
INDUSTRY OVERVIEW

The information in the section below has been partly derived from various publicly available government sources, market data providers and other independent third-party sources. In addition, this section and elsewhere in the document contains information extracted from the Ipsos Report, for the inclusion in this document. We have no reason to believe that such information is false or misleading in any material respects or that any fact has been omitted that would render such information false or misleading in any material respects. The information from official government sources has not been independently verified by us, the Sole Sponsor, the [REDACTED], the [REDACTED], the [REDACTED], any of our or their respective affiliates, directors or advisers or any other persons or parties involved in the [REDACTED], and no representation is given as to its fairness, correctness and accuracy. Accordingly, the information from official government sources contained herein may not be accurate and should not be unduly relied upon.

The information extracted from the Ipsos Report reflects estimates of market conditions based on samples and is prepared primarily as a market research tool. References to Ipsos should not be considered as the opinion of Ipsos as to the value of any security or the advisability of investing in our Group. Our Directors believe that the sources of information extracted from the Ipsos Report are appropriate sources for such information and have taken reasonable care in extracting and reproducing such information.

SOURCE AND RELIABILITY OF THE INFORMATION

We have commissioned Ipsos, an independent market research company, to analyse and report on the industry development and competitive landscape of the IT industry in Hong Kong for the period from 2015 to 2024 at a fee of HK\$1,077,000. Ipsos is an independent market research company and is one of the largest research companies in the world, employing approximately 18,000 personnel worldwide across 90 countries. Ipsos conducts research on market profiles, analysis on market size, share and segmentation, distribution and value analysis, competitor tracking and corporate intelligence.

Except as otherwise noted, all of the data and forecasts contained in this section are derived from the Ipsos Report, various official government publications and other publications.

In compiling the Ipsos Report, Ipsos obtained and gathered data and intelligence by: (a) conducting desk research covering government and regulatory statistics, industry reports and analyst reports, industry associations, industry journals and other online sources and data from the research database of Ipsos; (b) performing client consultation to obtain background information of our Group; and (c) conducting primary research by interviewing key stakeholders and industry experts.

The information and data gathered by Ipsos have been analysed, assessed and validated using Ipsos' inhouse analysis models and techniques. The methodology used by Ipsos is based on information sourced from multiple levels, which allows such information to be cross-referenced for accuracy.

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OVERVIEW OF THE IT INDUSTRY IN HONG KONG

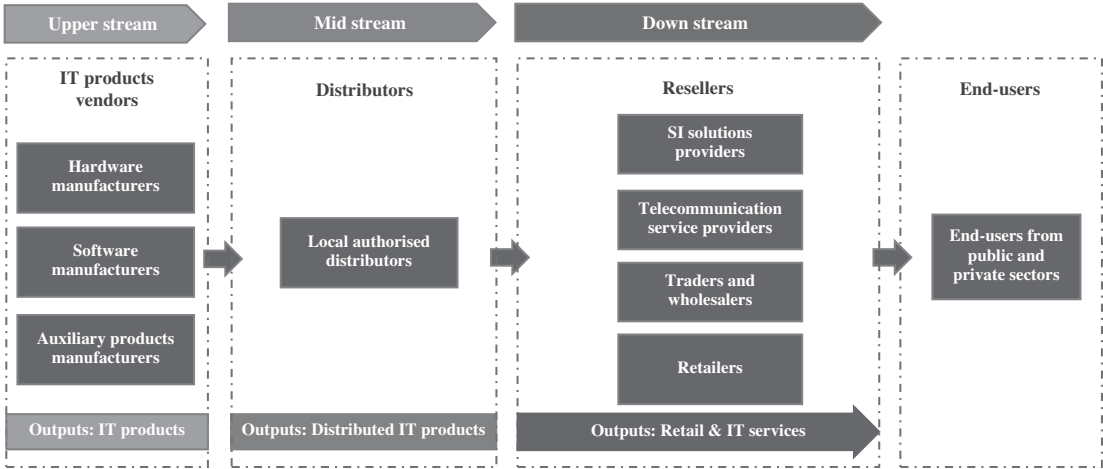
Introduction and definition

IT industry refers to the industry that comprises all kind of IT companies, which is considered as a broad industry consisting of a number of sub-segment industries. Some of the key sub-segment industries are:

- **IT products distribution industry:** The IT products distribution industry is a sub-segment of the IT industry, in which distributors act as intermediaries by sourcing IT products from varies IT products vendors and distribute them to SI solutions/ telecommunication service providers, traders and wholesalers, and retailers for them to further sell to end-users.
- **SI solutions industry:** The SI solutions industry is a sub-segment of the IT industry which includes companies that provide (i) IT infrastructure solutions services; and (ii) IT maintenance and support services.

Value chain

The figure below highlights the value chain of the IT Industry:



Source: Ipsos research and analysis

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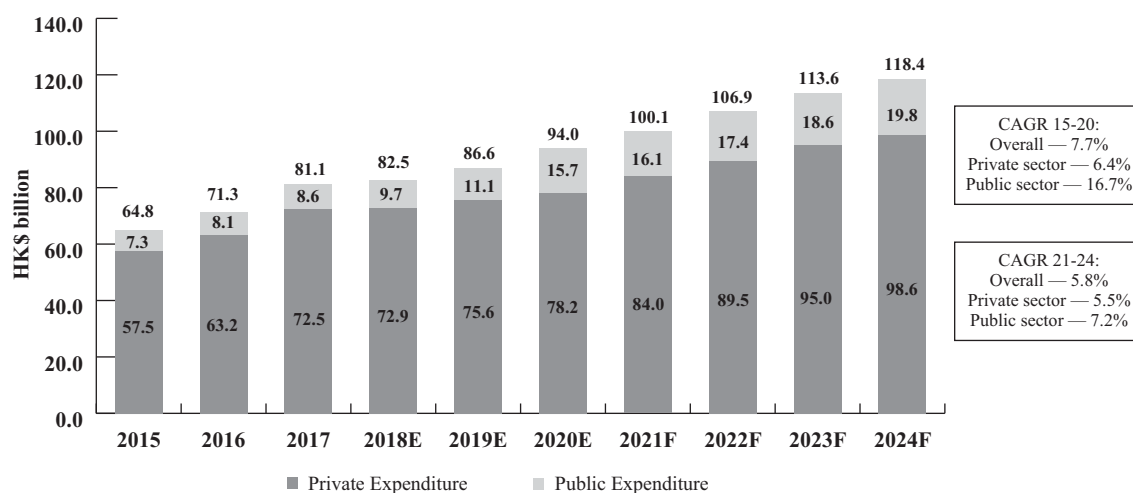
The value chain includes the following actors:

