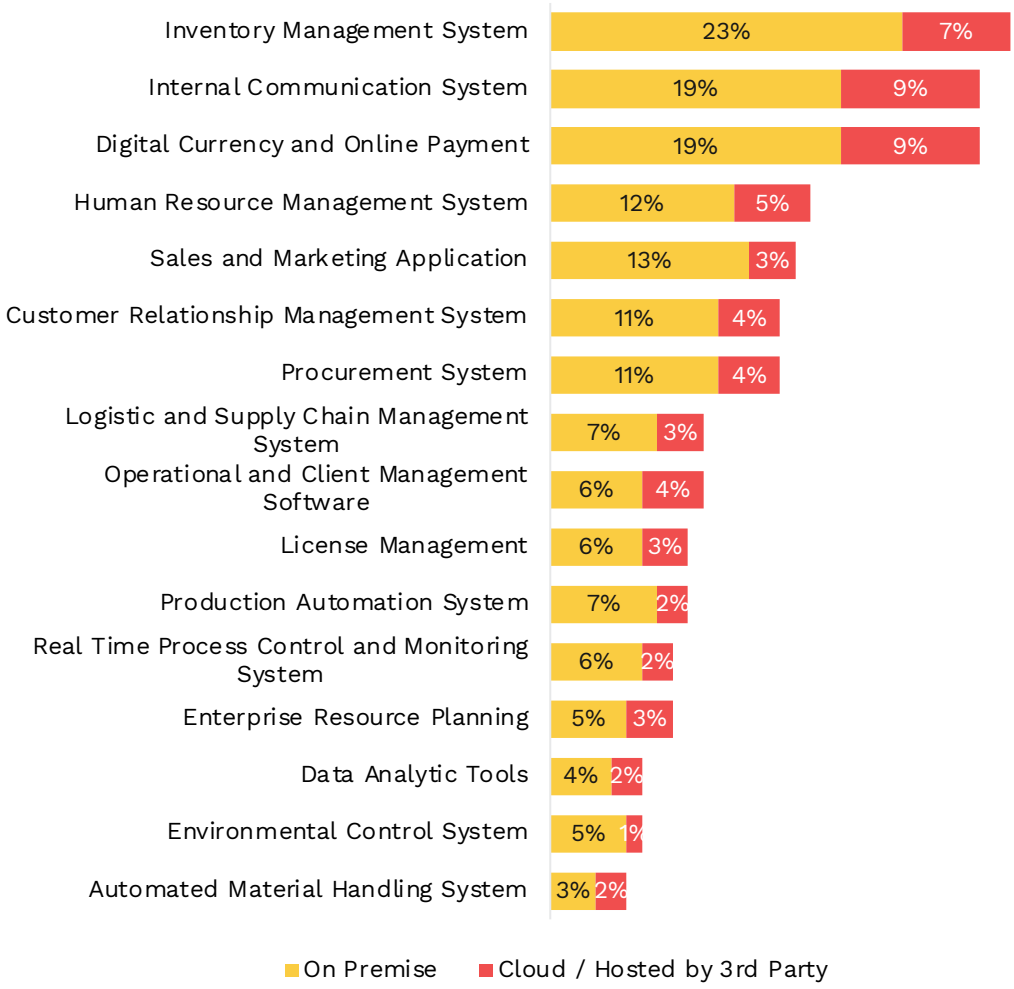


Figure 23: Advanced digital technology adoption

5.3.3 Adoption of Recent Digital Technology Trends

Among selected recent technology developments, cloud computing has the highest adoption (66%) followed by GPS and location tracking (30%) and IoT (21%). Cloud computing may be widely used by the businesses for data storage facilities while GPS and location tracking may be used for the purpose of directing customers to the business location, especially for online businesses.

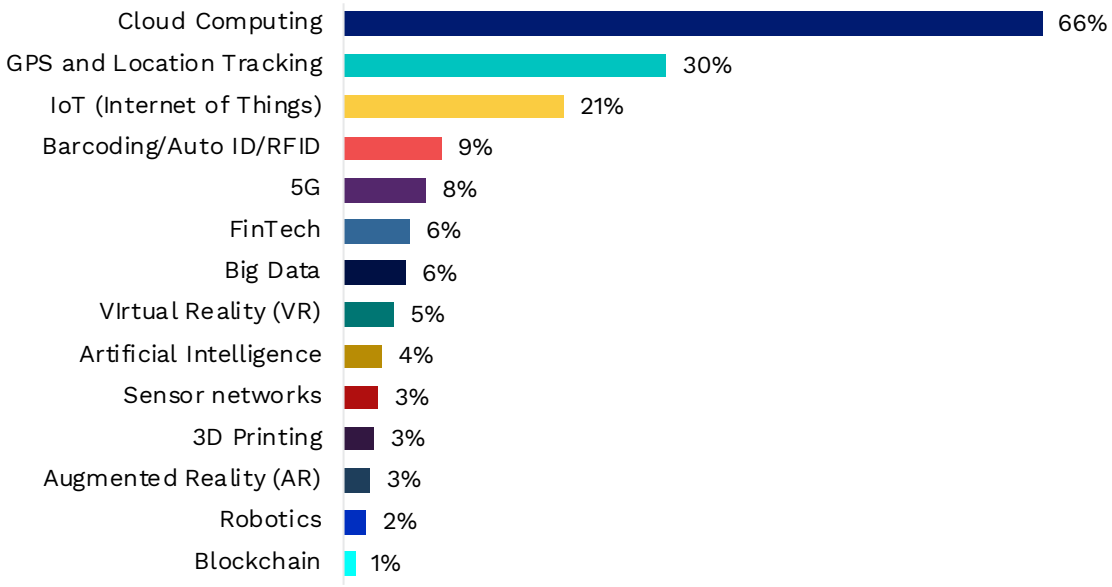


Figure 24: Other emerging technology adoption, by type

5.3.4 Digital Technology Adoption Driven by the COVID-19 Pandemic

The COVID-19 pandemic accelerated the rate of digital adoption among businesses in order to maintain business activities in light of restrictions.

35% of business respondents indicated that they had adopted Work From Home (WFH) software applications.

The top digital solutions adopted by businesses as result of the pandemic are: Online Meetings Using Communication Software (18%); Digital Currency and Online Payment (8%); Microsoft Office Applications (5%); Internal Communication Systems (5%); and Cloud Storage Services (5%).

