2018 Manpower Survey Report
Innovation and Technology Sector

2018 年 創 新 及 科 技 業
人 力 調 查 報 告 書

Innovation and Technology Training Board
Vocational Training Council
職 業 訓 練 局
創 新 及 科 技 訓 練 委 員 會

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ACKNOWLEDGEMENT

The Innovation and Technology Training Board (the Training Board) wishes to thank all the respondents of establishments for completing and returning the questionnaires, the Census and Statistics Department (C&SD) for assisting in sample selection and MOV Data Collection Center Limited in collecting data.

The Training Board is also grateful to all the parties for providing information on programmes and graduate statistics; in particular universities and major tertiary institutions offering IT and computing programmes.

DEFINITION OF TERMS

A company	"A company" is defined, for the purpose of this survey, as a business undertaking including establishments having the same first 7 digits of business registration number (i.e. under a single ownership or control) with the same nature of business (i.e. in the same branch). A company forms the basic enumeration unit in the survey.
A freelancer	"A freelancer" is a person who pursues a profession without a long-term commitment to any one employer in the IT sector. Freelancers may be engaged on a daily, an hourly or a project basis.
Average annual remuneration package	"Average annual remuneration package" refers to the annual remuneration package including basic salary, bonus/commission, housing allowance/benefit and other regular allowance. It is an average figure among employees engaging in the same principal job.
Employees	"Employees" refer to all full-time personnel who are directly paid by the company and who are either at work or temporarily absent from work, viz sick leave, maternity leave, annual vacation, causal leave or on strike.
Information technology	"Information technology" encompasses methods and techniques used in information handling, transmission and retrieval by automatic means, including computing, telecommunication (voice, data and video transmission by digital or analogue means), office automation and industrial automation.
Innovation and technology	"Innovation and technology" refers to those technologies that create new user experience or improve product performance that bring social and economic value.

IT & Communications Services Organisations	"IT & Communications Services Organisations" includes companies engaged in manufacture/wholesale/retail/import/ export of computers/peripheral equipment and computer software packages; provision of IT related products and services (such as Internet access/communications services, software support, data processing and technical services of computer facilities management), and digital creative.
IT employees	"IT employees" refers to all full-time personnel who are engaged in principal jobs related to general IT management, IT/software development, telecommunications and networking, technical services (including IT security, database, systems programming and field support), operation services, IT education and training, and IT sales and marketing. Users of IT systems as well as frequent users of IT packages are not considered as IT employees in this survey.
IT Users Organisations	"IT Users Organisations" includes companies in non-IT related sectors, which act as IT users. These sectors include manufacturing of non-IT products; electricity, gas and water; construction; wholesale/retail/import/export of non-IT products; catering and hotels; transport and storage services; financing, insurance, real estate and business services; medical and health care services; community, social and personal services; and government bureau/departments.
Research and development activities	"Research and development (R&D) activities" refers to creative works undertaken on a systematic basis so as to increase the stock of knowledge for devising new or improved products/ processes/applications. For those employees who focus on R&D projects related to IT, they will be grouped under the job category of R&D (IT) whilst those who focus on R&D projects on other areas will be grouped under R&D (non-IT related).
Retrenchment	"Retrenchment" is defined as employer's decision to downsize or re-organise to cope with the company's financial situation.
Vacancies	"Vacancies" refer to those unfilled, immediately available job openings for which the company is actively trying to recruit personnel at the time of survey.

鳴謝

承蒙各方支持，創新及科技業人力調查工作順利完成。各業界受訪機構填覆調查問卷、政府統計處及米奧特資料搜集中心分別協助抽取機構樣本和蒐集人力數據，創新及科技訓練委員會（本會）特此鳴謝。

另有多間機構提供課程資料及畢業生統計數字，特別是開辦資訊科技及電腦運算學課程的大學及大專院校，令調查資料更完備，本會謹此致謝。

詞彙釋義

公司	「公司」就是次調查而言，指業務經營者，同一公司可包括若干業務單位。這些業務單位的商業登記號碼首七個數字相同（即屬同一擁有權及控制權），且業務性質相同。是次調查以公司為點算單位。
自由工作者	「自由工作者」指並無與資訊科技業僱主建立長期僱傭關係的人士。自由工作者可以日薪、時薪或按項目收取報酬。
每年平均薪酬	「每年平均薪酬」指每年薪酬福利條件，以從事相同主要職務僱員的平均年薪計算，包括：底薪、花紅／佣金、房屋津貼／福利及其他例行津貼。
僱員	「僱員」指所有由公司直接支付薪金的全職員工，包括正執勤，以及因病假、產假、年假、事假或罷工而暫時缺勤的員工。
資訊科技	「資訊科技」是指處理、傳送及檢索資訊所應用的自動化方法及技術，例如電腦、電訊（包括以數碼及模擬方法傳送聲音、數據及影像）、辦公室自動化及工業自動化技術等。
創新及科技	「創新及科技」指運用科技創造新用戶體驗或改善產品表現，為社會及經濟增值。
資訊科技及通訊服務機構	「資訊科技及通訊服務機構」包括從事以下業務的機構：電腦、電腦周邊設備及套裝軟件的製造／批發／零售／進出口貿易、提供與資訊科技相關的產品及服務（例如互聯網接駁／通訊服務、軟件支援、資料處理、與電腦設備管理相關的技術服務）、數碼創意業務。

資訊科技僱員	「資訊科技僱員」指負責下列主要職務的全職員工：總資訊科技管理、資訊科技／軟件開發、電訊及網絡、技術服務（包括資訊科技保安、資料庫、系統程式編製及實地支援）、操作服務、資訊科技教育及訓練、資訊科技銷售及市場推廣。是次調查中，資訊科技系統的用戶，以及經常使用電腦套件的人士並不視為資訊科技僱員。
資訊科技用戶機構	「資訊科技用戶機構」指並非從事資訊科技業務，而是使用資訊科技服務的機構，包括非資訊科技產品製造商、電力、氣體燃料及水務、建造業、非資訊科技產品的零售批發及出入口業、飲食業及酒店業、運輸及貨倉服務業、金融、保險、房地產及商業服務業、醫療及保健服務業、社區、社會及個人服務業、政府部門。
研究與開發活動	「研究與開發（研發）活動」指在有系統的基礎上進行創造工作，透過增進知識，發明全新或改進的產品／程序／用途。專注資訊科技研發項目的僱員，將歸入研發（與資訊科技相關）工作類別；專責其他範疇研發項目的僱員，則納入研發（與資訊科技不相關）類別。
縮減開支	「縮減開支」指僱主為應付公司的財務狀況而決定縮減規模或重組業務架構。
空缺	「空缺」指需要立刻填補的崗位，而公司於調查期間正積極招聘人手。

I. EXECUTIVE SUMMARY

Background

1.1 The key objective of the Manpower Survey (MPS) of the Innovation and Technology Sector is to collect up-to-date manpower information with a view to assessing the manpower requirements and training needs of the innovation and technology sector.

1.2 The report presents the findings of the MPS of the Innovation and Technology Sector **conducted from April to June 2018**.

Survey Coverage

1.3 The Survey covered the following sectors and branches of the innovation and technology sector:

Sectors	Branches	Trade Description
Manufacturing	1	Manufacture and repair of computers and peripheral equipment; manufacture of electronic parts and components for computer and telecommunications equipment
	2	Other manufacturing (non-IT products)
Innovative Products and Services	3	Innovative products and services
Electricity, Gas and Water	4	Electricity, gas and water supply
Construction	5	Construction
Wholesale, Retail and Import/Export Trades, Catering and Hotels	6	Export trading, import for wholesale, wholesale and retail sale of computers, computer peripheral equipment and computer software packages
	7	Other import and export trades (except import and export trades of computers, computer peripherals and software packages)
	8	Other wholesale and retail (except wholesale and retail sale of computers, computer peripherals and software packages); accommodation and food service activities

Sectors	Branches	Trade Description
Transport and Storage Services	9	Airline companies
	10	Railway and cable transport; public bus services; licensed and franchised ferry services; vehicular tunnel, bridge and highway operators
	11	Air cargo forwarding services
	12	Other transport and storage services
Communications Services	13	Internet access services
	14	Communications services (except internet access services)
Financing, Insurance, Real Estate and Business Services	15	Domestic banking units
	16	Real estate brokerage and agency
	17	Others (financing, insurance, real estate and business services)
IT Products and Services Suppliers	18	IT related products and services (including consultancy, software development, software products, software support and maintenance services; data processing and tabulation services; engineering and technical services of computer facilities management)
Medical and Health Care Services	19	Medical, dental and other health care services (including Hospital Authority)
Community, Social and Personal Services	20	Universities and post-secondary colleges; research and scientific institutes (including Hong Kong Examination and Assessment Authority)
	21	Educational institutes other than universities, post-secondary colleges (excluding Hong Kong Examination and Assessment Authority)
	22	Motion pictures and other entertainment services; and television/radio stations and studios
	23	Others (community, social and personal services); Hong Kong Productivity Council & Hong Kong Trade Development Council
Digital Creative Sector	24	Other relevant organisations in the Digital Creative Sector

Sectors	Branches	Trade Description
Government Bureaux/ Department Sector	25	Government bureaux/departments

1.4 Research and Development (R&D) activities are newly included in the Manpower Survey of 2018 with the objective of accomplishing an exploratory understanding of the innovation activities in Hong Kong. Regarding R&D activities, only technological innovation (product / process innovation) was included. Supplementary samples in some specific branches where R&D activities could possibly be undertaken are suggested by the Training Board. In this regard, manpower information of R&D employees will not be projected to indicate the overall innovation situation in Hong Kong.

1.5 There are two job categories under R&D activities, namely Research and Development (IT related) where the employees focus on R&D projects related to IT (e.g. Information Communications Technology) and Research and Development (Non-IT related), where the employees focus on R&D projects in other areas (e.g. Biomedical Technology, Material and Precision Engineering). Moreover, only principal jobs of full time employees will be reflected in the manpower information if involvement in R&D activities is major.

Survey Methodology

Data collection

1.6 A total of 1 753 establishments was selected for the survey, with 1 476 establishments selected basing on the stratified random sampling method and 277 establishments selected as supplementary samples.

1.7 The data collection was carried out between April and June 2018. Among the 1 753 sampled establishments, 944 were successfully enumerated and 129 refused, giving a response rate of 88%.[1] Taking into account (i) the satisfactory response rate of individual branches, (ii) the fact that majority of prominent and sizeable establishments had responded to the survey, and (iii) the grossing-up of sample results basing on statistically-grounded method (except for R&D supplementary samples as mentioned in paragraph 1.4), it could be concluded that the survey findings presented in this report can generally reflect the manpower situation of the sector.

[1] The remaining cases were regarded as invalid cases, including establishments which were suspended operation or had not employed any IT and R&D staff and so on.

1.8 Survey data were collected through telephone interviews or face-to-face interviews with the sampled establishments based on a structured questionnaire. The questionnaire was divided into Part A and Part B, where Part A focusing on Research and Development while Part B focusing on Information Technology. In each part of the questionnaire, manpower information (number of employees, freelancers, vacancies, etc.) by principal job was collected.

1.9 The list of principal jobs was defined by the Training Board with detailed job description given for each job. While it was understood that the job titles adopted in the establishments might not be exactly the same as the principal jobs, respondents were required to report manpower information corresponding to the principal jobs basing on the job descriptions.

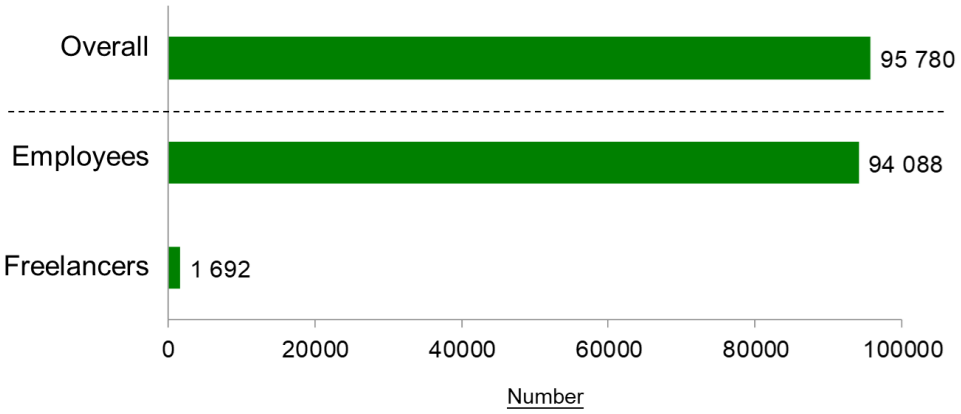
1.10 To ensure a smooth survey implementation and accuracy of survey findings, stringent quality assurance measures were applied at various stages of the survey, including thorough training of fieldwork staff, 100% vetting of questionnaires by a dedicated team of VTC, validation of collected data through computer programming, and so on.

Summary of Survey Findings

A. Information Technology (IT)

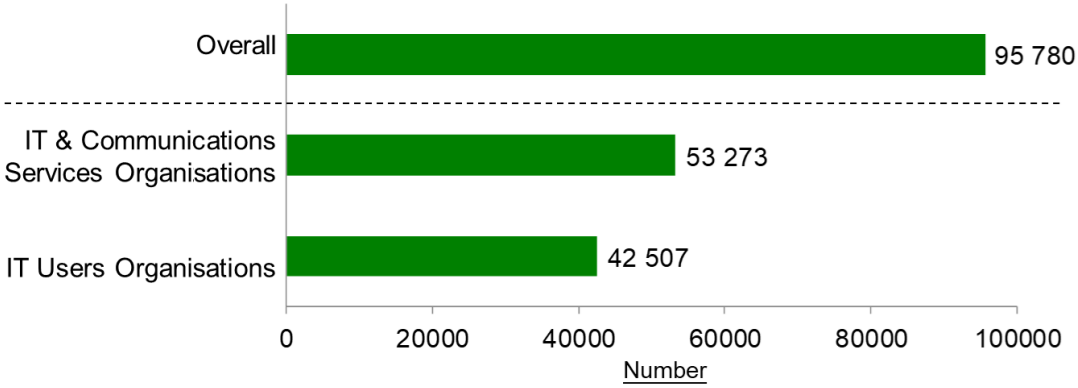
1.11 At the time of survey, there were 95 780 persons employed in the principal jobs of the IT sector in Hong Kong, comprising 94 088 employees and 1 692 freelancers.

Chart 1.1 Number of IT Employees and Freelancers



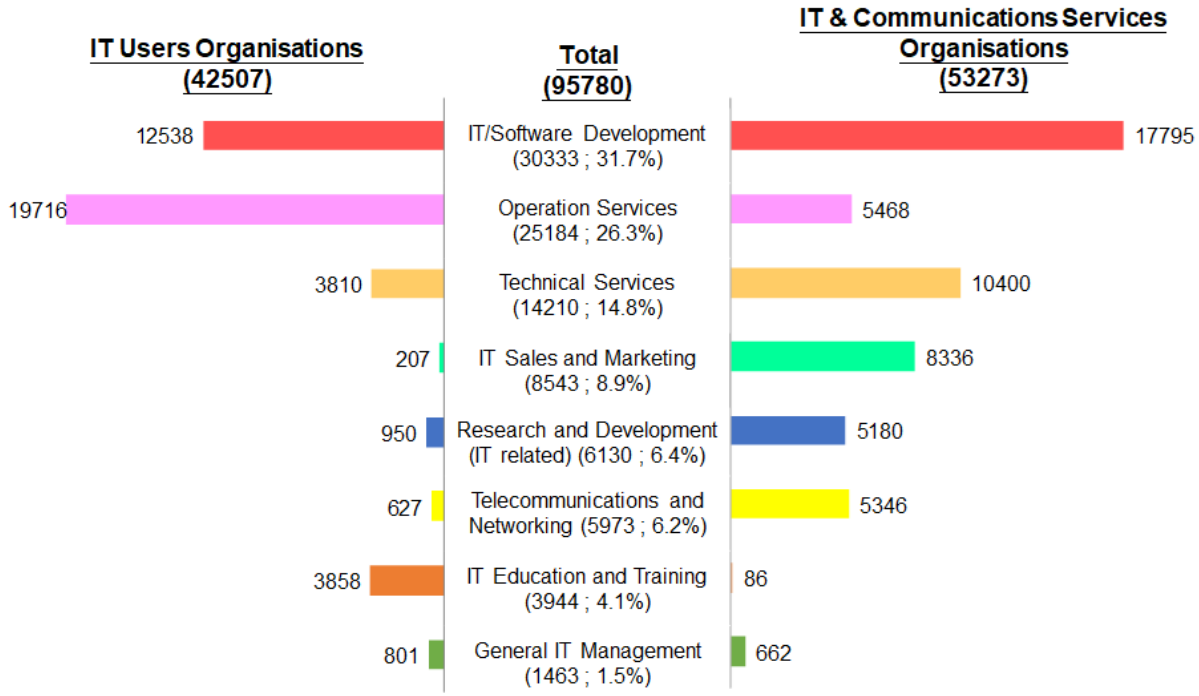
1.12 Of the 95 780 IT employees (including freelancers), 53 273 (55.6%) were working in the IT & Communications Services Organisations and 42 507 (44.4%) in the IT Users Organisations.

Chart 1.2 IT Employees (including Freelancers) by Type of Organisations



1.13 As regards the job categories, 30 333 (31.7%) were engaged in IT/software development, 25 184 (26.3%) in operation services, 14 210 (14.8%) in technical services, 8 543 (8.9%) in IT sales and marketing, 6 130 (6.4%) in research and development (IT related), 5 973 (6.2%) in telecommunications and networking, 3 944 (4.1%) in IT education and training and 1 463 (1.5%) in general IT management.

Chart 1.3 Manpower Structure by Job Category



Notes:

1) ( ) Figures in brackets are number of employees + freelancers and percentage of total.

2) Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

1.14 The manpower of the IT sector has been on a rising trend. The number of employees (including freelancers) increased by 7 986 (or 9.1%) during the past two years. The increase was mainly attributed to the growth in job categories of operation services (+5 519), IT/software development (+2 841) and IT sales and marketing (+1 366). It was, however, worth noting that a decrease was recorded for technical services (-1 490). The Training Board observes that the IT vendors enhance their product/services by strengthening their IT/Software development team whilst the IT user organsiations streamline their IT development team and offload the task to the IT vendors.

Table 1.1 Changes in the Number of IT Employees (including Freelancers) by Job Category by Type of Organisation Between 2016 and 2018

	IT & Communications Services Organisations			IT Users Organisations			Overall		
Job category	**2016**	**2018**	**Increase / Decrease**	**2016**	**2018**	**Increase / Decrease**	**2016**	**2018**	**Increase / Decrease**
General IT Management	448	662	+214 *(+47.8%)*	1 029	801	-228 *(-22.2%)*	1 477	1 463	-14 *(-0.9%)*
IT/Software Development *	16 281	22 975	+6 694 *(+41.1%)*	17 341	13 488	-3 853 *(-22.2%)*	33 622	36 463	+2 841 *(+8.4%)*
Telecommunications and Networking	5 036	5 346	+310 *(+6.2%)*	1 390	627	-763 *(-54.9%)*	6 426	5 973	-453 *(-7.0%)*
Technical Services	10 483	10 400	-83 *(-0.8%)*	5 217	3 810	-1 407 *(-27.0%)*	15 700	14 210	-1 490 *(-9.5%)*
Operation Services	5 241	5 468	+227 *(+4.3%)*	14 424	19 716	+5 292 *(+36.7%)*	19 665	25 184	+5 519 *(+28.1%)*
IT Education and Training	158	86	-72 *(-45.6%)*	3 569	3 858	+289 *(+8.1%)*	3 727	3 944	+217 *(+5.8%)*
IT Sales and Marketing	7 025	8 336	+1 311 *(+18.7%)*	152	207	+55 *(+36.2%)*	7 177	8 543	+1 366 *(+19.0%)*
Total	**44 672**	**53 273**	**+8 601** ***(+19.3%)***	**43 122**	**42 507**	**-615** ***(-1.4%)***	**87 794**	**95 780**	**+7 986** ***(+9.1%)***

Notes:

1) ( ) Growth rate as percentage of number of IT employees (including freelancers) in the same job category and type of organisation in 2016.

2) * For the figure of 2018, "Research and Development (IT related)" was included in "IT/Software Development".

3) Type of Organisations refers to (i) “IT & Communications Services Organisations” includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) “IT Users Organisations” includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

1.15 At the time of survey, there were 3 231 IT vacancies*, representing a vacancy rate of 3.3% of the existing IT posts. The vacancies concentrated on IT/software development (1 502 vacancies), followed by operation services (635 vacancies) and technical services (399 vacancies).

Table 1.2 Number of Existing IT Vacancies by Sector by Job Category

a) IT Vacancies (excluding Research and Development (IT related))

Sector	General IT Management	IT/ Software Development	Telecommunications and Networking	Technical Services	Operation Services	IT Education and Training	IT Sales and Marketing	Total
Manufacturing	-	12	-	36	18	-	-	**66**
	-	*(3.6%)*	-	*(5.9%)*	*(1.6%)*	-	-	
Innovative products and services	-	25	1	-	5	-	9	**40**
	-	*(6.8%)*	*(7.7%)*	-	*(4.3%)*	-	*(3.4%)*	
Electricity, Gas and Water	-	4	-	6	-	-	-	**10**
	-	*(2.3%)*	-	*(8.3%)*	-	-	-	
Construction	-	9	-	-	36	-	-	**45**
	-	*(6.4%)*	-	-	*(6.4%)*	-	-	
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	2	86	2	33	177	-	66	**366**
	(0.8%)	*(3.0%)*	*(0.9%)*	*(1.3%)*	*(2.6%)*	-	*(1.7%)*	
Transport and Storage Services	-	3	-	-	6	-	-	**9**
	-	*(0.4%)*	-	-	*(0.5%)*	-	-	
Communications Services	-	25	37	12	11	-	6	**91**
	-	*(3.7%)*	*(2.4%)*	*(0.9%)*	*(1.5%)*	-	*(0.4%)*	
Financing, Insurance, Real Estate and Business Services	-	267	7	49	134	-	-	**457**
	-	*(5.4%)*	*(4.0%)*	*(2.8%)*	*(2.4%)*	-	-	
IT Products and Services Suppliers	-	880	100	254	95	-	205	**1534**
	-	*(5.4%)*	*(2.7%)*	*(3.5%)*	*(2.4%)*	-	*(6.4%)*	
Medical and Health Care Services	-	24	-	-	11	-	-	**35**
	-	*(2.7%)*	-	-	*(5.8%)*	-	-	
Community, Social and Personal Services	2	22	2	5	134	8	1	**174**
	(1.2%)	*(1.4%)*	*(1.7%)*	*(0.7%)*	*(2.9%)*	*(0.2%)*	*(8.3%)*	
Digital Creative	-	47	-	-	-	-	4	**51**
	-	*(8.9%)*	-	-	-	-	*(10.3%)*	
Government Bureaux/Departments	11	98	4	4	8	-	-	**125**
	(8.0%)	*(4.7%)*	*(2.6%)*	*(2.8%)*	*(1.0%)*	-	-	
Total	**15**	**1 502**	**153**	**399**	**635**	**8**	**291**	**3 003**
	(1.0%)	***(4.7%)***	***(2.5%)***	***(2.7%)***	***(2.5%)***	***(0.2%)***	***(3.3%)***	

b) IT Vacancies (Research and Development (IT related) only)

Sector	Number of Vacancies	
Innovative products and services	1	*(0.1%)*
IT Products and Services Suppliers	189	*(4.3%)*
Universities and post-secondary colleges; Research and scientific institutes	28	*(3.6%)*
Others	10	*(2.7%)*
Total	**228**	***(3.6%)***

Note: ( ) As a percentage of number of IT posts (employees and freelancers + vacancies) by sector by job category.

* Vacancies included Research and Development (IT related).

1.16 As compared with the 2016 survey findings, the vacancy rate has slightly increased from 2.9% (2 629 vacancies) to 3.3% (3 231 vacancies). The vacancy rate was particularly high for the digital creative sector (6.9%) and the construction sector (5.7%) which might be attributable to the demand for more user interface design and Building Information Modelling (BIM) professionals in respective sector.

Table 1.3 Comparison of the IT Vacancies by Sector between 2016 and 2018

	2018		2016	
Sector	**Vacancies**	**Vacancy Rate**	**Vacancies**	**Vacancy Rate**
Manufacturing	72	3.0%	76	2.5%
Innovative products and services *	41	2.5%	N/A	N/A
Electricity, Gas and Water	10	3.0%	3	0.8%
Construction	45	5.7%	15	3.1%
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	366	2.2%	165	1.0%
Transport and Storage Services	9	0.4%	7	0.4%
Communications Services	91	1.6%	193	3.6%
Financing, Insurance, Real Estate and Business Services	457	3.6%	413	2.6%
IT Products and Services Suppliers	1 723	4.4%	1 269	4.1%
Medical and Health Care Services	35	3.2%	56	4.9%
Community, Social and Personal Services	202	1.7%	337	3.3%
Digital Creative	54	6.9%	21	3.3%
Government Bureaux/Departments	126	3.8%	74	2.6%
Total	**3 231**	**3.3%**	**2 629**	**2.9%**

Notes:

1) Vacancy Rate as a percentage of number of IT posts (employees and freelancers + vacancies).
2) * The sector "Innovative products and services" was newly included in the 2018 survey.

1.17 There were a total of 99 011 IT posts at the time of survey (including the number of existing employees, freelancers and vacancies). Among the various principal jobs, user support/coordinator accounted for the highest percentage of IT manpower demand (19.3%), followed by programmer/analyst programmer/software engineer (17.5%) and Sales/ Marketing Representative/Account Manager/Product Promotion Representative (7.1%).

Table 1.4 Percentage Distribution of IT Manpower Demand by Principal Job

Principal Job	IT Employees (including Freelancers)	IT Vacancies	Total IT Demand
IT Director/MIS Director/Head of IT/CIO	1.4%	0.5%	**1.3%**
CTO	0.2%	-	**0.2%**
Systems Development Manager	1.8%	1.2%	**1.8%**
IT Architect/Business Analyst	0.9%	0.6%	**0.9%**
Project Manager/Project Leader	4.2%	3.0%	**4.1%**
UX Designer	2.8%	3.8%	**2.9%**
Programmer/Analyst Programmer/Software Engineer	17.0%	31.5%	**17.5%**
Web Designer/Developer	1.4%	1.5%	**1.4%**
Quality Assurance Specialist/Software Assurance Specialist/Engineer/IT Systems Auditor	0.6%	1.6%	**0.7%**
Software Product Engineer	0.5%	0.2%	**0.4%**
Software/Firmware Product Designer/Product Analyst/ Developer/Software Product Manager	0.9%	1.0%	**0.9%**
Technical Writer	0.2%	0.2%	**0.2%**
Computer Game Designer/Artist/Developer/ Computer Graphic Designer/Artist/ Computer Animator/Web Graphic Designer/ Visual Effects Designer	1.5%	1.9%	**1.5%**
Telecommunications Manager/ Networking Manager	0.3%	0.2%	**0.3%**
Telecommunications Consultant// /Network Consultant	0.9%	0.2%	**0.9%**
Telecommunications Engineer/ Network Engineer	2.4%	4.0%	**2.5%**
Network Administrator/Network Officer	2.6%	0.4%	**2.5%**
IT Security Specialist/ Information Security Specialist/Information Security Officer	1.2%	1.1%	**1.2%**
Database Administrator/ Data Warehouse Administrator/ Database Designer	0.7%	0.3%	**0.7%**
Systems Programmer (in-house/vendor environment)/Systems Engineer	4.4%	2.3%	**4.3%**
Customer Engineering Manager/ Services Support Manager	0.9%	1.1%	**0.9%**
Customer Service Engineer/Field Engineer	1.5%	1.5%	**1.5%**
Field Technician	6.2%	6.1%	**6.2%**
Computer Operations Manager	1.0%	0.2%	**1.0%**
Help Desk Supervisor	0.4%	0.3%	**0.4%**
Help Desk Representative/ Customer Service Officer/ Representative	1.7%	1.3%	**1.7%**
Computer Operations Supervisor/Operations Support Supervisor	1.4%	1.0%	**1.4%**
Computer Operator/Systems Operator	2.4%	0.6%	**2.4%**
User Support/ Co-ordinator	19.4%	16.2%	**19.3%**
Lecturer/ Professor/ Training Officer	2.5%	0.2%	**2.5%**
IT Trainer/IT Instructor	1.6%	-	**1.5%**
Sales/Marketing Director/ Account Director/ Sales/ Marketing Manager	1.8%	1.9%	**1.8%**
Sales/Marketing Representative/ Account Manager/ Product Promotion Representative	7.1%	7.1%	**7.1%**
R&D Researcher/R&D Scientist/R&D Engineer	2.5%	1.9%	**2.5%**
R&D Technician	2.8%	4.9%	**2.9%**
R&D Supporting Staff	1.0%	0.2%	**1.0%**
Total	**100.0%**	**100.0%**	**100.0%**

Note: Figures may not add up to the total due to rounding.

1.18 At the time of survey, there were 4 148 seconded IT staff from contractor companies (578 and 3 570 from IT & Communications Services Organisations and IT Users Organisations respectively). In terms of the ratio of IT seconded staff to IT employees, such ratio was comparatively high for the medical and health care services sector (46.2%) and the Government Bureaux/Departments sector (43.6%).

Table 1.5 Number of IT Staff Seconded from Contractor Company(ies) and Number of Companies with IT staff Seconded from Contractor Company(ies)

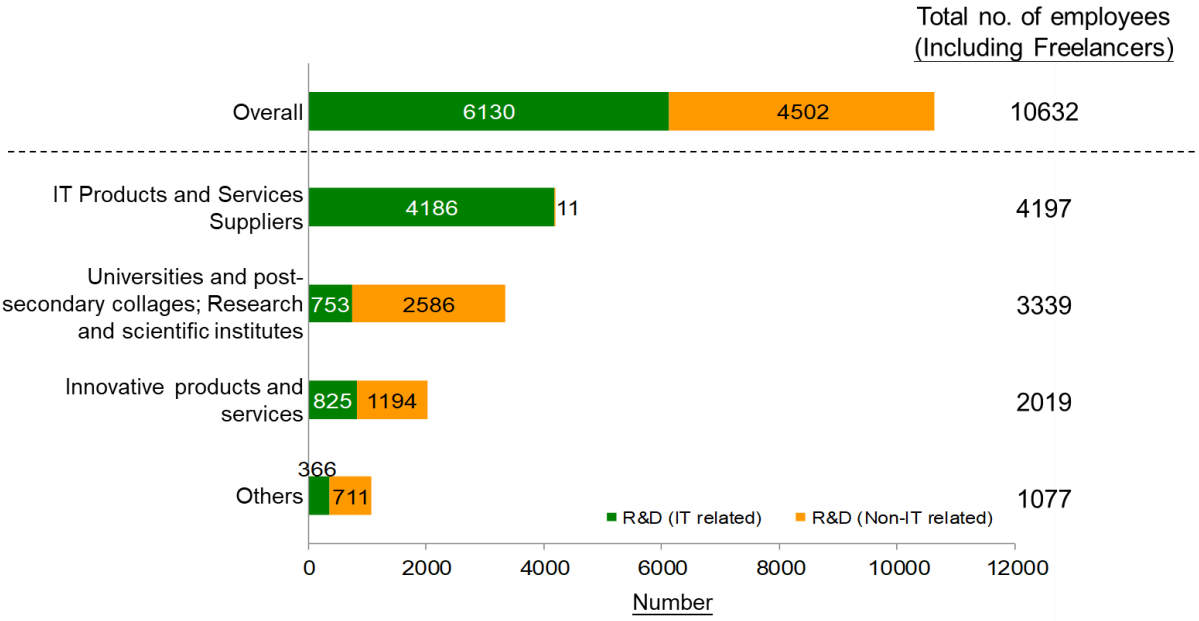
Sector	Number of IT staff seconded from contractor company	Number of IT employees and freelancers at time of survey	Number of seconded IT staff as a percentage of IT employees	Number of companies with IT staff seconded from contractor company
IT & Communications Services Organisations				
Manufacturing (IT-products)	20	1 016	2.0%	2
Innovative products and services	-	477	-	-
Wholesale, Retail and Import/Export Trades of the Computer Products and Software Packages	462	6 874	6.7%	13
IT Products and Services Suppliers	95	33 553	0.3%	52
Digital Creative	1	560	0.2%	1
Communications Services	-	5 613	-	-
Sub-total	***578***	***48 093***	***1.2%***	***68***
IT Users Organisations				
Other Manufacturing (non-IT products)	-	1 216	-	-
Innovative products and services	-	279	-	-
Electricity, Gas and Water	-	320	-	-
Construction	20	738	2.7%	3
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	274	9 428	2.9%	2
Transport and Storage Services	254	2 225	11.4%	40
Financing, Insurance, Real Estate and Business Services	327	12 138	2.7%	39
Medical and Health Care Services	492	1 066	46.2%	1
Community, Social and Personal Services	819	10 974	7.5%	191
Government Bureaux/Departments	1 384	3 173	43.6%	34
Sub-total	***3 570***	***41 557***	***8.6%***	***310***
Total	**4 148**	**89 650**	**4.6%**	**378**

B. Research and Development (R&D)

1.19 Within the companies covered in the survey, there were 10 632 persons engaged in research and development activities, comprising 10 564 employees and 68 freelancers.

1.20 Of the 10 632 employees (including freelancers) engaged in research and development activities, 6 130 (57.7%) were IT related and 4 502 (42.3%) were non-IT related.

Chart 1.4 Number of R&D Employees and Freelancers by Branch



1.21 At the time of survey, employers reported that there were 447 R&D vacancies, accounted for 4.0% of the existing R&D posts. The IT products and services suppliers reported the highest number of vacancies (189 IT related vacancies), followed by the universities and post-secondary colleges, research and scientific institutes (117 non-IT related and 28 IT related vacancies).

Table 1.6 Number of R&D vacancies by Branch

Job category	Innovative products and services	IT Products and Services Suppliers	Universities and post-secondary collages; Research and scientific institutes	Others	Overall
R&D (Non-IT related)	48 *(3.9%)*	- *(-)*	117 *(4.3%)*	54 *(7.1%)*	219 *(4.6%)*
R&D (IT related)	1 *(0.1%)*	189 *(4.3%)*	28 *(3.6%)*	10 *(2.7%)*	228 *(3.6%)*
R&D Total	**49** ***(2.4%)***	**189** ***(4.3%)***	**145** ***(4.2%)***	**64** ***(5.6%)***	**447** ***(4.0%)***

Note: ( ) As a percentage of number of R&D posts (employees and freelancers + vacancies) by job category.

Manpower projection for 2019-2022

1.22 Based on projected average annual manpower growth, estimated wastage rate of 3%, recent development of the IT sector and industry members' experience, the Training Board estimates the annual additional training requirement for IT employees from 2019 and 2022 by job category as shown in Table 1.7.

Table 1.7 Estimated Annual Additional Training Requirement for IT Employees from 2019 and 2022 by Job Category

Job Category	Estimated Annual Additional Training Requirement for 2019-2022 (Number of IT Employees)
IT Management	140 – 170
IT/Software Development Telecommunications & Networking Technical Services IT Sales & Marketing IT Education and Training	3 510 – 4 290
Operation Services	1 600 – 1 950
Total	5 250 – 6 410

Notes: (1) IT management job titles under various job categories in the 2018 survey were all grouped under the IT management job category.
(2) Figures may not add up to their totals due to rounding.

Major Conclusions and Recommendations

1.23 In view of the uncertainty of the global economic situation due to the recent trade war and Brexit as well as the debt crisis of some European countries, together with the structural transformation of China, it is likely that the economy of Hong Kong in the coming year will be slower than previous years with an expected growth rate of 3-4%. However, Hong Kong still has its competitive advantage as she has a robust ICT infrastructure and is consistently ranked among the best in the world in terms of digital readiness and internet access capabilities.[2] To foster the ICT industry development, the Hong Kong government has put in place many initiatives, including funding support, provision of infrastructure, international cooperation and manpower development. The Smart City Blueprint, unveiled in December 2017, maps out development plans for the next five years to enhance Hong Kong's sustainability by making use of innovation and technology. By and large, the need for the IT services driven by the digital transformation of the local companies coupled with the value-added applications using the new technologies will continue to sustain the growth of the industry in the coming years.