- **IT products vendors:** Hardware manufacturers offer Personal Computers (PCs) and network-related products and some of them also offer technology consulting and enterprises IT infrastructure including enterprise server and storage technology, technology support and networking products for enterprises. Besides, software manufacturers offer system software that manages computer applications and application software that are used to perform a specific task, such as Microsoft Office.
- **Distributors:** Authorised distributors meet certain requirements from the IT products vendors to represent their IT products. Requirements vary widely and depend on the specific company and distributorship. In general, distributors rarely offer SI solutions services such as installation.
- **SI solutions providers:** SI solutions providers procure IT products from authorised distributors and resell IT products and offer value-added solutions and supports which vary depending on the system integration solution providers.
- **Telecommunication service providers:** Some telecommunication service providers would mainly enter into an agreement with hardware vendors and/or its authorised distributors to resell IT products, such as smart phones and tablets, to their end customers. The telecommunication service providers may further bundle the IT products with their telecommunication services as a package to sell to its end customers.
- **Traders and wholesalers:** Traders and wholesalers procure hardware and/or software from IT products vendors and/or authorised distributors and sell these IT products to other actors in the field of 'resellers' in the value chain.
- **Retailers:** IT retailers can be further classified as chained retailers, independent retailers as well as brand's self-owned stores and showrooms. Retailers source products from authorised distributors, resellers and other retailers to individual end-users. In some cases, IT products vendors may also set up their own retail shops, in which case the IT products vendors directly supply IT products to the retail shop for sale to end-users. They usually provide basic services such as delivery, installation and extended warranty options.
- **End-users:** End-users include private companies or organisations, the government and non-government organisations.

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Market value of IT industry in Hong Kong

The chart below sets forth the market value of IT industry in Hong Kong from 2015 to 2020, with a forecast from 2021 to 2024:



Notes: 1. The market value of IT industry in Hong Kong refers to the total IT expenditure published by the Census and Statistics Department, HKSAR. 2. 2015 to 2017 data of the market value in the private sector are actual figures published by the Census and Statistics Department, HKSAR. Due to data unavailability, 2018 and 2019 data were calculated and estimated by Ipsos. 3. 2015 to 2018 data of the market value in the public sector are actual figures published by the Census and Statistics Department, HKSAR. The 2020 data was an estimated figure published by the Office of the Government Chief Information Officer. 4. The market value in the public sector refers to the total IT expenditure of (1) Bureaus and Departments of the Hong Kong Government; (2) Housing Authority; (3) Hospital Authority; and (4) subvented schools. 5. The estimation and forecast of market value of IT industry is based on (1) the forecast on the total IT expenditure in the public sector; and (2) the forecast on the total IT expenditure in the private sector.

Sources: Census and Statistics Department, HKSAR; Ipsos research and analysis

The market value of IT industry in Hong Kong experienced an increase from 2015 to 2020, from HK\$64.8 billion in 2015 to HK\$94.0 billion in 2020, representing a CAGR of approximately 7.7%. The market value in the private sector accounted for the largest proportion of the market value of IT industry in Hong Kong, recording growth from HK\$57.5 billion to HK\$78.2 billion at a CAGR of 6.4% during the said period. As for the public sector, the market value increased rapidly from 2015 to 2020, growing from HK\$7.3 billion to HK\$15.7 billion at a CAGR of 16.7%. Market value in the public sector consists of public spending on IT services from different areas of the public service including housing, health and education. The government doubled its expenditure on the Innovation and Technology Fund in 2020, and it has contributed to the significant increase in public expenditure in the same year to a large extent.

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During the forecast period from 2021 to 2024, it is expected that the market value of IT industry will continue to increase from HK\$100.1 billion to HK\$118.4 billion at a CAGR of approximately 5.8%. The IT industry in Hong Kong is expected to be supported by the rising demand for the emerging technologies in the industry. It is predicted that the market value in the private sector will remain as the largest proportion of the market value of IT industry in Hong Kong. The market value in the private sector is expected to grow at a moderate pace at a CAGR of 5.5%, increasing from HK\$84.0 billion to HK\$98.6 billion. During the same period, the market value in the public sector is expected to increase at a CAGR of 7.2%, increasing from HK\$16.1 billion in 2021 to HK\$19.8 billion in 2024.

OVERVIEW OF THE IT PRODUCTS DISTRIBUTION INDUSTRY IN HONG KONG

Introduction and definition

The IT products distribution industry is one of the sub-segments of the IT industry. IT products distribution industry refers to distributors conducting wholesale activities of IT products. IT products distributors play a vital role in fluidly connecting IT products vendors and resellers. The IT products distribution industry includes three types of products (i) hardware; (ii) software; and (iii) auxiliary products:

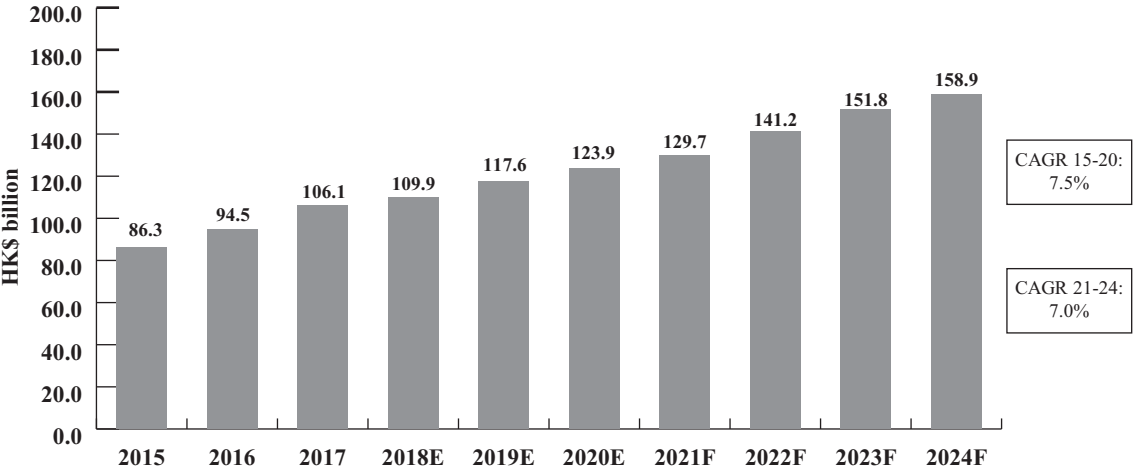
- **Hardware:** IT hardware includes a broad range of products such as desktop/laptop computers, monitors, keyboards and signage display, and peripherals like printers and scanners, as well as specialised or industrial items such as webcams and data storage devices used by corporations.
- **Software:** An IT software is a type of programmes which enable the users to perform some particular specific task or used to operate their computer. It essentially directs all of the peripheral devices on the entire computer system. A software application plays a key role of a mediator between the user and the computer hardware.
- **Auxiliary products:** IT auxiliary products includes a range of computer and networking parts and accessories such as power supplies, control and adaptor units, display cards and memory cards, etc.