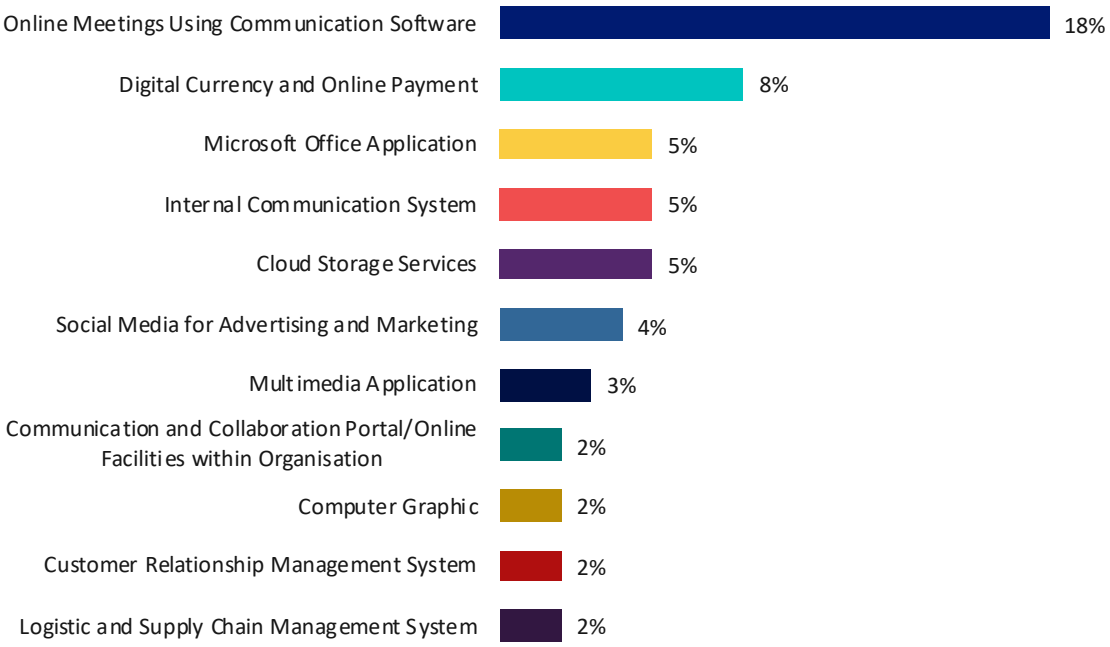


Figure 25: Information systems adopted as a result of the COVID-19 pandemic

5.3.5 Estimated Investment for Digital Technology Adoption

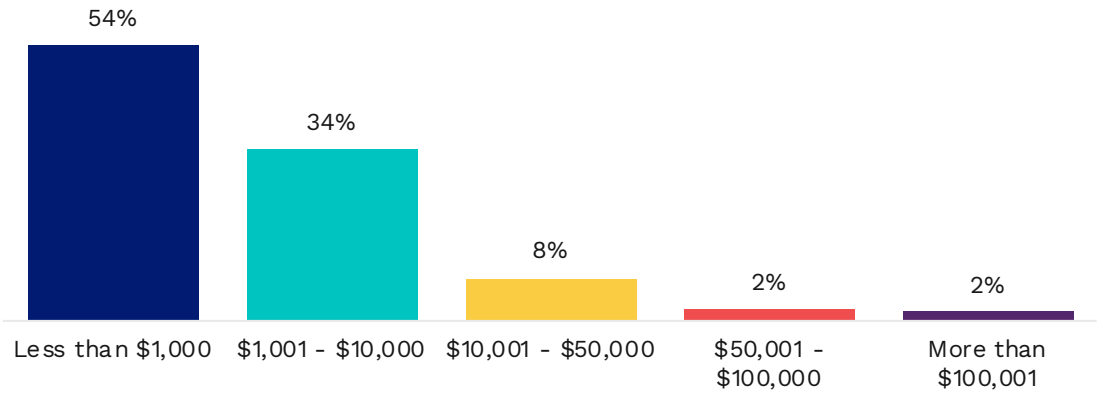


Figure 26: Estimated investment in digital technology adoption

5.3.6 Number of Days of Training Required to Adopt Digital Solution

78% of the businesses took less than 30 days to adopt the digital technology solutions, including the human resource adaption to the solution (training). This may be because the technologies adopted (Microsoft Office, Cloud Storage, Digital Currency/Payment, Communications Software) do not require specialised training. On the other hand, only 8% of the businesses have adopted more advanced to emerging digital technologies which require more than 121 days of formal training for their employees.

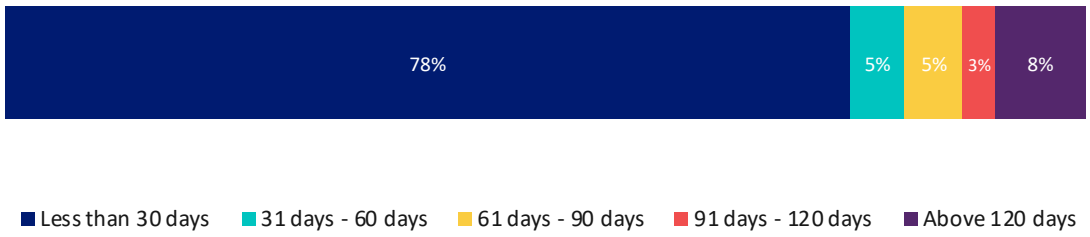


Figure 27: Number of days training

5.4 Adoption of Information Security Tools and Practices

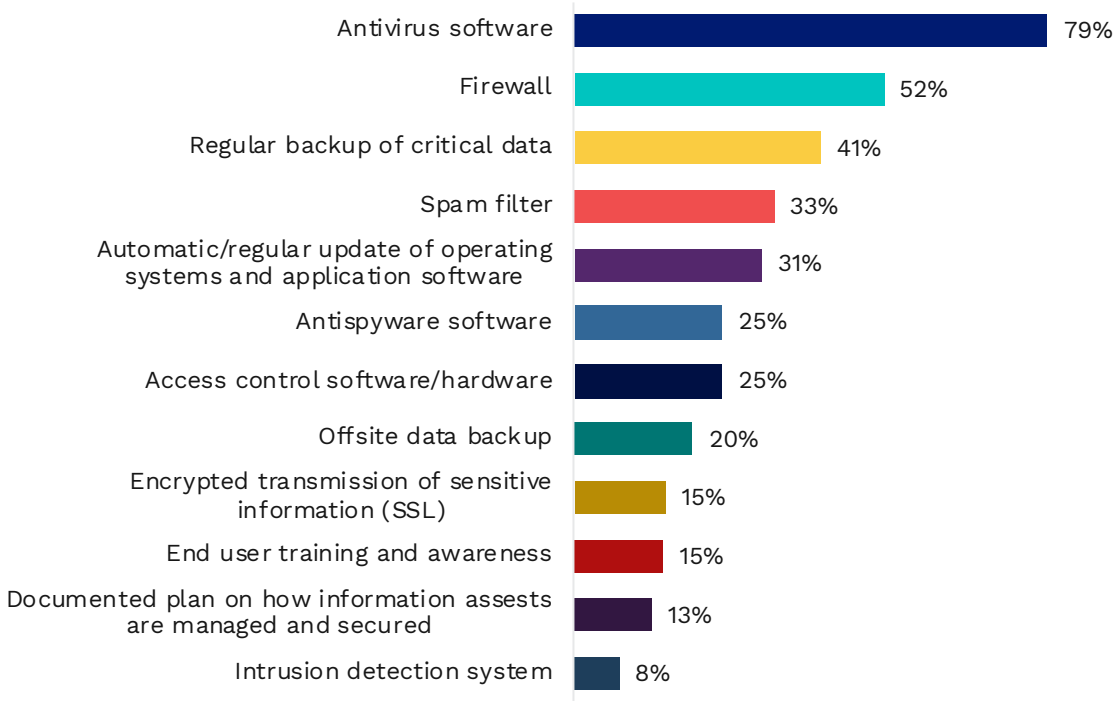


Figure 28: Efforts to protect information security

79% of businesses have installed antivirus software to protect their information security. This is followed by 52% that have included firewalls in their system and 41% that have conducted regular backups of their critical data. Information security is vital to businesses as unauthorised access to private data can lead to revenue loss, loss of customer trust or even the eventual end of a business.

5.5 Data Protection Measures

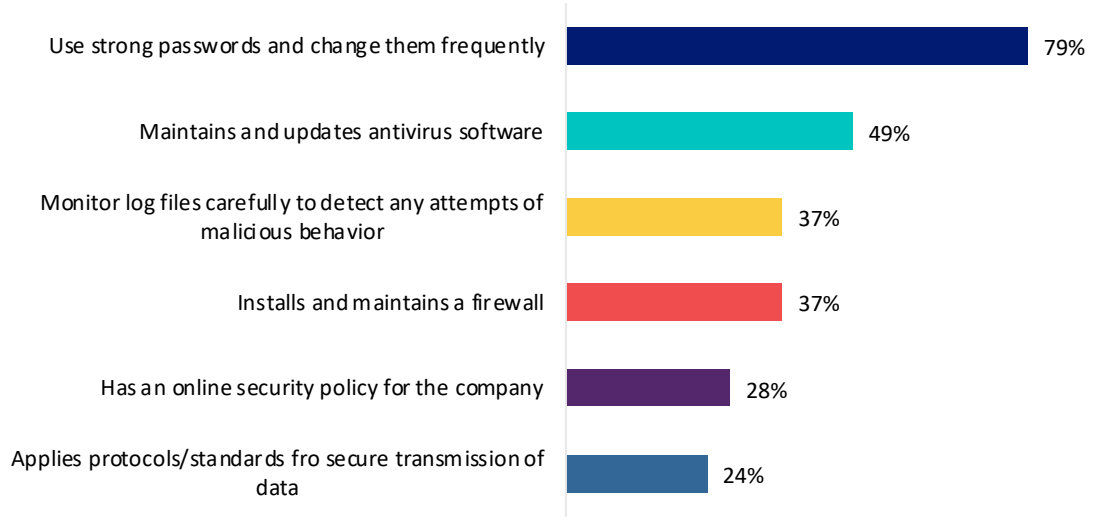


Figure 29: Data protection measures

The main data protection measures used by businesses to mitigate digital risks are at the basic level, which includes ensuring password strength and changing them frequently (79%) and updated antivirus software (49%).

Only 37% install and maintain firewalls, monitor log files (37%), have an online security policy (28%) and apply secure data transmission protocols and standards (24%).

6 ICT Barriers

6.1 Capitalisation of ICT



Figure 30: Capitalisation on the use of ICT

61% of businesses believe that they have not fully capitalised on ICT for their business hence there are further opportunities for the capitalisation of ICT within these businesses.