[2] Hong Kong Trade Development Council Research on Information and Communications Technology (ICT) industry on 5 July 2018.

Recommendations

1.24 Based on the short- to medium-term business outlook, and the manpower supply and demand situation derived from the survey findings, the Training Board recommends the following measures to all major stakeholders to meet the industry demand:

IT

(i) The stakeholders of the IT industry should raise the overall images/status of the industry to attract more people with good potential, particularly, the younger generation and collaborate with the IT professional bodies to launch promotion campaign to the students to arouse their interests in pursuing IT careers.

<u>For Employers</u>

Employers are recommended to:

(i) encourage their employees to take the various IT certified professional tests (e.g. Certified Information Systems Security Professional (CISSP) and the ISO27001 Lead Auditor Certification) and attend the specified training courses to meet the requirements for the certification.

(ii) equip their employees with the necessary skills and knowledge such as internet security and cloud computing and cultivate a life-long learning environment amongst the employees.

(iii) provide more support for the internship, e.g. mentorship, job shadowing, industrial attachment to enable students/trainees to gain practical working experiences in the workplace.

(iv) consider recruiting more experienced talents from overseas to train up the local IT workforce in the applications of advanced IT technologies through the Technology Talent Admission Scheme (Tech TAS) (www.itc.your.hk/en/techitas/).

<u>For Employees</u>

Employees are recommended to:

(i) make good use of the various government-subsidised training schemes, e.g. Reindustrialisation and Technology Trainning Programme (RTTP) and Continuing Education Fund (CEF), to enhance their skills and to keep abreast of the latest technologies.

(ii) keep updated of the technical knowhow of the new emerging technologies by different learning modes, including on-line certification courses in e-learning platforms.

For Training Providers

Training providers are recommended to:

(i) increase training places to cope with market needs and to enhance workers' skills, and by providing courses with emphasis on employability, IT emerging skills, especially the internet security, cloud computing technologies and data privacy regulation.

(ii) strengthen the collaboration with ASTRI and other leading technology companies to offer relevant educational programmes of advanced technologies (e.g. AI and Smart City) to the secondary students so that more students could be encouraged to study IT related programmes and choose IT as a career.

(iii) assist the IT employers to upgrade their employees in advanced IT skills. Retraining courses could be provided to the IT workforce timely to prepare them for the re-deployment in taking up duties related to the transformation of IT technologies.

(iv) explore to organise some awareness/appreciation courses of advanced IT technologies to the top management or middle management personnels to facilitate them to keep abreast of the applications and appreciate the benefits of bringing in such technologies in their companies.

(v) consider organising some pre-employment and upgrading IT courses to the youngsters with secondary school qualification such that they could be equipped with the IT skills to take up the operative and supporting duties.

R&D

(i) The training organisation or the Intellectual Property Department of the SAR Government should organise and offer more training courses related to Intellectual Property (IP) Management so that the relavant personnels will acquire the know-how of registration and application of IP rights.

(ii) More exchange forum and conference in specific technology areas should be organised in order for the R&D personnels to share and explore opportunities of collaboration for further development of their products and services.

(iii) R&D companies should strengthen their partnership with the public R&D Centers to reduce the time for product development by making use of the relevant technology licenses and making good use of the facilities of the testing laboratories of the Centers.

(iv) In line with the 2018 Policy Address to promote innovation and technology, more opportunities and incentives as well as support could be provided to the technology talents to set up their start-up companies.

(v) In order to attract foreign investors to set up their operations in Hong Kong, the Government should consider to take the initiatives in deploying more resources to train up R&D talents through the RTTP and promoting R&D activities in Hong Kong.

(vi) Manpower survey should be conducted periodically to keep track of the manpower demand and supply of the sector .

II. INTRODUCTION

Background

2.1 The Innovation and Technology Training Board of the Vocational Training Council is required by its terms of reference to determine the manpower demand of the innovation and technology sector and to make recommendations to the Council for the development of training facilities to meet the demand. The Training Board comprises members nominated by major trade associations, trade unions, professional bodies, educational/training institutions and government departments. The Training Board's membership and terms of reference are listed in *Appendices 1 and 2* respectively.

2.2 In pursuance of its terms of reference, the Training Board conducted the 2018 Manpower Survey of the Innovation and Technology Sector from **April to June 2018** to collect up-to-date manpower information with a view to assessing the manpower requirements and training needs of the innovation and technology sector. This report presents the findings of the survey concerned.

Survey Objective

2.3 The objective of the Survey is to collect the latest manpower information of the innovation and technology sector. Specifically, the survey aims –

(a) to collect up-to-date manpower information by principal jobs in related disciplines of the innovation and technology sector;

(b) to assess the technical manpower structure;

(c) to forecast training requirements in the near future; and

(d) to recommend to the Council the development of training strategies to meet such needs.

Survey Coverage

2.4 The Survey covered the following sectors and branches of the innovation and technology sector:

Sector	Branch	Trade Description
Manufacturing	1	Manufacture and repair of computers and peripheral equipment; manufacture of electronic parts and components for computer and telecommunications equipment
	2	Other manufacturing (non-IT products)
Innovative Products and Services	3	Innovative products and services
Electricity, Gas and Water	4	Electricity, gas and water supply
Construction	5	Construction
Wholesale, Retail and Import/Export Trades, Catering and Hotels	6	Export trading, import for wholesale, wholesale and retail sale of computers, computer peripheral equipment and computer software packages
	7	Other import and export trades (except import and export trades of computers, computer peripherals and software packages)
	8	Other wholesale and retail (except wholesale and retail sale of computers, computer peripherals and software packages); accommodation and food service activities
Transport and Storage Services	9	Airline companies
	10	Railway and cable transport; public bus services; licensed and franchised ferry services; vehicular tunnel, bridge and highway operators
	11	Air cargo forwarding services
	12	Other transport and storage services
Communications Services	13	Internet access services
	14	Communications services (except internet access services)
	15	Domestic banking units

Sector	Branch	Trade Description
	16	Real estate brokerage and agency
	17	Others (financing, insurance, real estate and business services)
IT Products and Services Suppliers	18	IT related products and services (including consultancy, software development, software products, software support and maintenance services; data processing and tabulation services; engineering and technical services of computer facilities management)
Medical and Health Care Services	19	Medical, dental and other health care services (including Hospital Authority)
Community, Social and Personal Services	20	Universities and post-secondary colleges; research and scientific institutes (including Hong Kong Examination and Assessment Authority)
	21	Educational institutes other than universities, post-secondary colleges (excluding Hong Kong Examination and Assessment Authority)
	22	Motion pictures and other entertainment services; and television/radio stations and studios
	23	Others (community, social and personal services); Hong Kong Productivity Council & Hong Kong Trade Development Council
Digital Creative Sector	24	Other relevant organisations in the Digital Creative Sector
Government Bureaux/ Department Sector	25	Government bureaux/departments

Sample Design

2.5 The sample design and selection were done by the Census and Statistics Department (C&SD) of the HKSAR in collaboration with the VTC. To ensure the selection of a representative sample and to facilitate subgroup analysis, a total of 1 753 establishments were invited for the survey. Out of this 1 753 establishments, 1 476 were selected by C&SD from the Central Register of Establishments (CRE)[3] using a statistically scientific method of stratified random sampling (comprising strata of establishments by three levels which were sector, branch and employment size). The remaining 277 companies (supplementary sample) were recommended for inclusion in the survey by the Training Board. These companies were prominent companies of other business natures which also employed innovation and technology employees, digital creative sector and relevant departments of Government.

Questionnaire Design

2.6 Survey data were collected through the use of a structured questionnaire. The questionnaire was divided into Part A and Part B, where Part A focusing on Research and Development while Part B focusing on Information Technology. In each part of the questionnaire, manpower information (number of employees, freelancers, vacancies, etc.) by principal job was collected.

2.7 Sample of questionnaire, explanatory notes and job descriptions for principal jobs are given in *Appendix 3*.

Data Collection Method

2.8 A survey pack, containing a notification letter and a survey questionnaire, together with an explanatory note and a list of principal jobs with job descriptions, was prepared for each of the invited establishments. The survey packs were dispatched by mail/email or in person. Responsible persons of the establishments were asked to provide information regarding the manpower situation in their establishments at the time of survey.

[3] The Census and Statistics Department maintains a computerised Central Register of Establishments which contains information relating to some 400 000 active establishments in Hong Kong. Information kept in the Register is updated on a quarterly basis through feedback from various surveys of the department and administrative returns from relevant government departments.

2.9 The list of principal jobs was defined by the Training Board with detailed job description given for each job. While it was understood that the job titles adopted in the establishments might not be exactly the same as the principal jobs, respondents were required to report manpower information corresponding to the principal jobs basing on the job descriptions.

2.10 During the fieldwork period, enumerators made telephone contacts with or visited individual establishments to assist respondents in completing questionnaires or to collect completed ones.

Quality Control Measures

2.11 Various measures were taken to assure the quality of the survey data collected. These included prior fieldwork preparation, thorough training of fieldwork staff, monitoring of the fieldwork execution, measures to increase the response rate, checking of the completed questionnaires, double data entry and validation of the collected data.

Fieldwork Period and Enumeration Results

2.12 The data collection was carried out between April and June 2018. Among the 1 753 sampled establishments, 944 were successfully enumerated and 129 refused, giving an effective response rate of 88%.[4] Taking into account (i) the satisfactory response rate of individual branches, (ii) the fact that majority of prominent and sizeable establishments had responded to the survey, and (iii) the grossing-up of sample results basing on statistically-grounded method (except for R&D supplementary samples as mentioned in paragraph 1.4), it could be concluded that the survey findings presented in this report can generally reflect the manpower situation of the sector. The response rate achieved for individual sector was also adequate to produce meaningful breakdown by sector *(Table 2.1)*.

[4] The remaining cases were regarded as invalid cases, including establishments which were suspended operation or had not employed any IT and R&D staff and so on.

Table 2.1 Number of establishments successfully enumerated by sector

Sector	No. of Establishments Sampled	Response Rate
Overall	1 753	88.0%
Manufacturing	104	88.3%
Innovative products and services	109	88.4%
Electricity, gas and water	6	80.0%
Construction	71	97.2%
Wholesale, retail and import/export trades, catering and hotel sector	223	87.0%
Transport and storage services	130	90.9%
Communications services	104	91.7%
Financing, insurance, real estate and business services	205	71.2%
IT products and services suppliers	397	89.7%
Medical and health care services	36	83.3%
Community, social and personal services	210	90.1%
Digital creative	78	94.6%
Government bureau/department	80	91.7%

III. SURVEY FINDINGS

A. Information Technology (IT)

i. Existing Manpower

a) Type of Organisations

3.1 At the time of survey, there were 95 780 persons employed in the principal jobs of the IT sector in Hong Kong, comprising 94 088 employees and 1 692 freelancers.

3.2 Of those 94 088 employees in the IT sector, slightly more employees were working in IT & Communications Services Organisations (52 759 employees) than IT Users Organisations (41 329 employees). The number of IT employees and freelancers by job category by type of organisation is summed up in Table 3.1. More detailed analysis of the findings by sector/branch by job category is presented in *Appendix 4*.

3.3 On the other hand, 1 178 freelancers were employed by IT Users Organisations while 514 freelancers were employed by IT & Communications Services Organisations.

Table 3.1 Number of IT Employees and Freelancers by Job Category by Type of Organisation

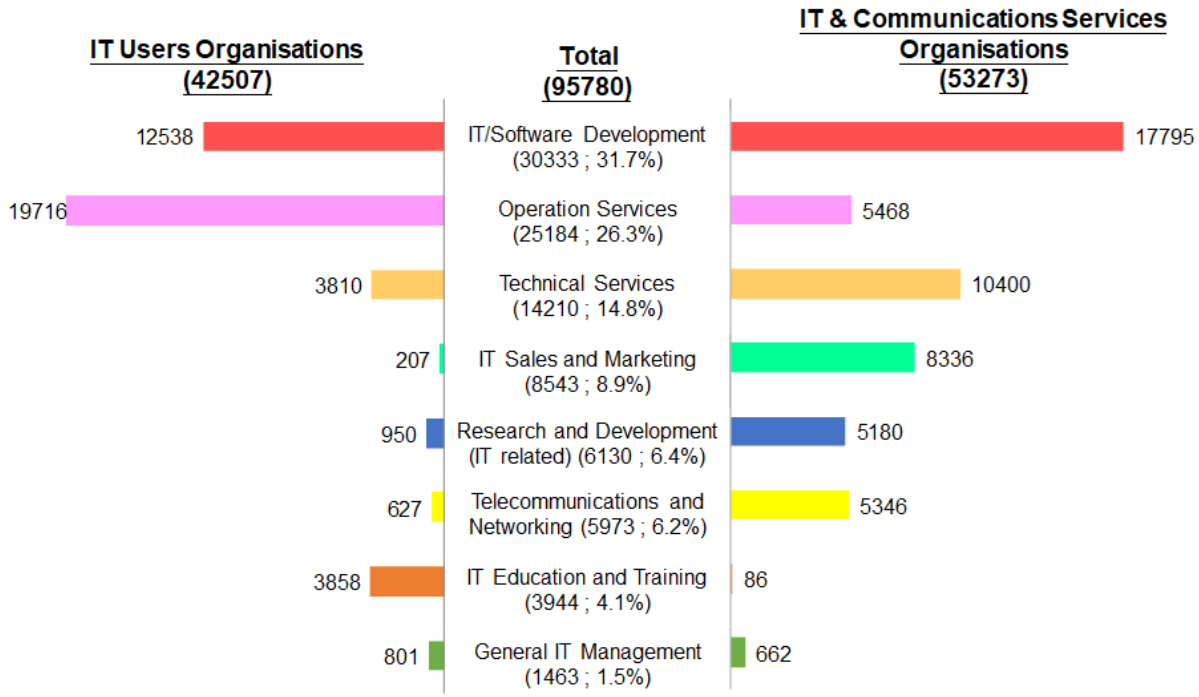
	IT & Communications Services Organisations			**IT Users Organisations**			**Overall**		
Job category	EM	FL	**Sub-total**	EM	FL	**Sub-total**	EM	FL	**Sub-total**
General IT Management	662	-	**662**	801	-	**801**	1 463	-	**1 463**
IT/Software Development	17 751	44	**17 795**	12 480	58	**12 538**	30 231	102	**30 333**
Telecommunications and Networking	5 346	-	**5 346**	619	8	**627**	5 965	8	**5 973**
Technical Services+	10 244	156	**10 400**	3 796	14	**3 810**	14 040	170	**14 210**
Operation Services	5 157	311	**5 468**	18 630	1 086	**19 716**	23 787	1 397	**25 184**
IT Education and Training	86	-	**86**	3 848	10	**3 858**	3 934	10	**3 944**
IT Sales and Marketing	8 335	1	**8 336**	205	2	**207**	8 540	3	**8 543**
Research and Development (IT related)	5 178	2	**5 180**	950	-	**950**	6 128	2	**6 130**
Total	52 759	514	**53 273 [55.6%]**	41 329	1 178	**42 507 [44.4%]**	94 088	1 692	**95 780**

Notes:
1) EM Number of IT employees (excluding freelancers).
2) FL Number of freelancers.
3) + Technical services include job categories IT security, database, systems programming and field support.
4) [ ] As a percentage of number of IT employees and freelancers in the whole economy.
5) Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

3.4 As regards the job categories, 30 333 persons (31.7%) were engaged in IT/software development, 25 184 persons (26.3%) in operation services, 14 210 persons (14.8%) in technical services, 8 543 persons (8.9%) in IT sales and marketing, 6 130 persons (6.4%) in research and development (IT related), 5 973 persons (6.2%) in telecommunications and networking, 3 944 persons (4.1%) in IT education and training and 1 463 persons (1.5%) in general IT management.

3.5 Chart 3.1 shows that majority of employees in IT & Communications Services Organisations engaged in IT/Software development, Technical Services and IT Sales and Marketing while for IT Users Organisations, over 75% of staff engaged in IT/Software development and Operation services.

Chart 3.1 Manpower Structure by Job Category (As in April 2018)



Notes:

1) ( ) Figures in brackets are number of employees + freelancers and percentage of total.

2) Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

3.6 To compare with the survey of 2016, the total manpower in the IT sector has increased from 87 794 to 95 780 (a growth of 9.1%). A significant increase (+8 601) in number of employees was noted for IT & Communications Services Organisations but the number of freelancers was slightly decreased (-183). For IT Users Organisations, no significant change in employees and freelancers was noted. More detailed analysis of the findings by type of organisations by branch is presented in *Appendix 5*.

Table 3.2 Comparison of the Number of IT Employees (including Freelancers) in the 2016 and 2018 Surveys by Type of Organisation

	IT & Communications Services Organisations		IT Users Organisations		Overall	
	2016	2018	2016	2018	2016	2018
Total	**44 672**	**53 273** ***(+19.3%)***	**43 122**	**42 507** ***(-1.4%)***	**87 794**	**95 780** ***(+9.1%)***
- Employees	*43 975*	*52 759*	*41 971*	*41 329*	***85 946***	***94 088***
- Freelancers	*697*	*514*	*1 151*	*1 178*	***1 848***	***1 692***

Notes:

1) ( ) Figures in brackets are percentage changes over the previous survey.

2) Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

3.7 The total manpower in the IT sector has increased from 87 794 in April 2016 to 95 780 in April 2018 (a growth of 9.1% or 7 986 IT employees and freelancers). The increase in number of IT employees and freelancers was mainly attributed to the growth in job categories of operation services (a growth of 5 519 employees and freelancers), IT/software development (a growth of 2 841 employees and freelancers) and IT sales and marketing (a growth of 1 366 employees and freelancers). It was, however, worth noting that a decrease was recorded for technical services (a decline of 1 490 employees and freelancers) as shown in Table 3.3.

3.8 With respect to the manpower in IT & Communications Services Organisations, an increase of 8 601 employees and freelancers (+19.3%) was recorded. The increase in number of employees and freelancers was found mainly in job categories of IT/software development (a growth of 6 694 employees and freelancers) and IT sales and marketing (a growth of 1 311 employees and freelancers).

3.9 As regards the manpower in IT Users Organisations, though there was an increase in job category of operation services (a growth of 5 292 employees and freelancers), such increase was compensated by a general decrease recorded in other job categories, particularly in IT/software development (a decline of 3 853 employees and freelancers) and technical services (a decline of 1 407 employees and freelancers).

Table 3.3 Changes in the Number of IT Employees (including Freelancers) by Job Category by Type of Organisation Between 2016 and 2018

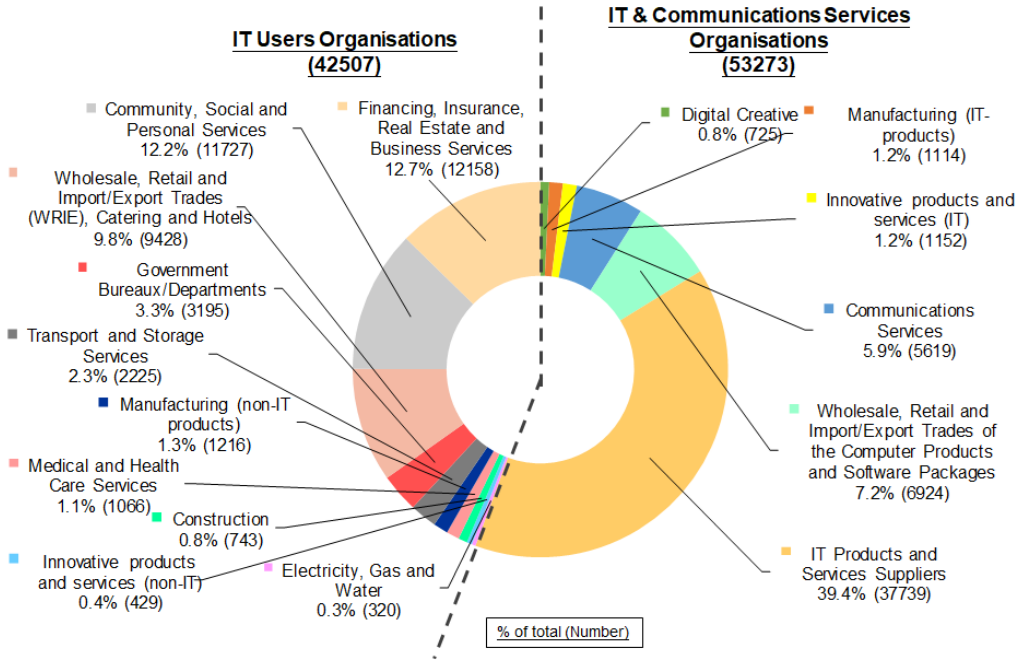
Job category	IT & Communications Services Organisations			IT Users Organisations			Overall		
	2016	2018	Increase / Decrease	2016	2018	Increase / Decrease	2016	2018	Increase / Decrease
General IT Management	448	662	+214 *(+47.8%)*	1 029	801	-228 *(-22.2%)*	1 477	1 463	-14 *(-0.9%)*
IT/Software Development *	16 281	22 975	+6 694 *(+41.1%)*	17 341	13 488	-3 853 *(-22.2%)*	33 622	36 463	+2 841 *(+8.4%)*
Telecommunications and Networking	5 036	5 346	+310 *(+6.2%)*	1 390	627	-763 *(-54.9%)*	6 426	5 973	-453 *(-7.0%)*
Technical Services	10 483	10 400	-83 *(-0.8%)*	5 217	3 810	-1 407 *(-27.0%)*	15 700	14 210	-1 490 *(-9.5%)*
Operation Services	5 241	5 468	+227 *(+4.3%)*	14 424	19 716	+5 292 *(+36.7%)*	19 665	25 184	+5 519 *(+28.1%)*
IT Education and Training	158	86	-72 *(-45.6%)*	3 569	3 858	+289 *(+8.1%)*	3 727	3 944	+217 *(+5.8%)*
IT Sales and Marketing	7 025	8 336	+1 311 *(+18.7%)*	152	207	+55 *(+36.2%)*	7 177	8 543	+1 366 *(+19.0%)*
Total	**44 672**	**53 273**	**+8 601** ***(+19.3%)***	**43 122**	**42 507**	**-615** ***(-1.4%)***	**87 794**	**95 780**	**+7 986** ***(+9.1%)***

Notes:
1) ( ) Growth rate as percentage of number of IT employees (including freelancers) in the same job category and type of organisation in 2016.
2) * For the figure of 2018, "Research and Development (IT related)" was included in "IT/Software Development".
3) Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3(selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

b) Sectors

3.10 With respect to the manpower by Sector, 37 739 employees and freelancers (39.4%) were working in the IT products and services suppliers sector, followed by the financing, insurance, real estate and business services sector (12 158 employees and freelancers or 12.7%), and the community, social and personal services sector (11 727 employees and freelancers or 12.2%).

Chart 3.2 Distribution of IT Employees (including Freelancers) by Sector



Notes:
1) ( ) as number of IT employees (including freelancers)
2) Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3(selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

3.11 Table 3.4 summing up the number of IT employees and freelancers by sector by job category.

Table 3.4 Number of IT Employees (including Freelancers) by Sector by Job Category

a) IT manpower (excluding Research and Development (IT related))

Sector	General IT Management	IT/ Software Development	Telecommu-nications and Networking	Technical Services	Operation Services	IT Education and Training	IT Sales and Marketing	Total
Manufacturing	41	320	138	570	1 128	-	35	**2 232**
Innovative products and services	13	344	12	16	112	-	259	**756**
Electricity, Gas and Water	8	167	15	66	64	-	-	**320**
Construction	16	131	36	27	528	-	-	**738**
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	244	2 806	218	2 515	6 669	22	3 828	**16 302**
Transport and Storage Services	20	780	24	111	1 290	-	-	**2 225**
Communications Services	38	656	1 518	1 333	699	-	1 369	**5 613**
Financing, Insurance, Real Estate and Business Services	191	4 702	167	1 690	5 388	-	-	**12 138**
IT Products and Services Suppliers	588	15 485	3 571	7 016	3 821	66	3 006	**33 553**
Medical and Health Care Services	9	858	8	11	180	-	-	**1 066**
Community, Social and Personal Services	160	1 605	117	707	4 518	3 856	11	**10 974**
Digital Creative	8	481	2	8	26	-	35	**560**
Government Bureaux/Departments	127	1 998	147	140	761	-	-	**3 173**
Total	**1 463**	**30 333**	**5 973**	**14 210**	**25 184**	**3 944**	**8 543**	**89 650**

b) IT manpower (Research and Development (IT related) only)

Sector	Number of Employees
Innovative products and services	825
IT Products and Services Suppliers	4 186
Universities and post-secondary colleges; Research and scientific institutes	753
Others	366
Total	**6 130**

3.12 The survey shows that IT manpower concentrated on the following sector and job category, accounted for about half of the total IT employment:

IT/software development
- IT products and services suppliers sector (15 485 employees and freelancers)

Telecommunications and networking
- IT products and services suppliers sector (3 571 employees and freelancers)

Technical services
- IT products and services suppliers sector (7 016 employees and freelancers)

Operation services
- WRIE, catering and hotels sector (6 669 employees and freelancers)
- Financing, insurance, real estate and business services sector (5 388 employees and freelancers)
- Community, social and personal services sector (4 518 employees and freelancers)

IT Education and Training
- Community, social and personal services sector (3 856 employees and freelancers)

IT sales and marketing
- WRIE, catering and hotels sector (3 828 employees and freelancers)
- IT products and services suppliers sector (3 006 employees and freelancers)

Research and Development (IT related)
- IT products and services suppliers sector (4 186 employees and freelancers)

3.13 As compared with the 2016 survey findings in Table 3.5, number of companies and employees covered by the Survey had increased by 412 (by 0.5%) and 209 322 (by 8.4%) respectively.

3.14 With respect to type of organisations, number of IT employees and freelancers in IT & Communications Services Organisation increased by 19.3% (by 8 601). It was, however, worth noting that a slightly decrease was recorded (-1.4%) for IT Users Organisations. More detailed analysis of data by job category/title by sector/branch and by employment size of company by sector are presented in *Appendices 6 and 7*.

Table 3.5 Comparison of the Number of IT Employees (including Freelancers) and Companies Covered in the 2016 and 2018 Surveys by Type of Organisation by Sector

Sector	No. of Companies Covered by the Survey		No. of Employees Covered by the Survey		No. of IT Employees (including Freelancers)	
	2016	2018	2016	2018	2016	2018
IT & Communications Services Organisation	**6 231**	**8 655** *[+38.9%]*	**101 347**	**133 295** *[+31.5%]*	**44 672**	**53 273** *[+19.3%]*
Manufacturing (IT-products)	446	602	1 918	2 545	1 318	1 114
Innovative products and services (IT) *	N/A	35	N/A	1 755	N/A	1 152
Wholesale, Retail and Import/Export Trades of the Computer Products and Software Packages	570	633	16 235	15 853	7 500	6 924
Communications Services	335	345	34 453	41 390	5 223	5 619
IT Products and Services Suppliers	4 809	6 965	47 222	70 398	30 013	37 739
Digital Creative	71	75	1 519	1 354	618	725
IT Users Organisations	**78 135**	**76 123** *[-2.6%]*	**2 384 598**	**2 561 972** *[+7.4%]*	**43 122**	**42 507** *[-1.4%]*
Other Manufacturing (non-IT products)	2 101	3 123	99 820	92 142	1 690	1 216
Innovative products and services (non-IT) *	N/A	70	N/A	3 532	N/A	429
Electricity, Gas and Water	7	9	7 936	5 893	390	320
Construction	5 397	7 136	120 470	159 712	473	743
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	41 023	33 460	781 354	821 585	8 995	9 428
Transport and Storage Services	5 902	6 026	196 833	218 957	1 990	2 225
Financing, Insurance, Real Estate and Business Services	10 459	13 671	474 526	569 235	15 726	12 158
Medical and Health Care Services	2 183	2 338	105 570	110 987	1 077	1 066
Community, Social and Personal Services	10 984	10 212	418 592	399 555	10 040	11 727
Government Bureaux/Departments	79	78	179 497	180 374	2 741	3 195
Total	**84 366**	**84 778** *[+0.5%]*	**2 485 945**	**2 695 267** *[+8.4%]*	**87 794**	**95 780** *[+9.1%]*

Notes:
1) * The branch "Innovative products and services" was newly included in the 2018 survey.
2) [ ] Figures in square brackets are percentage changes over the previous survey.
3) Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

Prominent Principal Jobs

3.15 Overall speaking, around half of IT manpower were engaged in the prominent principal jobs as listed in the following table.

Table 3.6 Prominent Principal Jobs by Type of Organisation

Type of Organisations	Prominent Principal Jobs	% of IT manpower covered
IT & Communications Services Organisations	Programmer/ Analyst Programmer/ Software Engineer	46%
	Sales/ Marketing Representative/ Account Manager/ Product Promotion Representative	
	Field Technician	
	User Support/ Co-ordinator	
IT Users Organisations	User Support/ Co-ordinator	52%
	Programmer/ Analyst Programmer/ Software Engineer	
Overall	**User Support/ Co-ordinator**	**50%**
	Programmer/ Analyst Programmer/ Software Engineer	
	Sales/ Marketing Representative/ Account Manager/ Product Promotion Representative	
	Field Technician	

Note:
Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

c) Job Nature

3.16 The majority of IT employees and freelancers were engaged in job nature related to operation and technical support (45.9%) and application development/engineering (27.2%). More detailed analysis of the findings by job nature by sector/branch is presented in *Appendix 8*.

Table 3.7 Percentage Distribution of IT Employees (including Freelancers) by Job Nature by Type of Organisation

Job Nature	IT & Communications Services Organisations	IT Users Organisations	Overall
Teaching in Academic and Education Institutions	0.3%	10.6%	**4.9%**
Product Development / Engineering (i.e. developing core technologies, products and services)	8.7%	4.6%	**6.9%**
Application Development / Engineering (i.e. using technologies, products and services to develop applications to meet the business needs)	27.5%	26.8%	**27.2%**
Operation and Technical Support	38.8%	54.8%	**45.9%**
Research and Development (IT related)	9.7%	2.2%	**6.4%**
Others (e.g. IT Sales and Marketing)	14.9%	0.9%	**8.7%**

Notes:
1) Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.
2) Overall figures in brackets may not add up to 100% due to rounding.

ii. Existing Vacancies

3.17 At the time of survey, there were 3 231 IT vacancies*, representing a vacancy rate of 3.3% of the existing IT posts. The IT products and services suppliers sector reported the highest number of vacancies (1 723 vacancies)*, followed by the financing, insurance, real estate and business services sector (457 vacancies) and the WRIE, catering and hotels sector (366 vacancies).

3.18 In terms of job category, the vacancies concentrated on IT/software development (1 502 vacancies), followed by operation services (635 vacancies) and technical services (399 vacancies).

Table 3.8 Number of Existing IT Vacancies by Sector by Job Category

a) IT Vacancies (excluding Research and Development (IT related))

Sector	General IT Management	IT/ Software Development	Telecommu-nications and Networking	Technical Services	Operation Services	IT Education and Training	IT Sales and Marketing	Total
Manufacturing	-	12	-	36	18	-	-	**66**
	-	*(3.6%)*	-	*(5.9%)*	*(1.6%)*	-	-	
Innovative products and services	-	25	1	-	5	-	9	**40**
	-	*(6.8%)*	*(7.7%)*	-	*(4.3%)*	-	*(3.4%)*	
Electricity, Gas and Water	-	4	-	6	-	-	-	**10**
	-	*(2.3%)*	-	*(8.3%)*	-	-	-	
Construction	-	9	-	-	36	-	-	**45**
	-	*(6.4%)*	-	-	*(6.4%)*	-	-	
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	2	86	2	33	177	-	66	**366**
	(0.8%)	*(3.0%)*	*(0.9%)*	*(1.3%)*	*(2.6%)*	-	*(1.7%)*	
Transport and Storage Services	-	3	-	-	6	-	-	**9**
	-	*(0.4%)*	-	-	*(0.5%)*	-	-	
Communications Services	-	25	37	12	11	-	6	**91**
	-	*(3.7%)*	*(2.4%)*	*(0.9%)*	*(1.5%)*	-	*(0.4%)*	
Financing, Insurance, Real Estate and Business Services	-	267	7	49	134	-	-	**457**
	-	*(5.4%)*	*(4.0%)*	*(2.8%)*	*(2.4%)*	-	-	
IT Products and Services Suppliers	-	880	100	254	95	-	205	**1534**
	-	*(5.4%)*	*(2.7%)*	*(3.5%)*	*(2.4%)*	-	*(6.4%)*	
Medical and Health Care Services	-	24	-	-	11	-	-	**35**
	-	*(2.7%)*	-	-	*(5.8%)*	-	-	
Community, Social and Personal Services	2	22	2	5	134	8	1	**174**
	(1.2%)	*(1.4%)*	*(1.7%)*	*(0.7%)*	*(2.9%)*	*(0.2%)*	*(8.3%)*	
Digital Creative	-	47	-	-	-	-	4	**51**
	-	*(8.9%)*	-	-	-	-	*(10.3%)*	
Government Bureaux/Departments	11	98	4	4	8	-	-	**125**
	(8.0%)	*(4.7%)*	*(2.6%)*	*(2.8%)*	*(1.0%)*	-	-	
Total	**15**	**1 502**	**153**	**399**	**635**	**8**	**291**	**3 003**
	(1.0%)	***(4.7%)***	***(2.5%)***	***(2.7%)***	***(2.5%)***	***(0.2%)***	***(3.3%)***	

b) IT Vacancies (Research and Development (IT related) only)

Sector	Number of Vacancies	
Innovative products and services	1	*(0.1%)*
IT Products and Services Suppliers	189	*(4.3%)*
Universities and post-secondary colleges; Research and scientific institutes	28	*(3.6%)*
Others	10	*(2.7%)*
Total	**228**	***(3.6%)***

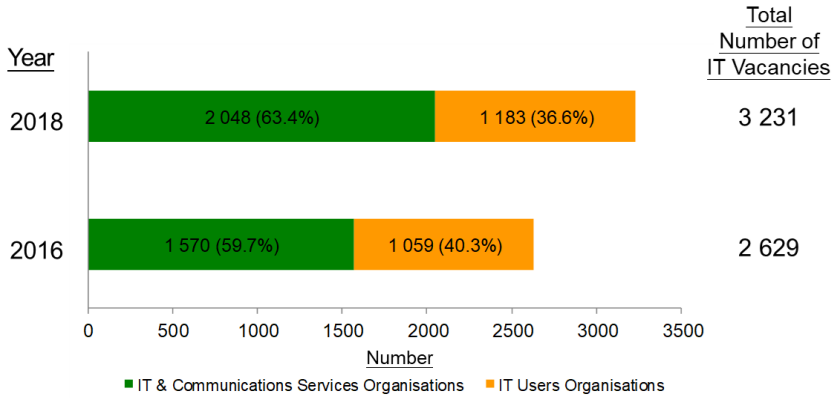
Notes:

1) ( ) As a percentage of number of IT posts (employees and freelancers + vacancies) by sector by job category.

2) * Vacancies included Research and Development (IT related).

3.19 2 048 vacancies (63.4%) were reported by IT & Communication Services Organisations, and 1 183 vacancies (36.6%) were reported by IT Users Organisations. The corresponding figures were 1 570 vacancies (59.7%) and 1 059 vacancies (40.3%) in the 2016 survey findings.

Chart 3.3 Distribution of IT Job Vacancies by Type of Organisation (2018 vs 2016)



3.20 As compared with the 2016 survey findings, the vacancy rate has slightly increased from 2.9% (2 629 vacancies) to 3.3% (3 231 vacancies). The vacancy rate was particularly high for the digital creative sector (6.9%) and the construction sector (5.7%), both of which exhibited an increase over the 2016 survey findings. It might be attributable to the demand for more user interface design and Building Information Modelling (BIM) professionals in respective sector. More detailed analysis of the findings by sector/branch by job category is presented in *Appendix 9*.