In the IT products distribution industry, other than simply distributing IT hardware and software to resellers, distributors are providing more value-added services. For IT products vendors, distributors act as promoters by selling IT products to potential resellers. Especially for mid-tier IT products vendors, distributors perform as an essential medium to portray the brand image of the IT products vendors in the local market by holding marketing events.

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Market value of the IT products distribution industry

The chart below sets forth the market value of the IT products distribution industry in Hong Kong from 2015 to 2020, with a forecast from 2021 to 2024:



Sources: Census and Statistics Department, HKSAR; Ipsos research and analysis

The market value of the IT products distribution industry increased from HK\$86.3 billion in 2015 to HK\$123.9 billion in 2020, at a CAGR of approximately 7.5%. The market value of the IT products distribution industry in Hong Kong recorded a significant increase during the historical period, generally attributed to the increasing adoption and upgrade of information technology in various business sectors. Despite the economic downturn and uncertainties in 2020 due to the outbreak of the COVID-19 pandemic, the demand for IT products from both the public and private sector still remained robust, supporting the IT products distribution industry.

During the forecast period, the market value of the IT products distribution industry is expected to increase at a CAGR of approximately 7.0% from 2021 to 2024. The industry is expected to maintain its growth at a CAGR of 7.0% as it is expected to be driven by the increasing demand for cloud and cyber security. Also, some business segments, such as sales of PCs and setup of video conferencing, recorded a notable increase in the first half of 2020 due to the remote working arrangement, and it is expected to be persisted in the future. The adoption of remote working arrangement during the outbreak of COVID-19 speeds up the digital transformation progress during the forecast period, illustrating sustainable demand for IT products in the future.

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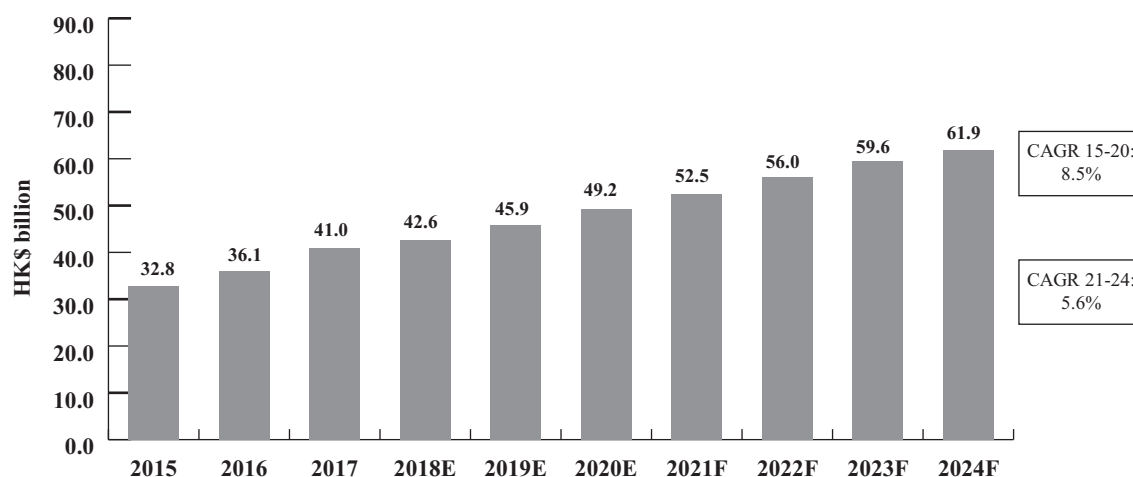
OVERVIEW OF THE SI SOLUTIONS INDUSTRY IN HONG KONG

Introduction and definition

The SI solutions industry, which is also commonly known as IT infrastructure solutions industry, is one of the sub-segments of the IT industry. SI solutions refer to solutions that include (i) IT infrastructure solutions, such as the assessment and design of new IT infrastructure, procurement of IT products, implementation, integration and installation of IT products; and (ii) IT maintenance and support services, such as joint support services, system maintenance support services, IT outsourcing, cabling, helpdesk services and secondment services.

Market value of the SI solutions industry

The chart below sets forth the market value of SI solutions industry in Hong Kong from 2015 to 2020, with a forecast from 2021 to 2024:



Source: Census and Statistics Department, HKSAR; Ipsos research and analysis

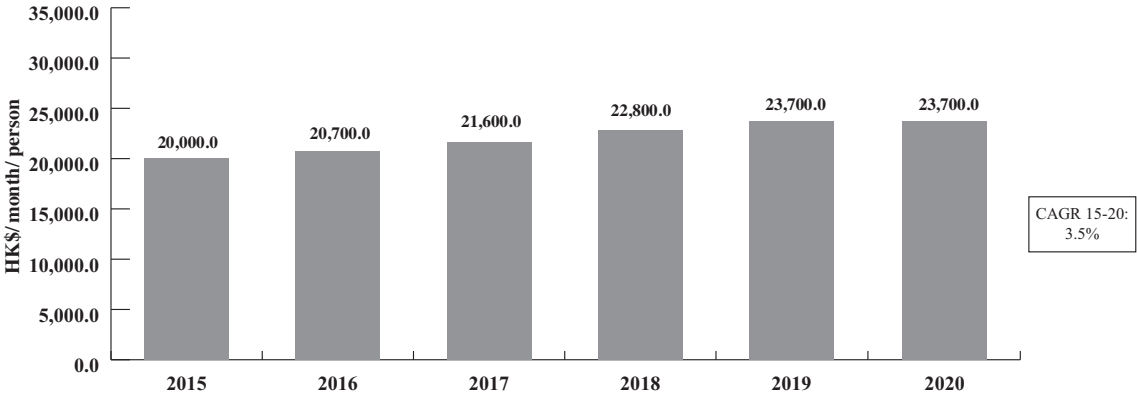
The market value of SI solutions industry recorded an overall increase from HK\$32.8 billion in 2015 to HK\$49.2 billion in 2020, at a CAGR of approximately 8.5%. The private sector has been the major contributor to the market value of SI solutions industry in Hong Kong, accounting for a share of approximately 90% to the total market value of SI solutions industry during the period from 2015 to 2020. Due to the increasing competition under globalisation, the private sector in Hong Kong has pursued the improvement of operational efficiency through the intensive adoption of information technology, transforming the needs as the demand for the SI solutions in Hong Kong. The market value of SI solutions industry in Hong Kong recorded a significant increase in 2019 mainly due to the rising demand for SI solutions, especially cloud computing and cyber security services, as a result of increasing digitisation in the private sector.