6.2 Potential Barriers for Maximising ICT Usage

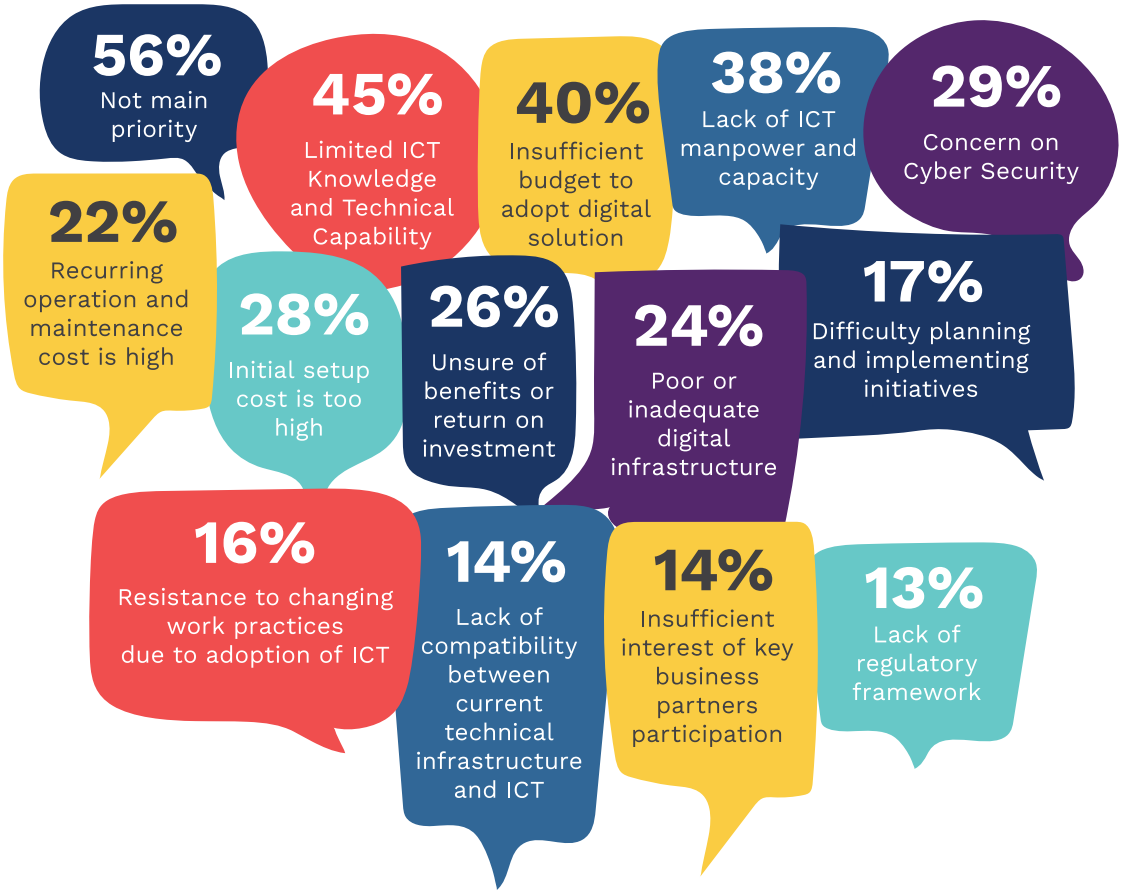


Figure 31: Barriers for maximising ICT usage

The main barriers for maximising ICT usage by businesses is their mindset as over half of the businesses (56%) have stated that ICT is not their main priority, and in some cases, they cite that the nature of work is not suited to ICT adoption (e.g. construction and tailoring work). 45% claim to have limited ICT knowledge and technical capability and 40% have insufficient budget to adopt digital solutions. Lack of ICT manpower and capacity, cyber security concerns and high initial setup costs are other key barriers.

7 Online Business Activities

7.1 Business-Related Activities Using the Internet

The top business-related activities performed over the internet are: 1) sending and receiving emails (89%); 2) seeking information / surfing the internet (88%); and 3) providing customer services (80%).

The respondents also indicate a preference for computers to perform these functions in comparison to smartphones or tablets.

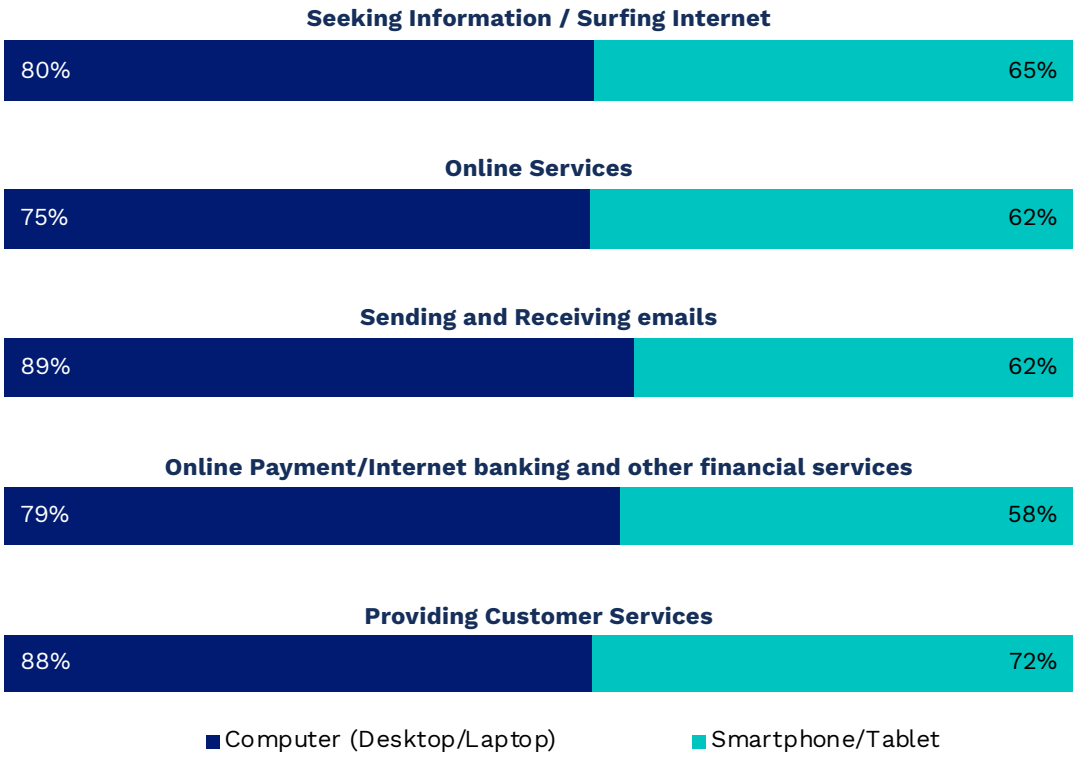


Figure 32: Internet related activities

7.2 Online Presence

60% of businesses indicating they have an online presence, have cited that their online presence is primarily through social media such as Instagram, Facebook, TikTok, and YouTube.

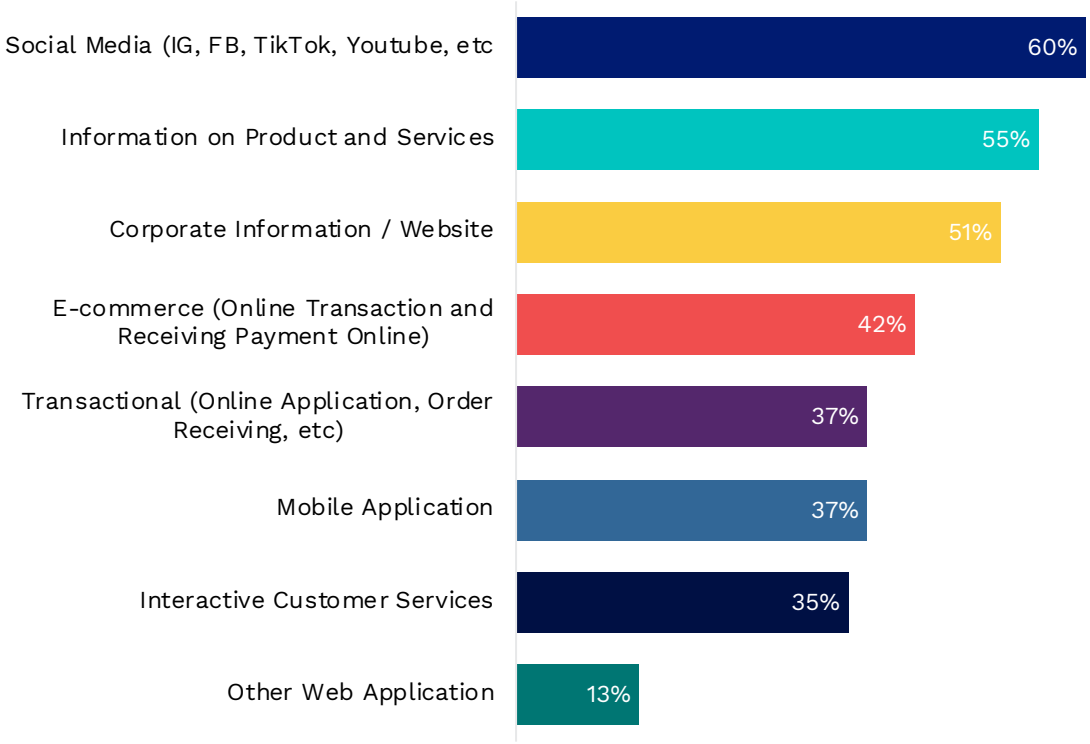


Figure 33: Online presence

7.3 Local Web / Mobile Applications Used by Businesses

The local web / applications with the most business users are the e-Darussalam services (82%), applications for paying utility bills (76%) and the JobCentre Brunei system (70%), which are also the most frequently used applications.