Table 3.9 Comparison of the IT Vacancies by Sector between 2016 and 2018

	2018		2016	
Sector	**Vacancies**	**Vacancy Rate**	**Vacancies**	**Vacancy Rate**
Manufacturing	72	3.0%	76	2.5%
Innovative products and services *	41	2.5%	N/A	N/A
Electricity, Gas and Water	10	3.0%	3	0.8%
Construction	45	5.7%	15	3.1%
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	366	2.2%	165	1.0%
Transport and Storage Services	9	0.4%	7	0.4%
Communications Services	91	1.6%	193	3.6%
Financing, Insurance, Real Estate and Business Services	457	3.6%	413	2.6%
IT Products and Services Suppliers	1 723	4.4%	1 269	4.1%
Medical and Health Care Services	35	3.2%	56	4.9%
Community, Social and Personal Services	202	1.7%	337	3.3%
Digital Creative	54	6.9%	21	3.3%
Government Bureaux/Departments	126	3.8%	74	2.6%
Total	**3 231**	**3.3%**	**2 629**	**2.9%**

Notes:
1) Vacancy Rate as a percentage of number of IT posts (employees and freelancers + vacancies).
2) * The sector "Innovative products and services" was newly included in the 2018 survey.

iii. Existing Manpower Demand

3.21 Taking the existing employees, freelancers and vacancies altogether, there were a total of 99 011 IT posts at the time of survey. Among the various principal jobs, user support/coordinator accounted for the highest percentage of IT manpower demand (19.3%), followed by programmer/analyst programmer/software engineer (17.5%) and sales/marketing representative/account manager/product promotion representative (7.1%).

Table 3.10 Percentage Distribution of IT Manpower Demand by Principal Job

Principal Job	IT Employees (including Freelancers)	IT Vacancies	Total IT Demand
IT Director/MIS Director/Head of IT/CIO	1.4%	0.5%	**1.3%**
CTO	0.2%	-	**0.2%**
Systems Development Manager	1.8%	1.2%	**1.8%**
IT Architect/Business Analyst	0.9%	0.6%	**0.9%**
Project Manager/Project Leader	4.2%	3.0%	**4.1%**
UX Designer	2.8%	3.8%	**2.9%**
Programmer/Analyst Programmer/Software Engineer	17.0%	31.5%	**17.5%**
Web Designer/Developer	1.4%	1.5%	**1.4%**
Quality Assurance Specialist/Software Assurance Specialist/Engineer/IT Systems Auditor	0.6%	1.6%	**0.7%**
Software Product Engineer	0.5%	0.2%	**0.4%**
Software/Firmware Product Designer/Product Analyst/ Developer/Software Product Manager	0.9%	1.0%	**0.9%**
Technical Writer	0.2%	0.2%	**0.2%**
Computer Game Designer/Artist/Developer/ Computer Graphic Designer/Artist/ Computer Animator/Web Graphic Designer/ Visual Effects Designer	1.5%	1.9%	**1.5%**
Telecommunications Manager/ Networking Manager	0.3%	0.2%	**0.3%**
Telecommunications Consultant// /Network Consultant	0.9%	0.2%	**0.9%**
Telecommunications Engineer/ Network Engineer	2.4%	4.0%	**2.5%**
Network Administrator/Network Officer	2.6%	0.4%	**2.5%**
IT Security Specialist/ Information Security Specialist/Information Security Officer	1.2%	1.1%	**1.2%**
Database Administrator/ Data Warehouse Administrator/ Database Designer	0.7%	0.3%	**0.7%**
Systems Programmer (in-house/vendor environment)/Systems Engineer	4.4%	2.3%	**4.3%**
Customer Engineering Manager/ Services Support Manager	0.9%	1.1%	**0.9%**
Customer Service Engineer/Field Engineer	1.5%	1.5%	**1.5%**
Field Technician	6.2%	6.1%	**6.2%**
Computer Operations Manager	1.0%	0.2%	**1.0%**
Help Desk Supervisor	0.4%	0.3%	**0.4%**
Help Desk Representative/ Customer Service Officer/ Representative	1.7%	1.3%	**1.7%**
Computer Operations Supervisor/Operations Support Supervisor	1.4%	1.0%	**1.4%**
Computer Operator/Systems Operator	2.4%	0.6%	**2.4%**
User Support/ Co-ordinator	19.4%	16.2%	**19.3%**
Lecturer/ Professor/ Training Officer	2.5%	0.2%	**2.5%**
IT Trainer/IT Instructor	1.6%	-	**1.5%**
Sales/Marketing Director/ Account Director/ Sales/ Marketing Manager	1.8%	1.9%	**1.8%**
Sales/Marketing Representative/ Account Manager/ Product Promotion Representative	7.1%	7.1%	**7.1%**
R&D Researcher/R&D Scientist/R&D Engineer	2.5%	1.9%	**2.5%**
R&D Technician	2.8%	4.9%	**2.9%**
R&D Supporting Staff	1.0%	0.2%	**1.0%**
Total	**100.0%**	**100.0%**	**100.0%**

Note: Figures may not add up to the total due to rounding.

iv. Staff Seconded from Contractor Company

3.22 At the time of survey, there were 4 148 seconded IT staff from contractor companies (578 and 3 570 from IT & Communications Services Organisations and IT Users Organisations respectively). In terms of the ratio of IT seconded staff to IT employees, such ratio was comparatively high for the medical and health care services sector (46.2%) and the Government Bureaux/Departments sector (43.6%).

Table 3.11 Number of IT Staff Seconded from Contractor Company(ies) and Number of Companies with IT staff Seconded from Contractor Company(ies)

Sector	Number of IT staff seconded from contractor company	Number of IT employees and freelancers at time of survey	Number of seconded IT staff as a percentage of IT employees	Number of companies with IT staff seconded from contractor company
IT & Communications Services Organisations				
Manufacturing (IT products)	20	1 016	2.0%	2
Innovative products and services	-	477	-	-
Wholesale, Retail and Import/Export Trades of the Computer Products and Software Packages	462	6 874	6.7%	13
IT Products and Services Suppliers	95	33 553	0.3%	52
Digital Creative	1	560	0.2%	1
Communications Services	-	5 613	-	-
Sub-total	***578***	***48 093***	***1.2%***	***68***
IT Users Organisations				
Other Manufacturing (non-IT products)	-	1 216	-	-
Innovative products and services	-	279	-	-
Electricity, Gas and Water	-	320	-	-
Construction	20	738	2.7%	3
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	274	9 428	2.9%	2
Transport and Storage Services	254	2 225	11.4%	40
Financing, Insurance, Real Estate and Business Services	327	12 138	2.7%	39
Medical and Health Care Services	492	1 066	46.2%	1
Community, Social and Personal Services	819	10 974	7.5%	191
Government Bureaux/Departments	1 384	3 173	43.6%	34
Sub-total	***3 570***	***41 557***	***8.6%***	***310***
Total	**4 148**	**89 650**	**4.6%**	**378**

Notes:

Type of Organisations refers to (i) "IT & Communications Services Organisations" includes Branches 1, 3 (selected), 6, 13, 14, 18 and 24; (ii) "IT Users Organisations" includes Branches 2, 3 (selected), 4-5, 7-12, 15-17, 19-23 and 25.

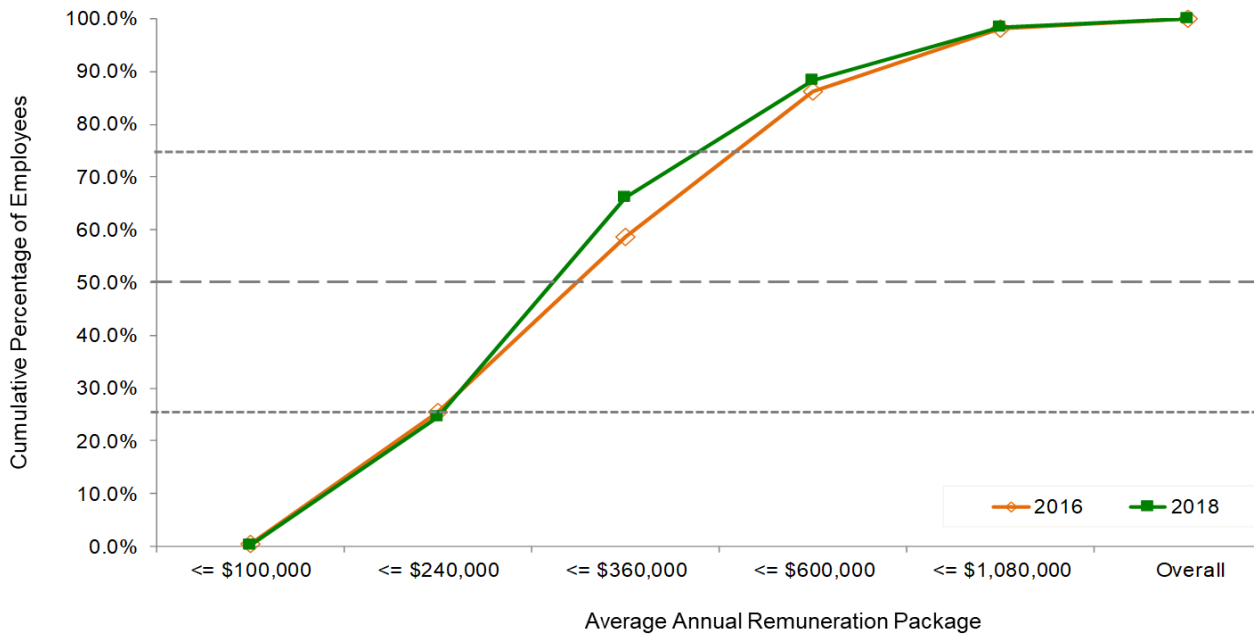
v. Annual Remuneration Package, Academic Qualification and Relevant Years of IT Experience

3.23 The average annual remuneration package of employees reveals that employers continue to offer competitive wages to secure and retain highly-skilled IT professionals. *Appendix 10* shows that the average annual remuneration package of IT employees (excluding freelancers) by job title.

Table 3.12 Distribution of Average Annual Income Range

	$1,080,001 or more	$600,001-$1,080,000	$360,001-$600,000	$240,001-$360,000	$100,001-$240,000	$100,000 or below
Overall	1.6%	10.1%	22.2%	41.4%	24.4%	0.2%

Chart 3.4 Cumulative percentage of average annual income range of IT Employees, 2016 and 2018



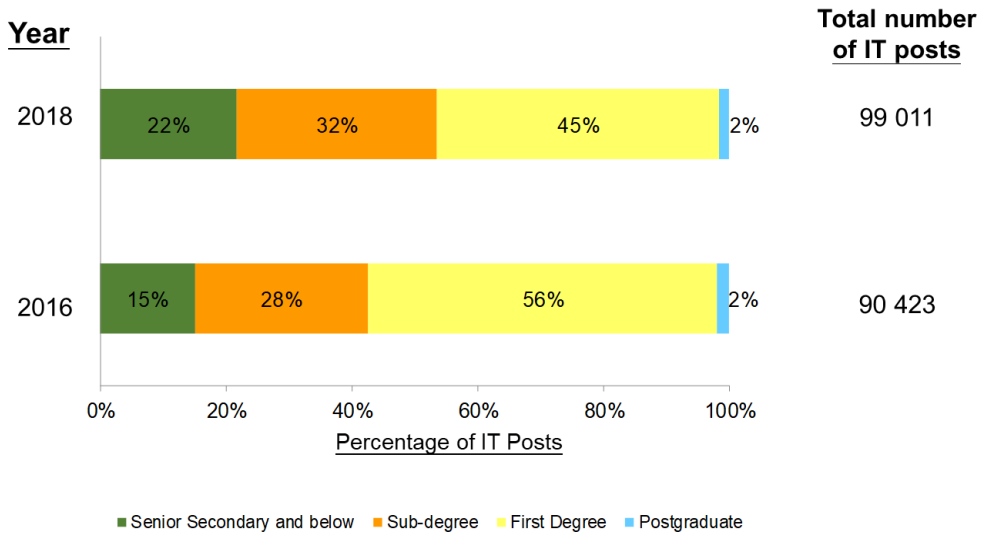
3.24 As expected, the IT sector is one of the most knowledge-intensive sectors and therefore employers generally preferred their IT employees to have tertiary level qualifications for most of the IT jobs. Around 47% of IT posts were preferred to have first degree or above qualifications and 32% to have sub-degree qualification.

Table 3.13 Distribution of Preferred Academic Qualification

	Postgraduate	First Degree	Sub-degree	Senior Secondary and below
Overall	1.6%	44.9%	31.8%	21.7%

3.25 It was, however, worth noting that the percentage of IT posts which were preferred to have tertiary level qualifications or above has decreased (79% in 2018 survey vs 86% in 2016 survey). Detailed findings on the preferred academic qualification of IT posts by job title are given in *Appendix 11*.

Chart 3.5 Profile of IT Manpower by Preferred Academic Qualification (2018 vs 2016)

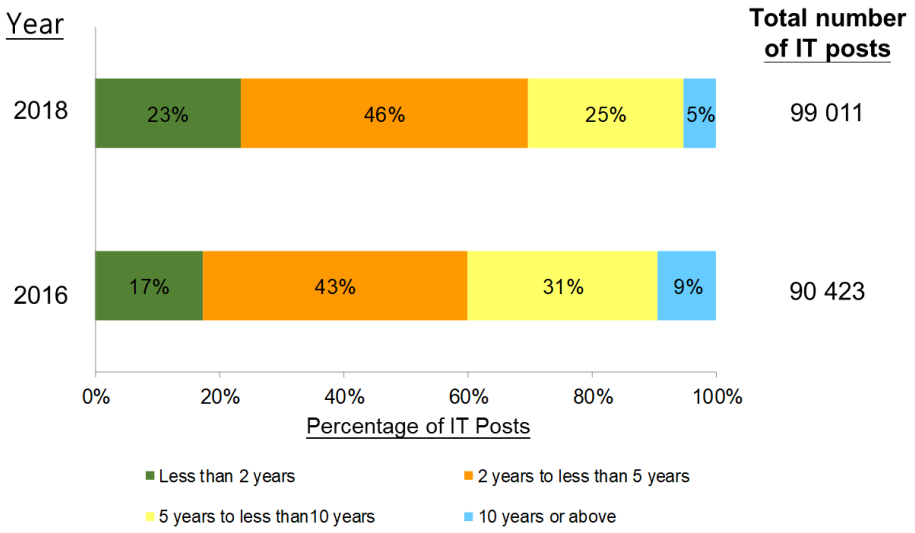


3.26 About 30% of IT posts were preferred to have relevant experience of 5 years or above and around 46% of IT posts were preferred to have 2 years to 5 years. Details showing the employers' preferred relevant years of IT experience of IT posts by job title are given in *Appendix 12*.

Table 3.14 Distribution of Preferred Relevant Years of Experience

	10 years or above	5 years to less than10 years	2 years to less than 5 years	Less than 2 years
Overall	**5.3%**	**25.1%**	**46.2%**	**23.4%**

Chart 3.6 Profile of IT Manpower by Preferred Relevant Years of Experience (2018 vs 2016)



3.27 It was worth noting that increased preference for employees of less than 2 years of experience was surveyed from employers in the level of both supervisor & middle management as well as operative and supporting staff.

vi. Staff Turnover and Recruits

3.28 Employers reported that 8 270 IT employees (or 8.9% of total IT posts) had left their companies in the past 12 months. The IT products and services suppliers sector has the largest number of IT employees (4 120) leaving the companies, followed by the financing, insurance, real estate and business services sector (1 362) and the WRIE, catering and hotels sector (1 182).

3.29 In addition, employers also revealed that 234 IT employees (or 0.3% of total IT posts) had left the companies due to retrenchment.

Table 3.15 Number of IT employees leaving the company in the past 12 months

Sector	Total	% of number of IT employees (including freelancers)	Employer's decision on retrenchment	% of number of IT employees (including freelancers)
Manufacturing	130	5.7%	6	0.3%
Innovative products and services	73	9.2%	2	0.3%
Electricity, Gas and Water	52	15.8%	-	-
Construction	57	7.3%	-	-
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	1 182	7.1%	14	0.1%
Transport and Storage Services	117	5.2%	11	0.5%
Communications Services	272	4.8%	-	-
Financing, Insurance, Real Estate and Business Services	1 362	10.8%	-	-
IT Products and Services Suppliers	4 120	11.7%	198	0.6%
Medical and Health Care Services	37	3.4%	-	-
Community, Social and Personal Services	637	5.7%	2	0.02%
Digital Creative	48	7.9%	-	-
Government Bureaux/Departments	183	5.5%	1	0.03%
Total	**8 270**	**8.9%**	**234**	**0.3%**

Note: Number of IT employees excluded Research and Development (IT related).

3.30 The turnover rate as a percentage of number of IT posts was 8.9% (8 270) in April 2018. The turnover rate was the highest for the electricity, gas and water sector (15.8%), followed by the IT products and services suppliers sector (11.7%) and the financing, insurance, real estate and business services sector (10.8%).

3.31 In 2017/18, 9 279 IT employees (or 10.4% of total IT employees) were recruited, including 7 921 (8.8%) experienced persons and 1 070 (1.2%) fresh graduates from Hong Kong, and 205 (0.2%) experienced persons and 83 (0.1%) fresh graduates outside Hong Kong.

3.32 The recruitment of non-locally and locally trained fresh graduates was in a ratio of 1 to 13 (as compared with a ratio of 1 to 4 in the 2016 survey) and the recruitment of non-locally and locally experienced persons was in a ratio of 1 to 39 (as compared with a ratio of 1 to 15 in the 2016 survey).

Recruitment	Number of Fresh Graduate	Number of Experienced Persons
Local	1 070 (1.2%)	7 921 (8.8%)
Overseas	83 (0.1%)	205 (0.2%)
Total	9 279	

Table 3.16 Recruitment Pattern and Internal Promotion of IT Employees in the Past 12 Months by Sector

Sector	Source of Recruitment: Fresh graduate of a Hong Kong institution		Fresh graduate of a non-HK institution		Experienced person recruited from Hong Kong		Experienced person recruited outside Hong Kong		Overall		IT employees promoted in the past 12 months	
Manufacturing	-	-	-	-	117	*(5.2%)*	-	-	**117**	***(5.2%)***	-	-
Innovative products and services	7	*(0.9%)*	1	*(0.1%)*	79	*(10.4%)*	1	*(0.1%)*	**88**	***(11.6%)***	62	*(8.2%)*
Electricity, Gas and Water	20	*(6.3%)*	-	-	14	*(4.4%)*	-	-	**34**	***(10.6%)***	8	*(2.5%)*
Construction	1	*(0.1%)*	-	-	39	*(5.3%)*	-	-	**40**	***(5.4%)***	28	*(3.8%)*
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	202	*(1.2%)*	7	*(*)*	1 102	*(6.8%)*	30	*(0.2%)*	**1 341**	***(8.2%)***	175	*(1.1%)*
Transport and Storage Services	14	*(0.6%)*	-	-	94	*(4.2%)*	-	-	**108**	***(4.9%)***	7	*(0.3%)*
Communications Services	72	*(1.3%)*	9	*(0.2%)*	313	*(5.6%)*	36	*(0.6%)*	**430**	***(7.7%)***	421	*(7.5%)*
Financing, Insurance, Real Estate and Business Services	101	*(0.8%)*	47	*(0.4%)*	1 334	*(11.0%)*	12	*(0.1%)*	**1 494**	***(12.3%)***	239	*(2.0%)*
IT Products and Services Suppliers	592	*(1.8%)*	7	*(*)*	3 798	*(11.3%)*	13	*(*)*	**4 410**	***(13.1%)***	486	*(1.4%)*
Medical and Health Care Services	-	-	-	-	85	*(8.0%)*	-	-	**85**	***(8.0%)***	37	*(3.5%)*
Community, Social and Personal Services	19	*(0.2%)*	8	*(0.1%)*	555	*(5.1%)*	113	*(1.0%)*	**695**	***(6.3%)***	112	*(1.0%)*
Digital Creative	20	*(3.6%)*	2	*(0.4%)*	43	*(7.7%)*	-	-	**65**	***(11.6%)***	14	*(2.5%)*
Government Bureaux/Departments	22	*(0.7%)*	2	*(0.1%)*	348	*(11.0%)*	-	-	**372**	***(11.7%)***	101	*(3.2%)*
Total	**1 070**	***(1.2%)***	**83**	***(0.1%)***	**7 921**	***(8.8%)***	**205**	***(0.2%)***	**9 279**	***(10.4%)***	**1 690**	***(1.9%)***

Notes:

1) ( ) As a percentage of number of IT employees (including freelancers) by sector.

2) * Less than 0.05%.

3) Number of IT employees excluded Research and Development (IT related).

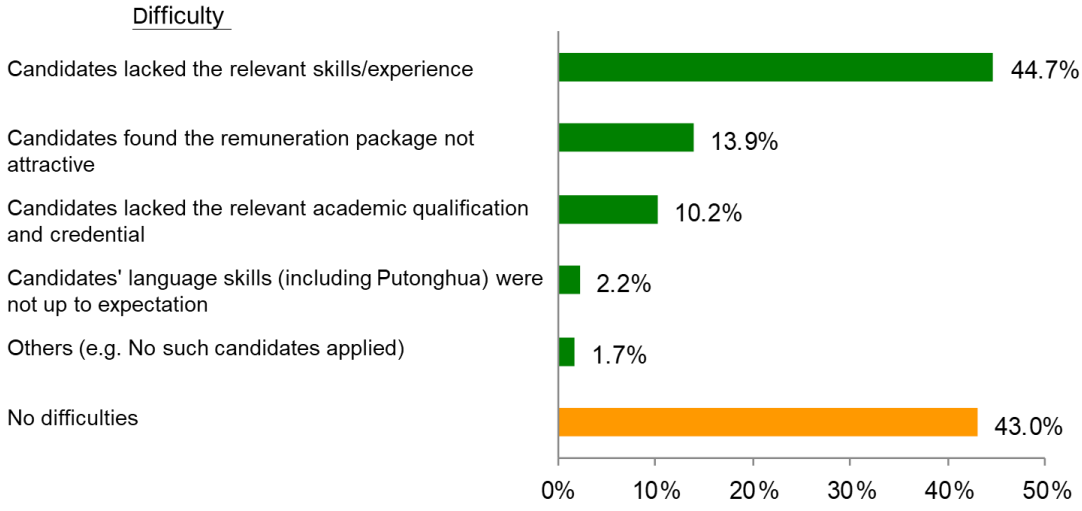
3.33 In the survey, employers who had recruited or tried to recruit IT employees in the past 12 months were asked to indicate the major difficulties encountered in recruitment. A total of 2 428 companies had encountered difficulties in recruitment of IT employees.

Table 3.17 Number of companies whether having recruited/tried to recruit IT employees and encountered difficulties in recruitment in the past 12 months

Sector	Encountered difficulties in recruitment	No encountered difficulties in recruitment	Total of companies whether having recruited
Manufacturing	16	25	41
Innovative products and services	24	10	34
Electricity, Gas and Water	-	2	2
Construction	35	3	38
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels	452	749	1 201
Transport and Storage Services	32	7	39
Communications Services	35	20	55
Financing, Insurance, Real Estate and Business Services	162	249	411
IT Products and Services Suppliers	1 489	555	2 044
Medical and Health Care Services	1	5	6
Community, Social and Personal Services	154	178	332
Digital Creative	14	6	20
Government Bureaux/Departments	14	25	39
Overall	**2 428**	**1 834**	**4 262**

3.34 The major difficulties encountered were "candidates lacked the relevant skills/experience" (44.7%), "candidates found the remuneration package not attractive" (13.9%) and "candidates lacked the relevant academic qualification and credential" (10.2%). More detailed analysis of the findings by employment size of company and by sector are shown in *Appendices 13 and 14*.

Chart 3.7 Percentage of Companies having Encountered Difficulties in Recruitment of IT Employees



vii. Training

3.35 A comparison of the top ten essential skills/knowledge in 2016 and 2018 (ranked in descending order of popularity) reported by employers to have training needs for IT employees is shown in Table 3.18. More detailed analysis of the findings by principal job

on the training needs of existing IT employees in the next 12 months is presented in *Appendix 15*.

Table 3.18 Comparison of the Top Ten Essential Skills / Knowledge between 2016 and 2018

Type of Skills / Knowledge	Rank of 2018	Rank of 2016
Virtualisation and Cloud Computing	1	2
Information and System Security	2	1
Internet/Intranet/Web Development	3	5
Mobile Computing	4	12
Java and Object-Oriented Technology	5	13
Project Management and Design	6	11
Windows Platform Technology	7	8
Networking/Data Communications	8	3
Linux/Unix & Open Source	9	17
e-Learning Technology and Development	10	7

Remark: Analysed by types of organisation, the top three essential skills are i) Virtualisation and Cloud Computing, ii) Internet/Intranet/Web Development, and iii) Data Science and Data Analytics for IT & Communication Services Organisations whilst those for IT Users Organisations, the top three essential skills include i) Information and System Security, ii) Virtualisation and Cloud Computing, and iii) Java and Object-oriented Technology.

3.36 The Training Board observes that the top two essential skills/knowledge in 2016 and 2018 are quite similar and considers that employers have the priority to train up IT staff in cloud computing and information security to meet the urgent need of enhancing the daily operation and meeting the data security compliances. The Training Board urges the employers to provide opportunities for the retraining of staff to cope with the transformation of new technologies.

viii. Employers' Forecast Growth

3.37 Taking employees, freelancers and vacancies altogether, there were a total of 99 011 IT posts at the time of survey. Employers in general anticipated their IT manpower situation in April 2019 to be similar to that in 2018. The forecast number of IT posts will be 99 126 in April 2019, merely increased by 0.1%. More detailed analysis of the findings on the number of posts is presented in *Appendix 16*.

Table 3.19 Employers' Forecast of IT Manpower Demand by April 2019 by Job Category

Job category	Number of IT posts* as of April 2017	Number of IT employees (including freelancers) in April 2018	Number of vacancies in April 2018	April 2019 Forecast IT Manpower Growth	April 2019 Forecast IT Manpower Demand*
General IT Management	1 472	1 463	15	+1	1 479
IT/Software Development	31 292	30 333	1 502	+86	31 921
Telecommunications and Networking	6 083	5 973	153	0	6 126
Technical Services	14 556	14 210	399	+10	14 619
Operation Services	25 725	25 184	635	+11	25 830
IT Education and Training	3 953	3 944	8	0	3 952
IT Sales and Marketing	8 598	8 543	291	+10	8 844
Research and Development (IT related)	6 230	6 130	228	-3	6 355
Overall	**97 909**	**95 780**	**3 231**	**+115 (+0.1%)**	**99 126**

Notes:
1) * IT manpower demand or IT posts includes the number of existing employees (including freelancers) and vacancies.
2) ( ) As growth rate as percentage of number of IT posts in April 2018.

B. Research and Development (R&D)

i. Background

3.38 R&D activities are newly included in the Manpower Survey of 2018 with the objective of accomplishing an exploratory understanding of the innovation activities in Hong Kong. Regarding R&D activities, only technological innovation (product / process innovation) was included. Supplementary samples in some specific branches where R&D activities could possibly be undertaken are suggested from the Training Board. In this regard, manpower information of R&D employees will not be projected to indicate the overall innovation situation in Hong Kong.

3.39 There are two job categories under R&D activities, namely Research and Development (IT related) where the employees focus on R&D projects related to IT (e.g. Information Communications Technology) and Research and Development (Non-IT related), where the employees focus on R&D projects in other areas (e.g. Biomedical Technology, Material and Precision Engineering). Moreover, only principal jobs of full time employees will be reflected in the manpower information if involvement in R&D activities is major. Details of the six principal jobs related to R&D is described in *Appendix 3*.

ii. Number of Employees and Vacancies

3.40 Within the companies covered in the survey, there were 10 632 persons engaged in research and development activities, comprising 10 564 employees and 68 freelancers. More detailed analysis of the findings by type of organisation is presented in *Appendix 17*.

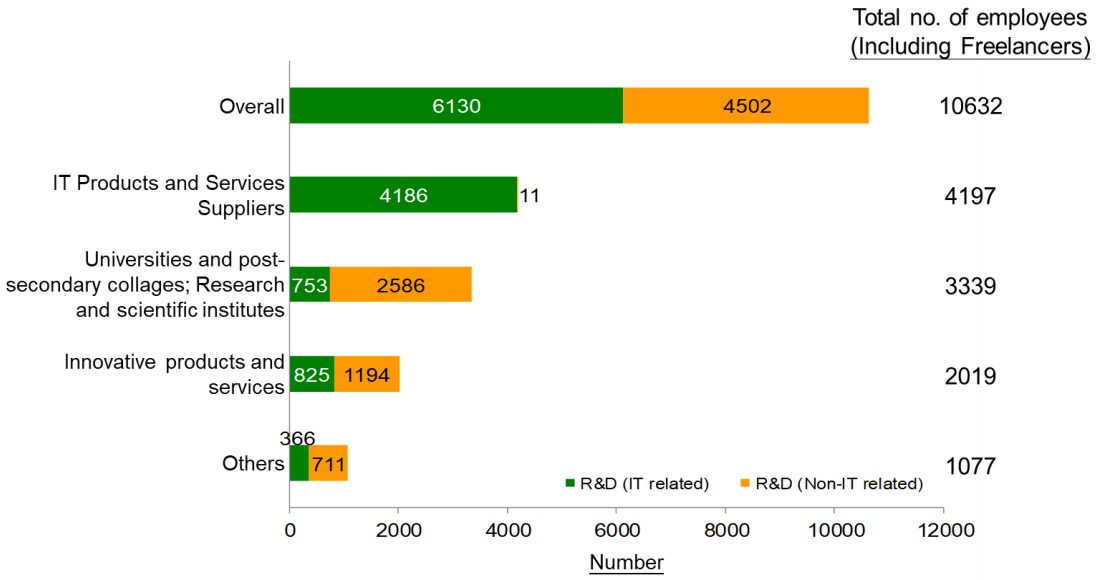
3.41 Of those 10 564 employees engaged in research and development activities, slightly more were IT related (6 128 employees or 58.0%) than non-IT related (4 436 employees or 42.0%).

3.42 On the other hand, the majority of those freelancers (66 freelancers or 97.1%) were non-IT related.

Table 3.20 Number of R&D Employees and Freelancers by Job category

Job category	Employees	Freelancers	Total
R&D (Non-IT related)	4 436	66	**4 502**
R&D (IT related)	6 128	2	**6 130**
Overall (R&D)	**10 564**	**68**	**10 632**

Chart 3.8 Number of R&D Employees and Freelancers by Job category by Sector



3.43 At the time of survey, employers reported that there were 447 R&D vacancies, accounted for 4.0% of the existing R&D posts. The IT products and services suppliers reported the highest number of vacancies (189 IT related vacancies), followed by the universities and post-secondary colleges, research and scientific institutes (117 non-IT related and 28 IT related vacancies).

Table 3.21 Number of R&D vacancies at time of survey by Branch

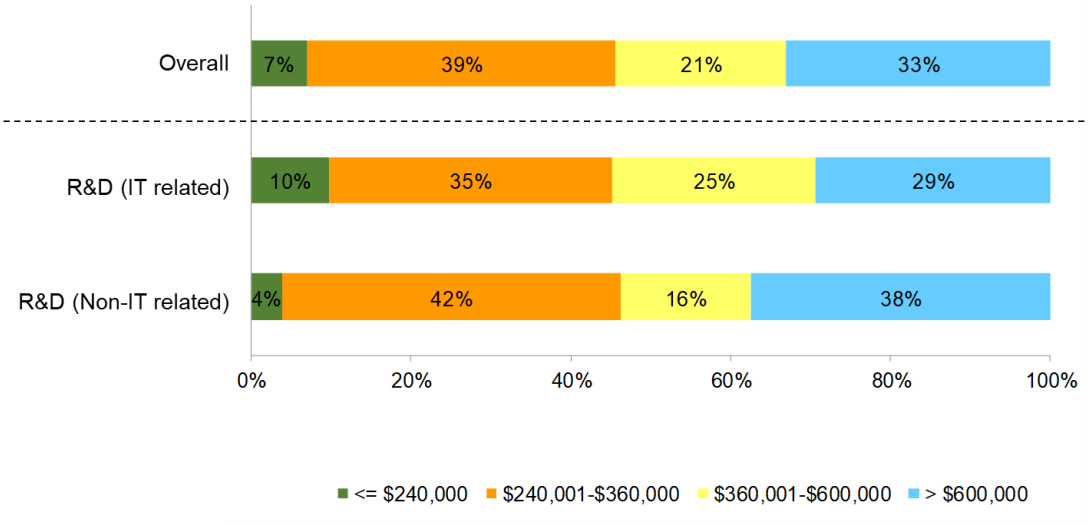
Job category	Innovative products and services	IT Products and Services Suppliers	Universities and post-secondary colleges; Research and scientific institutes	Others	Total
R&D (Non-IT related)	48	-	117	54	**219**
	(3.9%)	*(-)*	*(4.3%)*	*(7.1%)*	***(4.6%)***
R&D (IT related)	1	189	28	10	**228**
	(0.1%)	*(4.3%)*	*(3.6%)*	*(2.7%)*	***(3.6%)***
Overall (R&D)	49	189	145	64	**447**
	(2.4%)	*(4.3%)*	*(4.2%)*	*(5.6%)*	***(4.0%)***

Note:
( ) As a percentage of number of R&D posts (employees and freelancers + vacancies) by job category.

iii. Annual Remuneration Package, Academic Qualification and Relevant Years of Experience

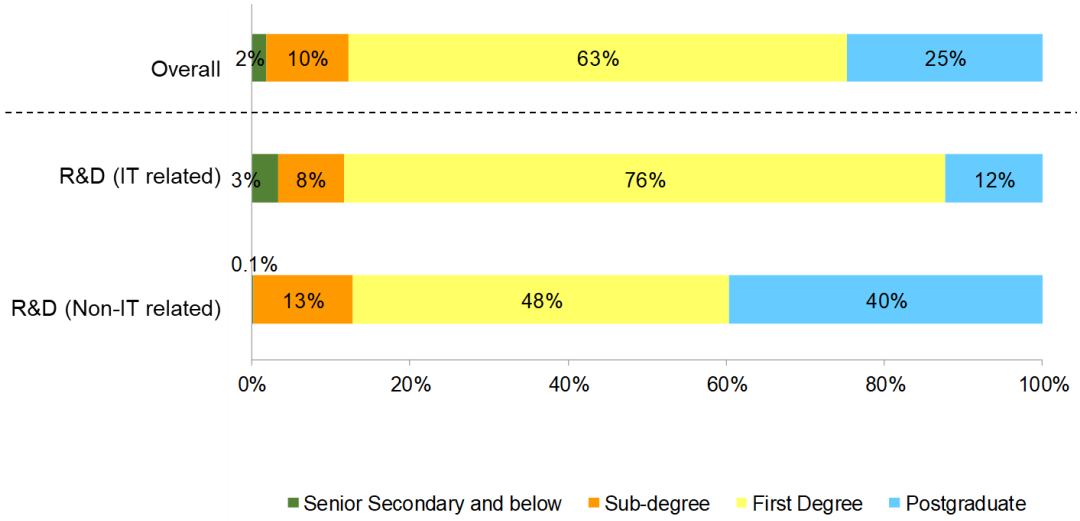
3.44 Employers offered competitive wages to secure and retain highly-skilled R&D professionals, especially for those non-IT related R&D professionals.