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During the forecast period from 2021 to 2024, the market value of SI solutions industry is expected to increase at a CAGR of approximately 5.6%, increasing from HK\$52.5 billion to HK\$61.9 billion during the said period. The overall expenditure on system integration during the forecast period is expected to achieve a notable growth rate from 2021 to 2024, in which the industry is expected to be driven by the increasing adoption of emerging technologies such as cloud and big data management. In particular, the demand for some specific types of SI solutions such as cyber security services, remote working and communication tools and systems as well as cloud computing services, are expected to grow under the introduction of social distancing measures as a result of COVID-19 outbreak.

Historical labour cost in the IT industry

The chart below sets forth the historical labour cost in the IT industry in Hong Kong from 2015 to 2020:



Note: Median monthly salary refers to the median monthly salary of employees engaged in the information and communications sector in Hong Kong, data published by the Census and Statistics Department. Among all publicly available data, the information and communications sector is the most related to the IT industry.

Sources: Census and Statistics Department, HKSAR; Ipsos research and analysis

The median monthly salary of employees in the information and communications sector in Hong Kong increased at a CAGR of approximately 3.5%, from HK\$20,000.0 in 2015 to HK\$23,700.0 in 2020. The excess demand for IT professionals in Hong Kong was one of the reasons contributing to the growing average annual salaries for IT professionals. In 2020, the median monthly salary remains unchanged as compared to the median monthly salary recorded in 2019. The outbreak of COVID-19 pandemic has deeply plagued Hong Kong’s economy, which has offset the constant growth of monthly salary of employees in the information and communications sector.

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COMPETITIVE ANALYSIS OF THE IT INDUSTRY IN HONG KONG

Competitive landscape of the IT products distribution industry

In 2020, there were approximately 30 to 40 IT products distributors in Hong Kong, of which less than ten market players were active in the industry. The IT products distribution industry is consolidated, with three market players dominated the market which in aggregate is estimated to hold no less than approximately 60% of the market share in terms of revenue in 2020. With the exception of the three dominated market players, the remaining market is observed as fragmented. The revenue from our distribution business in FY2020/2021 amounted to approximately HK\$203.5 million, representing a market share of approximately 0.2% in 2020. Competition among IT products distributors in Hong Kong is intensifying. IT products distributors are also facing competition from IT products vendors that sell directly to resellers, retailers and end-users. IT products distributors mainly position themselves by having divergent focus in terms of different brands, product types and/or IT solutions. Besides, some of the distributors in the industry are extending their operations with offering value-added services, such as effectively marketing new products to the target audience and offering spare unit of certain IT products to end-user for their temporary use and/or swapping that are able to differentiate themselves from their competitors.

Competitive landscape of the SI solutions industry

In 2020, there were approximately 2,000 companies offering SI solutions in Hong Kong, characterising the industry as highly competitive and fragmented. An SI solutions provider not only competes with other local industry players but also competes with the international SI solutions providers located in Hong Kong as well as IT products vendors who directly provide similar SI solutions services to customers. The industry is fragmented, with each of the top five SI solutions providers accounting for less than 4% of the total industry revenue in 2020. The revenue from our SI solutions business in FY2020/2021 amounted to approximately HK\$183.9 million, representing a market share of approximately 0.4% in 2020. Most of the companies who offer SI solutions services are small in scale, with only a small number of large companies operating in the industry.

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Top five players in SI solutions industry in 2020

The table below sets forth the top five SI solutions service providers in Hong Kong in 2020:

Rank	Company	Headquarter Location	Revenue in 2020 (HK\$ million)	Market Share
1	Company A	Hong Kong	1,571.8	3.2%
2	Company B	Hong Kong	1,365.3	2.8%
3	Company C	Hong Kong	1,199.9	2.4%
4	Company D	South Africa	851.5	1.7%
5	Company E	Hong Kong	556.6	1.1%
	Our Group (SI solution business)	Hong Kong	183.9	0.4%
	Others		43,511.0	88.4%
	Total		49,240.0	100.0%

Notes: 1. Percentages may not sum up to 100% due to rounding. Some totals may not correspond with the sum of the separate figures due to rounding. 2. Revenue figures provided represent revenue from SI solutions services in Hong Kong only and thus may be different from figures disclosed in the respective companies' annual reports. 3. The revenue of the top five players refers to their revenue in fiscal year 2020.

Source: Ipsos research and analysis

Key factors of competition

- **Reputation:** Reputation is one of the major competitive factors for retaining existing customers and attracting new customers in the IT industry as the IT industry in Hong Kong in a highly fragmented industry, companies that establish a better reputation can differentiate themselves from competitors since they can provide clients with the confidence of offering reliable services in a timely manner.
- **Customer relationships:** The dynamic nature of IT requires customers to continuously upgrade their existing computer systems, update software as well as implement new IT tools and systems including cloud storage and data management systems. Therefore, maintaining good customer relationships is vital to bring return business from existing customers, stabilising revenue by receiving business from existing customers for future IT projects.

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- **Product and service variety:** SI solutions providers, who can offer a wider range of products and services in terms of price, solutions and origin, will be more competitive in the market since they can offer more comprehensive and all-rounded services to the customers. Different customers have different requirements and budgets towards their IT needs, and therefore require a different kind of IT products to fulfil with. SI solutions providers who can provide a greater variety of IT products and services are, therefore, easier to capture different markets with different customer preference. For instance, SI solutions providers who can also provide mid-tier IT products with competitive pricing on the top of the top-tier IT products are facing a broader potential customer base by offering a wider range of products and services. In addition, SI solutions providers who are able to cooperate with new-to-market niche brands and offer emerging technologies and IT solutions to their customers not only can stand out from their counterparts by offering a greater variety of products and services, but also be able to penetrate new markets while the market presence of these niche brands is yet to build.