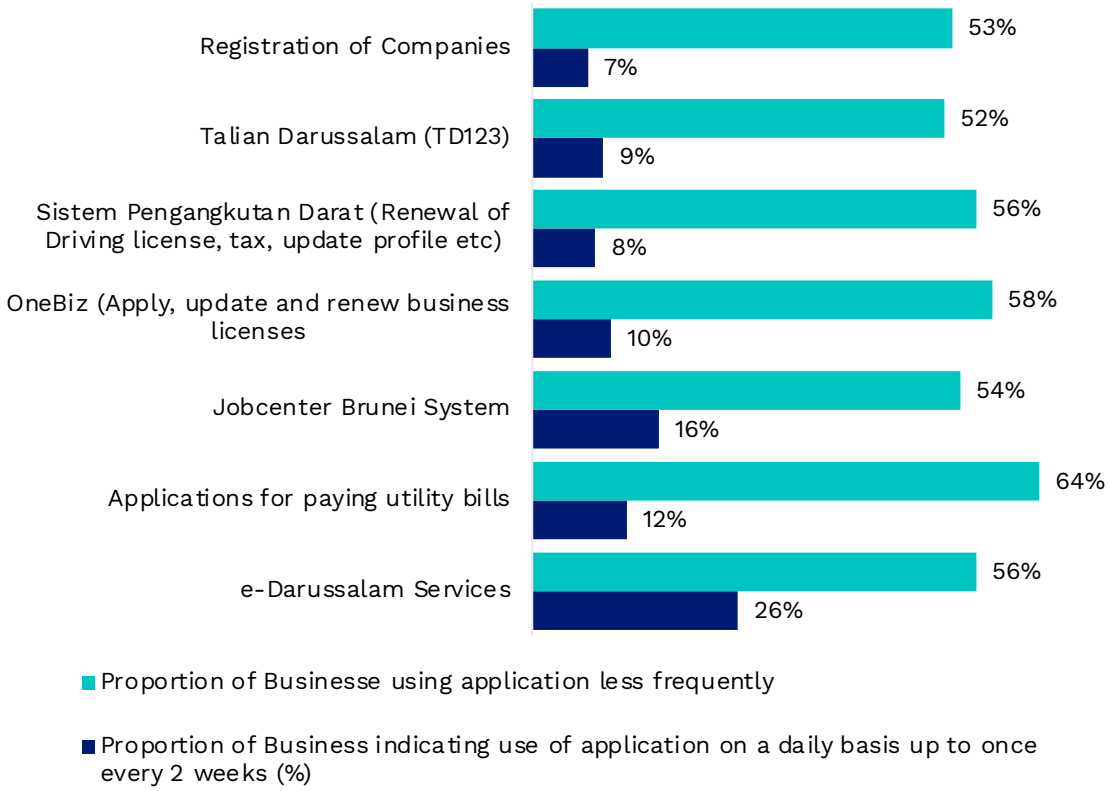


Figure 34: Use of local web / mobile applications by businesses

8 Social Media

8.1 Usage of Social Media

Out of all businesses surveyed, 56% are using social media. This is a 6% increase from the findings in the 2019 survey.



Figure 35: Usage of social media

8.2 Frequency of Social Media Usage

The top social media applications used frequently by businesses (daily to once a month) are WhatsApp (90%), Instagram (68.2%) and Facebook (67.8%). Whereas the social media applications used most by the businesses on a daily basis are WhatsApp (79%), Facebook (42%), and Instagram (40%).

The trend is similar to social media applications usage by Bruneian households, with the top applications being WhatsApp, Instagram and Facebook.

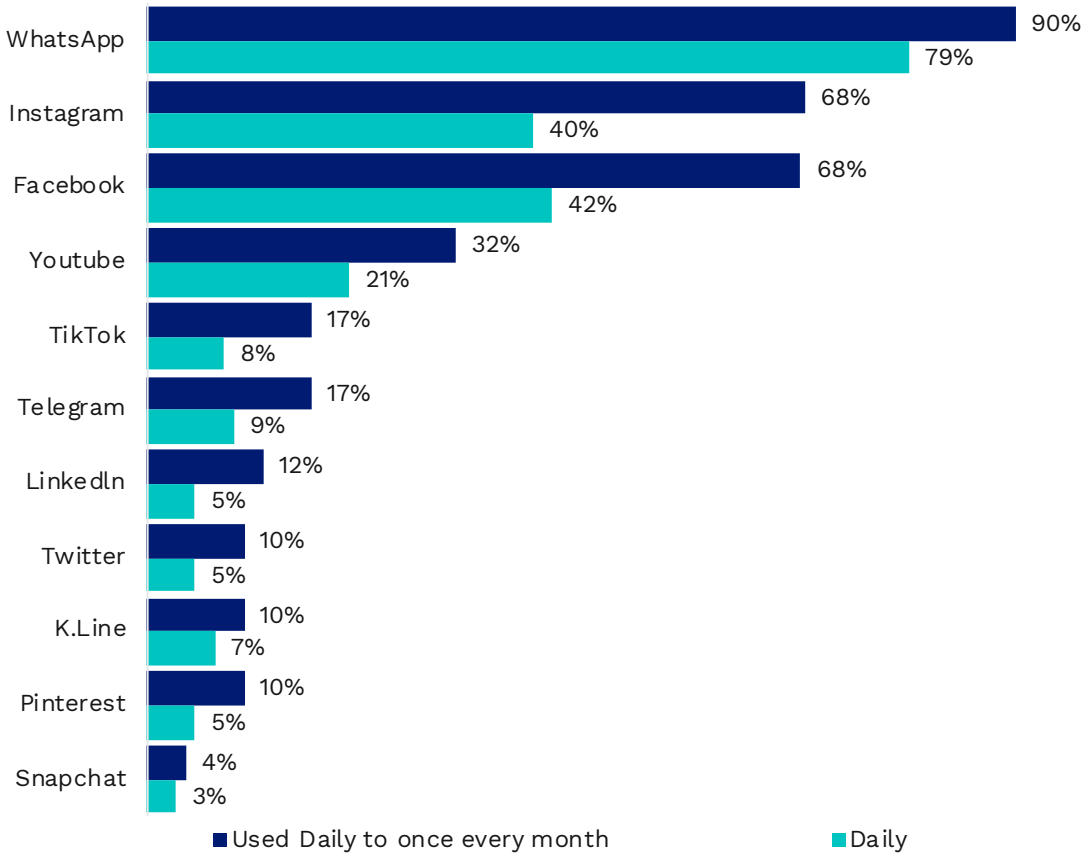


Figure 36: Frequency of social media usage

8.3 Frequency of Business activities on Social Media Platforms

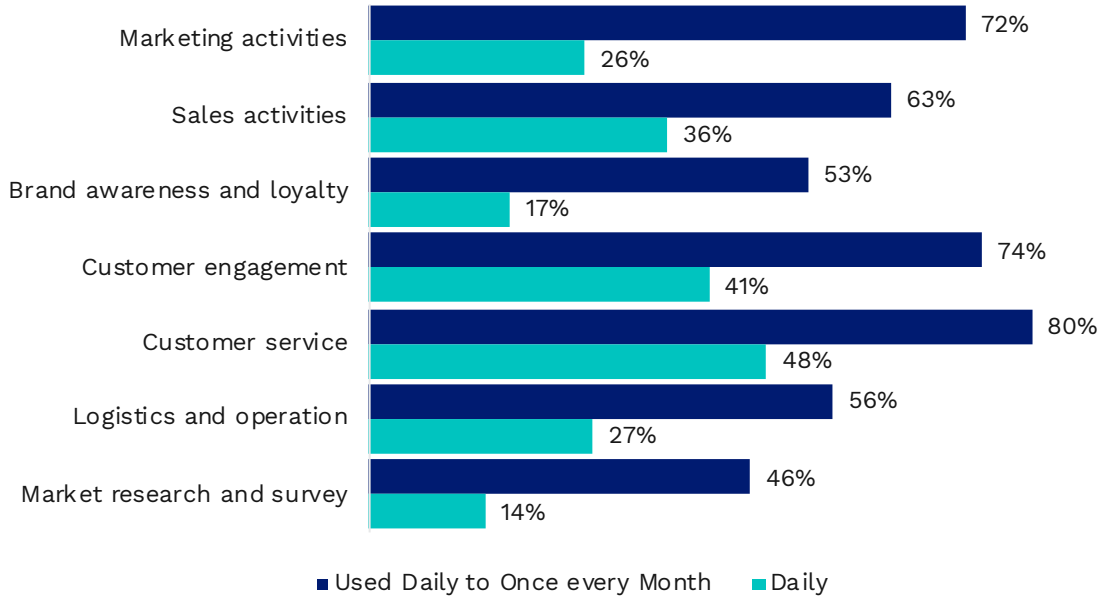


Figure 37: Frequency of business activities on social media

Most businesses conduct updates of their customer service (48%), customer engagement (41%) and sales activities (36%) daily on social media. This demonstrates that businesses mainly use social media for the purpose of attracting customers and building customer loyalty.

8.4 Expenditure on Social Media Usage

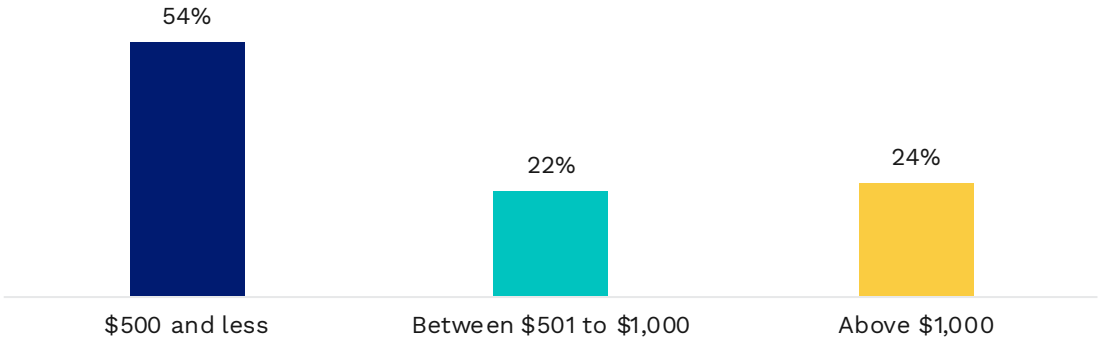


Figure 38: Social media expenditure

More than half (54%) of the businesses spend less than $500 on social media while more than 20% spend between $501 to $1,000.