Chart 3.9 Average Annual Remuneration Package for R&D Employees



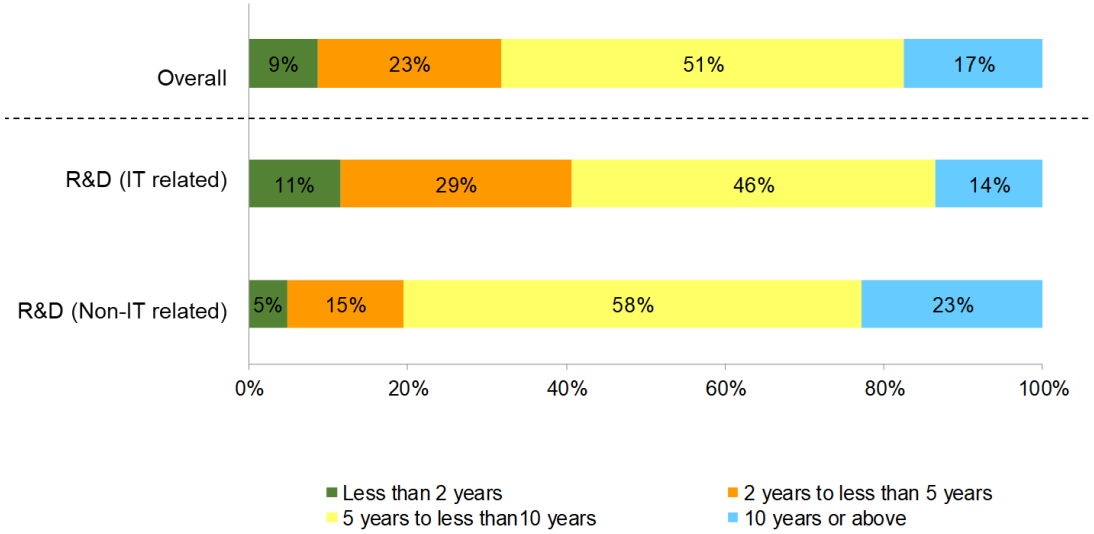
3.45 The majority of R&D posts were preferred to have tertiary level qualifications, with 88% preferred to have first degree or above qualifications and 10% sub-degree qualification.

Chart 3.10 Preferred Academic Qualification for R&D Employees



3.46 About 70% of R&D posts were preferred to have relevant experience of 5 years or above and 23% of R&D posts were preferred to have 2 years to 5 years.

Chart 3.11 Preferred Relevant Years of Experience for R&D Employees



iv. Training

3.47 The top two essential skills/knowledge reported by employers to have training needs for R&D employees were "technical skills" and "management skills".

Table 3.22 Training Needs of Existing R&D Employees in the Next 12 Months

Type of Skills / Knowledge	Rank of 2018
Technical Skills	1
Management Skills	2
Other R&D Training*	3
Knowledge related to licensing and patent application	4

Note: *Other R&D Training included forums/seminars on technology exchange.

v. Employers' Forecast Growth

3.48 Taking employees, freelancers and vacancies altogether, there were a total of 11 079 R&D posts at the time of survey. Employers in general anticipated their R&D manpower situation in April 2019 to be similar to that in 2018. The forecast number of R&D posts will be 11 092 in April 2019, merely increased by 0.1%.

Table 3.23 Employers' Forecast of R&D Manpower Demand by April 2019 by Job Category

Job category	Number of Posts as of April 2017	Number of Employees and Freelancers at Time of Survey	Number of Vacancies at Time of Survey	Forecasted Number of Posts Increased/ Decreased as of April 2019	Forecasted Number of R&D Posts as of April 2019
Research and Development (Non-IT related)	4 676	4 502	219	16	4 737
Research and Development (IT related)	6 230	6 130	228	- 3	6 355
Overall	**10 906**	**10 632**	**447**	**13**	**11 092**

Notes: * R&D manpower demand or R&D posts includes the number of existing employees (including freelancers) and vacancies.

vi. Source of Funding, Nature of R&D Activities and Mode of Training

3.49 The major source of funding for the research and development activities was "self-financed" (75.4%), followed by "government" (18.3%) and "group company or affiliates" (6.3%). In the nature of R&D activities, 72.4% of the research and development activities were "in-house R&D", 23.0% "collaboration arrangement" and 4.6% "contract out R&D". Among those involved in "contract out R&D" activities, only 0.2% was involved in off-shore R&D.

Chart 3.12 Source of Funding for R&D

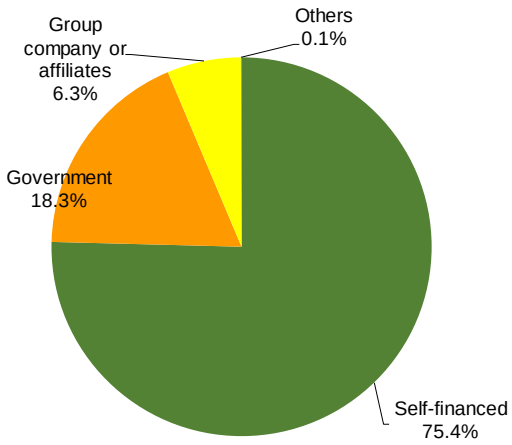
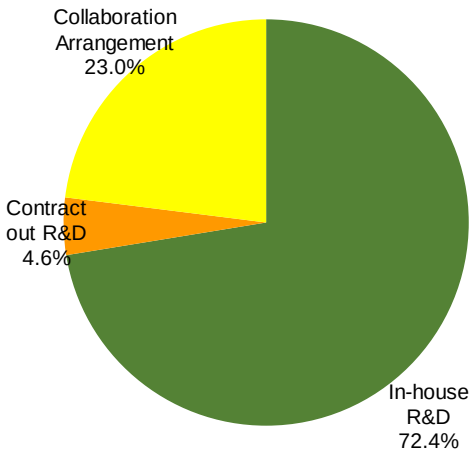
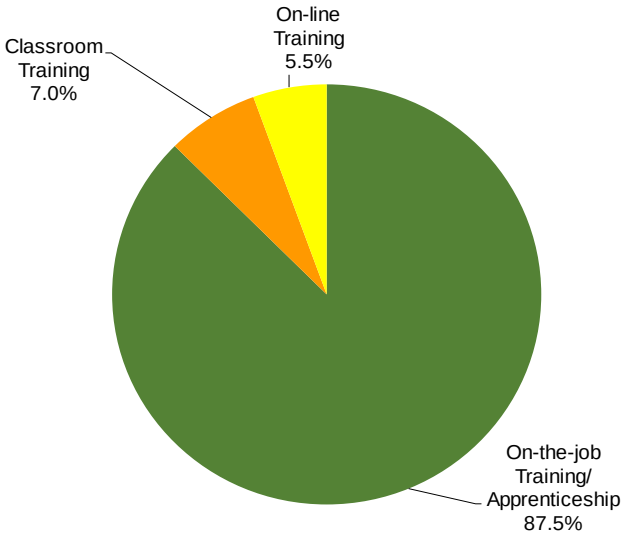


Chart 3.13 Nature of R&D Activities



3.50 The major mode of training for R&D staff was "on-the-job training/apprenticeship" (87.5%).

Chart 3.14 Mode of Training for R&D Staff



IV. OBSERVATIONS AND CONCLUSIONS

General

4.1 The Training Board has carefully examined the survey findings and is of the opinion that the data collected generally reflect the manpower situation of the personnels engaged in IT and R&D activities at the time of survey.

Manpower Changes

4.2 The manpower of the IT sector has been on a rising trend since 2006. The number of employees (including freelances) in Operation Services was rapidly increasing for past twelve years (by 12 428 ; by 97%). One of the possible reasons of increment was that the user companies have enhanced the manpower of user support in order to serve as coordinators with the vendors to support their services. In term of percentage changes, the IT sales and marketing increased by around 90% from 2006 to 2018, possibly due to the fact that the vendors have strengthened their sales team to provide more advices to potential clients.

4.3 The manpower changes of the IT sector by job category from 2006 to 2018 are shown in Table 4.1.

Table 4.1 Distribution of IT Employees (including Freelancers) by Job Category (2006 – 2018)

	Year						
Job category	**2006**	**2008**	**2010**	**2012**	**2014**	**2016**	**2018**
IT/Software Development[1]	28 916	24 206	26 340	29 085	31 414	33 622	36 463
Operation Services	12 756	16 235	15 950	17 305	19 105	19 665	25 184
Technical Services	10 333	11 151	12 996	14 495	14 788	15 700	14 210
Telecommunications and Networking	3 749	6 153	5 948	6 007	5 923	6 426	5 973
IT Sales and Marketing[2] [3]	4 517	4 531	5 741	6 705	6 710	7 177	8 543
IT Education and Training	2 575	3 302	5 161	3 650	3 571	3 727	3 944
General IT Management	1 627	1 119	1 242	1 438	1 462	1 477	1 463
Overall	**64 473**	**66 697** *(+3.4%)*	**73 378** *(+10.0%)*	**78 685** *(+7.2%)*	**82 973** *(+5.4%)*	**87 794** *(+5.8%)*	**95 780** *(+9.1%)*

Notes:

(1) The new job category "Research and Development (IT related)" was included under "IT/Software Development" for 2018.

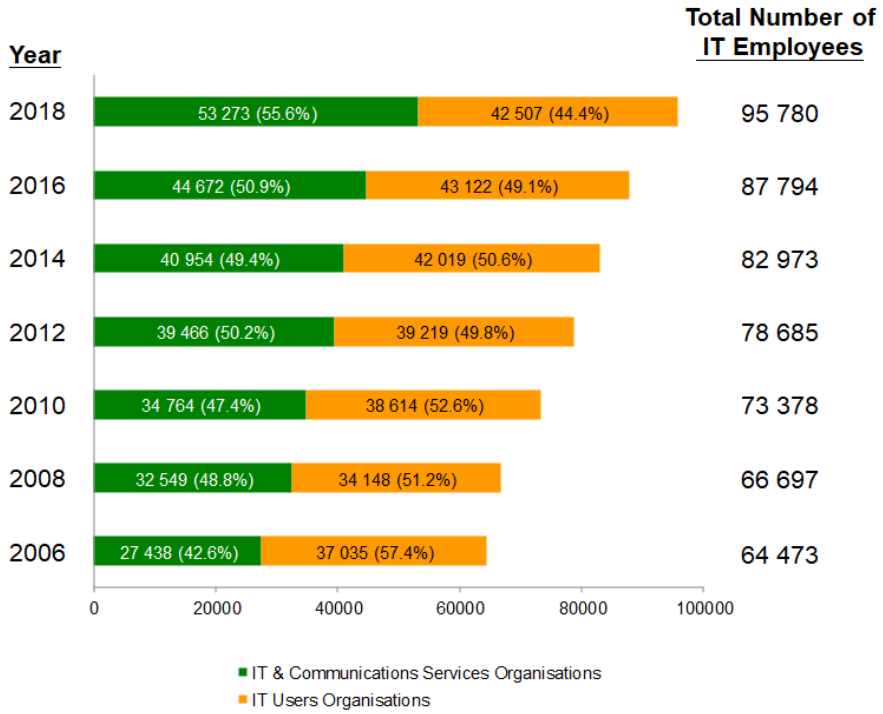
(2) Hardware and software sales employees with technical knowledge of IT products and services were classified under the job category "IT Sales" in 2006-2008 rounds and "IT Sales and Marketing" starting from 2010 round.

(3) The corresponding job category for 2006-2008 was "IT Sales".

4.4 Due to the adoption of Cloud Computing and new technologies (such as Artificial Intelligence, Big Data and Block chain, etc.), companies offload their technical manpower to the IT product and service vendors. A gradual shift of IT manpower from IT Users Organsiations to IT & Communications Services Organisations was noted for the past twelve years.

4.5 The changes in the number of IT employees (including freelancers) from 2006 to 2018 by type of organisations are shown in Chart 4.1.

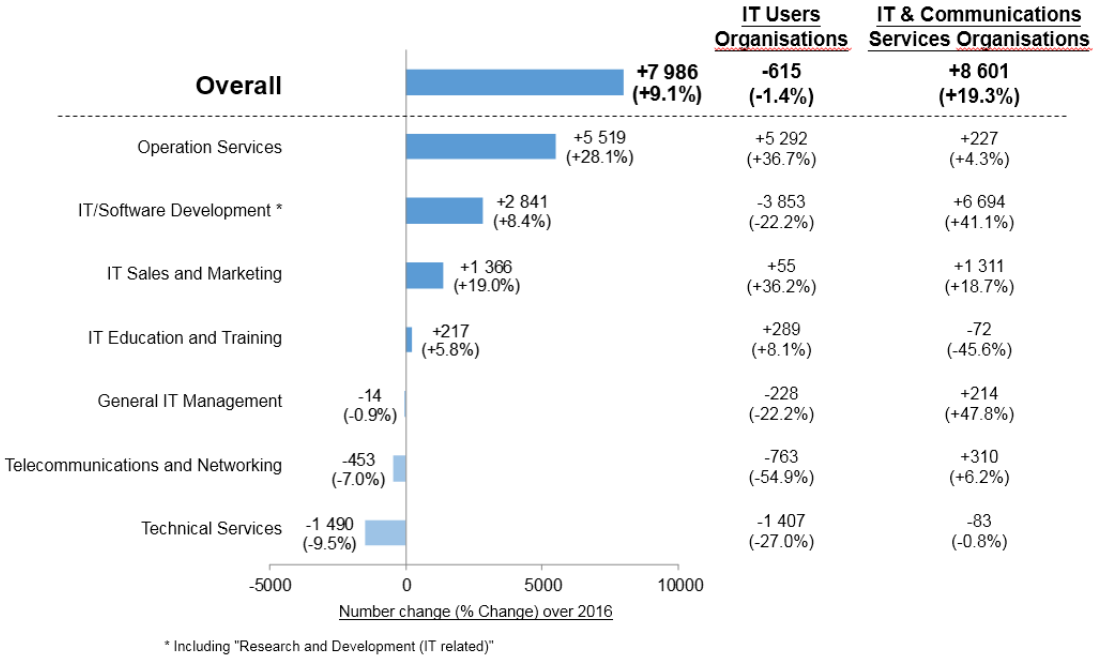
Chart 4.1 Changes in the Number of IT Employees (including Freelancers) from 2006 to 2018 by Type of Organisation



IT Staff Seconded from Contractor Company between 2018 and 2016

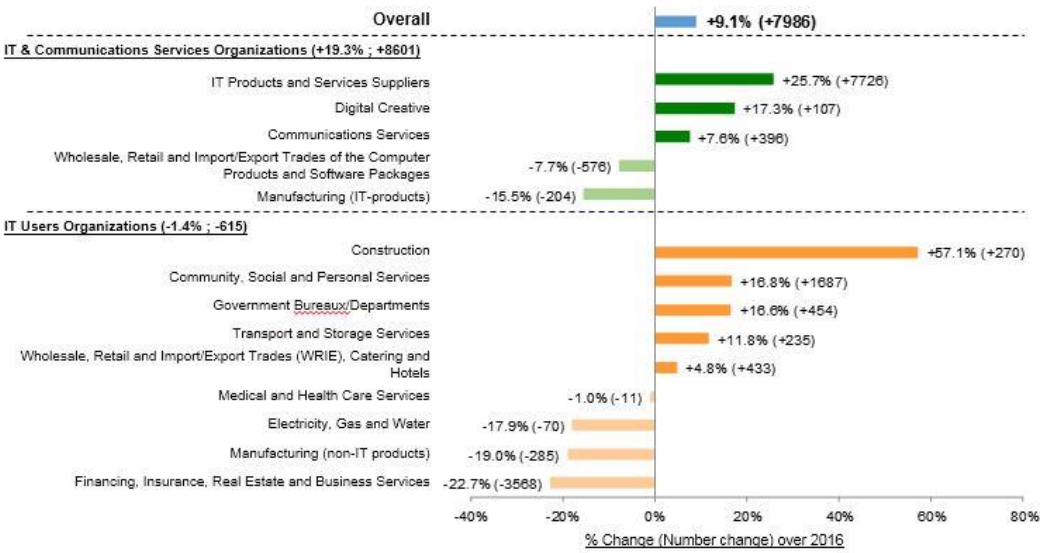
4.6 Comparing with 2016, IT & Communications Services Organisations needed to strengthen the technical competence of their workforce by increasing the number of IT employees and reducing the seconded IT staff whilst the IT Users Organisations increase the IT seconded staff to enhance the services provided to the clients.

Manpower Changes by Job Category between 2018 and 2016



4.7 The Training Board observes that the IT vendors enhance their product/services by strengthening their IT/Software development team whilst the IT user organsiations streamline their IT development team and offload the task to the IT vendors. However, they enhance their operation services by recruiting more user supports to coordinate with the vendors.

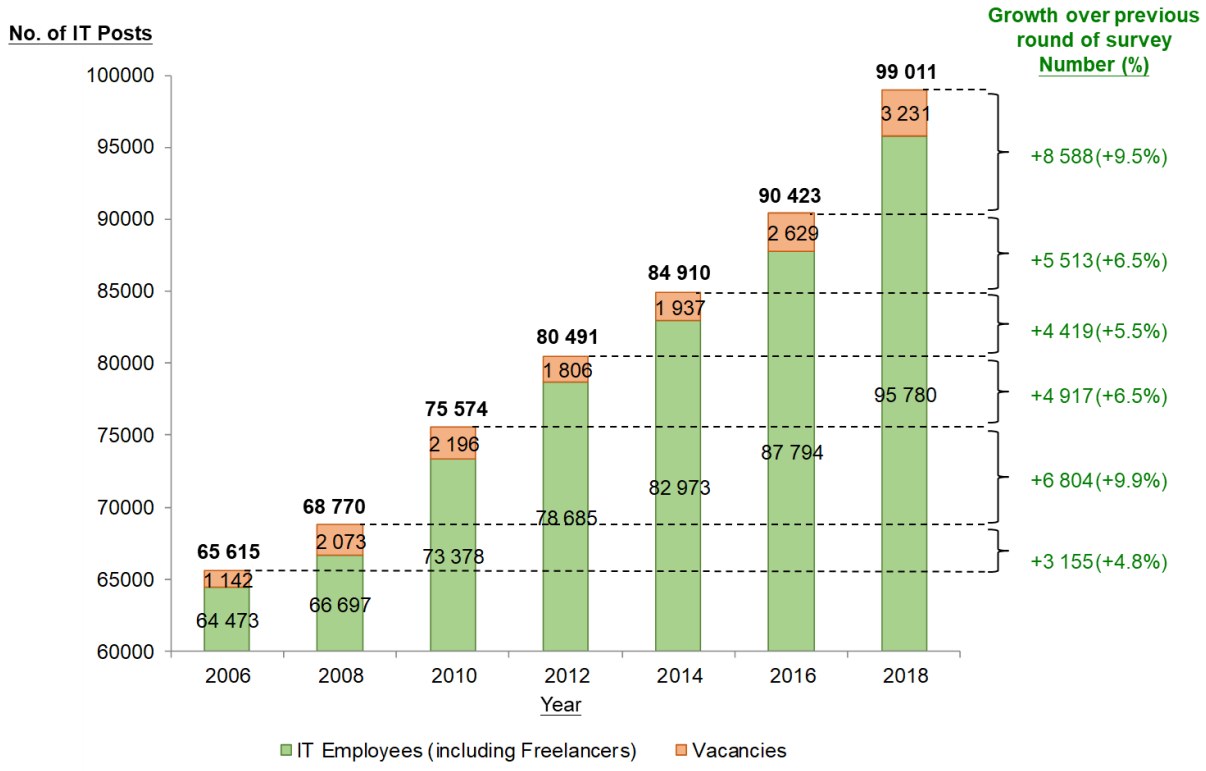
Manpower Changes by Sector Between 2018 and 2016



4.8 The Training Board observes that the manpower of IT products and services suppliers has increased by 25.7% for enhancing their product/service development as well as to strengthening their marketing team for improved product/service promotion whilst the manpower of programmer and user support increase in community, social and personnal services for enhancing their operation and services. On the other hand, the finance, insurance and real estate and business services sectors have experienced a manpower reduction of 22.7% which might be attributable to the adoption of powerful development software tools and outsourcing services related to Fintech.

4.9 Taking employees, freelancers and vacancies altogether, the number of IT posts showed a persistent growth from 2006 to 2018, with a significant increase from 2016 to 2018 (by 8 588 ; by 9.5%).

Chart 4.2 Total IT Posts, Employed and Vacancies (2006 – 2018)



Business Outlook

Global and Local Economic Outlook

4.10 According to 2018 October Update of the International Monetary Fund, the steady expansion under way since mid-2016 continues, with global growth for 2018–19 projected to remain at its 2017 level. Global growth is projected at 3.7 percent for 2018–19, lower than forecast in April due to the recent economic situation. In the United States, momentum is still strong as fiscal stimulus continues to increase, but the forecast for 2019 has been revised down due to recently announced trade measures, including the tariffs imposed on $200 billion of US imports from China. Growth projections have been marked down for the euro area and the United Kingdom, due to the weak currency and debt crisis of some European countries coupled with the uncertainties arise from the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union (EU). Among emerging market and developing economies, the growth prospects of many energy exporters have been lifted by higher oil prices.

4.11 China and a number of Asian economies are also projected to experience somewhat weaker growth in 2019 in the aftermath of the recently announced trade measures. Growth in China will remain strong but is projected to decline gradually from the average gross domestic product (GDP) rate of 6-6.5% annually in the coming years. China's economy is currently undergoing structural transformation to be more focused on developing service industries. As the economic growth of Hong Kong is largely influenced by the China economic situation, its growth is also expected to be positive but slower than before and is forecasted to grow steadily at around 3-4 %.

4.12 The employment situation in the IT sector going forward continues to hinge crucially on the overall economic growth and the pace of job creation. Despite the uncertainty of the global economic situation, Hong Kong still has its competitive advantage as she has a robust ICT infrastructure and is consistently ranked among the best in the world in terms of digital readiness and internet access capabilities.[5] To foster the ICT industry development, the Hong Kong government has put in place many initiatives, including funding support, provision of infrastructure, international cooperation and manpower development. The Smart City Blueprint, unveiled in December 2017, maps out development plans for the next five years to enhance Hong Kong's sustainability by making use of innovation and technology. By and large, the need for the IT services driven by the digital transformation of the local companies coupled with the value-added applications using the new technologies will continue to sustain the growth of the industry in the coming years.

[5] Hong Kong Trade Development Council Research on Information and Communications Technology (ICT) industry on 5 July 2018.

Recent Government Initiatives

4.13 In the 2018 Policy Address, the Government had announced the following initiatives which will affect the development of the personnels engaged in IT and R&D activities. The Government will:

(a) Inject HK$20 billion into the Research Endowment Fund of the Research Grants Council; launch a HK$3 billion Research Matching Grant Scheme; and introduce fellowship schemes for outstanding academics to strengthen the pool of talent in research and innovation and technology in Hong Kong.

(b) Expedite re-industrialisation by establishing a HK$2 billion re-industrialisation funding scheme to subsidise manufacturers to set up smart production lines in Hong Kong and allocating HK$2 billion for building advanced manufacturing facilities in industrial estates.

(c) Promote technology transfer by increasing the funding support to the Technology Transfer Offices of universities, the Technology Start-up Support Scheme for Universities, as well as the State Key Laboratories and Hong Kong branches of the Chinese National Engineering Research Centre.

(d) Introduce various initiatives, such as the Postgraduate Programme Finance Scheme for Local Students, the Technology Talent Admission Scheme, the Technology Talent Scheme and the enhanced Internship Programme, to proactively attract and nurture scientific research talent. Under the Technology Talent Admission Scheme, Reindustrialisation and Technology Training Programme (RTTP) was launched in August 2018 to encourage the local employers to train up their staff in advanced technologies.

(e) Establish two Innovation and Technology (I&T) clusters at the Hong Kong Science Parks, with one focusing on healthcare technologies and the other on artificial intelligence and robotics technologies.

(f) Open up government data to smart city development and annual plans to open up data by government departments will be announced by the end of 2018.

4.14 With the recent Government's Initiatives to support the innovation and technology development in Hong Kong, it is expected that more employment opportunities arise in both the personnels engaged in IT and R&D activities. To assure an adequate supply of competently skillful technical manpower to meet the demand of the sectors in the coming

years, the Training Board urges employers to provide opportunities both in terms of time and promotion incentives to encourage the employees to upgrade their technical skills in order to keep abreast of the development and applications of the new technologies.

Manpower Demand and Supply Analysis

4.15 As IT is a rapidly changing and developing sector, an accurate manpower projection method is required for educational planning purposes. Since it takes a number of years to educate and train people for IT jobs, industry needs must be anticipated sufficiently far in advance to allow time for training.

4.16 An adaptive filtering method is used to project the annual manpower requirement of the IT sector from 2019 to 2022 (Chart 4.3). This method produces projections based on past and present survey data (with heavier weight given to the more recent data). The Training Board selects the most appropriate projection by taking into consideration the socio-economic prospects and overall trend of the sector, employers' one-year forecast, and the annual wastage rate. Manpower projections of the IT sector are then translated into annual additional manpower requirement from 2019 to 2022 by job category as shown in Table 4.3.

Chart 4.3 Manpower Projection of the IT Sector from 2019 to 2022 (By using Adaptive Filtering Method)

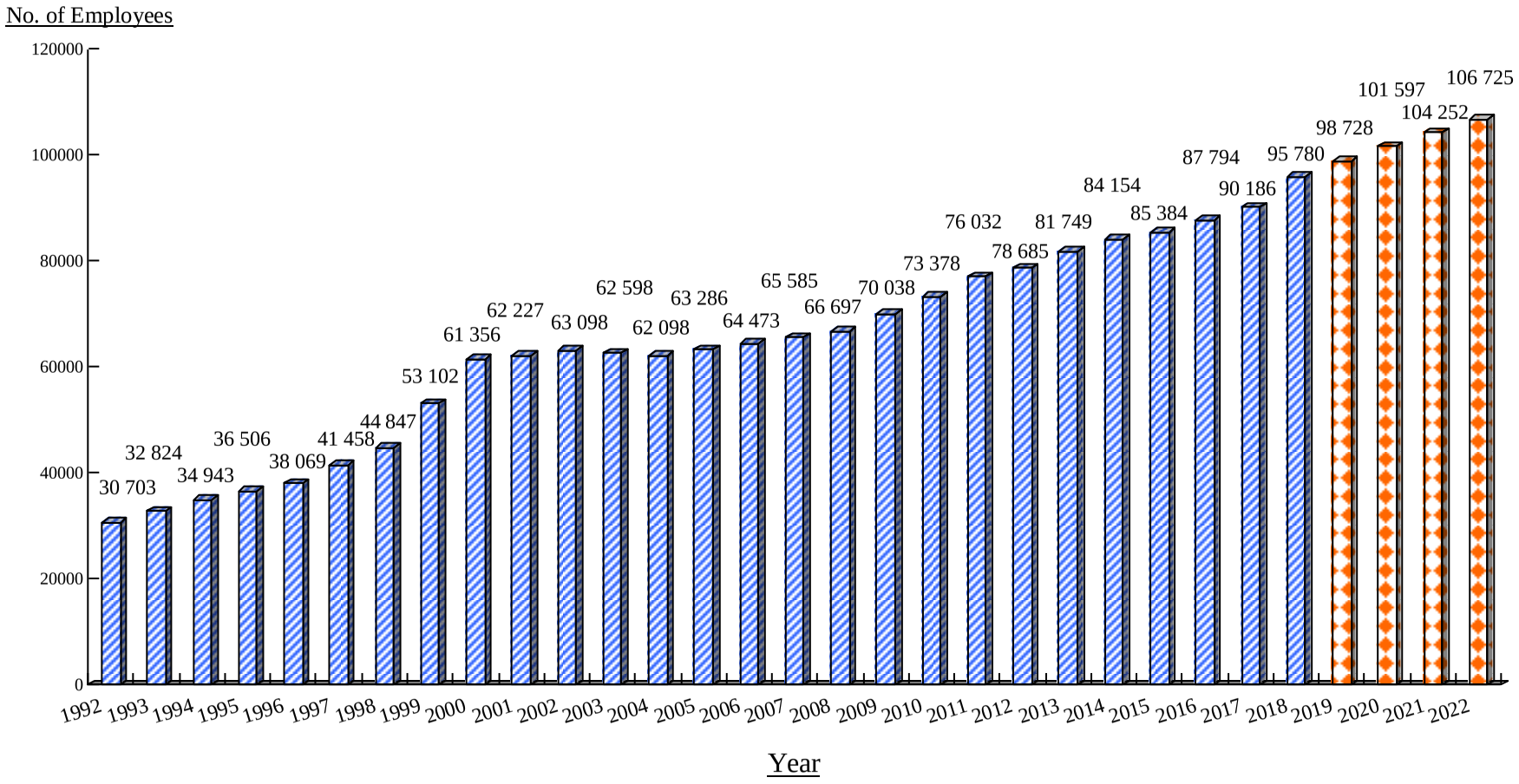


Table 4.3 Projected Annual Additional Manpower Requirement from 2019 to 2022 by Job Category

Job Category	Projected Average Annual Manpower Requirement (A)	Projected Average Annual Manpower Growth (B)	No. of Employees to Replenish Wastage* (C) = (A) x 0.03	Projected Annual Additional Manpower Requirement (D) = (B) + (C)
IT Management [1]	6 116	-34	184	150
IT / Software Development Telecommunications & Networking IT Security Database Systems Programming	49 626	1 666	1 489	3 155
Field Support IT Sales & Marketing	16 084	45	483	528
IT Education & Training	4 175	89	125	214
Operation Services	26 826	970	805	1 775
Grand Total	102 827	2 736	3 086	5 822

* Annual wastage rate [2] of 3.0% at each job category is assumed.

Notes: (1) IT management job titles under various job categories in the 2018 survey were all grouped under the IT management job category with a view to maintaining the historical trend for use in manpower projection of the IT sector.

(2) "Wastage rate" is defined as the percentage of IT employees leaving their current IT jobs and taking up non-IT positions, emigrating and for other reasons, out of the total number of IT employees.

(3) Figures may not add up to their totals due to rounding.

Distribution of Projected Annual Additional Manpower Requirement from 2019 to 2022 by Preferred Academic Qualification by Job Category

4.17 By adopting employers' preferred academic qualification of IT employees in paragraph 3.24 and *Appendix 11*, the Training Board estimates the distribution of projected annual additional manpower requirement from 2019 to 2022 by preferred academic qualification by job category in Table 4.4.

Table 4.4 Distribution of Projected Annual Additional Manpower Requirement from 2019 to 2022 by Preferred Academic Qualification by Job Category

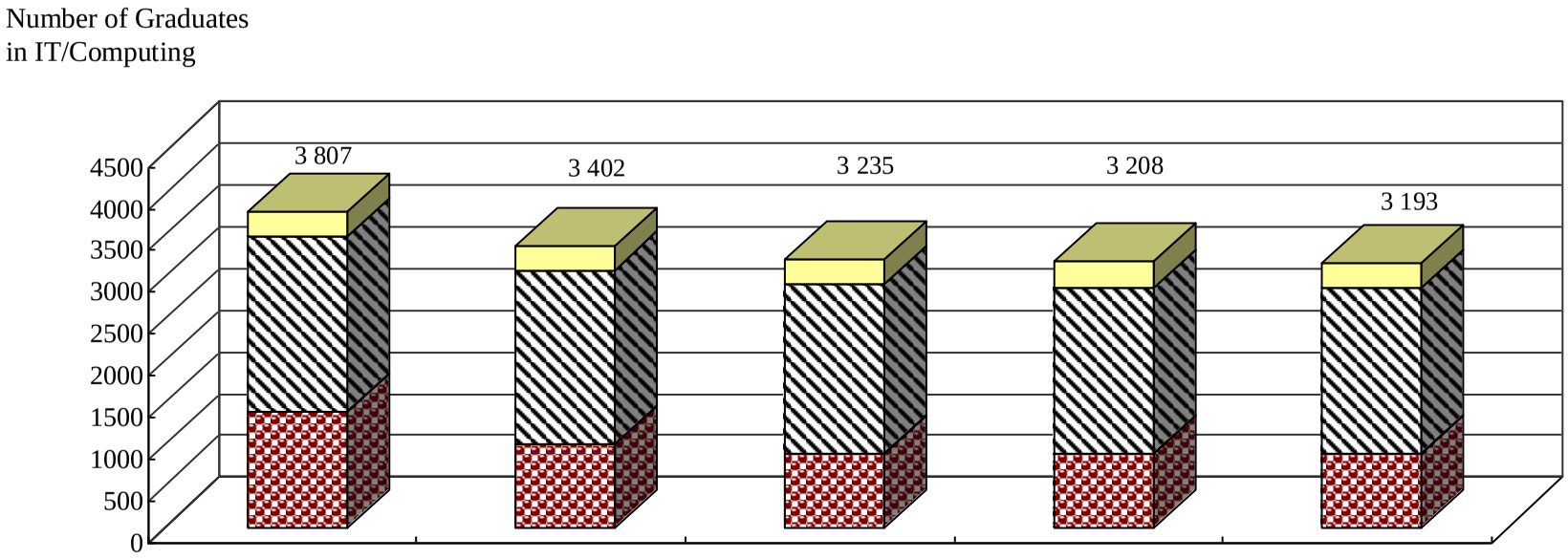
Job Category	Postgraduate (Higher degrees or equivalent)/ First Degree (First degree or equivalent)	Sub-Degree (Associate Degree, Higher Diploma, Professional Diploma, or equivalent)	Senior Secondary (Secondary 4-6, Diploma, HKDSE or equivalent)	Junior Secondary (Secondary 1-3 or equivalent)	Projected Annual Additional Manpower Requirement
IT Management [1]	125	23	2	-	150
IT / Software Development					
Telecommunications & Networking					
IT Security					
Database	1 997	1 276	563	61	3 897
Systems Programming					
Field Support					
IT Sales & Marketing					
IT Education & Training					
Operation Services	368	559	735	113	1 775
Grand Total	2 490	1 858	1 300	174	5 822

Notes: (1) IT management job titles under various job categories in the 2018 survey were all grouped under the IT management job category.
(2) Figures may not add up to their totals due to rounding.

Estimated Supply of IT or Computing Graduates from Local Educational Institutions

4.18 Based on the information provided by the UGC-funded institutions, The Open University of Hong Kong, The HKU SPACE Community College, and the Vocational Training Council, Charts 4.4 & 4.5, and *Appendices 18 & 19* show the existing planned output of their graduates from UGC / Government-funded and self-financed IT or computing programmes from 2018 to 2022.

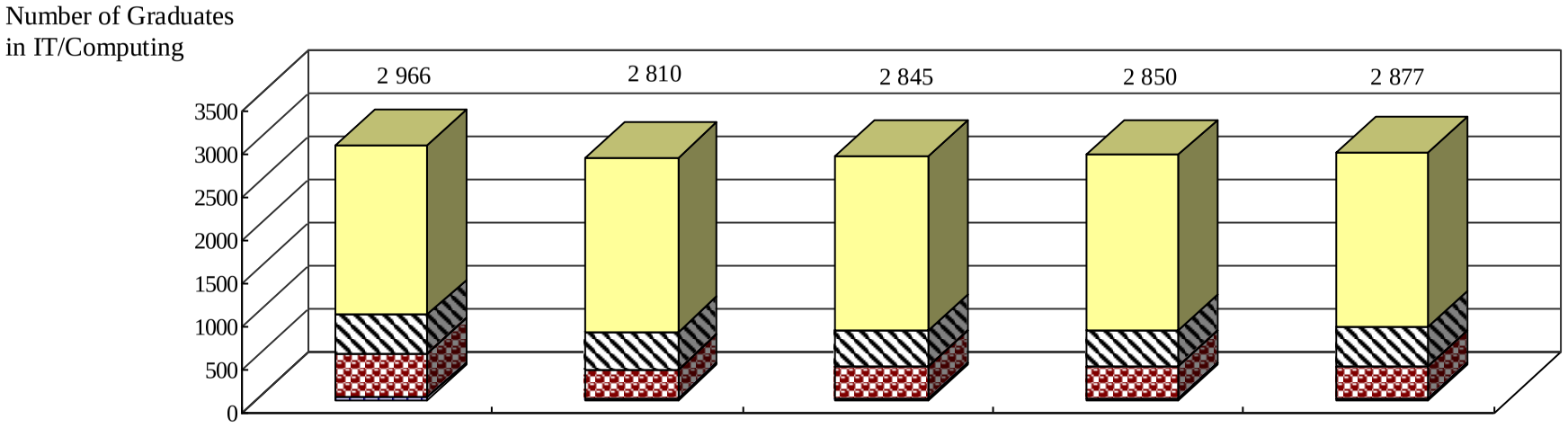
Chart 4.4 Planned Output of Graduates from UGC/Government-Funded IT or Computing Programmes from 2018 to 2022 by Educational Level



Year / Educational level	2018	2019	2020	2021	2022
Postgraduate	307	294	305	318	301
Degree	2 086	2 098	2 037	1 997	1 999
Sub-degree	1 414	1 010	893	893	893
Total	3 807	3 402	3 235	3 208	3 193

Sources: UGC-funded institutions and the Vocational Training Council.