Key drivers and opportunities

- **Implementation of emerging technologies and IT solutions (i.e. hyper-converged infrastructure (HCI), artificial intelligence (AI), and Device-as-a-service (DaaS)):** Business corporates in various sectors are seeking to transform their business through emerging technologies such as HCI and AI and IT solutions, such as DaaS. In recent years, a notable increase in the demand for these products and services are witnessed, driven by the initiatives to improve business operation efficiency through the application of these emerging technologies. The market size of HCI in Asia-Pacific was valued at US\$1,738.5 million in 2020, with the expectation that the market will continue to grow during the forecast period from 2021 to 2024 at a CAGR of 36.4%. The remarkable growth opportunities of HCI in the Asia-Pacific region is also expected to be observed in Hong Kong over the forecast period. It is observed that there is an increasing trend of HCI adoption in both the public and private sectors in Hong Kong. It is observed that there is an increasing trend of HCI, AI and DaaS adoption in the private sector, such as the insurance sector, the banking and finance sector and the education sector, for setting up the virtual desktop infrastructure, assist data collection and enable data analytics to improve organization-wide decision-making process. And the market of AI infrastructure in Asia-Pacific is expected to grow at a fast pace as well, at a CAGR of approximately 34.3% during the forecast period. Besides, there has been an increasing trend in the IT industry of shifting from selling products to customers to offering DaaS, whereby various hardware, software and services (such as ongoing technical support and product exchange) are bundled as a licensed package and offered to customers as a periodic subscription service. The high awareness about DaaS market is generally driven by the significant adoption of contract-based services and solutions, and the escalating need to lower the capital expenditure and operational expenditure by enterprises. Hence, the increasing popularity of emerging technologies is expected to create more business opportunities for the IT industry in Hong Kong.

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- **Increasing demand for mobile financial services:** The increasing digitisation in the financial and banking sector will further boost the demand for IT services, especially SI solutions, in Hong Kong. The rising trend of mobile payment services has stimulated the demand for cyber security services as well as digital transformation services, creating an opportunity for the IT industry, especially for the service providers who focus on delivering cyber security solutions and fintech projects.
- **Supportive initiatives from the Government:** The Government has carried out several supporting initiatives which drive the growth of the IT industry in Hong Kong. For instance, according to the 2020-21 Budget, the Government has planned to (i) increase the grant ceiling for the Technology Voucher Programme to HK\$600,000 and raise the government's funding ratio to 75% (ii) inject HK\$345 millions to a pilot subsidy scheme to encourage logistics industry apply technology to enhance productivity in 2020 to promote industry application for advanced technology in Hong Kong. The Research Grants Council under the University Grants Committee (UGC) aims to increase the level of Research and Development (R&D) in Hong Kong, as it is one of the foundations of the development of Information and Technology (I&T) in Hong Kong. It provides sufficient funding related to the research of new technology and/or uses of new technologies. Throughout the process of the R&D, research teams need to procure IT systems and infrastructure to support their researches. While for those R&D projects with a direct focus on technologies, new products developed will require the implementation of new IT components and infrastructures as a part of the productisation process, thereby benefiting SI solutions providers and IT products distributors in Hong Kong. Regarding the re-industrialisation funding scheme under the Innovation and Technology Fund, it was launched to promote the "re-industrialisation" of Hong Kong industries to develop advanced manufacturing industries that are based on new technologies and smart production. The RFS subsidises manufacturers to set up new smart production lines in Hong Kong. The re-industry requires digitalisation and the implementation of IT network infrastructures and related technologies such as cloud platforms, automation systems, smart sensors, and IoT networks, and security systems to provide smart manufacturing re-industrialisation mandated by the Government.
- **Increasing the use of cloud computing:** The cloud service market in Hong Kong had a strong development during the past few years. In 2020, the estimated spending on cloud in Hong Kong was approximately HK\$8,264.0 million, with the expectation that the spending will increase at a CAGR of approximately 20.0% from 2021 to 2024. The increase in the popularity of deploying cloud will increase the demand for the cloud infrastructure building and related cloud security control, contributing to the development and the evolution of the IT industry in Hong Kong.

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- **Increasing importance of IT solutions and services in business operation:** Under the social distancing measures adopted under the global COVID-19 outbreak, business organisations discovered that traditional business and operation models are hard to sustain and operate under COVID-19 pandemic. Many organisations have then undergone digitisation to enable remote working arrangement while retailers have tried to launch e-commerce platforms to safeguard their business. Such change has spiked an increase in demand for SI solutions as well as the demand for IT products, such as VPN services, real-time communication tools as well as remote working software. The shift to IT solution, triggered by the outbreak of COVID-19, is expected to sustain even in the post-COVID-19 era and creating an opportunity to the IT industry in Hong Kong.
- **Emerging demand for content delivery network (CDN):** Due to the increasing demand for the rich media and video streaming over the website, the size of content to be delivered on the network and hence the demand for high-speed network has been driven up in the recent years. CDN, which accelerates web delivery speed by setting up geographical pick-up spots for data, has therefore become necessary for content distributors. In Hong Kong and even across all countries, CDN is not just a fundamental IT architecture to reduce network latency for general businesses, but also to support service for latency-sensitive devices for providers types such as autonomous driving, remote surgery, and mission critical communications. With the 5G communication technology gradually being implemented in various industry for different use cases in Hong Kong, such technology will be crucial to avoid bottlenecking at the stage of content distribution. Hence, the distribution of CDN services is expected to be one of the major drivers of the IT industry in Hong Kong in the foreseeable future.

Threats and challenges

- **Shortage of human resources:** IT industry requires numerous skilled, knowledgeable and experienced employees to provide quality and speedy services to customers. Solid knowledge on technical issues in various types of system integration projects across different sectors is essential in the sector. According to the latest Manpower Survey of the IT Sector conducted by Vocational Training Council (VTC) in 2018, approximately 44.7% of the employers were found to have experienced difficulties in attracting experienced candidates to apply for existing vacancies. Consequently, the shortage of human resources in the industry poses a threat to the IT industry, which adversely affects the capacity as well as the future development of the sector.
- **Cyber security fears amongst potential customers:** Cyber security is a major public concern. IT services, such as cloud and mobile applications, are often being questioned on the data security during the deployment. While the concern on cyber security could create extra demand for IT security control, such cyber security fears and the potential additional cost on IT security control would become the push factors from the customers' point of view, reducing the willingness to adopt any new IT technologies.

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Entry barriers

- **Unestablished reputation:** Establishing a good reputation through the provision of high service quality is important for players in the IT industry to compete successfully in the industry. However, reputation can only be built up through customer satisfaction in former or current projects. Hence, new entrants with reputation yet to establish may encounter difficulties to attract customers and capture market share in the sector.
- **Difficulties in hiring experienced IT professionals:** The IT industry faces a shortage of experienced IT professionals. New entrants with little capital and resources may encounter difficulty in attracting professionals. Furthermore, experienced IT professionals generally prefer to work in structured and large companies, in which the companies can offer competitive remuneration packages and are able to capture large and complex projects.
- **Unestablished relationship with IT products vendors:** It is important for players in the IT industry to establish good relationship and wide connections with IT products vendors. For instance, IT products distributors in the industry that have well-established relationships with IT products vendors could face a higher chance in obtaining distributorship rights of a certain brand and maintain a high level of products. For IT SI solutions providers, maintaining stable and sustained business relationships with IT products vendors could receive benefits such as rebates and marketing funds. However, new entrants with unestablished relationship with suppliers may find it difficult to procure internationally renowned brands or to provide wide range of products to fulfil customers' requirements and investment budget on IT systems.