9 E-Commerce

9.1 Awareness of E-commerce Regulations



Figure 39: E-commerce regulations awareness

An equal percentage of businesses (50%) are aware and unaware of e-commerce regulations.

9.2 Sales Activities Online



Figure 40: Sales activities online

Only 27% of the businesses claim that they sell their products and services online, indicating that only a very small percentage of the businesses are involved in e-commerce.

9.3 Online Sales in Past One Year

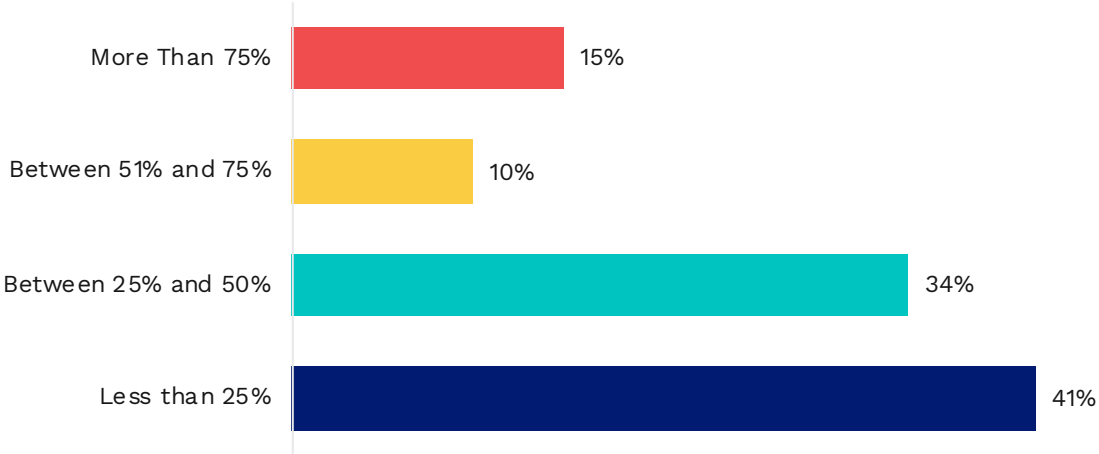


Figure 41: Proportion of online sales out of total sales in the past one year

Out of those that do sell their products and services online, 41% have estimated that less than 25% of their sales were received through online sales in the past one year. 34% of the businesses indicated that their online sales make up between 25%-50% of their total sales while 25% have online sales that make up more than 50% of their total sales.

9.4 Online Sale to Local and International customers

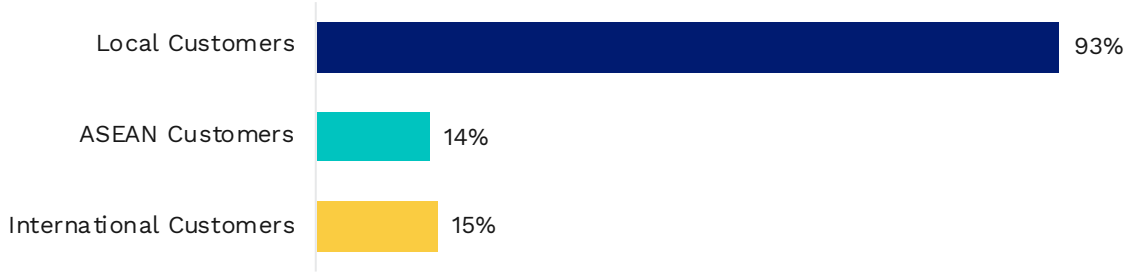


Figure 42: Online sales customers

Businesses selling their products and services online mainly serve the local market (94%). The distribution of sales to the ASEAN and international markets is relatively low (14% and 15%, respectively).

9.5 Reasons for Doing Business Online

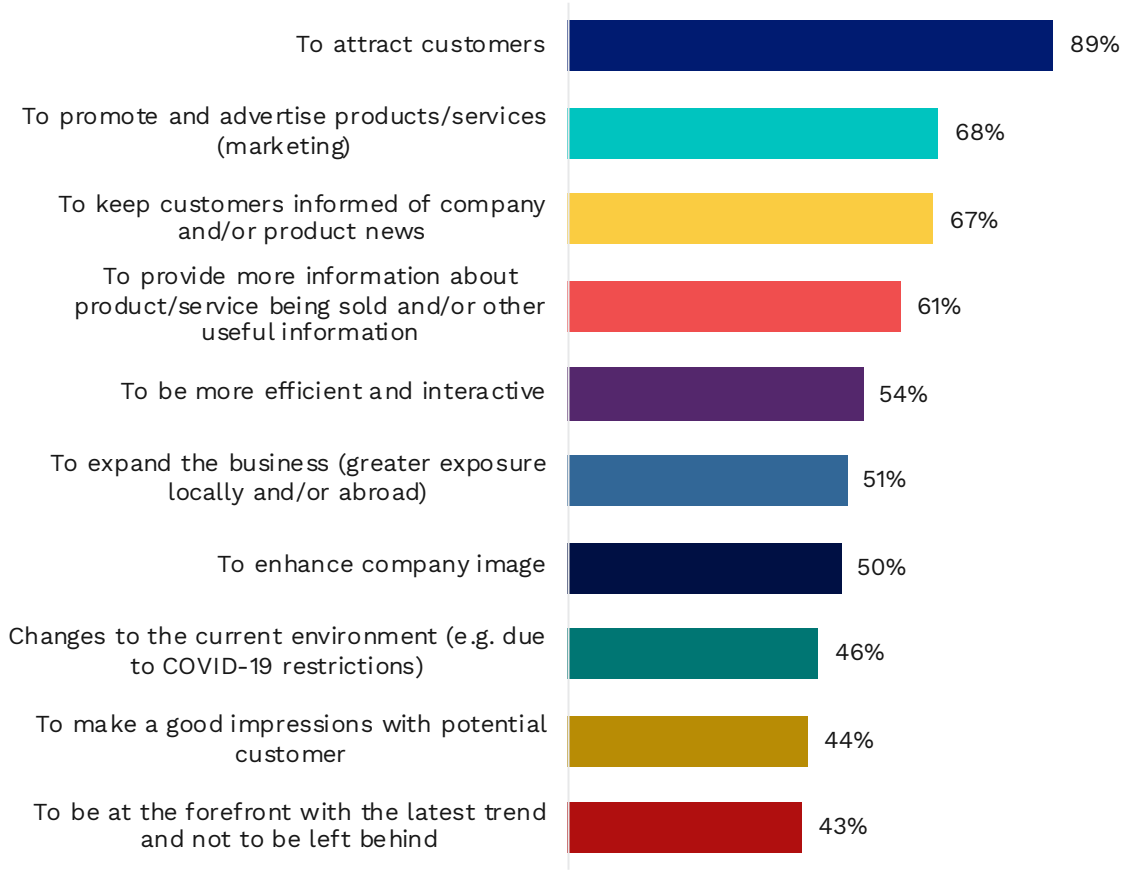


Figure 43: Reasons for doing business online

It is observed that the main reasons for selling online by most of the businesses are mainly to attract customers (89%), marketing of products and services (68%), and to keep customers informed (67%).

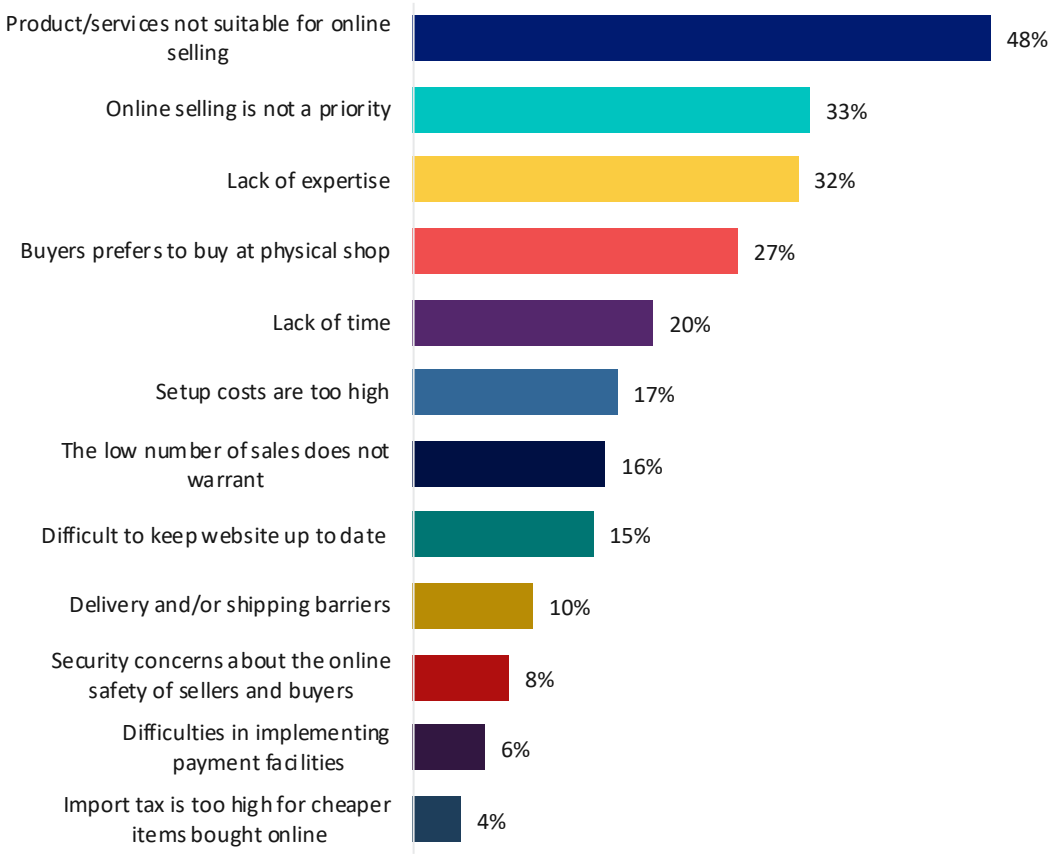


Figure 44: Reasons for not doing business online

Most of the businesses do not proceed with e-commerce due to their product/services not being suitable for online selling (48%). Furthermore, online selling is not their priority (33%), and lack of ICT expertise (32%) and buyer preferences for purchasing at physical stores are other main reasons for lack of adoption of e-commerce.