Chart 4.5 Planned Output of Graduates from Self-Financed IT or Computing Programmes from 2018 to 2022 by Educational Level



Year / Educational level	2018	2019	2020	2021	2022
Postgraduate	1 980	2 030	2 032	2 033	2 028
Degree	459	435	424	428	460
Sub-degree	505	331	374	374	374
Senior Secondary	22	14	15	15	15
Total	2 966	2 810	2 845	2 850	2 877

Sources: UGC-funded institutions, The Open University of Hong Kong, The HKU SPACE Community College, and the Vocational Training Council.

4.19 Supply of graduates including those existing IT employees who take upgrading courses is related to participation rate, which is the percentage of graduates in IT or computing programmes who will actually join the IT sector. After studying the Employment Surveys of Full-time UGC-funded Institutions Graduates in Academic Year (AY) 2016/17 in Chart 4.6, the Training Board concludes that the successful participation rates for full-time first-degree graduates would not be less than 74% and for full-time sub-degree graduates would not be less than 60%. Some of the graduates from Higher Diploma/Associate Degree programmes would choose to further their studies after graduation. Accordingly, the average annual supply of graduates in IT or computing programmes joining the IT sector from local educational institutions from 2018 to 2022 is estimated in Table 4.5.

Table 4.5 Estimated Average Annual Supply of Graduates in IT or Computing Programmes from 2018 to 2022 by Educational Level

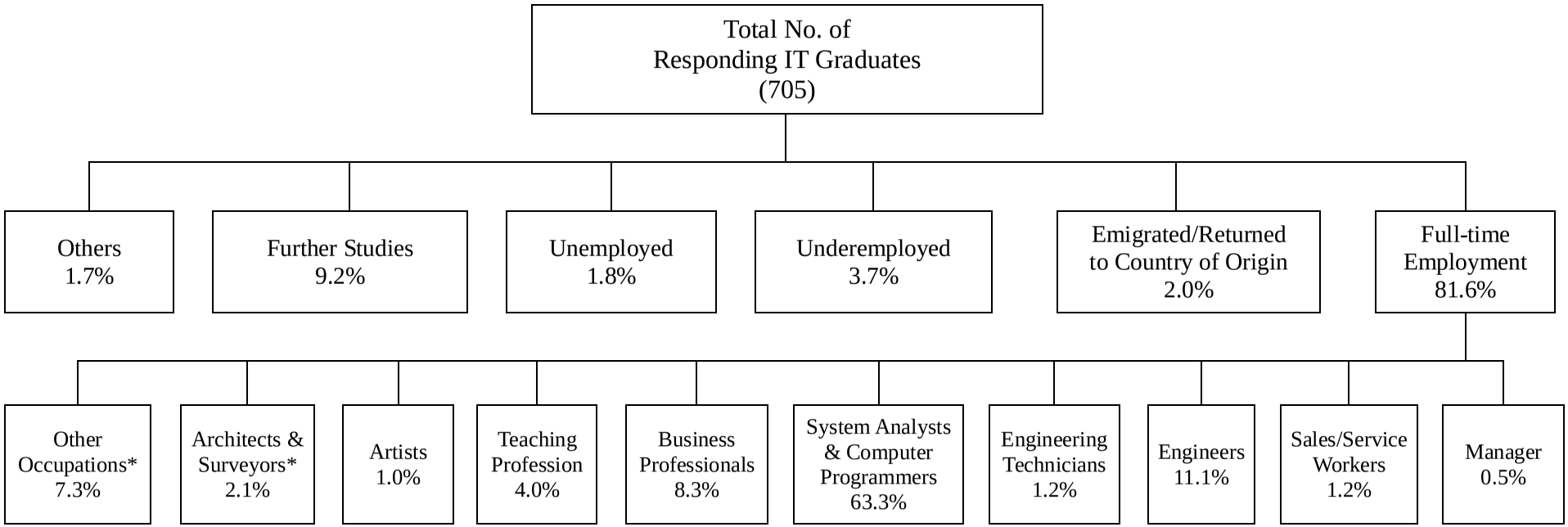
Educational Level	Mode	Average Annual No. of Graduates		Average* Successful Participation Rate	Average Annual Supply		
		GF	**SF**		**GF**	**SF**	**Total**
Degree							
Research Postgraduate Degree (MPhil/PhD) (1)	FT/PT	305	16	0.41	125	7	132
Taught Postgraduate Degree/Diploma/ Certificate (MSc/MA) (1)	FT/PT	-	2 004	0.77	-	1 543	1 543
First Degree (1)	FT/PT	2 043	35	0.74	1 512	26	1 538
First Degree (3)	FT F2F	-	185	0.75	-	139	139
First Degree (3)	DL	-	146	0.75	-	110	110
First Degree (4)	FT	-	76	0.75	-	57	57
Sub- total		*2 348*	*2 462*		*1 637*	*1 882*	*3 519*
Sub-degree							
Higher Diploma/ Associate Degree (1)	FT	81	185	0.60	49	111	160
Higher Diploma/ Associate Degree (2)	FT	-	186	0.60	-	112	112
Higher Diploma (4)	FT/PTE	940	21	0.72	677	15	692
Higher Diploma/ Associate Degree (3)	DL/F2F	-	1	0.75	-	1	1
Sub-total		*1 021*	*393*		*726*	*239*	*965*
Total		**3 369**	**2 855**		**2 363**	**2 121**	**4 484**

* Based on the Employment Surveys of Full-time UGC-funded Institutions, The Open University of Hong Kong, and the Vocational Training Council Graduates, 2016/17.

Remarks: FT = Full-time; PT = Part-time; PTE = Part-time Evening; GF = UGC/Government-funded; SF = Self-financed; DL = Distance Learning; F2F = Face to Face

(1) Courses offered by the UGC-funded institutions
(2) Courses offered by the HKU SPACE Community College
(3) Courses offered by The Open University of Hong Kong
(4) Courses offered by the Vocational Training Council

Chart 4.6 Initial Destinations of Full-time First-degree Graduates from UGC-funded IT or Computer Science Programmes

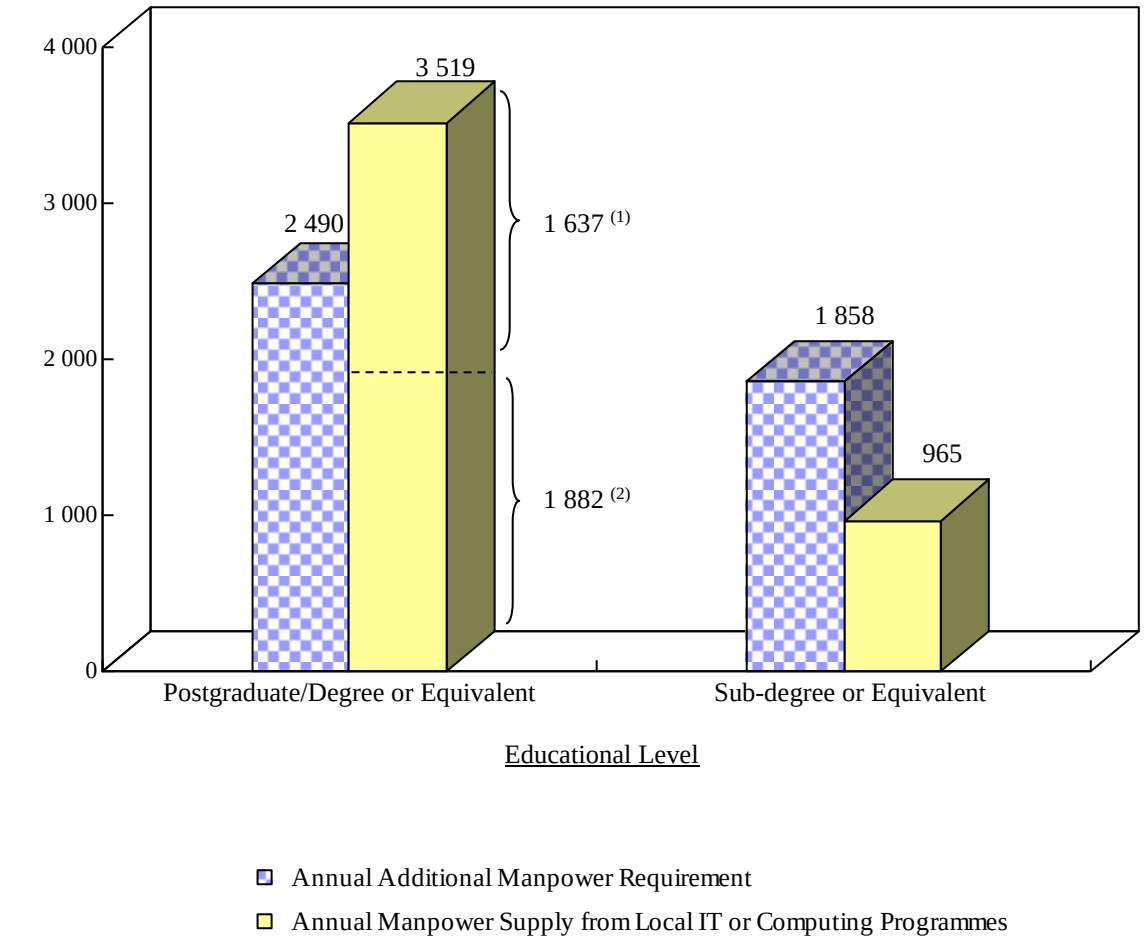


* Occupations not relevant to participation rate were excluded. As a result, the successful participation rate calculated was 74.0% (i.e. 81.6% x 90.6%) for full-time first-degree UGC-funded graduates.

Source: Employment Survey of the Graduates from Full-time UGC-funded Programmes in Academic Year 2016/17.

4.20 The primary objective of the analysis is to assess the annual additional manpower demand and supply situation of the IT sector from 2019 to 2022 by educational level as shown in Chart 4.7.

Chart 4.7 Annual Additional Manpower Demand and Supply Situation from 2019 to 2022 by Educational Level



Notes : (1) Annual manpower supply fromUGC/Government-funded local IT or computing programmes.
(2) Annual manpower supply from self-financed local IT or computing programmes.

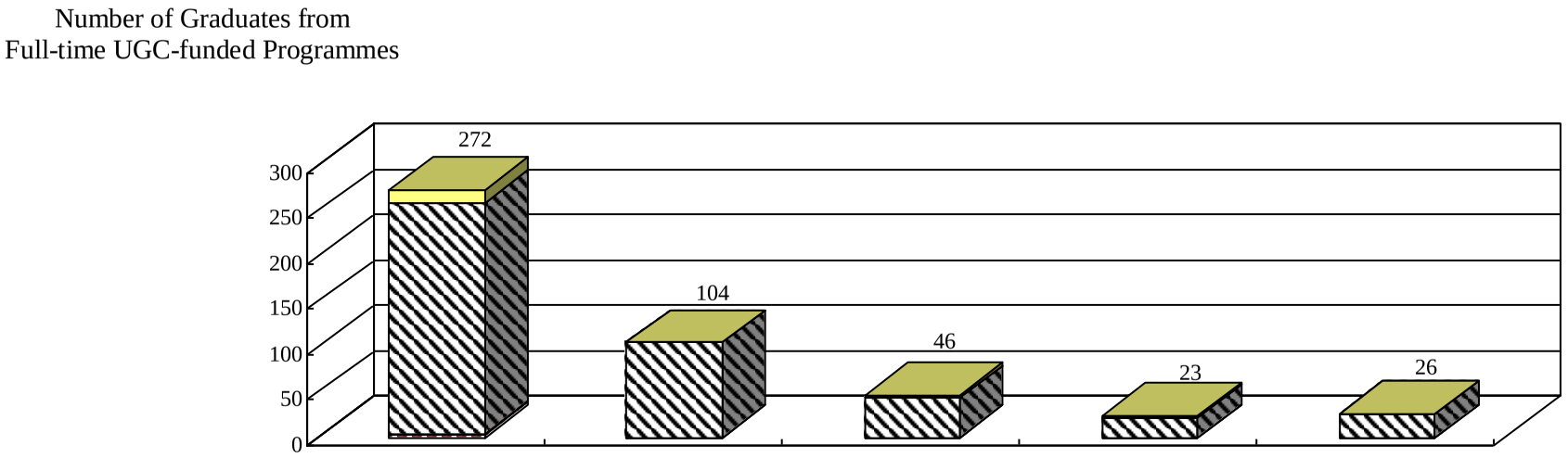
4.21 From Tables 4.3, 4.4 and Chart 4.7, it can be concluded that the average annual supply of 3 519 local degree graduates from IT or computing programmes would be able to meet the forecast annual additional manpower demand for 2 490 IT employees with such qualification. A recruitment pattern of systems analysts / computer programmers by educational level by academic programme category (other than IT / computer science) is shown in Chart 4.8. It is anticipated that some graduates of non-IT subjects would like to take up IT jobs as their career development.

4.22 It is shown in Table 3.16, that most IT staff in various industry sectors are either promoted internally or experienced persons recruited from Hong Kong. This would create further vacancies at various IT jobs to be filled by fresh university graduates.

4.23 At the sub-degree level, the forecast annual additional manpower demand for 1 858 IT employees would not be able to meet by the average annual supply of 965 IT or computing graduates with such qualification. The forecast annual shortfall of 893 additional IT employees could be met in general by IT or computing graduates returning from overseas and non-IT / computing graduates who have received in-depth conversion IT training. Many local graduates pursuing non-IT or non-computing related courses are willing to attend various IT courses offered by local educational institutions and subsequently take up IT jobs.

4.24 For the other academic qualifications level, the IT sector will need to recruit annually 1 474 people for various IT jobs (Table 4.4). Such demand can be met from the supply of Senior Secondary or below school leavers. Most of these people should need relevant skill training before they are capable of performing the IT jobs effectively. Local educational and training institutions and employers will provide basic skills training to meet their needs.

Chart 4.8 Recruitment Pattern of System Analysts/Computer Programmers by Educational Level by Academic Programme Category (APC) (Other Than IT/Computer Science)



Academic Programme Category / Educational level	Engineering & Technology	Business & Management Studies	Mathematical Sciences/ Social Sciences	Arts, Design & Performing Arts/ Physical Sciences	Others (1)	Total
Postgraduate	14	-	3	1	1	19
Degree	255	104	43	22	25	449
Sub-degree	3	-	-	-	-	3
Total	272	104	46	23	26	471

Notes : (1) Other APCs include biological sciences, mass communication & documentation, languages & related studies, humanities, medicine, and education.

(2) As some programmes of the UGC-funded institutions are mapped to more than one APC, students on these programmes are counted across the APCs concerned on a pro rata basis. Thus the student numbers of some APCs are decimal figures. In the above table, the relevant figures are rounded to the nearest whole number.

Source : Employment Survey of the Graduates from Full-time UGC-funded Programmes in Academic Year 2016/17.

V. RECOMMENDATIONS

Overview

5.1 In view of the uncertainty of the global economic situation due to the recent trade war and Brexit as well as the debt crisis of some European countries, together with the structural transformation of China, it is likely that the economy of Hong Kong in the coming year will be slower than previous years with an expected growth rate of 3-4%.

5.2 However, Hong Kong still have it competitive advantage as she has a robust ICT infrastructure and is consistently ranked among the best in the world in terms of digital readiness and internet access capabilities. According to the annual global ICT Development Index published by International Telecommunication Union (ITU) in November 2017, Hong Kong ranked second in Asia and sixth in the world, which together with Korea, were the only two Asian economies making into the top 10. According to the World Economic Forum's Networked Readiness Index 2016, Hong Kong ranked third in Asia and 12th globally in terms of readiness to participate in and benefit from IT developments.

5.3 To foster the ICT industry development, the Hong Kong government has put in place many initiatives, including funding support, provision of infrastructure, international cooperation and manpower development. The Smart City Blueprint, unveiled in December 2017, maps out development plans for the next five years to enhance Hong Kong's sustainability by making use of innovation and technology. In terms of infrastructure, the Hong Kong Science & Technology Parks Corporation (HKSTPC) and Cyberport, both of which are fully owned by the government, nurture technology companies by providing state-of-the-art facilities including R&D offices, meeting venues and technical centres with professional support services. The Hong Kong government's Innovation and Technology Fund (ITF) has provided an alternative source of funding for the industry.

5.4 With the recent Government's Initiatives to support the innovation and technology development in Hong Kong, it is expected that more employment opportunities arise in both the personnels engaged in IT and R&D activities. To assure an adequate supply of competently skillful technical manpower to meet the demand of the sectors in the coming years, the Training Board urges employers to provide opportunities both in terms of time and promotion incentives to encourage the employees to upgrade their technical skills in order to keep abreast of the development and applications of the new technologies.

Annual Manpower Training Requirement

5.5 The findings of the survey reflect the manpower situation of the IT sector at the time of the survey. However, the current uncertainty in global financial markets might have an effect on the IT manpower demand.

5.6 Based on projected average annual manpower growth, estimated wastage rate of 3%, recent development of the IT sector and industry members' experience, the Training Board estimates the annual additional training requirement for IT employees from 2019 and 2022 by job category as shown in Table 5.1.

Table 5.1 Estimated Annual Additional Training Requirement for IT Employees from 2019 and 2022 by Job Category

Job Category	Estimated Annual Additional Training Requirement for 2019-2022 (Number of IT Employees)
IT Management	140 – 170
IT/Software Development Telecommunications & Networking Technical Services IT Sales & Marketing IT Education and Training	3 510 – 4 290
Operation Services	1 600 – 1 950
Total	5 250 – 6 410

Notes: (1) IT management job titles under various job categories in the 2018 survey were all grouped under the IT management job category.
(2) Figures may not add up to their totals due to rounding.

Relevant Organisations for Technology Transfer, R&D Collaboration and Development

5.7 In order to leverage the R&D effort by making good use of the facilities and services offered by the public R&D organisations and universities, the Training Board urges the employers to seek assistance from the following organisations for R&D development and technology transfers:

i. Hong Kong Science and Technology Parks Corporation;
ii. Cyperport;
iii. The Hong Kong R&D Centres;
iv. Hong Kong Productivity Council; and
v. Technology Transfer Offices of the Local Universities

5.8 Details of the organisations are included in Appendix 20.

Relevant Organisations/Programmes for Skill Upgrading

5.9 To facilitate the employers to upgrade the technical knowledge and know-how of their workforce, the Training Board encourages them to make use of the services or subsidies provided by the following organisations/programmes:

i. Training Programmes offered by VTC;
ii. Reindustrialisation and Technology Training Programme;
iii. Engineering Graduate Training Scheme (EGTS); and
iv. Hong Kong Productivity Council

5.10 Details of the programmes/ services of the organisations or subsidized schemes are described in Appendix 21.

Recommended Focus Areas for Training

Financial Technology (FinTech)

5.11 FinTech, the application of information technology to the provision of financial services, has surged in recent years, spurred by dramatic advances in technology along with post-crisis regulatory changes. The financial services sector has seen a new wave of participants, including FinTech start-ups as well as major e-commerce and technology firms, alongside incumbent financial institutions. Many FinTech companies are providing financial services directly to customers in areas such as payments and P2P (peer-to-peer) lending. Others are seeking to challenge incumbents in a range of areas, while yet others are working with incumbents to improve their services.

5.12 Blockchain is a software platform which uses advanced cryptographic techniques and peer-to-peer networks to enable the creation of secure, collaborative and trustworthy applications in a cost-effective and reliable fashion. This technology has strong significance to various applications such as crypto-currency and payment systems, digital rights management, and health records management. It is considered a disruptive FinTech that can potentially disintermediate some expensive overheads in legacy financial computer systems and also promote automation and digitalisation.

5.13 ASTRI has also partnered with one of the local leading banks to develop a Blockchain-based property valuation system to simplify the existing paper-based and time-consuming property valuation process. They will continue to collaborate with different financial institutions to develop Blockchain applications in areas like trade finance, mortgage, digital identity management and insurance.

5.14 In an effort to push Hong Kong towards a cashless society, the Hong Kong Monetary Authority (HKMA) Faster Payment System was launched in September 2018 to enable instant payments in Hong Kong. With the new system in place and growing number of users, Hong Kong is on track towards its cashless ambition.

CybersSecurity

5.15 Cybersecurity is the protection of computer systems from the theft or damage to the hardware, software and the information on them, as well as from disruption or misdirection of the services they provide. It includes controlling physical access to the hardware, as well as protecting against harm that may come via network access, data and code injection, and due to malpractice by operators, whether intentional, accidental, or due to them being tricked into deviating from secure procedures. The field is of growing importance due to the increasing reliance on computer systems and the Internet in most societies, wireless networks such as Bluetooth and Wi-Fi and the growth of "smart" devices, including smartphones, televisions and tiny devices as part of the Internet of Things.

Big Data

5.16 Dealing with unstructured and structured data, Data Science is a field that comprises of everything that related to data cleaning, preparation, and analysis. It is the combination of statistics, mathematics, programming, problem solving, capturing data in ingenious ways, the ability to look at things differently, and the activity of cleansing, preparing, and aligning the data. In simple terms, it is the umbrella of techniques used when trying to extract insights and information from data. The definition of Big Data, given by Gartner[6] is, "Big data is high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation". Data Analytics is the science of examining raw data with the purpose of drawing conclusions about that information and it involves applying an algorithmic or mechanical process to derive insights. It is used in a number of industries to allow the organisations and companies to make better decisions as well as verify and disprove existing theories or models.

[6] Gartner – an IT research company

Artificial Intelligence (AI)

5.17 Enterprises in major industries such as banking and finance, retail and marketing, as well as manufacturing, are already leveraging it for important & detailed tasks such as placing of financial market trades, communicating and answering to customer enquiries in human lingo, gathering market/customer intelligence, interpreting images and translating large volumes of data into useful trends, feedbacks and actionable insights for real-time strategy and operational planning. Since the change is inevitable and AI disruptions is increasing its impact exponentially and geometrically, enterprises now face with the question of whether they have aligned and integrated AI effectively or not. Hong Kong enterprises have been catching up on AI development and many servicing companies have continued to explore the opportunity to enhance their operation efficiencies by deploying AI solutions.

Cloud Computing

5.18 Cloud computing is the delivery of computing services—servers, storage, databases, networking, software, analytics, intelligence and more — over the Internet ("the cloud") to offer faster innovation, flexible resources and economies of scale. The user company typically pays only for cloud services used, helping lower the operating costs, using the infrastructure more efficiently and scale as the business needs change. Cloud computing eliminates the capital expense of buying hardware and software and setting up and running on-site datacenters—the racks of servers, the round-the-clock electricity for power and cooling, the IT experts for managing the infrastructure. Most cloud computing services are providing self service and on demand, so even vast amounts of computing resources can be provisioned in minutes, typically with just a few mouse clicks, giving businesses a lot of flexibility and taking the pressure off capacity planning. Many cloud providers offer a broad set of policies, technologies and controls that strengthen your security posture overall, helping protect your data, apps and infrastructure from potential threats. The benefits of cloud computing services include the ability to scale elastically, that means delivering the right amount of IT resources— computing power, storage, bandwidth right when it is needed and from the right geographic location. There are three different ways to deploy cloud services: on a public cloud, private cloud or hybrid cloud.

Smart City

5.19 The Smart City Blueprint for Hong Kong published in 2017 has set out more than 70 initiatives, including infrastructure projects such as eID, smart lamppost, a revamped Government's cloud infrastructure and a new big data analytics platform. An important objective in promoting smart city development is to enhance the Government's capability in innovation and the standard of city management.

5.20 The Smart City initiatives certainly will enhance the demand for IT professional to implement the initiatives and the policy includes:

(i) Smart Mobility
(ii) Smart Living
(iii) Smart Environment
(iv) Smart People
(v) Smart Government
(vi) Smart Economy

Virtual Reality/Augmented Reality (VR/AR)

5.21 Smartphones, coupled with headsets, have been the most common use of delivering VR experiences for the past few years. This has been the most accessible entry-point for consumer VR use. Virtual reality is a lot more mature than the existing augmented reality market. The required software tools and hardware platforms to create immersive VR experiences are already available. Virtual Reality is showing some effective industry use-cases as well, from real estate applications to tourism. Augmented Reality is already being utilised in industries including manufacturing, healthcare and logistics. Certainly, there is a growing demand for more advanced development for both hardware and software especially the animation algorithm for the technologies to be mature to be used in our daily lives.

Recommendations

5.22 Based on the short- to medium-term business outlook, and the manpower supply and demand situation derived from the survey findings, the Training Board recommends the following measures to all major stakeholders to meet the industry demand:

IT

(i) The stakeholders of the IT industry should raise the overall images/status of the industry to attract more people with good potential, particularly, the younger generation and collaborate with the IT professional bodies to launch promotion campaign to the students to arouse their interests in pursuing IT careers.

For Employers

Employers are recommended to:

(i) encourage their employees to take the various IT certified professional tests (e.g. Certified Information Systems Security Professional (CISSP) and the ISO27001 Lead Auditor Certification) and attend the specified training courses to meet the requirements for the certification.

(ii) equip their employees with the necessary skills and knowledge such as internet security and cloud computing and cultivate a life-long learning environment amongst the employees.

(iii) provide more support for the internship, e.g. mentorship, job shadowing, industrial attachment to enable students/trainees to gain practical working experiences in the workplace.

(iv) consider recruiting more experienced talents from overseas to train up the local IT workforce in the applications of advanced IT technologies through the Technology Talent Admission Scheme (Tech TAS) (www.itc.your.hk/en/techitas/).

For Employees

Employees are recommended to:

(i) make good use of the various government-subsidised training schemes, e.g. Reindustrialisation and Technology Training Programme (RTTP) and Continuing Education Fund (CEF), to enhance their skills and to keep abreast of the latest technologies.

(ii) keep updated of the technical knowhow of the new emerging technologies by different learning modes, including on-line certification courses in e-learning platforms.

For Training Providers

Training providers are recommended to:

(i) increase training places to cope with market needs and to enhance workers' skills, and by providing courses with emphasis on employability, IT emerging skills, especially the internet security, cloud computing technologies and data privacy regulation.

(ii) strengthen the collaboration with ASTRI and other leading technology companies to offer relevant educational programmes of advanced technologies (e.g. AI and Smart City) to the secondary students so that more students could be encouraged to study IT related programmes and choose IT as a career.

(iii) assist the IT employers to upgrade their employees in advanced IT skills. Retraining courses could be provided to the IT workforce timely to prepare them for the re-deployment in taking up duties related to the transformation of IT technologies.

(iv) explore to organise some awareness/appreciation courses of advanced IT technologies to the top management or middle management personnels to facilitate them to keep abreast of the applications and appreciate the benefits of bringing in such technologies in their companies.

(v) consider organising some pre-employment and upgrading IT courses to the youngsters with secondary school qualification such that they could be equipped with the IT skills to take up the operative and supporting duties.

R&D

(i) The training organisation or the Intellectual Property Department of the SAR Government should organise and offer more training courses related to Intellectual Property (IP) Management so that the relavant personnels will acquire the know-how of registration and application of IP rights.

(ii) More exchange forum and conference in specific technology areas should be organised in order for the R&D personnels to share and explore opportunities of collaboration for further development of their products and services.

(iii) R&D companies should strengthen their partnership with the public R&D Centers to reduce the time for product development by making use of the relevant technology licenses and making good use of the facilities of the testing laboratories of the Centers.

(iv) In line with the 2018 Policy Address to promote innovation and technology, more opportunities and incentives as well as support could be provided to the technology talents to set up their start-up companies.

(v) In order to attract foreign investors to set up their operations in Hong Kong, the Government should consider to take the initiatives in deploying more resources to train up R&D talents through the RTTP and promoting R&D activities in Hong Kong.

(vi) Manpower survey should be conducted periodically to keep track of the manpower demand and supply of the sector .

I. 報告摘要

背景

1.1 進行創新及科技業人力調查，旨在蒐集最新人力資料，以評估業界的人力及培訓需求。

1.2 調查於 **2018 年 4 月至 6 月**進行，本報告載述人力調查所得的結果。

調查範圍

1.3 調查覆蓋以下創新及科技行業及業務：

行業	業務	業務範圍
製造業	1	電腦及其周邊設備的製造及修理；電腦及電訊設備電子零件及組件的製造
	2	其他製造業（非資訊科技產品）
創新產品及服務業	3	創新產品及服務
電力、氣體燃料及水務	4	電力、燃氣及自來水供應
建造業	5	建造
零售批發及出入口貿易、飲食業及酒店業	6	電腦、電腦周邊設備及套裝軟件的出口貿易、進口批發、批發及零售
	7	其他出入口貿易（電腦、電腦周邊設備及套裝軟件的出入口貿易除外）
	8	其他批發及零售（電腦、電腦周邊設備及套裝軟件的批發及零售除外）；住宿及膳食服務活動

行業	業務	業務範圍
運輸及貨倉服務業	9	航空公司
	10	鐵路及纜索運輸；公共巴士服務；持牌及專營渡輪服務；汽車隧道、橋樑及高速公路營運者
	11	航空貨運代理服務
	12	其他運輸及貨倉服務
通訊服務業	13	互聯網接駁服務
	14	通訊服務（互聯網接駁服務除外）
金融、保險、 房地產及 商業服務業	15	本地銀行單位
	16	地產經紀及代理
	17	其他（金融、保險、房地產及商業服務）
資訊科技產品及 服務供應商	18	與資訊科技相關的產品及服務（包括顧問、軟件開發、軟件產品、軟件支援及修護服務；資料處理及編纂服務；電腦設備管理的工程及技術服務）
醫療及保健服務業	19	醫療、牙科及其他保健服務 （包括醫院管理局）
社區、社會及 個人服務業	20	大學及專上學院；科研機構；香港考試及評核局
	21	其他院校（大學及專上學院、香港考試及評核局除外）
	22	電影及其他娛樂服務；電視台、電台及製作室
	23	其他（社區、社會及個人服務）；香港生產力促進局；香港貿易發展局
數碼創意業	24	數碼創意業內其他相關機構
政府部門	25	政府部門

1.4 研發活動是 2018 年人力調查新增的範疇，旨在探討並了解香港的科研創新活動。本調查涵蓋的研發活動僅包括技術創新範疇（產品／程序創新）。本會把若干個或會進行研發活動的特定業務納入為調查補充樣本；因此，研發僱員的人力資料並非反映香港整體的創新情況。

1.5 研發活動分為兩個技能類別：「研究與開發（與資訊科技相關）」，僱員集中研發資訊科技相關項目（如：資訊通訊技術）；至於「研究與開發（與資訊科技不相關）」，僱員則集中研發其他領域項目（如：生物醫學技術、物料與精密工程）。此外，只有主力負責研發活動的全職僱員，其主要職務才會在人力資料反映出來。

調查方法

蒐集數據

1.6 本會共邀請了 1 753 間機構參與人力調查，當中 1 476 間採用分層隨機抽樣的統計方法選出；其餘 277 間為補充樣本。

1.7 數據蒐集於 2018 年 4 月至 6 月期間進行。在 1 753 間抽樣機構中，共有 944 間順利集得統計資料，另有 129 間不予回覆，回應率為 88%[1]。本會考慮以下因素：(i)各類業務機構的回應率令人滿意、(ii)知名及具規模的機構大多回覆了問卷，以及(iii)樣本結果可運用統計學方式倍大（第 1.4 段所述的研發補充樣本除外），總結本報告所載的調查結果大致可反映業內的整體人力情況。

1.8 本會採用一套有系統的調查問卷，透過電話或面見訪問抽樣機構蒐集資料。問卷分為 A 及 B 兩部分，分別調查「研究與開發」及「資訊科技」兩大範疇。每部分按主要職務蒐集各項人力資料，包括僱員、自由工作者及空缺數目。

1.9 本會訂明業內各項主要職務，並詳述每個工種的工作說明。然而，各機構採用的職稱與表列的主要職務名稱或有所不同，因此本會請受訪機構按照工作說明填報主要職務的人力資料。

1.10 調查各階段採取多項措施，確保過程順利和集得的數據準確無誤，當中包括：給予調查人員全面培訓、由 VTC 的專責團隊核對所有收回的問卷、利用電腦程式核實蒐集所得的資料。

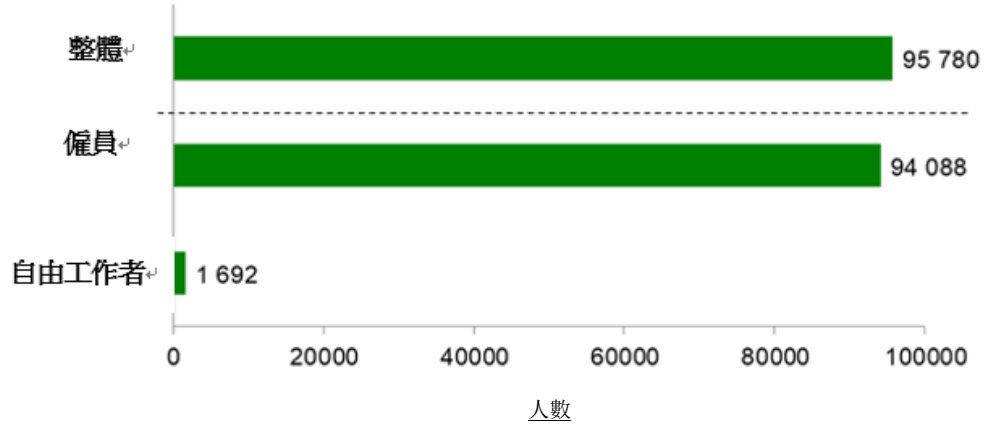
[1] 其餘個案視為無效，包括已停止運作的機構，以及並無聘請資訊科技及研發員工的機構。

調查結果摘要

I. 資訊科技業

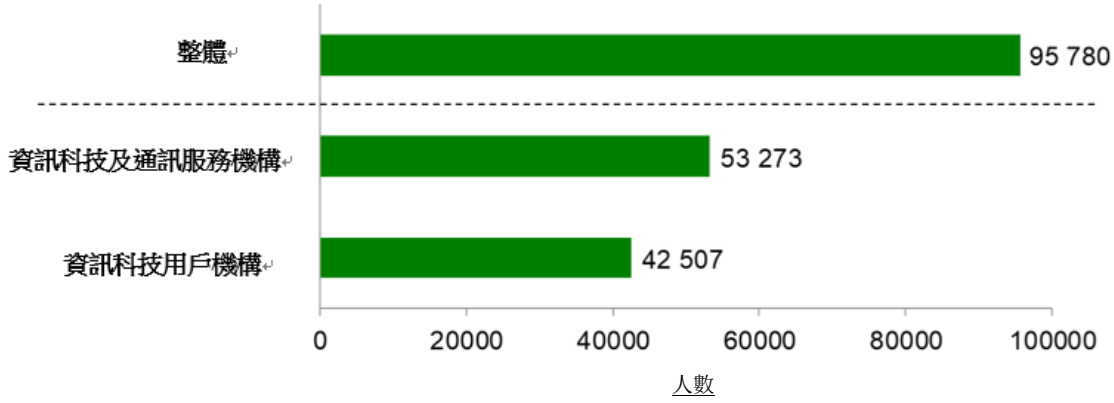
1.11 調查期間，本港共有 95 780 人從事資訊科技業的主要職務，當中有 94 088 名僱員及 1 692 名自由工作者。