Competitive advantage of our Company

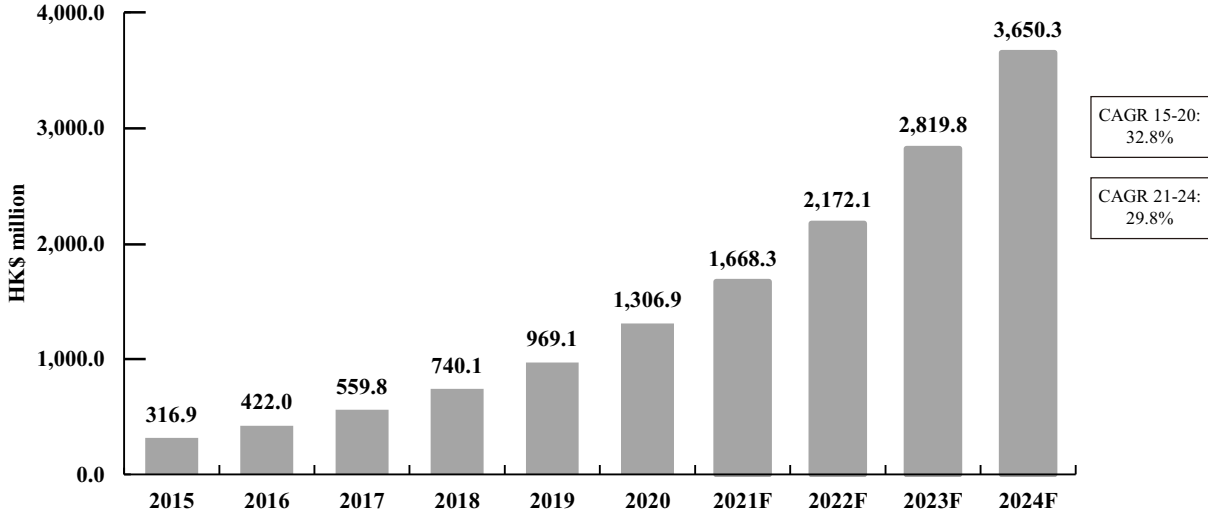
Please refer to the section headed "Business – Our competitive strengths" for a detailed discussion of our Company's competitive strengths.

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OVERVIEW OF THE HCI AND AI INFRASTRUCTURE MARKET IN HONG KONG

Market value of HCI in Hong Kong

The chart below sets forth the market value of HCI in Hong Kong from 2015 to 2020, with a forecast for 2021 to 2024:



Source: Ipsos research and analysis

Notes:

1. The forecast of the market value of HCI in Hong Kong is based on the assumptions that (i) the global economy and that of Hong Kong remains in steady growth across the period from 2021 to 2024; (ii) there is no external shocks, such as financial crises or natural disasters (as regards COVID-19, it is assumed there is no significant escalation), that will influence the demand and supply of the HCI market in Hong Kong from 2021 to 2024; (iii) the secondary statistics and reports reference are true and accurate and did not omit critical information; and (iv) the information being shared by key stakeholders and industry experts in Ipsos’s primary research are of their best knowledge to the market, and is valid with no significant deviations from the actual figures/situations.
2. The forecast of the market value of HCI in Hong Kong is estimated based on the historical trend and growth momentum of IT expenditure on HCI in Hong Kong derived from (i) desk research covering government and regulatory statistics, industry reports and analyst reports published by product vendors and market researchers, and other online sources and data from the research database of Ipsos; and (ii) comprehensive primary research by interviewing key stakeholders and industry experts from leading HCI product vendors and distributors in Hong Kong, who have extensive knowledge in the HCI market in the Hong Kong. The information and data collected from the abovementioned methodology have been verified, analysed and cross-checked by Ipsos.

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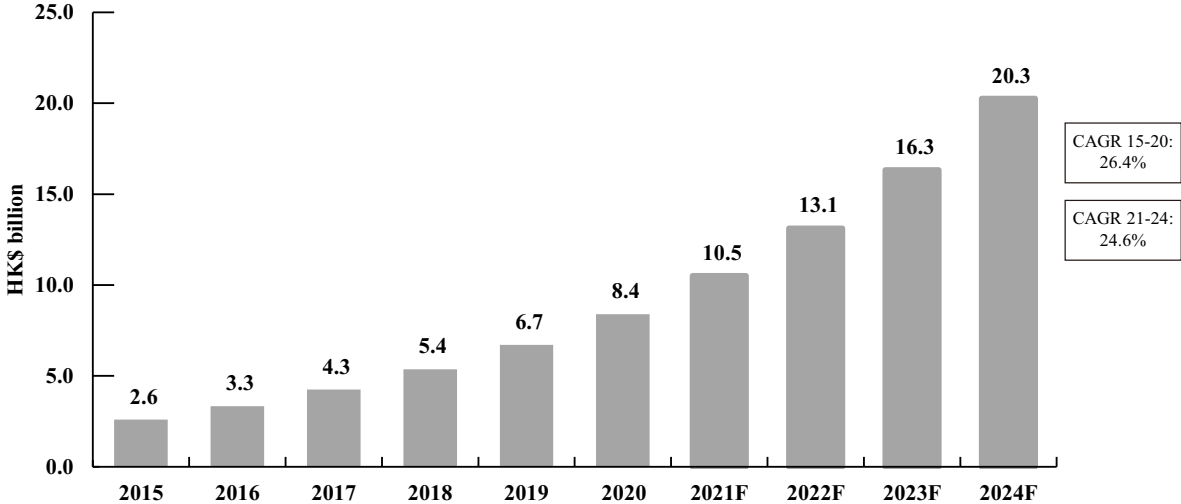
The market value of HCI in Hong Kong recorded a sharp growth from HK\$316.9 million in 2015 to HK\$1,306.9 million in 2020, at a CAGR of approximately 32.8%. The growth of the market value of HCI was due to the growing number of data centres, rise in demand for data protection & recovery, and the increased adoption of virtual desktop infrastructure in Hong Kong. HCI has a strong competitive advantage over the traditional three-tier architecture, as it is simpler to deploy, more scalable, and of lower maintenance costs than the traditional architecture. Therefore, there is an increasing number of organisations that are willing to deploy HCI to increase their operational efficiency and to lower the cost of IT maintenance. Acknowledged the benefits of HCI over traditional infrastructures, new branches and companies set up in Hong Kong were generally keen on adopting HCI as part of their IT infrastructure. Financial service institutions, education institutions, governmental institutions, and conglomerates were the top segments in Hong Kong that contributed the most to the growth in market value over the historical period. As supported by various segments and newly set-up companies, the market value of HCI in Hong Kong has increased exponentially by more than two times over the historical period.