9.6 Benefits of E-Commerce

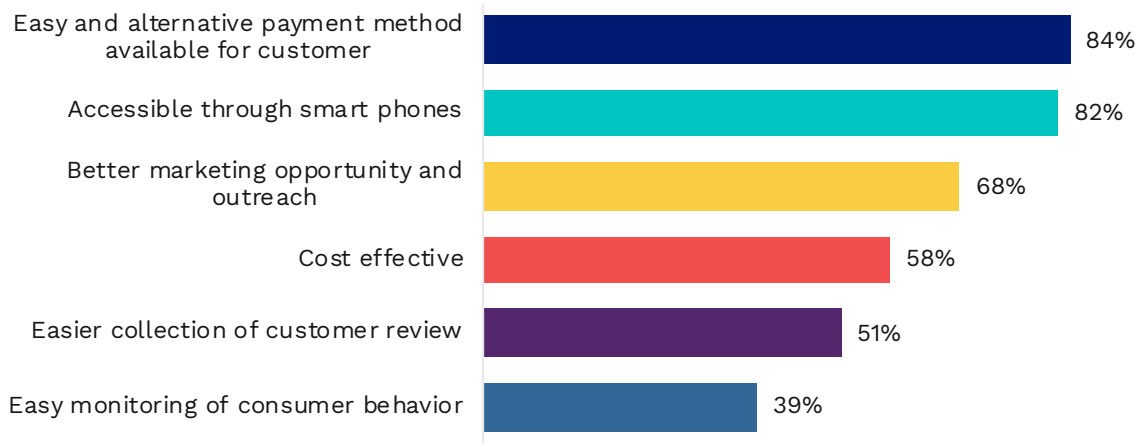


Figure 45: Benefits of e-commerce

The top benefit of e-commerce as perceived by businesses is to engage customers. 84% of the businesses that sell their products and services online feel that e-commerce is beneficial because it provides an easy and alternative payment method for their customers. 82% feel that the accessibility through their smartphones enables e-commerce activities. Marketing, cost effectiveness and ease in collection of customer review data are also among the benefits of e-commerce (68%). Only 39% of respondents find that the monitoring of consumer behaviour is a benefit of e-commerce. This may be because the monitoring of customer behaviour may require businesses to have IT skilled staff i.e., data analytics and scientist.

9.7 Challenges of Doing Business Online

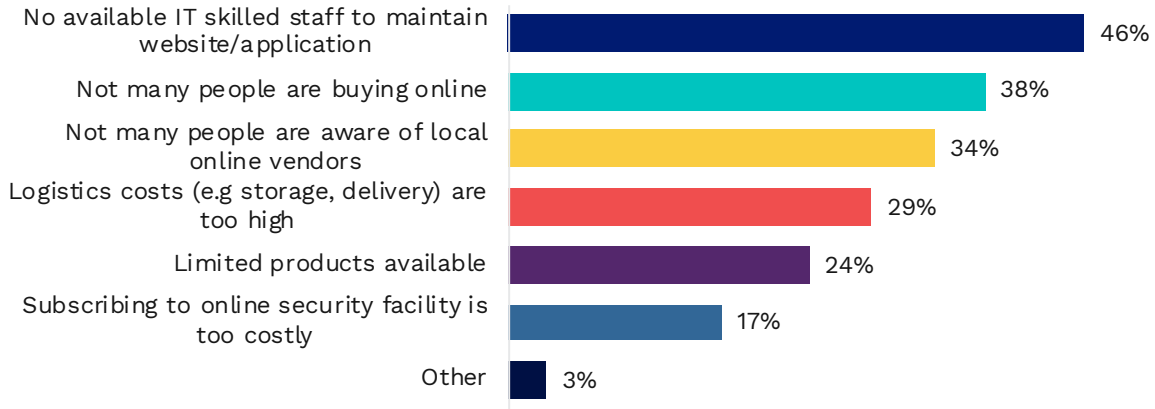


Figure 46: Challenges of online business

The results indicate the top challenge faced by businesses when conducting business online is the lack of ICT skilled staff to maintain their website / application (46%). This is followed by the limited number of customers buying online (38%), lack of awareness of local vendors by customers (34%), high logistic costs (29%) and high online security facility costs (17%).

Other difficulties encountered by businesses are lack of skills in marketing and promotion, not all local users or customers may know how to use IT to enable them to buy online, and ensuring safety of the delivery of their products (particularly for high value products such as jewellery).

9.8 Payment Method Offered to Customers

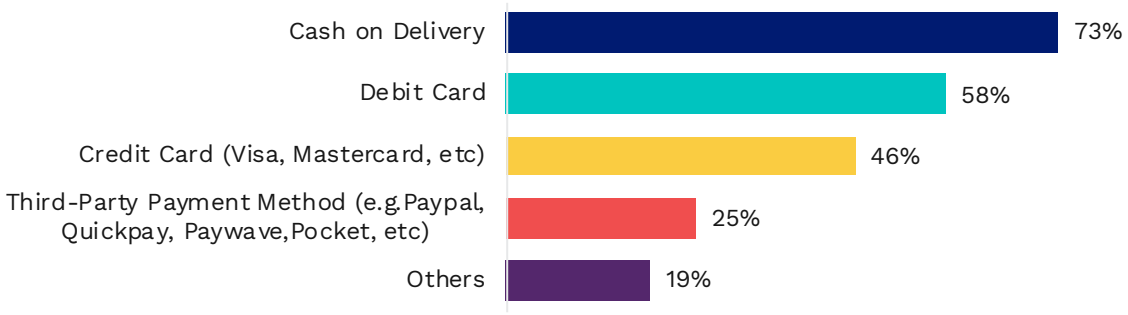


Figure 47: Payment methods

'Cash on delivery' is still the preferred payment method among business (73%). However, non-cash electronic payment methods are also widely offered by businesses undertaking online transactions, with debit cards (58%), credit cards (46%) and third-party digital payment methods (PayPal, QuickPay, PayWave, Pocket, etc.) (25%) being used. 19% utilise other forms of payment, including bank transfer and cheques.

10 IR 4.0 Assessment

10.1 IR 4.0 Technologies Expected to Impact Businesses

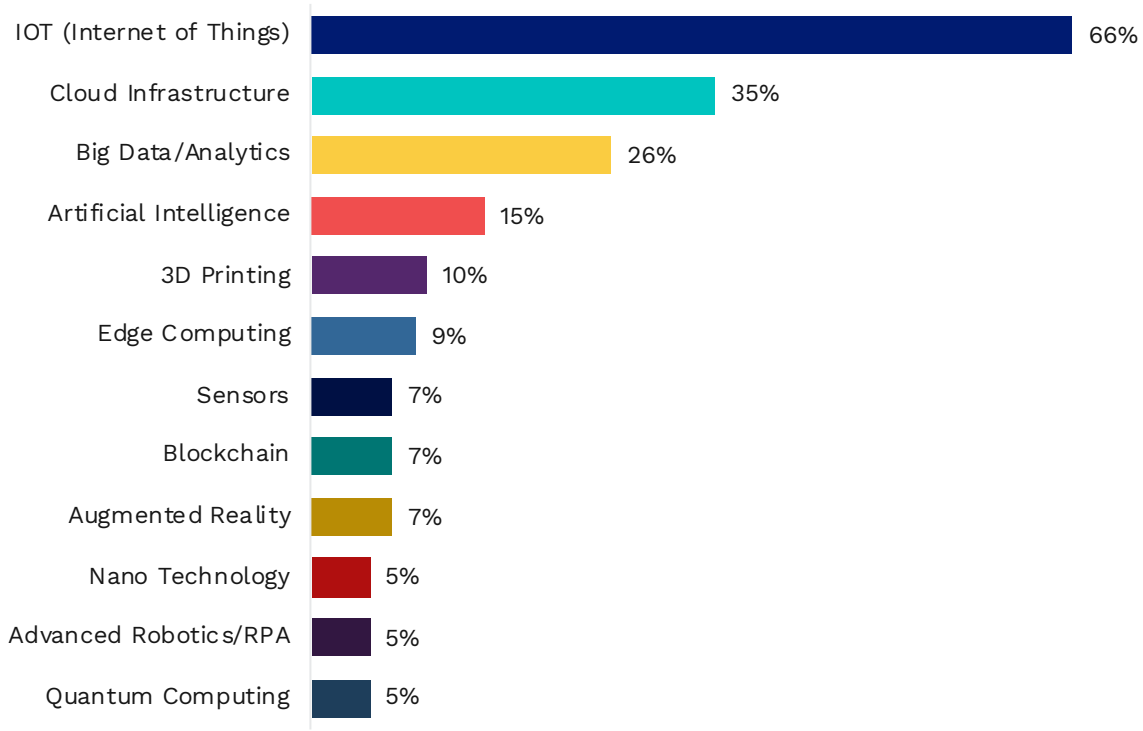


Figure 48: IR 4.0 technology expected to impact businesses

When asked about which 4th Industrial Revolution (IR 4.0) technologies are expected to have a profound impact to their activities, businesses expect that Internet of Things (IoT) (66%), Cloud Infrastructure (35%), and Big Data / Analytics (26%) will have the biggest impact to their operations.