圖 1.1 資訊科技僱員和自由工作者人數



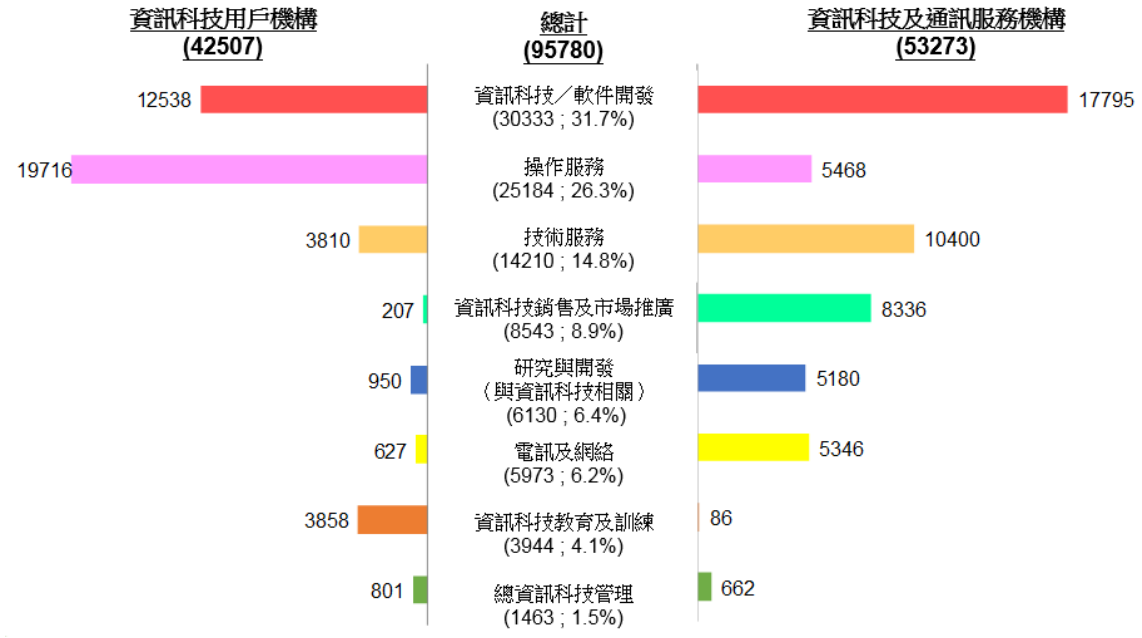
1.12 95 780 名資訊科技僱員（包括自由工作者）中，53 273 人(55.6%)受僱於資訊科技及通訊服務機構；42 507 人(44.4%)任職資訊科技用戶機構。

圖 1.2 資訊科技僱員和自由工作者人數（按機構類別劃分）



1.13 按技能類別劃分，30 333 人(31.7%)從事資訊科技／軟件開發，25 184 人(26.3%)負責操作服務，14 210 人(14.8%)提供技術服務，8 543 人(8.9%)任職資訊科技銷售及市場推廣，6 130 人(6.4%)從事研究與開發（與資訊科技相關），5 973 人(6.2%)從事電訊及網絡，3 944 人(4.1%)從事資訊科技教育及訓練，1 463 人(1.5%)負責總資訊科技管理。

圖 1.3　　各技能類別人力結構



註：
1)　　(　)　括弧內數字代表僱員與自由工作者人數之總和，以及佔總人力的百分比。
2)　　機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

1.14　　資訊科技業的人力過去多年呈上升趨勢。業內僱員數目（包括自由工作者）在過去兩年增加 7 986 人（9.1%），主要由於以下技能類別的人手增加：操作服務 (多 5 519 人)、資訊科技／軟件開發 (多 2 841 人)、資訊科技銷售及市場推廣 (多 1 366 人)。然而，技術服務僱員及自由工作者人數有所減少（少 1 490 人），值得留意。本會觀察到，資訊科技服務供應商透過擴充資訊科技／軟件開發團隊，以提升產品／服務。另一方面，資訊科技用戶機構則精簡資訊科技開發人手，並把工作外判予資訊科技服務供應商。

表 1.1　　比較 2016 年與 2018 年各技能類別和機構類別
資訊科技僱員人數變化（包括自由工作者）

	資訊科技及通訊服務機構			資訊科技用戶機構			整體		
技能類別	**2016**	**2018**	**升／跌幅**	**2016**	**2018**	**升／跌幅**	**2016**	**2018**	**升／跌幅**
總資訊科技管理	448	662	+214 *(+47.8%)*	1 029	801	-228 *(-22.2%)*	1 477	1 463	-14 *(-0.9%)*
資訊科技／軟件開發*	16 281	22 975	+6 694 *(+41.1%)*	17 341	13 488	-3 853 *(-22.2%)*	33 622	36 463	+2 841 *(+8.4%)*
電訊及網絡	5 036	5 346	+310 *(+6.2%)*	1 390	627	-763 *(-54.9%)*	6 426	5 973	-453 *(-7.0%)*
技術服務	10 483	10 400	-83 *(-0.8%)*	5 217	3 810	-1 407 *(-27.0%)*	15 700	14 210	-1 490 *(-9.5%)*
操作服務	5 241	5 468	+227 *(+4.3%)*	14 424	19 716	+5 292 *(+36.7%)*	19 665	25 184	+5 519 *(+28.1%)*
資訊科技教育及訓練	158	86	-72 *(-45.6%)*	3 569	3 858	+289 *(+8.1%)*	3 727	3 944	+217 *(+5.8%)*
資訊科技銷售及市場推廣	7 025	8 336	+1 311 *(+18.7%)*	152	207	+55 *(+36.2%)*	7 177	8 543	+1 366 *(+19.0%)*
總計	**44 672**	**53 273**	**+8 601** ***(+19.3%)***	**43 122**	**42 507**	**-615** ***(-1.4%)***	**87 794**	**95 780**	**+7 986** ***(+9.1%)***

註：
1)　(　)代表與 2016 年相比，同一技能類別和機構類別中資訊科技僱員人數（包括自由工作者）的百分比變化。
2)　*有關 2018 年調查數字，「研究與開發（與資訊科技相關）」包括在「資訊科技／軟件開發」內。
3)　機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

1.15　　調查期間，資訊科技業有 3 231 個空缺*；換言之，空缺率佔現有資訊科技職位的 3.3%。空缺集中在資訊科技／軟件開發（1 502 個），其次是操作服務（635 個）和技術服務（399 個）。

表 1.2　　各行業及技能類別現有資訊科技職位空缺額

(i)　資訊科技職位空缺（不包括研究與開發（與資訊科技相關））

行業	總資訊科技管理	資訊科技／軟件開發	電訊及網絡	技術服務	操作服務	資訊科技教育及訓練	資訊科技銷售及市場推廣	總計
製造業	- -	12 *(3.6%)*	- -	36 *(5.9%)*	18 *(1.6%)*	- -	- -	**66**
創新產品及服務業	- -	25 *(6.8%)*	1 *(7.7%)*	- -	5 *(4.3%)*	- -	9 *(3.4%)*	**40**
電力、氣體燃料及水務	- -	4 *(2.3%)*	- -	6 *(8.3%)*	- -	- -	- -	**10**
建造業	- -	9 *(6.4%)*	- -	- -	36 *(6.4%)*	- -	- -	**45**
零售批發及出入口貿易、飲食業及酒店業	2 *(0.8%)*	86 *(3.0%)*	2 *(0.9%)*	33 *(1.3%*	177 *(2.6%)*	- -	66 *(1.7%)*	**366**
運輸及貨倉服務業	- -	3 *(0.4%)*	- -	- -	6 *(0.5%)*	- -	- -	**9**
通訊服務業	- -	25 *(3.7%)*	37 *(2.4%)*	12 *(0.9%)*	11 *(1.5%)*	- -	6 *(0.4%)*	**91**
金融、保險、房地產及商業服務業	- -	267 *(5.4%)*	7 *(4.0%)*	49 *(2.8%)*	134 *(2.4%)*	- -	- -	**457**
資訊科技產品及服務供應商	- -	880 *(5.4%)*	100 *(2.7%)*	254 *(3.5%)*	95 *(2.4%)*	- -	205 *(6.4%)*	**1534**
醫療及保健服務業	- -	24 *(2.7%)*	- -	- -	11 *(5.8%)*	- -	- -	**35**
社區、社會及個人服務業	2 *(1.2%)*	22 *(1.4%)*	2 *(1.7%)*	5 *(0.7%)*	134 *(2.9%)*	8 *(0.2%)*	1 *(8.3%)*	**174**
數碼創意業	- -	47 *(8.9%)*	- -	- -	- -	- -	4 *(10.3%)*	**51**
政府部門	11 *(8.0%)*	98 *(4.7%)*	4 *(2.6%)*	4 *(2.8%)*	8 *(1.0%)*	- -	- -	**125**
總計	**15** ***(1.0%)***	**1 502** ***(4.7%)***	**153** ***(2.5%)***	**399** ***(2.7%)***	**635** ***(2.5%)***	**8** ***(0.2%)***	**291** ***(3.3%)***	**3 003**

(ii) 資訊科技職位空缺（僅限研究與開發（與資訊科技相關））

行業	空缺額	
創新產品及服務業	1	*(0.1%)*
資訊科技產品及服務供應商	189	*(4.3%)*
大學及專上學院；科研機構	28	*(3.6%)*
其他	10	*(2.7%)*
總計	**228**	***(3.6%)***

註：　( ) 佔各行業及技能類別中資訊科技職位（即僱員及自由工作者與空缺之總和）的百分比。

* 空缺包括研究與開發（與資訊科技相關）。

1.16 與 2016 年調查結果相比，空缺率由 2.9%（2 629 個空缺）微升至 3.3%（3 231 個空缺）。當中，數碼創意業(6.9%)和建造業(5.7%)的空缺率特別高，這或許是由於業界對用戶介面設計及建築資訊模型專才的需求增加所致。

表1.3 比較2018年與2016年各行業資訊科技職位空缺

行業	2018 空缺	2018 空缺率	2016 空缺	2016 空缺率
製造業	72	3.0%	76	2.5%
創新產品及服務業*	41	2.5%	N/A	N/A
電力、氣體燃料及水務	10	3.0%	3	0.8%
建造業	45	5.7%	15	3.1%
零售批發及出入口貿易、飲食業及酒店業	366	2.2%	165	1.0%
運輸及貨倉服務業	9	0.4%	7	0.4%
通訊服務業	91	1.6%	193	3.6%
金融、保險、房地產及商業服務業	457	3.6%	413	2.6%
資訊科技產品及服務供應商	1 723	4.4%	1 269	4.1%
醫療及保健服務業	35	3.2%	56	4.9%
社區、社會及個人服務業	202	1.7%	337	3.3%
數碼創意業	54	6.9%	21	3.3%
政府部門	126	3.8%	74	2.6%
總計	**3 231**	**3.3%**	**2 629**	**2.9%**

註：

1) 空缺率是空缺額佔資訊科技職位數目（即僱員及自由工作者人數與空缺額之總和）的百分比。

2) * 「創新產品及服務業」是 2018 年調查新納入的行業。

1.17　　調查期間共有 99 011 個資訊科技職位，包括現有僱員、自由工作者和職位空缺。在不同主要職務中，用戶支援／統籌員佔資訊科技人力需求比率最高(19.3%)，其次是程式編製員／分析程式員／軟件工程師(17.5%)和銷售／市場代表／客戶經理／產品推廣代表(7.1%)。

表 1.4　　各主要職務資訊科技人力需求比率分布

主要職務	資訊科技僱員（包括自由工作者）	資訊科技職位空缺	總資訊科技人力需求
資訊科技總監／管理資訊系統總監／資訊科技主管／首席資訊主任	1.4%	0.5%	**1.3%**
首席技術總監	0.2%	-	**0.2%**
系統開發經理	1.8%	1.2%	**1.8%**
資訊科技建築師／商業分析員	0.9%	0.6%	**0.9%**
項目經理／項目組長	4.2%	3.0%	**4.1%**
用戶體驗設計師	2.8%	3.8%	**2.9%**
程式編製員／分析程式員／軟件工程師	17.0%	31.5%	**17.5%**
網站設計員／開發員	1.4%	1.5%	**1.4%**
品質檢查專責經理／軟件品質檢查專責經理／工程師／電腦系統審核經理	0.6%	1.6%	**0.7%**
軟件產品工程師	0.5%	0.2%	**0.4%**
軟件／固件產品設計員／產品分析員／開發員／軟件產品經理	0.9%	1.0%	**0.9%**
技術撰稿員	0.2%	0.2%	**0.2%**
電腦遊戲設計／美術／開發員／電腦圖像設計／美術員／電腦動畫設計師／網頁圖像設計師／視覺效果設計師	1.5%	1.9%	**1.5%**
電訊經理／網絡經理	0.3%	0.2%	**0.3%**
電訊顧問／網絡顧問	0.9%	0.2%	**0.9%**
電訊工程師／網絡工程師	2.4%	4.0%	**2.5%**
網絡管理主任／網絡主任	2.6%	0.4%	**2.5%**
電腦保安專責經理／資訊保安專責經理／資訊保安主任	1.2%	1.1%	**1.2%**
資料庫管理主任／數據庫管理主任／資料庫設計員	0.7%	0.3%	**0.7%**
系統程式編製員（機構內部／電腦供應商）／系統工程師	4.4%	2.3%	**4.3%**
客戶工程經理／服務支援經理	0.9%	1.1%	**0.9%**
客戶服務工程師／實地服務工程師	1.5%	1.5%	**1.5%**
實地服務技術員	6.2%	6.1%	**6.2%**
電腦操作經理	1.0%	0.2%	**1.0%**
求助台主任	0.4%	0.3%	**0.4%**
求助台服務員／客戶服務主任／服務員	1.7%	1.3%	**1.7%**
電腦操作主任／操作支援主任	1.4%	1.0%	**1.4%**
電腦操作員／系統操作員	2.4%	0.6%	**2.4%**
用戶支援／統籌員	19.4%	16.2%	**19.3%**
講師／教授／訓練主任	2.5%	0.2%	**2.5%**
資訊科技訓練員／資訊科技教導員	1.6%	-	**1.5%**
銷售／市場總監／客戶總監／銷售／市場經理	1.8%	1.9%	**1.8%**
銷售／市場代表／客戶經理／產品推廣代表	7.1%	7.1%	**7.1%**
研發研究員／研發科學家／研發工程師	2.5%	1.9%	**2.5%**
研發技術員	2.8%	4.9%	**2.9%**
研發輔助人員	1.0%	0.2%	**1.0%**
總計	**100.0%**	**100.0%**	**100.0%**

註：　因四捨五入關係，相加後的百分比未必等於 100%。

1.18 調查期間，承判商公司共調派 4 148 名資訊科技人員到不同機構（資訊科技及通訊服務機構調派 578 人，資訊科技用戶機構調派 3 570 人）。以借調資訊科技人員與資訊科技僱員的比率而言，醫療及保健服務業(46.2%)和政府部門(43.6%)所錄得的比率相對較高。

表 1.5 承判商公司調派資訊科技人員數目及借調相關人員的公司數目

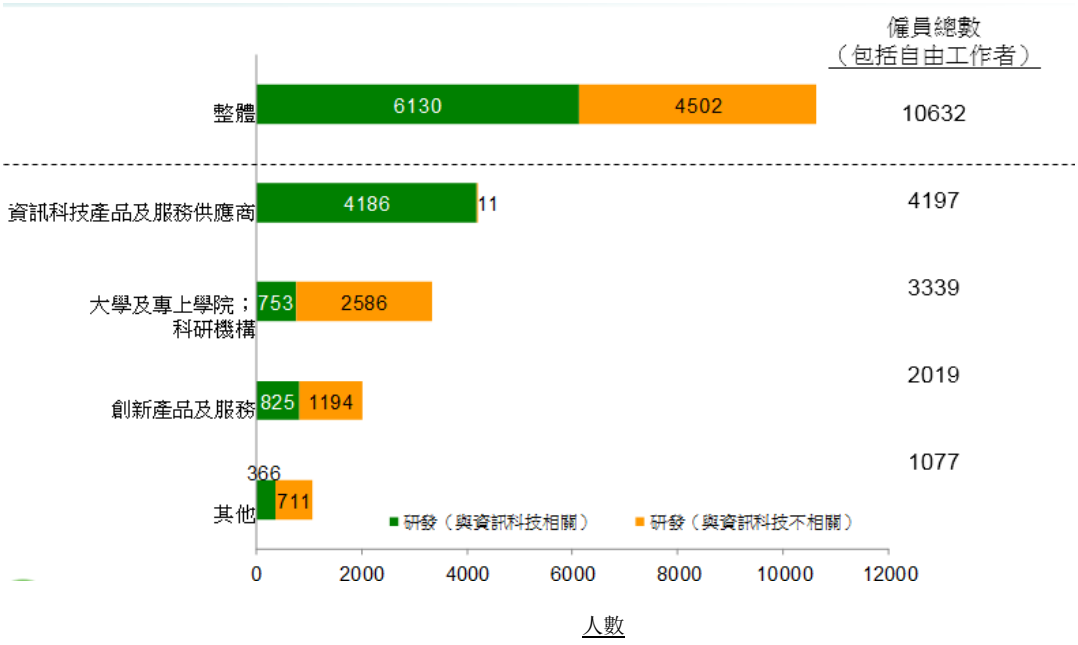
行業	承判商公司調派的資訊科技人員人數	調查時資訊科技僱員和自由工作者人數	借調的資訊科技人員佔資訊科技僱員人數的比率	從承判商公司借調資訊科技人員的公司數目
資訊科技及通訊服務機構				
製造業（資訊科技產品）	20	1 016	2.0%	2
創新產品及服務業	-	477	-	-
電腦產品及套裝軟件的零售批發及出入口貿易	462	6 874	6.7%	13
資訊科技產品及服務供應商	95	33 553	0.3%	52
數碼創意業	1	560	0.2%	1
通訊服務業	-	5 613	-	-
小計	***578***	***48 093***	***1.2%***	***68***
資訊科技用戶機構				
其他製造業（非資訊科技產品）	-	1 216	-	-
創新產品及服務業	-	279	-	-
電力、氣體燃料及水務	-	320	-	-
建造業	20	738	2.7%	3
零售批發及出入口貿易、飲食業及酒店業	274	9 428	2.9%	2
運輸及貨倉服務業	254	2 225	11.4%	40
金融、保險、房地產及商業服務業	327	12 138	2.7%	39
醫療及保健服務業	492	1 066	46.2%	1
社區、社會及個人服務業	819	10 974	7.5%	191
政府部門	1 384	3 173	43.6%	34
小計	***3 570***	***41 557***	***8.6%***	***310***
總計	**4 148**	**89 650**	**4.6%**	**378**

II. 研究與開發（研發）

1.19　　調查所涵蓋的公司當中，有 10 632 人從事研究與開發活動，其中包括 10 564 名僱員和 68 名自由工作者。

1.20　　從事研究與開發活動的 10 632 名僱員（包括自由工作者）當中，與資訊科技相關的有 6 130 人(57.7%)，與資訊科技不相關的有 4 502 人(42.3%)。

圖 1.4　　研發僱員及自由工作者人數（按業務劃分）



1.21　　僱主填報調查期間有 447 個研發空缺，佔現有研發職位 4.0%，當中資訊科技產品及服務供應商的空缺額最多（189 個與資訊科技相關空缺），其次是大學及專上學院與科研機構（117 個空缺與資訊科技不相關；28 個與資訊科技相關）。

表 1.6　　調查期間各業務的研發空缺額

技能類別	創新產品及服務	資訊科技產品及服務供應商	大學及專上學院科研機構	其他	整體
研發（與資訊科技不相關）	48 *(3.9%)*	- *(-)*	117 *(4.3%)*	54 *(7.1%)*	219 *(4.6%)*
研發（與資訊科技相關）	1 *(0.1%)*	189 *(4.3%)*	28 *(3.6%)*	10 *(2.7%)*	228 *(3.6%)*
總計（研發）	**49** ***(2.4%)***	**189** ***(4.3%)***	**145** ***(4.2%)***	**64** ***(5.6%)***	**447** ***(4.0%)***

註：
( )　佔研發職位數目（僱員及自由工作者人數與空缺額之總和）的百分比，按技能類別劃分。

2019 年至 2022 年人力推算

1.22 根據推算的平均每年人力增長和估計流失率（3%），並考慮資訊科技業最新發展及業內委員的經驗，本會估計 2019 年至 2022 年間各技能類別每年需額外培訓的僱員人數，載於表 1.7。

表 1.7 估計 2019 年至 2022 年間每年需額外培訓各技能類別資訊科技僱員人數

技能類別	估計 2019-2022 年每年需額外培訓人數（資訊科技僱員數目）
資訊科技管理	140 – 170
資訊科技／軟件開發 電訊及網絡 技術服務 資訊科技銷售及市場推廣 資訊科技教育及訓練	3 510 – 4 290
操作服務	1 600 – 1 950
總計	5 250 – 6 410

註: (1) 在 2018 年的調查，各技能類別的資訊科技管理職稱全歸入「資訊科技管理 」類別。
(2) 因四捨五入關係，各項數字相加或與總計數字略有出入。

主要結論及建議

1.23 近來醞釀的貿易戰、英國脫歐及部分歐洲國家出現債務危機，加上內地經濟結構轉型，種種因素使全球經濟前景不明朗，香港來年經濟可能較過去多年放緩，估計增長率為 3-4%。然而，香港仍然具備競爭優勢。香港的資訊及通訊科技基建完善，數碼化準備程度及互聯網接達能力[2]都在全球名列前茅。香港政府推出多項措施，促進資訊及通訊科技業發展，包括撥款資助、加強基建、促進國際合作及人才培育。2017 年 12 月公布的「香港智慧城市藍圖」，勾劃政府未來五年的智慧城市發展計劃，冀透過創新及科技增強香港可持續發展的能力。整體而言，本地公司進行數碼轉型或採用新科技為業務增值，會帶動未來數年對資訊科技服務的需求，使行業持續增長。

[2] 香港貿易發展局經貿研究報告：香港資訊及通訊科技業概況，2018年7月5日發表。

建議

1.24 本會根據短至中期行業前景展望，以及按調查結果推算的市場人力供求情況，建議業界各持份者可採取以下措施，以滿足行業需求：

資訊科技業

(i) 資訊科技業持份者應提高業界整體形象／地位，吸引更多具潛質的人士，尤其是年輕一代入行。另可與資訊科技專業團體合作向學生推行宣傳計劃，激發他們投身資訊科技業的興趣。

<u>供僱主參考</u>

建議僱主：

(i) 鼓勵僱員參加不同的資訊科技專業認證考試（例如：資訊系統安全認證專家[CISSP]和 ISO27001 主任審核員證書），並參與指定的培訓課程，以達到認證要求。

(ii) 讓僱員掌握所需的技能與知識，例如網絡保安和雲端運算，並提倡僱員終身學習的風氣。

(iii) 為實習培訓計劃提供更多支援，例如師友輔導、工作影子、工作實習等，協助學生／學員取得職場實務工作經驗。

(iv) 考慮透過科技人才入境計劃(www.itc.your.hk/en/techitas/)，從海外招聘更多富經驗的專才，培訓本地資訊科技人員應用先進行業技術。

<u>供僱員參考</u>

建議僱員：

(i) 善用不同的政府資助培訓計劃，例如再工業化及科技培訓計劃[RTTP]和持續進修基金[CEF]，協助提升個人技能及緊貼先進科技發展。

(ii) 透過不同的學習模式，包括電子學習平台的網上認證課程，掌握新興技術以提升個人技術水平。

<u>供培訓機構參考</u>

建議培訓機構：

(i) 配合市場需要增加培訓名額，協助提升僱員技能；開辦以加強就業能力、新興資訊科技技術為主的課程，特別是網絡保安、雲端運算技術和資料私隱守則。

(ii) 加強與應科院及其他大型科技企業的合作，為中學生開辦有關先進技術（例如人工智能與智慧城市）的課程，從而鼓勵更多學生修讀資訊科技相關的課程，並選擇投身資訊科技業。

(iii) 協助資訊科技業僱主培養僱員掌握先進技能；並為資訊科技人員適時提供再培訓課程，裝備他們因應資訊科技技術變化，承擔新的任務。

(iv) 探討為高中層管理人員籌辦課程加強對資訊科技先進技術的認知，協助他們了解技術應用，並肯定引入相關技術可為機構帶來的效益。

(v) 考慮為具中學教育程度的青年人開辦職前資訊科技提升課程，使他們掌握所需技能，以備從事操作及支援職務。

研究與開發

(i) 培訓機構或香港特別行政區知識產權署應籌辦及提供更多有關知識產權[IP]管理的培訓課程，讓相關人員獲取有關註冊申請知識產權的知識。

(ii) 就特定技術範疇舉辦更多交流論壇及會議，讓研發人員分享其產品服務，進一步探索合作發展的機會。

(iii) 研發公司應與公營研發中心加強合作，借助相關技術牌照，以及善用中心的測試實驗室設施，以縮短產品開發時間。

(iv) 配合 2018 年《施政報告》倡議推動創新科技，為技術人才提供更多機會、補助與支援，鼓勵他們成立初創公司。

(v) 為了吸引外國投資者在香港成立辦事處，政府應考慮主動動用更多資源，透過再工業化及科技培訓計劃，培育研究與開發人才，並推動香港研發活動的發展。

(vi) 定期進行人力調查，了解業界的人力供求情況。

II. 緒論

背景

2.1 創新及科技訓練委員會（下稱「本會」）由職業訓練局[VTC]成立，職責之一是確定創新及科技業的人力需求，並向局方提供建議，配合需求發展培訓設施。本會成員由各大行業商會、職工會、專業團體、教育培訓機構及政府部門提名出任。本報告*附錄 1* 及*附錄 2* 分別載列本會的成員組合和職權範圍。

2.2 本會依據職權範圍，於 **2018 年 4 月至 6 月**進行創新及科技業 2018 年人力調查，蒐集最新人力資料，以評估業界的人力及培訓需求。本報告載述人力調查所得的結果。

人力調查目的

2.3 人力調查旨在蒐集創新及科技業的最新人力資料，尤其重於以下幾方面：

(i) 蒐集創新及科技行業內主要職務的最新人力資料；

(ii) 評估技術人力結構；

(iii) 預測未來短期的培訓需求；以及

(iv) 向局方提出發展培訓策略的建議，以配合需求。

調查範圍

2.4　　調查覆蓋以下創新及科技行業及業務：

行業	業務	業務範圍
製造業	1	電腦及其周邊設備的製造及修理；電腦及電訊設備電子零件及組件的製造
	2	其他製造業（非資訊科技產品）
創新產品及服務業	3	創新產品及服務
電力、氣體燃料及水務	4	電力、燃氣及自來水供應
建造業	5	建造
零售批發及出入口貿易、飲食業及酒店業	6	電腦、電腦周邊設備及套裝軟件的出口貿易、進口批發、批發及零售
	7	其他出入口貿易（電腦、電腦周邊設備及套裝軟件的出入口貿易除外）
	8	其他批發及零售（電腦、電腦周邊設備及套裝軟件的批發及零售除外）；住宿及膳食服務活動
運輸及貨倉服務業	9	航空公司
	10	鐵路及纜索運輸；公共巴士服務；持牌及專營渡輪服務；汽車隧道、橋樑及高速公路營運者
	11	航空貨運代理服務
	12	其他運輸及貨倉服務
通訊服務業	13	互聯網接駁服務
	14	通訊服務（互聯網接駁服務除外）
金融、保險、房地產及商業服務業	15	本地銀行單位
	16	地產經紀及代理
	17	其他（金融、保險、房地產及商業服務）

行業	業務	業務範圍
資訊科技產品及服務供應商	18	與資訊科技相關的產品及服務（包括顧問、軟件開發、軟件產品、軟件支援及修護服務；資料處理及編纂服務；電腦設備管理的工程及技術服務）
醫療及保健服務業	19	醫療、牙科及其他保健服務 （包括醫院管理局）
社區、社會及個人服務業	20	大學及專上學院；科研機構；香港考試及評核局
	21	其他院校（大學及專上學院、香港考試及評核局除外）
	22	電影及其他娛樂服務；電視台、電台及製作室
	23	其他（社區、社會及個人服務）；香港生產力促進局；香港貿易發展局
數碼創意業	24	數碼創意業內其他相關機構
政府部門	25	政府部門

抽樣設計

2.5 抽樣設計及篩選程序由香港特別行政區政府統計處（下稱「統計處」）與 VTC 合作進行。為確保抽樣具代表性，以便按機構組別進行分析，本會共邀請了 1 753 間機構參與人力調查，當中 1 476 間由統計處採用分層抽樣的統計科學方法（分為行業、業務及公司規模三個層級），從機構單位記錄庫[3]內選出；其餘 277 間為補充樣本，屬其他業務性質但有聘請創新及科技僱員的知名公司、從事數碼創意業或是相關政府部門，由本會建議納入調查內。

問卷設計

2.6 本會採用一套有系統的調查問卷蒐集資料。問卷分為 A 及 B 兩部分，分別調查「研究與開發」及「資訊科技」兩大範疇。每部分按主要職務蒐集各項人力資料，包括僱員、自由工作者及空缺數目。

2.7 問卷樣本、附註和主要職務工作說明載於*附錄 3*。

數據蒐集方法

2.8 本會準備調查文件，內載邀請函、調查問卷、附註和主要職務工作說明表，並以郵遞／電郵或親自派送往各間獲邀參與調查的機構，請負責人提供機構在調查期間的人力資料。

[3] 政府統計處備有一個電腦化機構單位記錄庫，載有本港約400 000個活躍機構單位的資料。政府統計處根據各項統計調查的結果及有關政府部門的行政紀錄，按季更新記錄庫內的資料。

2.9　本會訂明業內各項主要職務，並詳述每個工種的工作說明。儘管如此，各機構採用的職稱與表列的主要職務名稱不盡相同，因此本會請受訪機構按照工作說明填報主要職務的人力資料。

2.10　調查期間，統計員透過電話聯絡或親往拜訪個別機構，協助受訪者填寫問卷或收集已填妥的問卷。

質素控制措施

2.11　本會採取多項措施，確保蒐集調查數據的質素，當中包括：調查前的準備工作、給予調查人員全面培訓、監察調查工作進度、採取措施提高回覆率、核對填妥的問卷、檢查重複輸入的數據、核實蒐集所得的資料。

調查期及訪問結果

2.12　本會於 2018 年 4 月至 6 月期間蒐集數據。在 1 753 間抽樣機構中，共有 944 間順利集得統計資料，另有 129 間不予回覆，有效回應率為 88%[4]。本會考慮以下因素：(i)各類業務機構的回應率令人滿意、(ii)知名及具規模的機構大多回覆了問卷，以及(iii)樣本結果可運用統計學方式倍大（第 1.4 段所述的研發補充樣本除外），總結本報告所載的調查結果大致可反映業內的整體人力情況。個別行業錄得的回覆率亦足以為各行業提供具意義的分類統計資料*（表 2.1）*。

[4] 其餘個案視為無效，包括已停止運作的機構，以及並無聘請資訊科技及研發員工的機構。

表2.1　各行業成功受訪機構數目

行業	抽樣機構數目	回覆率
整體	1 753	88.0%
製造業	104	88.3%
創新產品及服務業	109	88.4%
電力、氣體燃料及水務	6	80.0%
建造業	71	97.2%
零售批發及出入口貿易、 飲食業及酒店業	223	87.0%
運輸及貨倉服務業	130	90.9%
通訊服務業	104	91.7%
金融、保險、房地產及 商業服務業	205	71.2%
資訊科技產品及服務供應商	397	89.7%
醫療及保健服務業	36	83.3%
社區、社會及個人服務業	210	90.1%
數碼創意業	78	94.6%
政府部門	80	91.7%

III. 調查結果

I. 資訊科技業

i. 現有僱員

1) 機構類別

3.1 調查期間，本港共有 95 780 人從事資訊科技業的主要職務，當中有 94 088 名僱員及 1 692 名自由工作者。

3.2 94 088 名資訊科技僱員中，資訊科技及通訊服務機構的僱員（52 759 人）略多於資訊科技用戶機構的僱員（41 329 人）。表 3.1 按機構和技能類別列出資訊科技僱員和自由工作者人數。*附錄 4* 按行業／業務及技能類別，詳細分析相關調查結果。

3.3 此外，有 1 178 名自由工作者受僱於資訊科技用戶機構，514 名自由工作者受僱於資訊科技及通訊服務機構。

表 3.1 資訊科技僱員和自由工作者人數（按機構及技能類別劃分）

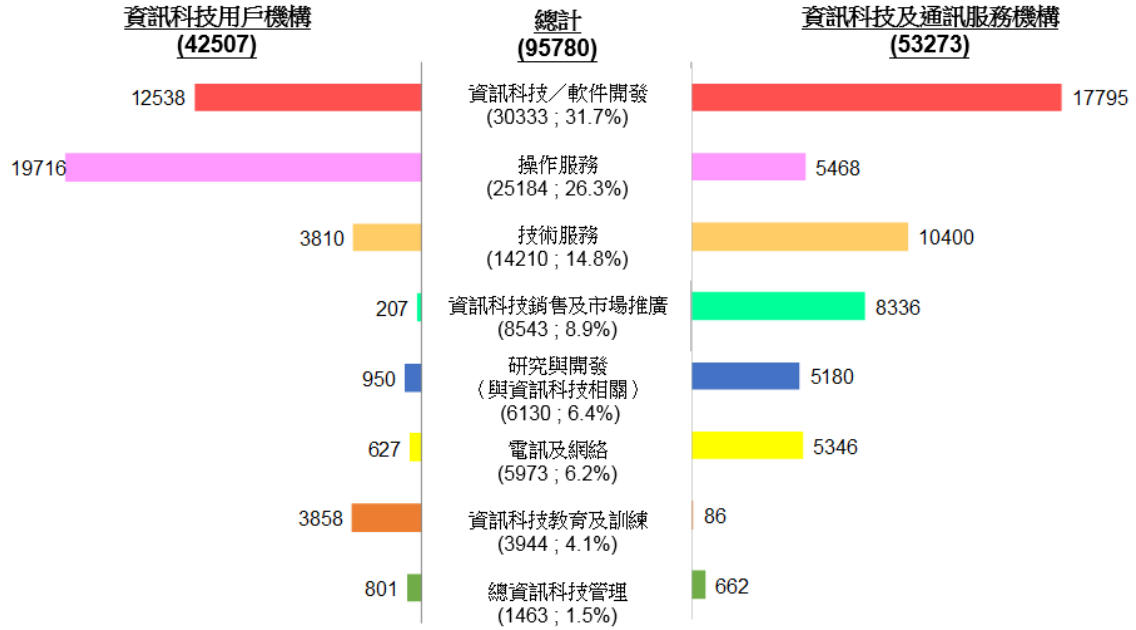
	資訊科技及通訊服務機構			資訊科技用戶機構			整體		
技能類別	EM	FL	小計	EM	FL	小計	EM	FL	小計
總資訊科技管理	662	-	**662**	801	-	**801**	1 463	-	**1 463**
資訊科技／軟件開發	17 751	44	**17 795**	12 480	58	**12 538**	30 231	102	**30 333**
電訊及網絡	5 346	-	**5 346**	619	8	**627**	5 965	8	**5 973**
技術服務+	10 244	156	**10 400**	3 796	14	**3 810**	14 040	170	**14 210**
操作服務	5 157	311	**5 468**	18 630	1 086	**19 716**	23 787	1 397	**25 184**
資訊科技教育及訓練	86	-	**86**	3 848	10	**3 858**	3 934	10	**3 944**
資訊科技銷售及市場推廣	8 335	1	**8 336**	205	2	**207**	8 540	3	**8 543**
研究與開發（與資訊科技相關）	5 178	2	**5 180**	950	-	**950**	6 128	2	**6 130**
總計	52 759	514	**53 273 [55.6%]**	41 329	1 178	**42 507 [44.4%]**	94 088	1 692	**95 780**

註：
1) EM 資訊科技僱員人數（不包括自由工作者）。
2) FL 自由工作者人數。
3) + 「技術服務」包括「資訊科技保安」、「資料庫」、「系統程式編製」和「實地支援」等技能類別。
4) [ ] 佔所有行業資訊科技僱員及自由工作者總數的百分比。
5) 機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