During the forecast period from 2021 to 2024, the market value of HCI in Hong Kong is expected to increase from HK\$1,668.3 million in 2021 to HK\$3,650.3 million in 2024, at a CAGR of approximately 29.8%. It is expected that HCI will continue to gain popularity in Hong Kong as enterprises are more willing to invest in upgrading IT infrastructures for cloud computing, data security, and virtualisation, especially when their old IT infrastructures run out of warranty. In addition, the banking and financial sector is one of the main contributors to the growth in the market value of HCI in Hong Kong during the historical period, and the sector is expected to expand moderately throughout the forecast period. Since the beginning of 2021, Goldman Sachs, Citigroup, UBS, and other international investment banks and financial institutions have expanded their staff in Hong Kong, reconfirming their commitment to Hong Kong as an international financial center. The continued expansion of the banking and financial sector could potentially drive up the spending in IT infrastructure, as well as that of HCI. Besides, the trend of remote working and digital transformation started in 2020 due to the outbreak of COVID-19 has encouraged the commercial sector to upgrade IT infrastructures for the increasingly necessary deployment of virtualisation in the future, which is expected to further stimulate the demand for HCI in Hong Kong. In this relation, the HCI market in Hong Kong is expected to continue with exponential growth throughout the forecast period.

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Market value of AI infrastructure in Hong Kong

The chart below sets forth the market value of AI infrastructure in Hong Kong from 2015 to 2020, with a forecast for 2021 to 2024:



Source: Ipsos research and analysis

Notes:

1. The forecast of the market value of AI infrastructure in Hong Kong the is based on the assumptions that (i) the global economy and that of Hong Kong remains in steady growth across the period from 2021 to 2024; (ii) there is no external shocks, such as financial crises or natural disasters (as regards COVID-19, it is assumed there is no significant escalation), that will influence the demand and supply of the AI infrastructure market in Hong Kong from 2021 to 2024; (iii) the secondary statistics and reports that Ipsos took reference are true and accurate and did not omit critical information; (iv) the information being shared by key stakeholders and industry experts in Ipsos’s primary research are of their best knowledge to the market, and is valid with no significant deviations from the actual figures/situations.
2. The forecast of the market value is estimated based on the historical trend and growth momentum of IT expenditure on AI infrastructure in Hong Kong derived from (i) desk research covering government and regulatory statistics, industry reports and analyst reports published by product vendors and market researchers, and other online sources and data from the research database of Ipsos; (ii) comprehensive primary research by interviewing key stakeholders and industry experts from leading AI infrastructure product vendors and distributors in Hong Kong. Interviewees cover or have extensive knowledge in the AI infrastructure market in the Hong Kong. The information and data collected from abovementioned methodology have been verified, analysed and cross-checked by Ipsos.

INDUSTRY OVERVIEW

The AI infrastructure market in Hong Kong recorded a sharp growth from HK\$2.6 billion in 2015 to HK\$8.4 billion in 2020, at a CAGR of approximately 26.4%. The growth in the market value of AI infrastructure in Hong Kong was due to the increasing adoption of AI technology in Hong Kong, as the deployment of AI technology requires investment in AI infrastructure such as AI server, AI storage, AI applications and AI system infrastructure software. There is an increase in the number of businesses in Hong Kong started to adopt big data analytics, cloud computing and machine learning, enabling themselves to identify lucrative customer segments, make products and services more personalized, and run their operations more efficiently. As companies and institutions from different industry verticals such as financial institutions, logistics companies, retail brands and enterprises have started to realize the need to store and maintain massive amount of data which is required for training and building their own AI algorithms, many of them have started to invest in AI infrastructures by building on-premises AI servers and purchasing on-cloud AI servers.

During the forecast period from 2021 to 2024, the market value of the AI infrastructure in Hong Kong is expected to increase from HK\$10.5 billion in 2021 to HK\$20.3 billion in 2024, at a CAGR of approximately 24.6%. It is expected that the market value of AI infrastructures in Hong Kong will continue to grow as various organizations and businesses including governments, financial intuitions, technology and innovation businesses, travel and logistics firms and retail businesses are adapting to the use of AI. With a majority of retail banks in Hong Kong have already adopted or plan to adopt AI applications in 2020, the total amount of capital expenditure on AI by the retail banking sector in Hong Kong is expected to increase by more than two-third throughout the forecast period. As AI is moving toward the adoption stage in Hong Kong, it is becoming more resources demanding in terms of computing power and storage capacity. Hence, many of these companies are expected to continue investing in upgrading their AI infrastructure, such as AI servers and AI storage to improve their AI performance.

COMPETITIVE ANALYSIS OF THE HCI AND AI INFRASTRUCTURE MARKET IN HONG KONG

Competitive landscape of the HCI market

The HCI market in Hong Kong is concentrated, with over 10 brands of HCI products actively available as at 2020. The major customers of HCI products in Hong Kong encompass the public sector, including (i) government, (ii) education; and (iii) healthcare, and the private sectors, including (i) banking, finance services and insurance, (ii) retail; and (iii) trading and logistics. The following table sets forth the top five HCI products brands and their respective market share in terms of revenue in Hong Kong in FY2020:

Rank	HCI product brands	Revenue in 2020 (HK\$ million)	Market Share
1	Brand C	519.4	39.7%
2	Brand D	237.8	18.2%
3	Brand A	110.2	8.4%
4	Brand E	72.6	5.6%
5	Brand F	49.9	3.8%
	Others	317.0	24.3%
	Total	1306.9	100.0%

INDUSTRY OVERVIEW

Competitive landscape of the AI infrastructure market

The AI infrastructure market in Hong Kong is relatively fragmented with over 400 brands available as at 2020. The major customers of AI infrastructure in Hong Kong encompass the public sector, including (i) government, (ii) education and (iii) healthcare, and the private sectors, including (i) banking and finance; (ii) professional services (such as accounting, legal and consulting); and (iii) transportation and logistics. The following table sets forth the top five AI infrastructure brands and their respective market share in terms of revenue in Hong Kong in FY2020:

Rank	AI infrastructure product brands	Revenue in FY2020 (HK\$ million)	Market Share
1	Brand G	2,587.6	30.9%
2	Brand H	349.3	4.2%
3	Brand I	170.8	2.0%
4	Brand J	163.9	2.0%
5	Brand D	156.7	1.9%
	Others	4,956.7	59.1%
	Total	8,385.0	100.0%