10.2 Priorities When Investing on IR 4.0 Technology



Figure 49: Business priorities when making IR 4.0 investments

74% of respondents have identified that protecting their organisation from disruption is their top priority for undertaking investment on IR4.0 technology and readiness. 70% of the respondents prioritise finding growth opportunities for their existing products and services and 69% prioritise the provision of training and development of their workforce.

10.3 Investment on IR 4.0 in Past Two Years

Businesses were asked to indicate whether they had invested in any IR 4.0 technologies in the past two (2) years in the following fields: Research and Development; Production or Manufacturing; Purchasing; Logistics; Sales; Service; and IT.

64% of businesses have made small to large investments towards the implementation of IR 4.0 or digital readiness in the next two years.

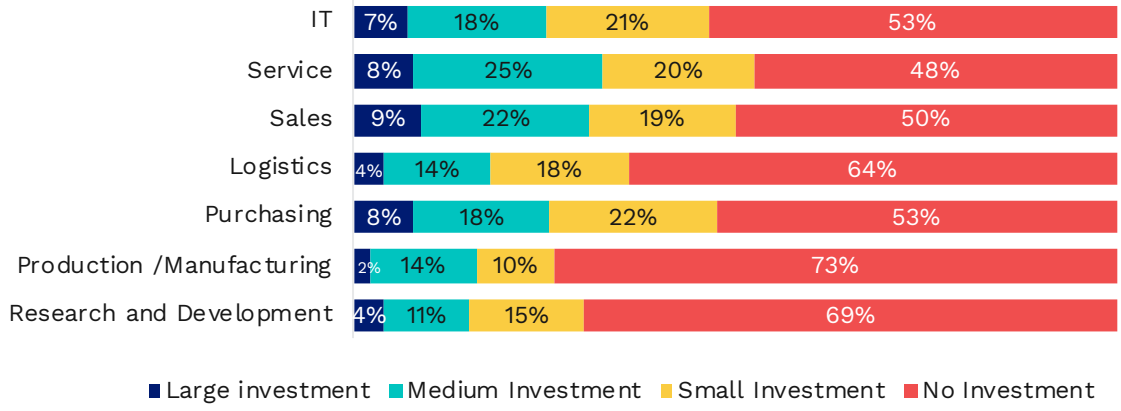


Figure 50: IR 4.0 implementation past two years

The largest investments have been made in the areas of Sales (9%), Purchasing (8%) and Services (8%). These also represent the top areas that businesses have been making investments in general.

10.4 Future IR 4.0 Investment In The Next Five Years

72% of businesses plan to make small to large investments towards the implementation of IR4.0 or digital readiness in the next five (5) years.

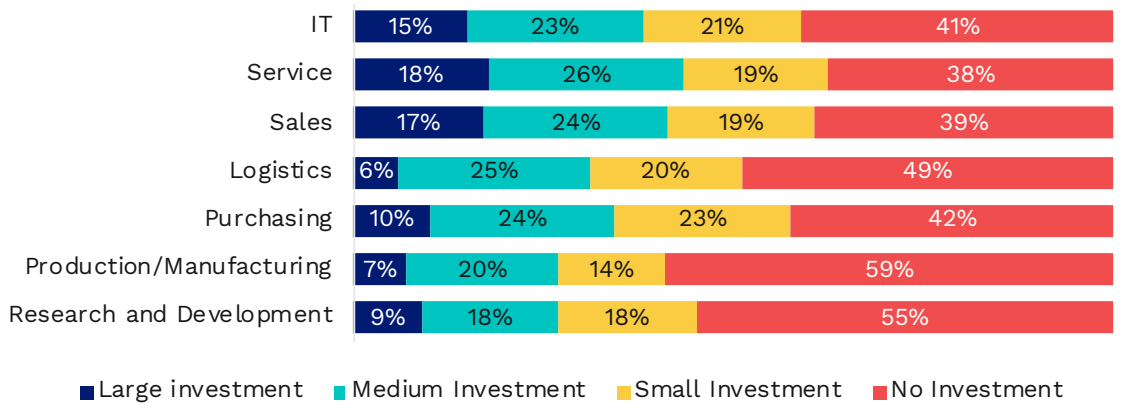


Figure 51: IR 4.0 future investment

The largest investments are expected in Service (18%), Sales (17%) and IT (15%).

10.5 Implementation of IR 4.0 Strategy

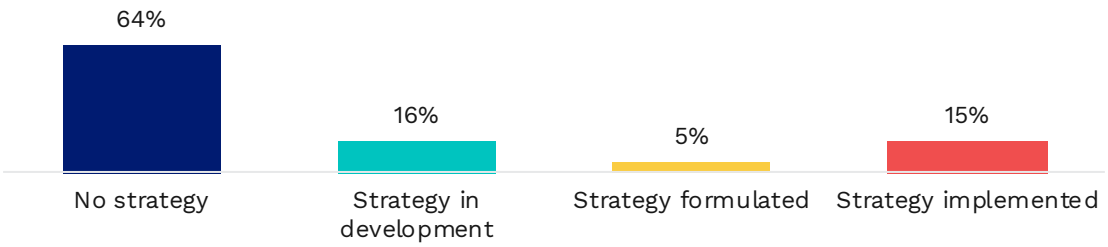


Figure 52: IR 4.0 strategy implementation status

64% of respondents shared that they have no strategy in place to implement IR 4.0. 16% of businesses have a strategy currently in development, while 15% have strategies in implementation or already implemented, and 5% indicated that they have a strategy formulated (but not yet implemented).

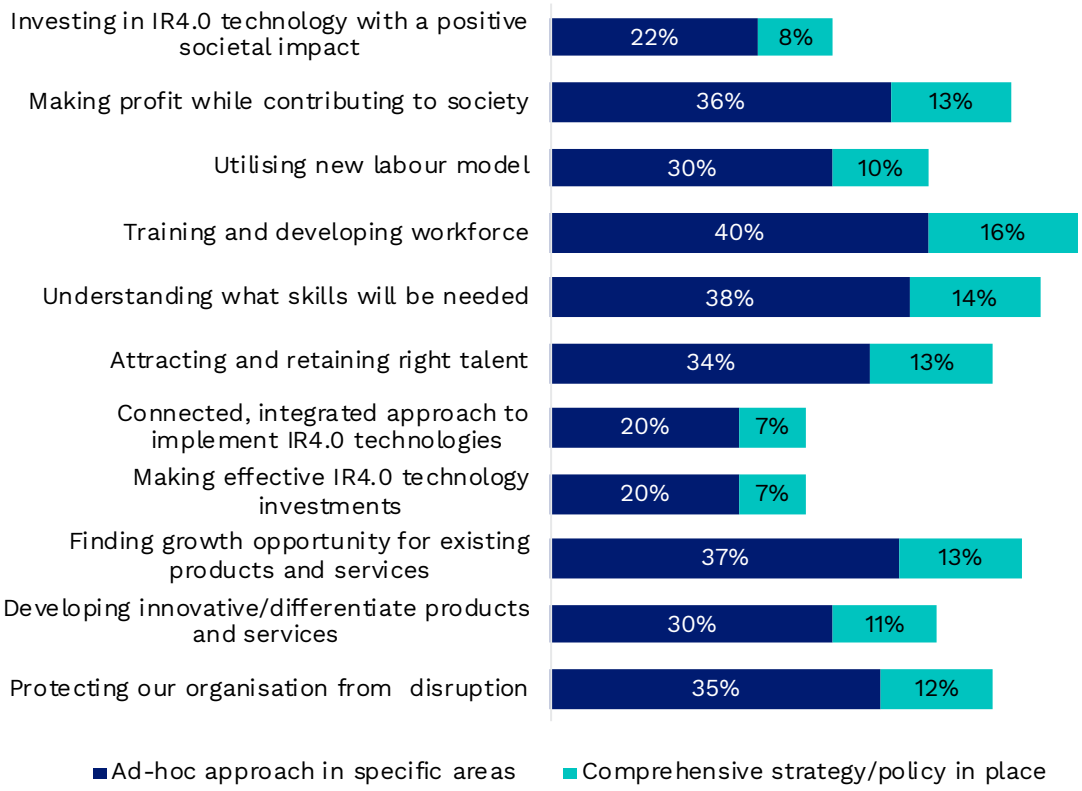


Figure 53: Nature of strategies for adopting IR 4.0 technology and readiness, by priority area

Businesses were asked which priority areas they targeted for the implementation of IR 4.0 technology. The top areas where most businesses adopted a strategy related to IR 4.0 technology readiness is related to ensuring the right skills and competencies are in place, particularly workforce training and development (56%) and understanding what skills will be needed (52%). This is followed by finding growth opportunities for existing products and services (50%).