3.4　　按技能類別劃分，30 333 人(31.7%)從事資訊科技／軟件開發，25 184 人(26.3%)從事操作服務，14 210 人(14.8%)從事技術服務，8 543 人(8.9%)從事資訊科技銷售及市場推廣，6 130 人(6.4%)從事研究與開發（與資訊科技相關），5 973 人(6.2%)從事電訊及網絡，3 944 人(4.1%)從事資訊科技教育及訓練，1 463 人(1.5%)從事總資訊科技管理。

3.5　　圖 3.1 顯示資訊科技及通訊服務機構中，大部分僱員從事資訊科技／軟件開發、技術服務、資訊科技銷售及市場推廣；至於資訊科技用戶機構，超過 75%僱員從事資訊科技／軟件開發和操作服務。

圖 3.1　　各技能類別人力結構（2018 年 4 月）



註：

1)　(　)　括弧內數字代表僱員與自由工作者人數之總和，以及佔總人力的百分比。

2)　機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

3.6 與 2016 年調查相比，資訊科技業僱員總數由 87 794 增至 95 780 人，升幅為 9.1%。資訊科技及通訊服務機構的僱員人數大幅增加 8 601 人；但自由工作者人數則略減 183 人。資訊科技用戶機構的僱員和自由工作者人數均沒有顯著變化。*附錄 5* 按機構類別及業務，詳細分析有關調查結果。

表 3.2 比較 2016 年與 2018 年各機構類別資訊科技僱員人數（包括自由工作者）

	資訊科技及通訊服務機構		資訊科技用戶機構		整體	
	2016	**2018**	**2016**	**2018**	**2016**	**2018**
總計	**44 672**	**53 273** ***(+19.3%)***	**43 122**	**42 507** ***(-1.4%)***	**87 794**	**95 780** ***(+9.1%)***
- *僱員*	*43 975*	*52 759*	*41 971*	*41 329*	***85 946***	***94 088***
- *自由工作者*	*697*	*514*	*1 151*	*1 178*	***1 848***	***1 692***

註：

1) ( ) 代表對比上次調查的百分比變化。

2) 機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

3.7 資訊科技業僱員總數由 2016 年 4 月 87 794 人，增至 2018 年 4 月 95 780 人，即增加 7 986 名僱員及自由工作者，增幅為 9.1%。資訊科技業僱員及自由工作者人數錄得增幅的技能類別主要包括：操作服務（共增加 5 519 人）；資訊科技／軟件開發（共增加 2 841 人）；資訊科技銷售及市場推廣（共增加 1 366 人）。然而，值得留意的是，技術服務僱員及自由工作者人數有所減少（減少 1 490 人），詳見表 3.3。

3.8 資訊科技及通訊服務機構的僱員及自由工作者增加 8 601 人，增幅為 19.3%，僱員及自由工作者錄得增長的技能類別主要是：資訊科技／軟件開發（增加 6 694 人）、資訊科技銷售及市場推廣（增加 1 311 人）。

3.9 至於資訊科技用戶機構的僱員及自由工作者，雖然操作服務技能類別的僱員人數上升（增加 5 292 名），但增幅因其他技能類別的僱員人數普遍下降而抵銷，特別是資訊科技／軟件開發（減少 3 853 人）和技術服務（減少 1 407 人）。

表 3.3　　比較 2016 年與 2018 年各技能類別和機構類別資訊科技僱員人數變化（包括自由工作者）

	資訊科技及通訊服務機構			資訊科技用戶機構			整體		
技能類別	**2016**	**2018**	**升／跌幅**	**2016**	**2018**	**升／跌幅**	**2016**	**2018**	**升／跌幅**
總資訊科技管理	448	662	+214 *(+47.8%)*	1 029	801	-228 *(-22.2%)*	1 477	1 463	-14 *(-0.9%)*
資訊科技／軟件開發*	16 281	22 975	+6 694 *(+41.1%)*	17 341	13 488	-3 853 *(-22.2%)*	33 622	36 463	+2 841 *(+8.4%)*
電訊及網絡	5 036	5 346	+310 *(+6.2%)*	1 390	627	-763 *(-54.9%)*	6 426	5 973	-453 *(-7.0%)*
技術服務	10 483	10 400	-83 *(-0.8%)*	5 217	3 810	-1 407 *(-27.0%)*	15 700	14 210	-1 490 *(-9.5%)*
操作服務	5 241	5 468	+227 *(+4.3%)*	14 424	19 716	+5 292 *(+36.7%)*	19 665	25 184	+5 519 *(+28.1%)*
資訊科技教育及訓練	158	86	-72 *(-45.6%)*	3 569	3 858	+289 *(+8.1%)*	3 727	3 944	+217 *(+5.8%)*
資訊科技銷售及市場推廣	7 025	8 336	+1 311 *(+18.7%)*	152	207	+55 *(+36.2%)*	7 177	8 543	+1 366 *(+19.0%)*
總計	**44 672**	**53 273**	**+8 601** ***(+19.3%)***	**43 122**	**42 507**	**-615** ***(-1.4%)***	**87 794**	**95 780**	**+7 986** ***(+9.1%)***

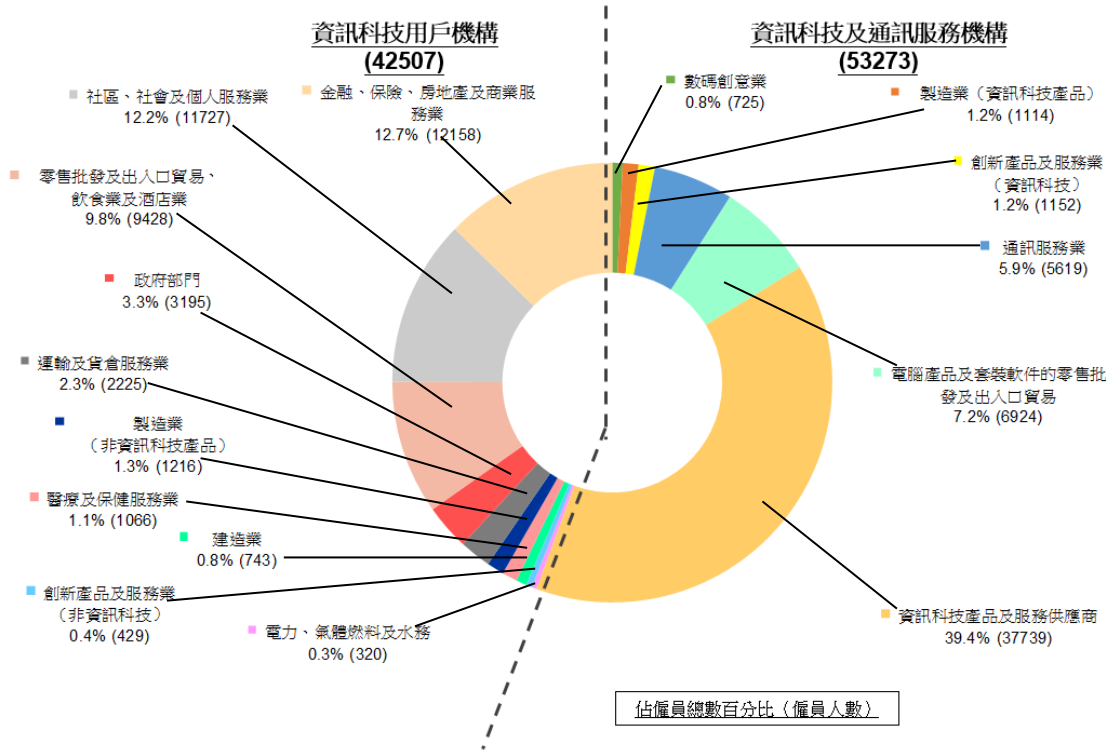
註：

1) (　)代表與 2016 年相比，同一技能類別和機構類別中資訊科技僱員人數（包括自由工作者）的百分比變化。
2) *有關 2018 年調查數字，「研究與開發（與資訊科技相關）」包括在「資訊科技／軟件開發」內。
3) 機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

2) 行業

3.10　　按行業劃分，資訊科技產品及服務供應商的僱員和自由工作者有 37 739 人 (39.4%)，其次是金融、保險、房地產及商業服務業（12 158 人，佔 12.7%），以及社區、社會及個人服務業（11 727 人，佔 12.2%）。

圖 3.2　　各行業資訊科技僱員（包括自由工作者）分布情況



註：
1)　( )代表資訊科技僱員人數（包括自由工作者）。
2)　機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

3.11　　表 3.4 概括各行業及技能類別的資訊科技僱員和自由工作者人數。

表 3.4　　各行業及技能類別資訊科技僱員人數（包括自由工作者）

(i)　資訊科技僱員（不包括研究與開發（與資訊科技相關））

行業	總資訊科技管理	資訊科技／軟件開發	電訊及網絡	技術服務	操作服務	資訊科技教育及訓練	資訊科技銷售及市場推廣	總計
製造業	41	320	138	570	1 128	-	35	**2 232**
創新產品及服務業	13	344	12	16	112	-	259	**756**
電力、氣體燃料及水務	8	167	15	66	64	-	-	**320**
建造業	16	131	36	27	528	-	-	**738**
零售批發及出入口貿易、飲食業及酒店業	244	2 806	218	2 515	6 669	22	3 828	**16 302**
運輸及貨倉服務業	20	780	24	111	1 290	-	-	**2 225**
通訊服務業	38	656	1 518	1 333	699	-	1 369	**5 613**
金融、保險、房地產及商業服務業	191	4 702	167	1 690	5 388	-	-	**12 138**
資訊科技產品及服務供應商	588	15 485	3 571	7 016	3 821	66	3 006	**33 553**
醫療及保健服務業	9	858	8	11	180	-	-	**1 066**
社區、社會及個人服務業	160	1 605	117	707	4 518	3 856	11	**10 974**
數碼創意業	8	481	2	8	26	-	35	**560**
政府部門	127	1 998	147	140	761	-	-	**3 173**
總計	**1 463**	**30 333**	**5 973**	**14 210**	**25 184**	**3 944**	**8 543**	**89 650**

(ii) 資訊科技僱員（僅限研究與開發（與資訊科技相關））

行業	僱員人數
創新產品及服務業	825
資訊科技產品及服務供應商	4 186
大學及專上學院；科研機構	753
其他	366
總計	**6 130**

3.12 調查顯示，資訊科技僱員集中在下列行業和技能類別，約佔資訊科技僱員總數的一半：

資訊科技／軟件開發
- 資訊科技產品及服務供應商（15 485 名僱員和自由工作者）

電訊及網絡
- 資訊科技產品及服務供應商（3 571 名僱員和自由工作者）

技術服務
- 資訊科技產品及服務供應商（7 016 名僱員和自由工作者）

操作服務
- 零售批發及出入口貿易、飲食業及酒店業（6 669 名僱員和自由工作者）
- 金融、保險、房地產及商業服務業（5 388 名僱員和自由工作者）
- 社區、社會及個人服務業（4 518 名僱員和自由工作者）

資訊科技教育及訓練
- 社區、社會及個人服務業（3 856 名僱員和自由工作者）

資訊科技銷售及市場推廣
- 零售批發及出入口貿易、飲食業及酒店業（3 828 名僱員和自由工作者）
- 資訊科技產品及服務供應商（3 006 名僱員和自由工作者）

研究與開發（與資訊科技相關）
- 資訊科技產品及服務供應商（4 186 名僱員和自由工作者）

3.13 表 3.5 顯示，與 2016 年調查結果相比，調查所涵蓋的公司增加了 412 間（升幅為 0.5%），僱員增加了 209 322 人（升幅為 8.4%）。

3.14　機構類別方面，資訊科技及通訊服務機構的資訊科技僱員和自由工作者人數增加了 19.3%（8 601 人），但值得留意的是，資訊科技用戶機構錄得輕微跌幅(-1.4%)。*附錄 6 及 7* 分別按技能類別／職稱和行業／業務，以及行業和公司規模，詳細分析有關調查結果。

表 3.5　比較 2016 年與 2018 年調查涵蓋之公司數目及各行業和機構類別資訊科技僱員人數（包括自由工作者）

行業	調查涵蓋的公司數目 2016	調查涵蓋的公司數目 2018	調查涵蓋的僱員人數 2016	調查涵蓋的僱員人數 2018	資訊科技僱員人數（包括自由工作者） 2016	資訊科技僱員人數（包括自由工作者） 2018
資訊科技及通訊服務機構	**6 231**	**8 655** *[+38.9%]*	**101 347**	**133 295** *[+31.5%]*	**44 672**	**53 273** *[+19.3%]*
製造業（資訊科技產品）	446	602	1 918	2 545	1 318	1 114
創新產品及服務業（資訊科技）*	不適用	35	不適用	1 755	不適用	1 152
電腦產品及套裝軟件的零售批發及出入口貿易	570	633	16 235	15 853	7 500	6 924
通訊服務業	335	345	34 453	41 390	5 223	5 619
資訊科技產品及服務供應商	4 809	6 965	47 222	70 398	30 013	37 739
數碼創意業	71	75	1 519	1 354	618	725
資訊科技用戶機構	**78 135**	**76 123** *[-2.6%]*	**2 384 598**	**2 561 972** *[+7.4%]*	**43 122**	**42 507** *[-1.4%]*
其他製造業（非資訊科技產品）	2 101	3 123	99 820	92 142	1 690	1 216
創新產品及服務業（非資訊科技）*	不適用	70	不適用	3 532	不適用	429
電力、氣體燃料及水務	7	9	7 936	5 893	390	320
建造業	5 397	7 136	120 470	159 712	473	743
零售批發及出入口貿易、飲食業及酒店業	41 023	33 460	781 354	821 585	8 995	9 428
運輸及貨倉服務業	5 902	6 026	196 833	218 957	1 990	2 225
金融、保險、房地產及商業服務業	10 459	13 671	474 526	569 235	15 726	12 158
醫療及保健服務業	2 183	2 338	105 570	110 987	1 077	1 066
社區、社會及個人服務業	10 984	10 212	418 592	399 555	10 040	11 727
政府部門	79	78	179 497	180 374	2 741	3 195
總計	**84 366**	**84 778** *[+0.5%]*	**2 485 945**	**2 695 267** *[+8.4%]*	**87 794**	**95 780** *[+9.1%]*

註：
1)　* 「創新產品及服務業」為 2018 年調查新納入的業務。
2)　[ ]　方括號內數字代表相對上次調查的百分比變化。
3)　機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 和 25。

主要職務

3.15 整體而言，約半數資訊科技從業員從事下表所列的主要職務。

表 3.6 各機構類別的主要職務

機構類別	主要職務	所佔資訊科技僱員百分比
資訊科技及通訊服務機構	程式編製員／分析程式員／軟件工程師	46%
	銷售／市場代表／客戶經理／產品推廣代表	
	實地服務技術員	
	用戶支援／統籌員	
資訊科技用戶機構	用戶支援／統籌員	52%
	程式編製員／分析程式員／軟件工程師	
整體	**用戶支援/統籌員**	**50%**
	程式編製員／分析程式員／軟件工程師	
	銷售／市場代表／客戶經理／產品推廣代表	
	實地服務技術員	

註：
機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

3) 工作性質

3.16 大部分資訊科技僱員和自由工作者從事與操作和技術支援(45.9%)，以及應用設計／開發(27.2%)有關的工作。*附錄 8* 按工作性質及行業／業務，詳細分析有關調查結果。

表 3.7 各工作性質及機構類別
資訊科技僱員人數（包括自由工作者）
百分比分布情況

工作性質	資訊科技及通訊服務機構	資訊科技用戶機構	整體
在學術和教育機構從事教學工作	0.3%	10.6%	**4.9%**
產品設計／開發（即開發核心技術、產品和服務）	8.7%	4.6%	**6.9%**
應用設計／開發（即運用科技、產品和服務開發業務所需的應用程式）	27.5%	26.8%	**27.2%**
操作和技術支援	38.8%	54.8%	**45.9%**
研究與開發（與資訊科技相關）	9.7%	2.2%	**6.4%**
其他（如：資訊科技銷售及市場推廣）	14.9%	0.9%	**8.7%**

註：
1) 機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。
2) 因四捨五入關係，整體數字相加後的百分比未必等於 100%。

ii. 現有空缺

3.17 調查期間，資訊科技業有 3 231 個空缺*；換言之，空缺率佔現有資訊科技職位的 3.3%。資訊科技產品及服務供應商填報的空缺額最多（1 723 個）*，其次是金融、保險、房地產及商業服務業（457 個），以及零售批發及出入口貿易、飲食業及酒店業（366 個）。

3.18 就技能類別而言，空缺集中在資訊科技／軟件開發（1 502 個），其次是操作服務（635 個）和技術服務（399 個）。

表 3.8 各行業及技能類別現有資訊科技職位空缺額

(i) 資訊科技職位空缺（不包括研究與開發（與資訊科技相關））

行業	總資訊科技管理	資訊科技／軟件開發	電訊及網絡	技術服務	操作服務	資訊科技教育及訓練	資訊科技銷售及市場推廣	總計
製造業	-	12	-	36	18	-	-	**66**
	-	*(3.6%)*	-	*(5.9%)*	*(1.6%)*	-	-	
創新產品及服務業	-	25	1	-	5	-	9	**40**
	-	*(6.8%)*	*(7.7%)*	-	*(4.3%)*	-	*(3.4%)*	
電力、氣體燃料及水務	-	4	-	6	-	-	-	**10**
	-	*(2.3%)*	-	*(8.3%)*	-	-	-	
建造業	-	9	-	-	36	-	-	**45**
	-	*(6.4%)*	-	-	*(6.4%)*	-	-	
零售批發及出入口貿易、飲食業及酒店業	2	86	2	33	177	-	66	**366**
	(0.8%)	*(3.0%)*	*(0.9%)*	*(1.3%)*	*(2.6%)*	-	*(1.7%)*	
運輸及貨倉服務業	-	3	-	-	6	-	-	**9**
	-	*(0.4%)*	-	-	*(0.5%)*	-	-	
通訊服務業	-	25	37	12	11	-	6	**91**
	-	*(3.7%)*	*(2.4%)*	*(0.9%)*	*(1.5%)*	-	*(0.4%)*	
金融、保險、房地產及商業服務業	-	267	7	49	134	-	-	**457**
	-	*(5.4%)*	*(4.0%)*	*(2.8%)*	*(2.4%)*	-	-	
資訊科技產品及服務供應商	-	880	100	254	95	-	205	**1534**
	-	*(5.4%)*	*(2.7%)*	*(3.5%)*	*(2.4%)*	-	*(6.4%)*	
醫療及保健服務業	-	24	-	-	11	-	-	**35**
	-	*(2.7%)*	-	-	*(5.8%)*	-	-	
社區、社會及個人服務業	2	22	2	5	134	8	1	**174**
	(1.2%)	*(1.4%)*	*(1.7%)*	*(0.7%)*	*(2.9%)*	*(0.2%)*	*(8.3%)*	
數碼創意業	-	47	-	-	-	-	4	**51**
	-	*(8.9%)*	-	-	-	-	*(10.3%)*	
政府部門	11	98	4	4	8	-	-	**125**
	(8.0%)	*(4.7%)*	*(2.6%)*	*(2.8%)*	*(1.0%)*	-	-	
總計	**15**	**1 502**	**153**	**399**	**635**	**8**	**291**	**3 003**
	(1.0%)	***(4.7%)***	***(2.5%)***	***(2.7%)***	***(2.5%)***	***(0.2%)***	***(3.3%)***	

(ii) 資訊科技職位空缺（僅限研究與開發（與資訊科技相關））

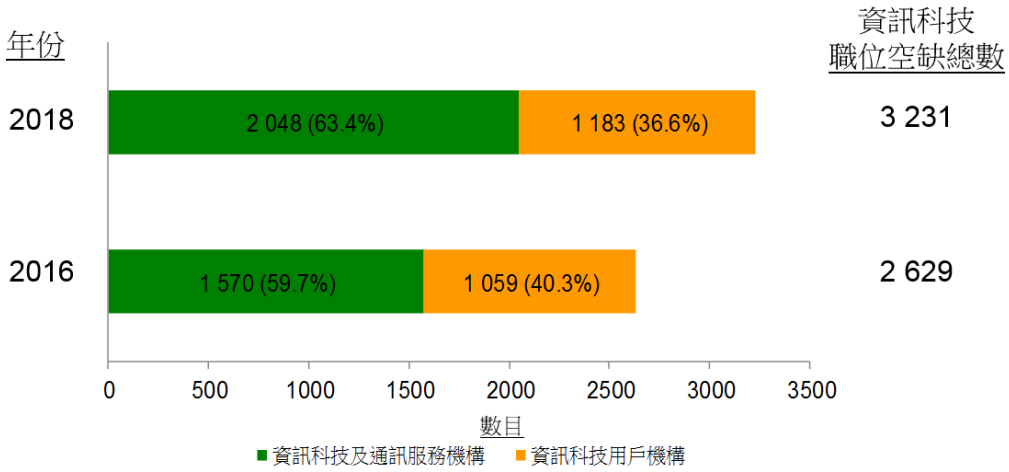
行業	空缺額	
創新產品及服務業	1	*(0.1%)*
資訊科技產品及服務供應商	189	*(4.3%)*
大學及專上學院；科研機構	28	*(3.6%)*
其他	10	*(2.7%)*
總計	**228**	***(3.6%)***

註： ( ) 佔各行業及技能類別中資訊科技職位（即僱員及自由工作者與空缺之總和）的百分比。

* 空缺包括研究與開發（與資訊科技相關）。

3.19　　資訊科技及通訊服務機構填報有 2 048 個空缺(63.4%)；資訊科技用戶機構則填報有 1 183 個空缺(36.6%)。根據 2016 年調查結果，這兩個機構類別的空缺額分別有 1 570 個(59.7%)和 1 059 個(40.3%)。

圖 3.3　　各機構類別資訊科技空缺分布情況（2018 年與 2016 年相比）



3.20　　與 2016 年調查結果相比，空缺率由 2.9%（2 629 個空缺）微升至 3.3%（3 231 個空缺）。當中，數碼創意業(6.9%)和建造業(5.7%)的空缺率特別高，兩者均較 2016 年調查時上升，這可能是因業界對用戶介面設計及建築資訊模型專業人士的需求增加所帶動。*附錄 9* 按行業／業務及技能類別，詳細分析有關調查結果。

表3.9　　比較2018年與2016年各行業資訊科技空缺

行業	2018 空缺	2018 空缺率	2016 空缺	2016 空缺率
製造業	72	3.0%	76	2.5%
創新產品及服務業*	41	2.5%	不適用	不適用
電力、氣體燃料及水務	10	3.0%	3	0.8%
建造業	45	5.7%	15	3.1%
零售批發及出入口貿易、飲食業及酒店業	366	2.2%	165	1.0%
運輸及貨倉服務業	9	0.4%	7	0.4%
通訊服務業	91	1.6%	193	3.6%
金融、保險、房地產及商業服務業	457	3.6%	413	2.6%
資訊科技產品及服務供應商	1 723	4.4%	1 269	4.1%
醫療及保健服務業	35	3.2%	56	4.9%
社區、社會及個人服務業	202	1.7%	337	3.3%
數碼創意業	54	6.9%	21	3.3%
政府部門	126	3.8%	74	2.6%
總計	**3 231**	**3.3%**	**2 629**	**2.9%**

註：
1)　空缺率是空缺額佔資訊科技職位數目（即僱員及自由工作者人數與空缺額之總和）的百分比。
2)　*「創新產品及服務業」是 2018 年調查新納入的行業。

iii. 現有人力需求

3.21　　合計現有僱員、自由工作者和職位空缺，調查期間共有 99 011 個資訊科技職位。在不同主要職務中，用戶支援／統籌員佔資訊科技人力需求比率最高(19.3%)，其次是程式編製員／分析程式員／軟件工程師(17.5%)和銷售／市場代表／客戶經理／產品推廣代表(7.1%)。

表 3.10　　各主要職務資訊科技人力需求比率分布

主要職務	資訊科技僱員（包括自由工作者）	資訊科技職位空缺	總資訊科技人力需求
資訊科技總監／管理資訊系統總監／資訊科技主管／首席資訊主任	1.4%	0.5%	**1.3%**
首席技術總監	0.2%	-	**0.2%**
系統開發經理	1.8%	1.2%	**1.8%**
資訊科技建築師／商業分析員	0.9%	0.6%	**0.9%**
項目經理／項目組長	4.2%	3.0%	**4.1%**
用戶體驗設計師	2.8%	3.8%	**2.9%**
程式編製員／分析程式員／軟件工程師	17.0%	31.5%	**17.5%**
網站設計員／開發員	1.4%	1.5%	**1.4%**
品質檢查專責經理／軟件品質檢查專責經理／工程師／電腦系統審核經理	0.6%	1.6%	**0.7%**
軟件產品工程師	0.5%	0.2%	**0.4%**
軟件／固件產品設計員／產品分析員／開發員／軟件產品經理	0.9%	1.0%	**0.9%**
技術撰稿員	0.2%	0.2%	**0.2%**
電腦遊戲設計／美術／開發員／電腦圖像設計／美術員／電腦動畫設計師／網頁圖像設計師／視覺效果設計師	1.5%	1.9%	**1.5%**
電訊經理／網絡經理	0.3%	0.2%	**0.3%**
電訊顧問／網絡顧問	0.9%	0.2%	**0.9%**
電訊工程師／網絡工程師	2.4%	4.0%	**2.5%**
網絡管理主任／網絡主任	2.6%	0.4%	**2.5%**
電腦保安專責經理／資訊保安專責經理／資訊保安主任	1.2%	1.1%	**1.2%**
資料庫管理主任／數據庫管理主任／資料庫設計員	0.7%	0.3%	**0.7%**
系統程式編製員（機構內部／電腦供應商）／系統工程師	4.4%	2.3%	**4.3%**
客戶工程經理／服務支援經理	0.9%	1.1%	**0.9%**
客戶服務工程師／實地服務工程師	1.5%	1.5%	**1.5%**
實地服務技術員	6.2%	6.1%	**6.2%**
電腦操作經理	1.0%	0.2%	**1.0%**
求助台主任	0.4%	0.3%	**0.4%**
求助台服務員／客戶服務主任／服務員	1.7%	1.3%	**1.7%**
電腦操作主任／操作支援主任	1.4%	1.0%	**1.4%**
電腦操作員／系統操作員	2.4%	0.6%	**2.4%**
用戶支援／統籌員	19.4%	16.2%	**19.3%**
講師／教授／訓練主任	2.5%	0.2%	**2.5%**
資訊科技訓練員／資訊科技教導員	1.6%	-	**1.5%**
銷售／市場總監／客戶總監／銷售／市場經理	1.8%	1.9%	**1.8%**
銷售／市場代表／客戶經理／產品推廣代表	7.1%	7.1%	**7.1%**
研發研究員／研發科學家／研發工程師	2.5%	1.9%	**2.5%**
研發技術員	2.8%	4.9%	**2.9%**
研發輔助人員	1.0%	0.2%	**1.0%**
總計	**100.0%**	**100.0%**	**100.0%**

註：　因四捨五入關係，相加後的百分比未必等於 100%。

iv. 從承判商公司借調的員工

3.22 調查期間，承判商公司共調派 4 148 名資訊科技人員到不同機構（資訊科技及通訊服務機構調派 578 人，資訊科技用戶機構調派 3 570 人）。以借調資訊科技人員與資訊科技僱員的比率而言，醫療及保健服務業(46.2%)和政府部門(43.6%)所錄得的比率相對較高。

表 3.11 承判商公司調派資訊科技人員數目及借調相關人員的公司數目

行業	承判商公司調派的資訊科技人員人數	調查時資訊科技僱員和自由工作者人數	借調的資訊科技人員佔資訊科技僱員人數的比率	從承判商公司借調資訊科技人員的公司數目
資訊科技及通訊服務機構				
製造業（資訊科技產品）	20	1 016	2.0%	2
創新產品及服務業	-	477	-	-
電腦產品及套裝軟件的零售批發及出入口貿易	462	6 874	6.7%	13
資訊科技產品及服務供應商	95	33 553	0.3%	52
數碼創意業	1	560	0.2%	1
通訊服務業	-	5 613	-	-
小計	***578***	***48 093***	***1.2%***	***68***
資訊科技用戶機構				
其他製造業（非資訊科技產品）	-	1 216	-	-
創新產品及服務業	-	279	-	-
電力、氣體燃料及水務	-	320	-	-
建造業	20	738	2.7%	3
零售批發及出入口貿易、飲食業及酒店業	274	9 428	2.9%	2
運輸及貨倉服務業	254	2 225	11.4%	40
金融、保險、房地產及商業服務業	327	12 138	2.7%	39
醫療及保健服務業	492	1 066	46.2%	1
社區、社會及個人服務業	819	10 974	7.5%	191
政府部門	1 384	3 173	43.6%	34
小計	***3 570***	***41 557***	***8.6%***	***310***
總計	**4 148**	**89 650**	**4.6%**	**378**

註：
機構類別指(i)「資訊科技及通訊服務機構」包括業務 1、3（指定業務）、6、13、14、18 及 24；(ii)「資訊科技用戶機構」包括業務 2、3（指定業務）、4-5、7-12、15-17、19-23 及 25。

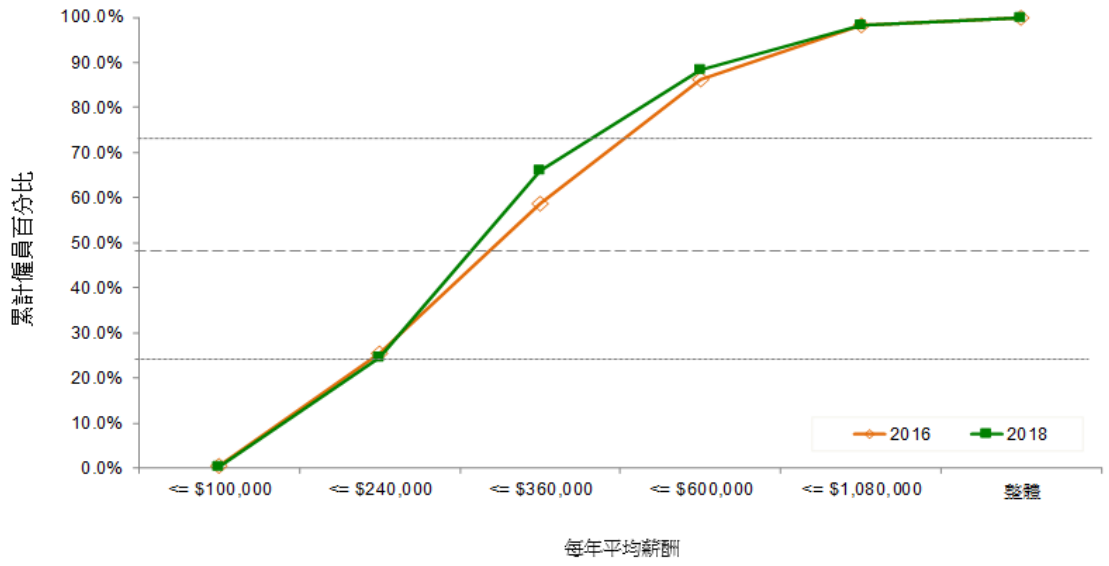
v. 每年薪酬、學歷和相關資訊科技年資

3.23 僱員的每年平均薪酬反映，僱主仍繼續給予具競爭力的薪酬，以聘用和挽留資訊科技專才。*附錄 10* 按職稱顯示資訊科技僱員（不包括自由工作者）的每年平均薪酬。

表 3.12 每年平均薪酬幅度分布

	$1,080,001 或以上	$600,001-$1,080,000	$360,001-$600,000	$240,001-$360,000	$100,001-$240,000	$100,000 或以下
整體	1.6%	10.1%	22.2%	41.4%	24.4%	0.2%

圖 3.4 2016 年與 2018 年資訊科技僱員平均年薪累計百分比



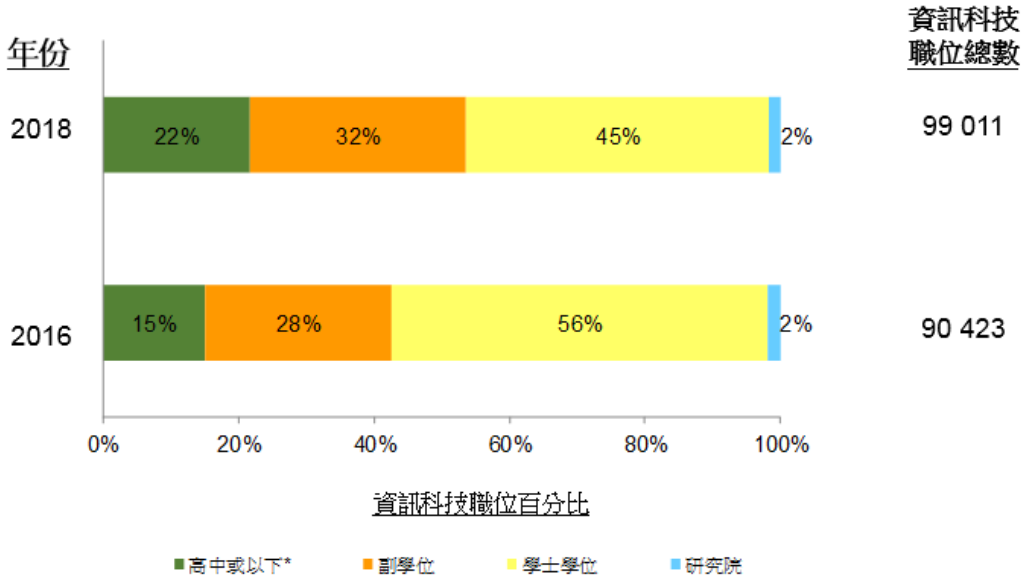
3.24 如本會預期，資訊科技業是知識最密集的行業之一，因此僱主普遍傾向聘請持有大專程度學歷的人士擔任大部分資訊科技工作；約 47%資訊科技職位宜有學士或以上學歷，32%職位宜有副學位學歷。

表 3.13 宜有學歷分布情況

	研究院	學士學位	副學位	高中或以下
整體	1.6%	44.9%	31.8%	21.7%

3.25　　然而，值得留意的是宜有大專程度或以上學歷的資訊科技職位數目所佔比率下降（2018 年調查為 79%；2016 年調查為 86%）。*附錄 11* 按職稱詳細列載資訊科技職位宜有學歷的調查結果。

圖 3.5　　資訊科技僱員宜有學歷（2018 年與 2016 年相比）

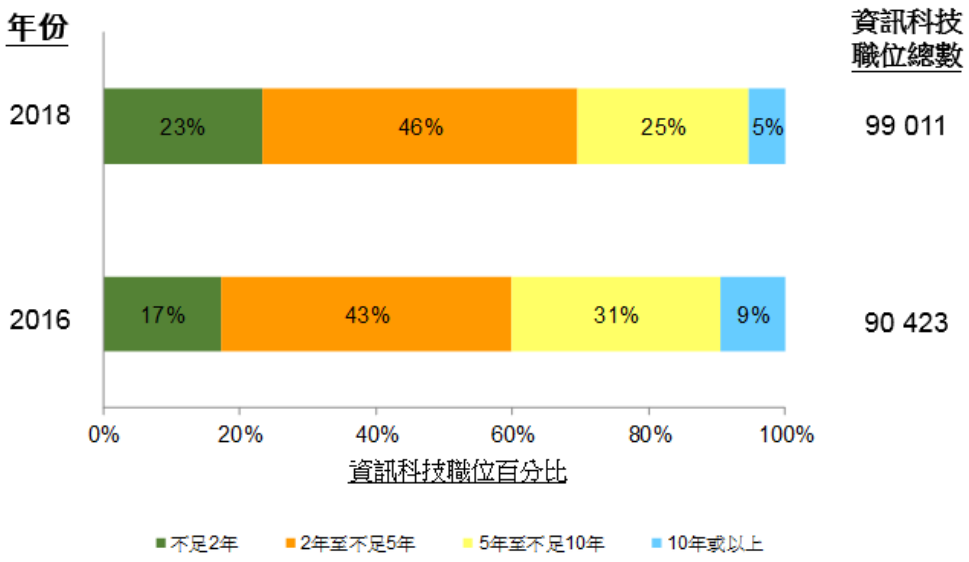


3.26　　約 30%資訊科技職位宜具備五年或以上工作經驗；約 46%資訊科技職位宜具備兩年至五年工作經驗。*附錄 12* 按職稱詳細列載資訊科技職位宜有相關年資的調查結果。