Key drivers and opportunities

- Rise in the adoption of HCI in data centers:** Data centres are the backbone of online business operations and consumers. There was a growth in data centres in Hong Kong and it was aided by the increased internet usage for personal and business purposes by consumers through smartphones and high-speed broadband connectivity. Moreover, the adoption of cloud-based services by enterprises and the increasing use of social media by consumers aid in constructing hyper-scale data centers by organizations such as Facebook, Google, Amazon Web Services (AWS), and Microsoft. In addition, the enormous data growth is leading to increased IP traffic in both traditional and cloud data centres. Due to the competitive advantage of HCI over traditional infrastructure that HCI is more flexible, scalable, and easier to manage, HCI is becoming mainstream in most data centres. Also, with many organisations already looking at hyper-converged solutions as part of their long-term infrastructure strategy, HCI is expected to have a massive opportunity to grow and expand in the future. The capacity, scalability, and efficiency of data centres have also emerged into the spotlight as the COVID-19 pandemic led to an increase in remote working, causing various industries to scale up investments in building new IT infrastructures or updating existing IT infrastructures. Hence, as the adoption of HCI is increasingly popular in data centres, the demand for HCI is expected to be driven up by the rise in investments related to data centre infrastructures.

INDUSTRY OVERVIEW

- **Potential cost-saving for the deployment of HCI:** The deployment of HCI lowers the total cost of ownership and operating expenses for backup and disaster recovery, as it reduces the requirement of separate deduplication devices, backup software, and storage arrays by combining storage and server. As such, the deployment of hyper-converged technologies could yield tremendous annual discounted benefits and significant return on investment. Moreover, HCI enables memory duplication and compression, which can be used to enhance the utilisation levels of available resources. With more companies starting to realise such cost-saving potential and migrate from traditional infrastructure to HCI, the demand for HCI in Hong Kong is likely to remain robust in the future.
- **Increase in the need for AI server for better computing power:** AI applications empowered by machine learning and deep learning are effective tools for identifying hidden market trend and consumer preferences. Many enterprises in Hong Kong have started to notice the benefits of machine learning and deep learning. Banks, in particular, have started to deploy AI in identifying suspicious cases of money laundering based on transaction patterns and customer profiles. The applications of AI can be used for Know-Your-Client (KYC) and Anti-Money Laundering (AML) checks, which normally requires weeks of human resources to finish tasks such as read through documents and data entry. With the help of machine learning and other AI technologies such as natural language processing and speech recognition, automated solutions are now able to handle cognitive processes such as reading a document or listening to a recording and potentially reduce the work hours to days or hours instead of weeks. As the amount of data-intensive workload grows, these AI applications demand constant upgrade on AI server to avoid bottleneck in processing. Hence, the demand for AI infrastructure in Hong Kong is expected to be driven by the wide application of AI computing by the enterprises especially for the financial sector.
- **Rise in demand for AI storage:** With the robust computing power of AI that it could bring massive added-value to businesses, a wide range of businesses in Hong Kong have started their adoption of digital technologies with corporates leading the way in terms of digital investments and innovation. With the necessity to store massive amount of customer data for AI analytics, corporates will have to invest in AI infrastructure such as storage infrastructures for AI. Some corporates would choose to invest in building on-premises AI storage to mitigate the risk of data leakage. On the other hand, some corporates would store their less sensitive data in various cloud service providers or data centers. As more investment in AI storage would be required for matching the surging demand for AI computing power, the market value of AI infrastructure including AI storage in Hong Kong is expected to expand rapidly throughout the forecast period.

INDUSTRY OVERVIEW

RECENT TREND AND DEVELOPMENT

The outbreak of COVID-19 in or around December 2019 has adverse impact on the global economy and across different industry sectors. In response, countries across the world have imposed widespread lockdowns, closure of work places and restrictions on mobility and travel to contain the spread of the virus which has disrupted business operations, supply chains and workforce availability across the world, leading to substantial declines in business activities. Despite these disruptions, the impact of COVID-19 on the IT industry in Hong Kong is believed to be as comparatively mild and short-term than that on other sectors. The market promptly recovered subsequently by the second half of 2020. According to the Ipsos Report, amid the impact brought by the outbreak of COVID-19, the market value of the IT products distribution industry and of the SI solutions industry in Hong Kong is only estimated to record a drop at a year-on-year rate of approximately 0.7% and 0.6% between 2019 and 2020 respectively, being significantly lower than other industry sectors such as property, retail and hospitality and tourism industries, which have recorded a drop at a year-on-year rate of approximately 11.1%, 28.7% and 63% between 2019 and 2020 respectively. The SI solutions industry in Hong Kong has swiftly recovered since April 2020 as the social distancing and work-from-home practice has hastened the growth in demand of IT needs in the areas of digital transformation, real-time collaboration and communication platform, cloud services and security control. Driven by the downstream demand in the SI solutions industry, the IT products distribution industry in Hong Kong has also gradually recovered since June 2020.

In general, the outbreak of COVID-19 has impacted on the IT industry in Hong Kong in the following two ways: (i) the mandatory or voluntary social distancing measures implemented by the Government, public organisations and private enterprises to contain the spread of the virus such as work-from-home arrangement, closure of offices and facilities, disruption to or even suspension of normal business operations have deferred the provision of on-site implementation services and thereby delayed the execution and implementation of various IT projects; and (ii) as the outbreak of COVID-19 and the corresponding social distancing measures have reshaped the IT applications in both commercial activities and daily lives causing fundamental changes in the underlying IT needs, commercial organisations have become more conservative in budgeting their IT expenditure and taken more time to observe, analyse and ascertain their IT needs and business performance and hence delayed their spending on IT products. Nevertheless, under the social distancing measures adopted during the outbreak of COVID-19, business organisations discovered that traditional business and operation models are hard to sustain and operate under COVID-19 pandemic. Many organisations have then undergone digitisation to enable remote working arrangement while retailers have tried to launch e-commerce platforms to safeguard their business. Such change has spiked an increase in demand for SI solutions as well as the demand for IT products, such as VPN services, real-time communication tools as well as remote working software. The shift to IT solution, triggered by the outbreak of COVID-19, is expected to sustain even in the post-COVID-19 era and creating an opportunity to the IT industry in Hong Kong.

Besides, the Government announced on 8 April 2020 a HK\$137.5 billion package of relief measures to help businesses stay afloat, keep workers in employment and relieve financial burdens of individuals and businesses. Supporting measurements for the IT industry include (i) a Distance Business Programme under Innovation and Technology Bureau of approximately HK\$500 million to support enterprises in adopting technology to continue business with technology adoption and related training for employees and (ii) encouraging the development of 5G by subsidising 50% of the costs for 5G-related projects, subject to a cap of HK\$500,000 for each project.