In each of the listed priority areas, less than 20% of businesses have a formal comprehensive strategy or policy in place, and prefer to take an ad-hoc approach as needed.

10.6 Challenges of Implementing an IR 4.0 Strategy

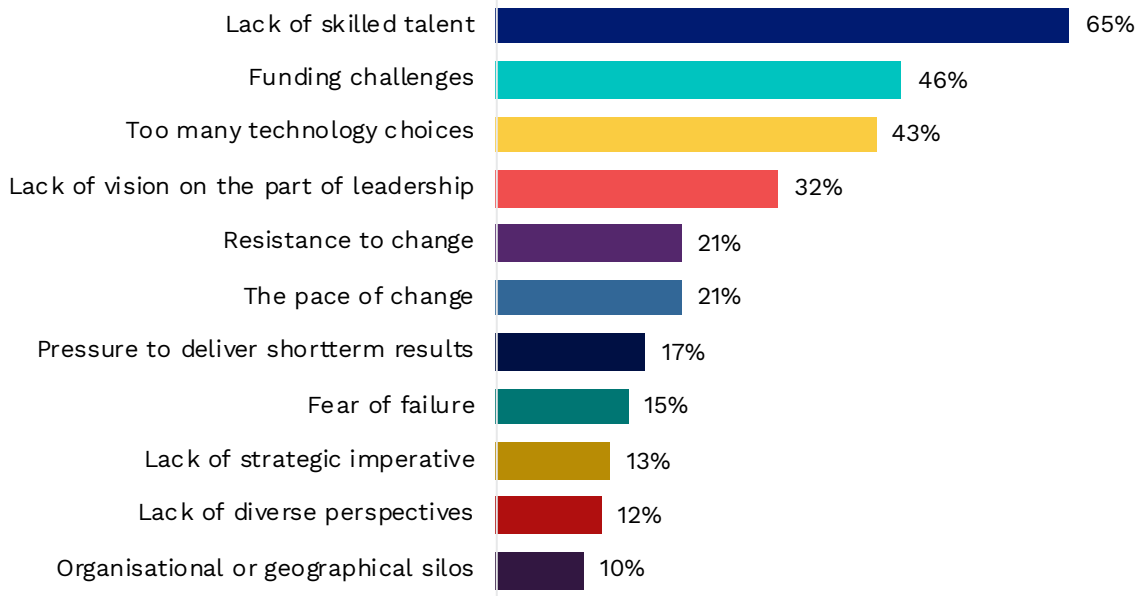


Figure 54: Challenges of IR 4.0 strategy implementation

The greatest challenge for businesses to change their business strategies for IR4.0 is the lack of skilled talent (65%). Other top concerns expressed by businesses are lack of funding available to cover the costs of adopting IR 4.0 (46%) and not knowing which technology to choose or lack of familiarity with the various IR 4.0 technologies (43%). Given the lack familiarity, education and relevant promotion campaigns are crucial to enhance a higher level of awareness and familiarity with IR 4.0 technologies.

10.7 Organisational Readiness for IR 4.0 Implementation

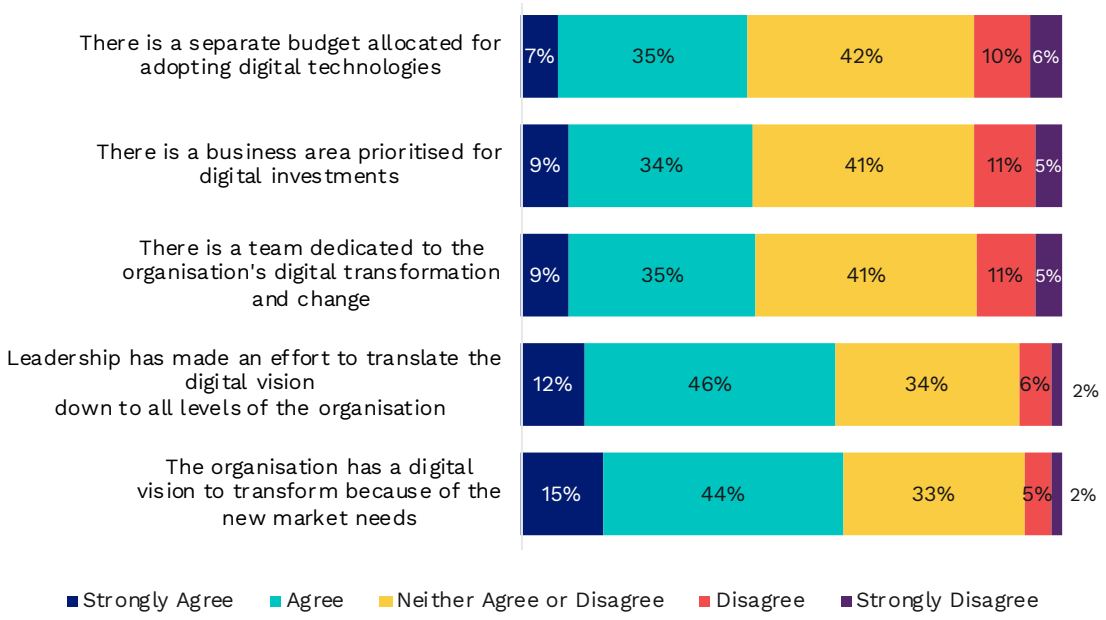


Figure 55: Perception of businesses on IR 4.0 implementation in their organisations

59% of respondents agree or strongly agree that their organisation has a digital vision to transform because of new market needs, while 58% cite that their leadership has made an effort to translate the digital vision down to all levels of the organisation.

However, less than half of respondents have a team dedicated to the organisation's digital transformation and change, a business area prioritised for digital investments or a separate budget allocated for adopting digital technologies.

10.8 Employee Readiness for IR 4.0

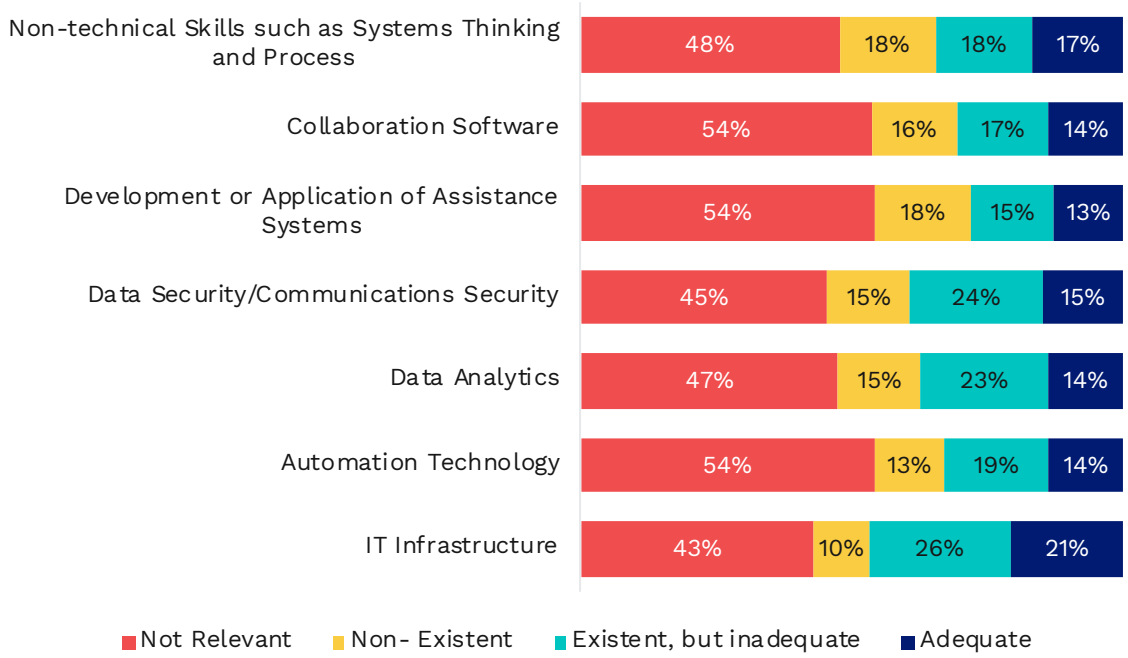


Figure 56: Employee skills for IR 4.0

Businesses were asked whether their employees had the necessary future digital skills in areas perceived to support readiness for the '4th Industrial Revolution' (IR 4.0):

- IT Infrastructure
- Automation Technology
- Data Analytics
- Data Security / Communications Security
- Development or Application of Assistance Systems
- Collaboration Software
- Non-technical skills such as Systems Thinking and Processes

The majority of businesses felt these skills were not relevant to them. Employee readiness across all the identified future digital skills are relatively low, with the highest being in the field of 'IT infrastructure' with 20% of businesses indicating that this skill is at an adequate level among employees. The skills that businesses most felt their employees did not have any knowledge or expertise on at all are on Development or Application and the non-technical skills.