表 3.14　　宜有相關年資分布情況

	10 年或以上	5 年至不足 10 年	2 年至不足 5 年	不足 2 年
整體	**5.3%**	**25.1%**	**46.2%**	**23.4%**

圖 3.6　　資訊科技僱員宜有相關年資（2018 年與 2016 年相比）



3.27　　值得留意的是，僱主漸漸願意起用年資不足兩年的僱員擔任主任和中層管理職級，以及操作和支援員工。

vi.　僱員流動和招聘情況

3.28　　僱主填報過去 12 個月有 8 270 名資訊科技僱員離職，佔業內職位總數 8.9%。資訊科技僱員離職人數最多的是資訊科技產品及服務供應商，有 4 120 人；其次是金融、保險、房地產及商業服務業（1 362 人），以及零售批發及出入口貿易、飲食業及酒店業（1 182 人）。

3.29　　另外，僱主亦表示有 234 名資訊科技僱員因公司縮減開支而離職，佔業內資訊科技職位總數 0.3%。

表 3.15　過去 12 個月離職資訊科技僱員人數

行業	總計	佔資訊科技僱員人數（包括自由工作者）的百分比	僱主決定縮減開支	佔資訊科技僱員人數（包括自由工作者）的百分比
製造業	130	5.7%	6	0.3%
創新產品及服務業	73	9.2%	2	0.3%
電力、氣體燃料及水務	52	15.8%	-	-
建造業	57	7.3%	-	-
零售批發及出入口貿易、飲食業及酒店業	1 182	7.1%	14	0.1%
運輸及貨倉服務業	117	5.2%	11	0.5%
通訊服務業	272	4.8%	-	-
金融、保險、房地產及商業服務業	1 362	10.8%	-	-
資訊科技產品及服務供應商	4 120	11.7%	198	0.6%
醫療及保健服務業	37	3.4%	-	-
社區、社會及個人服務業	637	5.7%	2	0.02%
數碼創意業	48	7.9%	-	-
政府部門	183	5.5%	1	0.03%
總計	**8 270**	**8.9%**	**234**	**0.3%**

註：資訊科技僱員不包括研究與開發（與資訊科技相關）人員。

3.30　2018 年 4 月，資訊科技僱員的流動率為 8.9%（8 270 人）。電力、氣體燃料及水務的僱員流動率最高，佔 15.8%；其次是資訊科技產品及服務供應商，佔 11.7%；以及金融、保險、房地產及商業服務業，佔 10.8%。

3.31　2017/18 年度招聘了 9 279 名資訊科技僱員，佔業內僱員總數 10.4%。新聘僱員中，有 7 921 名(8.8%)具工作經驗人士從本港招聘；1 070 名(1.2%)為本地應屆畢業生。從本港境外招聘的具經驗人士則有 205 人(0.2%)，另有本港境外應屆畢業生 83 人(0.1%)。

3.32　非本地受訓和本地受訓應屆畢業生的招聘比例為 1 比 13（2016 年調查結果：1 比 4），而具經驗非本地人士和本地人士的招聘比例為 1 比 39（2016 年調查結果：1 比 15）。

招聘	應屆畢業生人數	具工作經驗人士人數
本地	1 070　(1.2%)	7 921　(8.8%)
海外	83　(0.1%)	205　(0.2%)
總計	9 279	

表 3.16　　過去 12 個月各行業資訊科技僱員招聘及內部晉升情況

行業	新聘僱員來源：本地院校應屆畢業生		非本地院校應屆畢業生		從本港聘請具工作經驗人士		從本港境外聘請具工作經驗人士		整體		過去12個月獲晉升的資訊科技僱員	
製造業	-	-	-	-	117	*(5.2%)*	-	-	**117**	***(5.2%)***	-	-
創新產品及服務業	7	*(0.9%)*	1	*(0.1%)*	79	*(10.4%)*	1	*(0.1%)*	**88**	***(11.6%)***	62	*(8.2%)*
電力、氣體燃料及水務	20	*(6.3%)*	-	-	14	*(4.4%)*	-	-	**34**	***(10.6%)***	8	*(2.5%)*
建造業	1	*(0.1%)*	-	-	39	*(5.3%)*	-	-	**40**	***(5.4%)***	28	*(3.8%)*
零售批發及出入口貿易、飲食業及酒店業	202	*(1.2%)*	7	*(*)*	1 102	*(6.8%)*	30	*(0.2%)*	**1 341**	***(8.2%)***	175	*(1.1%)*
運輸及貨倉服務業	14	*(0.6%)*	-	-	94	*(4.2%)*	-	-	**108**	***(4.9%)***	7	*(0.3%)*
通訊服務業	72	*(1.3%)*	9	*(0.2%)*	313	*(5.6%)*	36	*(0.6%)*	**430**	***(7.7%)***	421	*(7.5%)*
金融、保險、房地產及商業服務業	101	*(0.8%)*	47	*(0.4%)*	1 334	*(11.0%)*	12	*(0.1%)*	**1 494**	***(12.3%)***	239	*(2.0%)*
資訊科技產品及服務供應商	592	*(1.8%)*	7	*(*)*	3 798	*(11.3%)*	13	*(*)*	**4 410**	***(13.1%)***	486	*(1.4%)*
醫療及保健服務業	-	-	-	-	85	*(8.0%)*	-	-	**85**	***(8.0%)***	37	*(3.5%)*
社區、社會及個人服務業	19	*(0.2%)*	8	*(0.1%)*	555	*(5.1%)*	113	*(1.0%)*	**695**	***(6.3%)***	112	*(1.0%)*
數碼創意業	20	*(3.6%)*	2	*(0.4%)*	43	*(7.7%)*	-	-	**65**	***(11.6%)***	14	*(2.5%)*
政府部門	22	*(0.7%)*	2	*(0.1%)*	348	*(11.0%)*	-	-	**372**	***(11.7%)***	101	*(3.2%)*
總計	**1 070**	***(1.2%)***	**83**	***(0.1%)***	**7 921**	***(8.8%)***	**205**	***(0.2%)***	**9 279**	***(10.4%)***	**1 690**	***(1.9%)***

註：

1) ( ) 佔各行業資訊科技僱員人數（包括自由工作者）的百分比。

2) *少於 0.05%。

3) 資訊科技僱員不包括研究與開發（與資訊科技相關）人員。

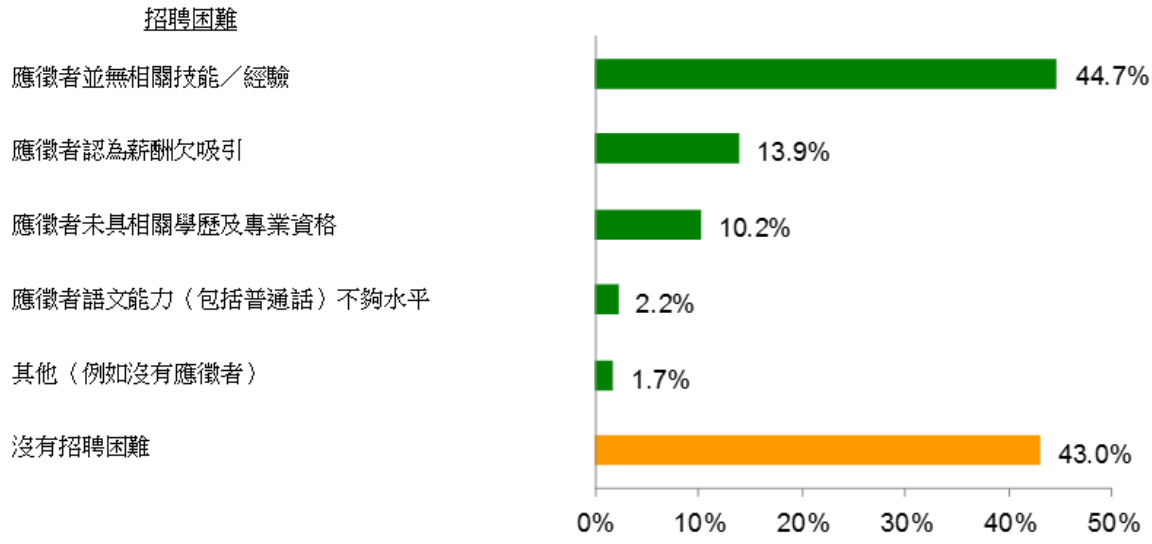
3.33　　是次調查請過去 12 個月曾招聘或嘗試招聘資訊科技員工的僱主說明招聘過程中所遇到的主要困難；共有 2 428 間公司表示在招聘過程中曾遇困難。

表 3.17　　過去 12 個月曾經／嘗試招聘資訊科技員工並遇到招聘困難的公司數目

行業	招聘過程中曾遇困難	招聘過程中沒有遇上困難	曾經招聘的公司數目
製造業	16	25	41
創新產品及服務業	24	10	34
電力、氣體燃料及水務	-	2	2
建造業	35	3	38
零售批發及出入口貿易、飲食業及酒店業	452	749	1 201
運輸及貨倉服務業	32	7	39
通訊服務業	35	20	55
金融、保險、房地產及商業服務業	162	249	411
資訊科技產品及服務供應商	1 489	555	2 044
醫療及保健服務業	1	5	6
社區、社會及個人服務業	154	178	332
數碼創意業	14	6	20
政府部門	14	25	39
整體	**2 428**	**1 834**	**4 262**

3.34　　招聘遇到的主要困難包括：「應徵者並無相關技能／經驗」(44.7%)、「應徵者認為薪酬欠吸引」(13.9%)、以及「應徵者未具相關學歷及專業資格」(10.2%)。*附錄 13 及 14* 分別按公司規模及行業，詳細分析有關調查結果。

圖 3.7　　招聘資訊科技員工過程中曾遇困難的公司數目百分比



vii. 培訓

3.35　　本會於 2016 年和 2018 年調查請僱主填報資訊科技僱員最需要掌握的十大基本技能／知識（按普及程度降序排列），兩者之比較見表 3.18。*附錄 15* 詳細分析未來 12 個月各主要職務現有資訊科技僱員的培訓需求調查結果。

表 3.18　　比較 2018 年與 2016 年十大基本技能／知識

技能／知識類別	2018 年排名	2016 年排名
虛擬化及雲端運算	1	2
資訊及系統保安	2	1
互聯網／內聯網／網絡開發	3	5
流動電腦應用	4	12
Java 及物件導向技術	5	13
項目管理及設計	6	11
視窗平台技術	7	8
網絡／數據通訊	8	3
Linux/Unix 及源碼開放程式	9	17
網上教學科技及開發	10	7

註：　按機構類別分析，資訊科技及通訊服務機構的三大基本技能為：i)虛擬化及雲端運算、ii)互聯網／內聯網／網絡開發，以及 iii)數據科學和數據分析；資訊科技用戶機構的三大基本技能為：i)資訊及系統保安、ii)虛擬化及雲端運算，以及 iii) Java 及物件導向技術。

3.36　　據本會觀察，2016 年和 2018 年調查所得的兩大基本技能／知識相若，本會認為僱主須加強培訓資訊科技人員的雲端運算和資訊保安技能／知識，以應付日常業務和遵守數據安全守則的迫切需求。本會促請僱主給予員工再培訓機會，以應付新科技轉型。

viii. 僱主預期人力增長

3.37　　合計僱員、自由工作者和職位空缺，調查期間共有 99 011 個資訊科技職位。僱主普遍預期，2019 年 4 月的資訊科技人力狀況與 2018 年相若。預計 2019 年 4 月將有 99 126 個資訊科技職位，微增 0.1%。職位數目的詳細調查結果分析載於*附錄 16*。

表 3.19　　僱主預期各技能類別的資訊科技人力需求（2019 年 4 月）

技能類別	2017 年 4 月資訊科技職位數目*	2018 年 4 月資訊科技僱員人數（包括自由工作者）	2018 年 4 月空缺額	預期 2019 年 4 月資訊科技人力增長	預期 2019 年 4 月資訊科技人力需求*
總資訊科技管理	1 472	1 463	15	+1	1 479
資訊科技／軟件開發	31 292	30 333	1 502	+86	31 921
電訊及網絡	6 083	5 973	153	0	6 126
技術服務	14 556	14 210	399	+10	14 619
操作服務	25 725	25 184	635	+11	25 830
資訊科技教育及訓練	3 953	3 944	8	0	3 952
資訊科技銷售及市場推廣	8 598	8 543	291	+10	8 844
研究與開發（與資訊科技相關）	6 230	6 130	228	-3	6 355
整體	**97 909**	**95 780**	**3 231**	**+115 (+0.1%)**	**99 126**

註：
1)　*資訊科技人力需求或資訊科技職位計及現有僱員人數（包括自由工作者）及空缺額。
2)　（ ）對比 2018 年 4 月資訊科技職位數目的增長率。

II. 研究與開發（研發）

i. 背景

3.38 研發活動是 2018 年人力調查新增的範疇，旨在探討並了解香港的科研創新活動。本調查涵蓋的研發活動僅包括技術創新範疇（產品／工藝創新）。本會把若干個或會進行研發活動的特定業務納入為調查補充樣本；因此，研發僱員的人力資料並非反映香港整體的創新情況。

3.39 研發活動分為兩個技能類別：「研究與開發（與資訊科技相關）」，僱員集中研發資訊科技相關項目（如：資訊通訊技術）；至於「研究與開發（與資訊科技不相關）」，僱員則集中研發其他領域項目（如：生物醫學技術、物料與精密工程）。此外，只有主力負責研發活動的全職僱員，其主要職務才會在人力資料反映出來。六項與研發有關的主要職務詳情載於*附錄 3*。

ii. 僱員人數及空缺額

3.40 調查所涵蓋的公司當中，有 10 632 人從事研究與開發活動，其中包括 10 564 名僱員和 68 名自由工作者。各機構類別的詳細調查結果分析載於*附錄 17*。

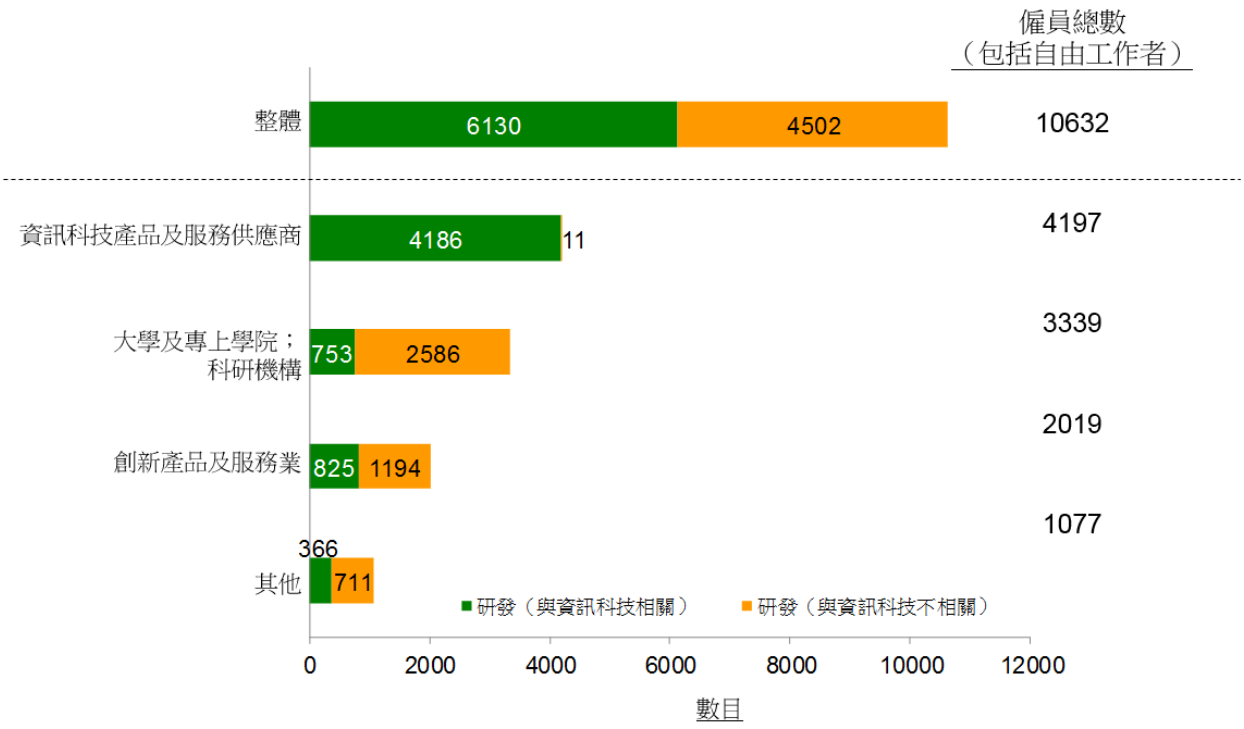
3.41 從事研究與開發活動的 10 564 名僱員當中，與資訊科技相關的有 6 128 人 (58.0%)，略多於與資訊科技不相關的 4 436 人(42.0%)。

3.42　　另一方面，大部分自由工作者從事的工作並非與資訊科技相關（共 66 人，佔 97.1%）。

表 3.20　　各技能類別研發僱員及自由工作者人數

技能類別	僱員	自由工作者	總計
研發（與資訊科技不相關）	4 436	66	**4 502**
研發（與資訊科技相關）	6 128	2	**6 130**
整體（研發）	**10 564**	**68**	**10 632**

圖 3.8　　研發僱員及自由工作者人數（按技能類別及行業劃分）



3.43　　僱主填報調查期間有 447 個研發空缺，佔現有研發職位 4.0%，當中資訊科技產品及服務供應商的空缺額最多（189 個與資訊科技相關空缺），其次是大學及專上學院與科研機構（117 個空缺與資訊科技不相關；28 個與資訊科技相關）。

表 3.21　　調查期間各業務的研發空缺額

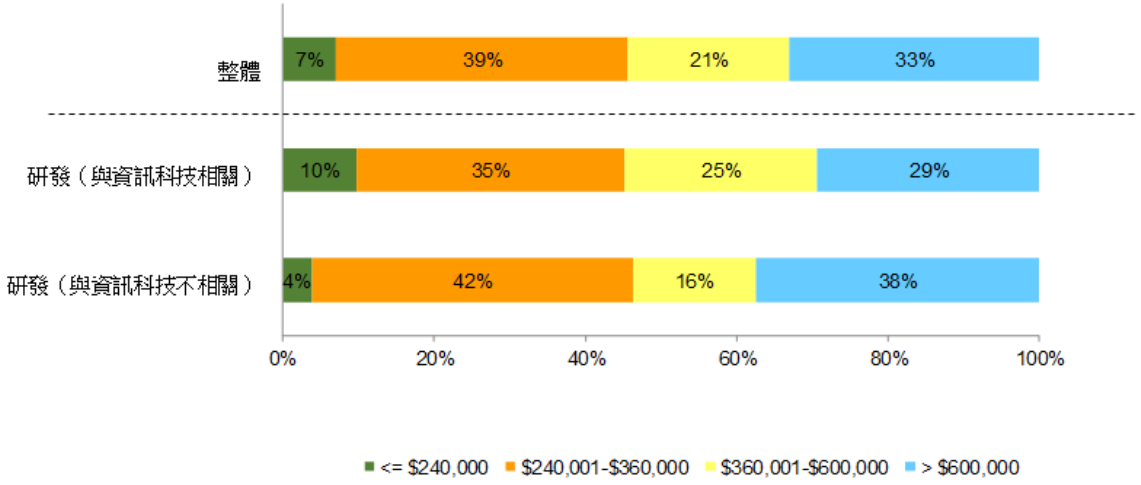
技能類別	創新產品及服務	資訊科技產品及服務供應商	大學及專上學院科研機構	其他	總計
研發（與資訊科技不相關）	48 *(3.9%)*	- *(-)*	117 *(4.3%)*	54 *(7.1%)*	**219** ***(4.6%)***
研發（與資訊科技相關）	1 *(0.1%)*	189 *(4.3%)*	28 *(3.6%)*	10 *(2.7%)*	**228** ***(3.6%)***
整體（研發）	49 *(2.4%)*	189 *(4.3%)*	145 *(4.2%)*	64 *(5.6%)*	**447** ***(4.0%)***

註：( )　　佔研發職位數目（僱員及自由工作者人數與空缺額之總和）的百分比，按技能類別劃分。

iii. 每年薪酬、學歷和相關年資

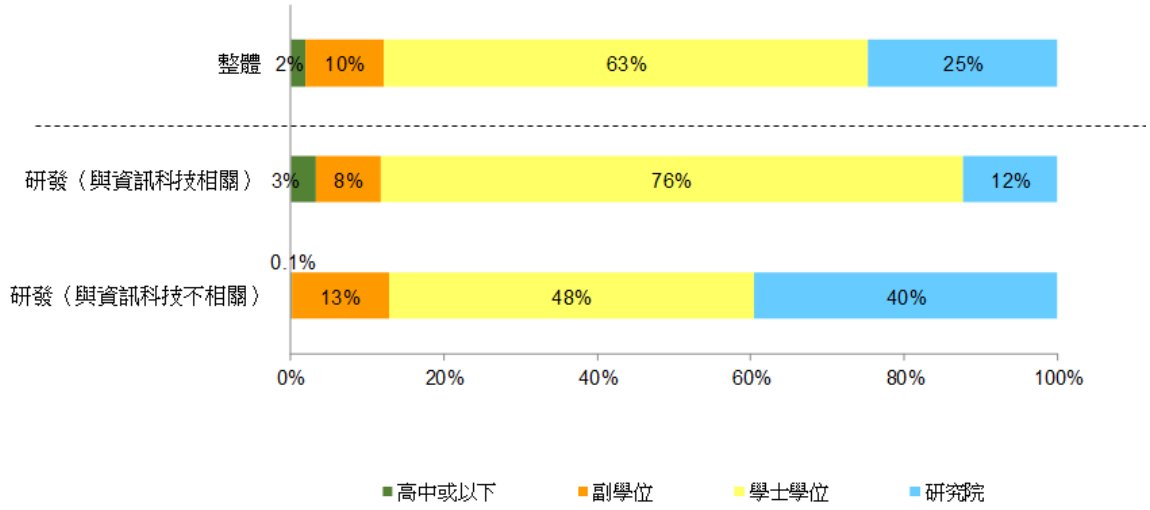
3.44 僱主提供的薪酬具競爭力，能聘用和挽留能幹的研發專才，尤其是與資訊科技不相關的研發人才。

圖 3.9 研發僱員每年平均薪酬



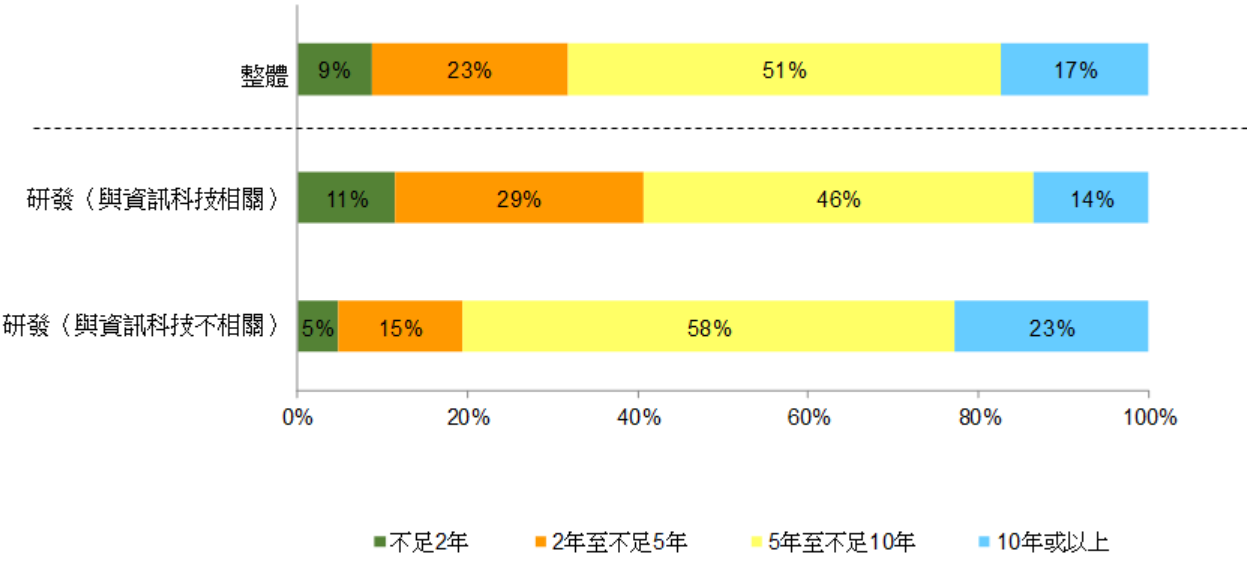
3.45 大部分研發職位的僱員宜有大專程度學歷；88%職位宜有學士或以上學歷，10%職位宜有副學位學歷。

圖 3.10 研發僱員宜有學歷



3.46　　約 70%研發職位宜具備五年或以上相關工作經驗，23%研發職位宜具備兩至五年年資。

圖 3.11　　研發僱員宜有相關年資



iv.　培訓

3.47　　僱主認為研發僱員最需要接受「專業技能」和「管理技能」這兩大基本技能／知識的訓練。

表 3.22　　未來 12 個月現有研發僱員的訓練需求

技能／知識類別	2018 年排名
專業技能	1
管理技能	2
其他研究與開發訓練*	3
專利授權及註冊申請知識	4

註：*其他研究與開發訓練包括技術交流論壇／研討會。

v. 僱主預期人力增長

3.48 合計僱員、自由工作者和職位空缺，調查期間共有 11 079 個研發職位。僱主普遍預期 2019 年 4 月的研發人力狀況與 2018 年相若。預計 2019 年 4 月將有 11 092 個研發職位，微增 0.1%。

表 3.23 僱主預期各技能類別的研發人力需求（2019 年 4 月）

技能類別	2017 年 4 月職位數目	調查時僱員及自由工作者人數	調查時空缺額	預期 2019 年 4 月職位增減	預期 2019 年 4 月研發職位數目
研究與開發（與資訊科技不相關）	4 676	4 502	219	16	4 737
研究與開發（與資訊科技相關）	6 230	6 130	228	- 3	6 355
整體	**10 906**	**10 632**	**447**	**13**	**11 092**

註：*研發人力需求或研發職位計及現有僱員人數（包括自由工作者）及空缺。

vi. 資金來源、研發活動性質及培訓模式

3.49 研究與開發活動的資金主要來自「自籌資金」(75.4%)，其次是「政府」(18.3%)和「集團公司或附屬公司」(6.3%)。研發活動性質方面，「內部研發」佔 72.4%，「合作安排」佔 23.0%，「以外判形式研發」佔 4.6%。「以外判形式研發」的活動當中，僅 0.2%屬離岸研發。

圖 3.12　　研發資金來源

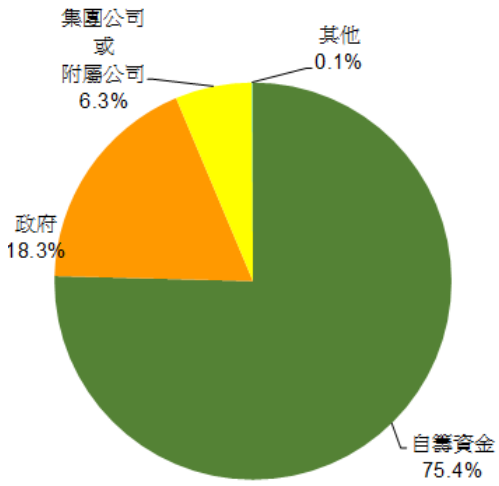
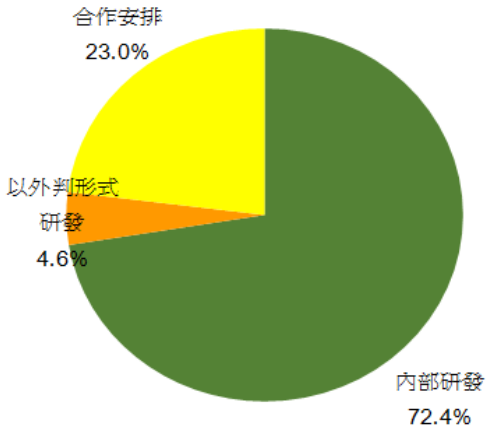
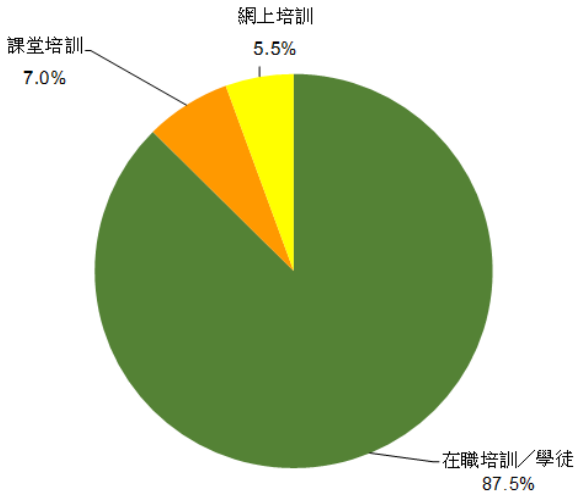


圖 3.13　　研發活動性質



3.50　　研發人員主要透過「在職培訓／學徒」計劃接受培訓(87.5%)。

圖 3.14　　研發人員培訓模式



IV. 觀察所得及結論

概況

4.1 本會仔細審視調查結果，認為所得數據大致反映調查期間從事資訊科技與研發活動的人力情況。

人力變化

4.2 資訊科技業的人力自2006年起呈上升趨勢。過去12年，操作服務的僱員數目（包括自由工作者）急速增加（達12 428人；97%），當中原因可能是資訊科技用戶機構增加人手與供應商聯繫協調，以加強服務支援。按百分比變幅計算，從事資訊科技銷售及市場推廣的人力，在2006至2018年間上升約90%，原因可能是供應商增聘銷售人員，為潛在客戶進一步提供意見。

4.3 表 4.1 列出 2006 年至 2018 年間資訊科技業各技能類別的人力變化。

表 4.1 各技能類別資訊科技僱員（包括自由工作者）的分布(2006 –2018)

	年份						
技能類別	**2006**	**2008**	**2010**	**2012**	**2014**	**2016**	**2018**
資訊科技／軟件開發[1]	28 916	24 206	26 340	29 085	31 414	33 622	36 463
操作服務	12 756	16 235	15 950	17 305	19 105	19 665	25 184
技術服務	10 333	11 151	12 996	14 495	14 788	15 700	14 210
電訊及網絡	3 749	6 153	5 948	6 007	5 923	6 426	5 973
資訊科技銷售及市場推廣[2][3]	4 517	4 531	5 741	6 705	6 710	7 177	8 543
資訊科技教育及訓練	2 575	3 302	5 161	3 650	3 571	3 727	3 944
總資訊科技管理	1 627	1 119	1 242	1 438	1 462	1 477	1 463
總計	**64 473**	**66 697** *(+3.4%)*	**73 378** *(+10.0%)*	**78 685** *(+7.2%)*	**82 973** *(+5.4%)*	**87 794** *(+5.8%)*	**95 780** *(+9.1%)*

註：

(1) 2018 年調查新增「研究與開發（與資訊科技相關）」技能類別，納入「資訊科技／軟件開發」範疇。

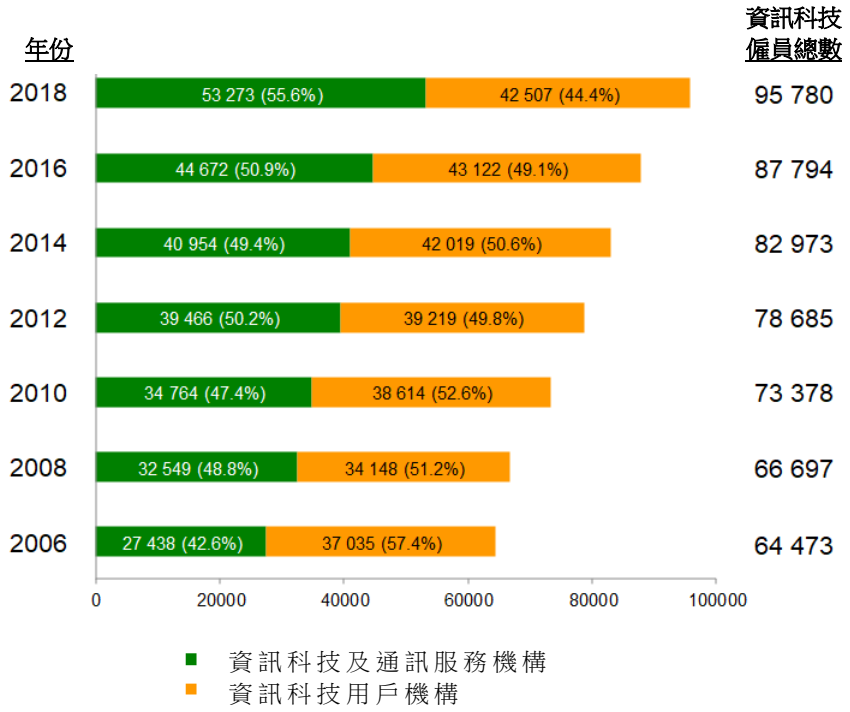
(2) 具資訊科技產品及服務技術知識的硬件及軟件銷售人員，於2006年及2008年調查撥歸「資訊科技銷售」類別，然後於2010年調查起納入「資訊科技銷售及市場推廣」類別。

(3) 2006 年及 2008 年調查的相應技能類別為「資訊科技銷售」。

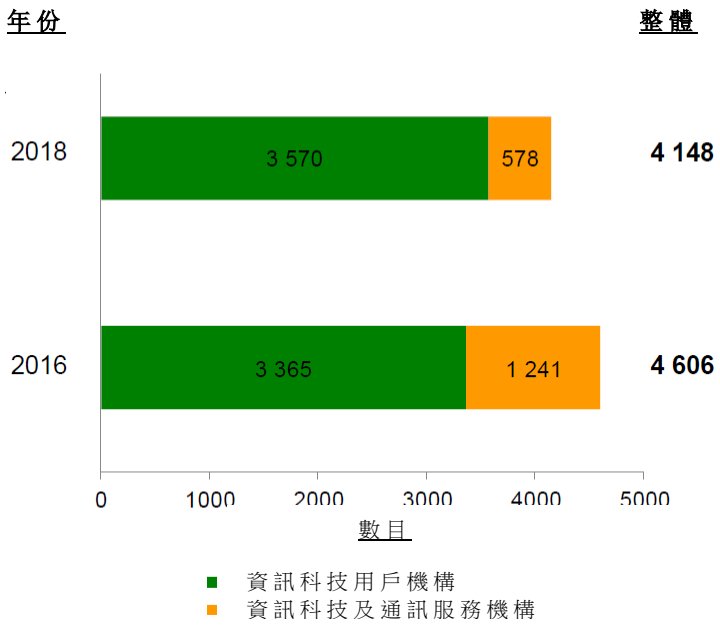
4.4　　由於逐步採用雲端運算及（例如人工智能、大數據與區塊鏈等）新科技，企業轉而向資訊科技產品及服務供應商尋求技術支援。過去 12 年，資訊科技人力已逐步由資訊科技用戶機構轉移至資訊科技及通訊服務機構。

4.5　　圖4.1按機構類別顯示2006年至2018年間，資訊科技僱員人數（包括自由工作者）的變化情況。

圖 4.1　2006 年至 2018 年間資訊科技僱員人數（包括自由工作者）的變化
(按機構類別劃分)

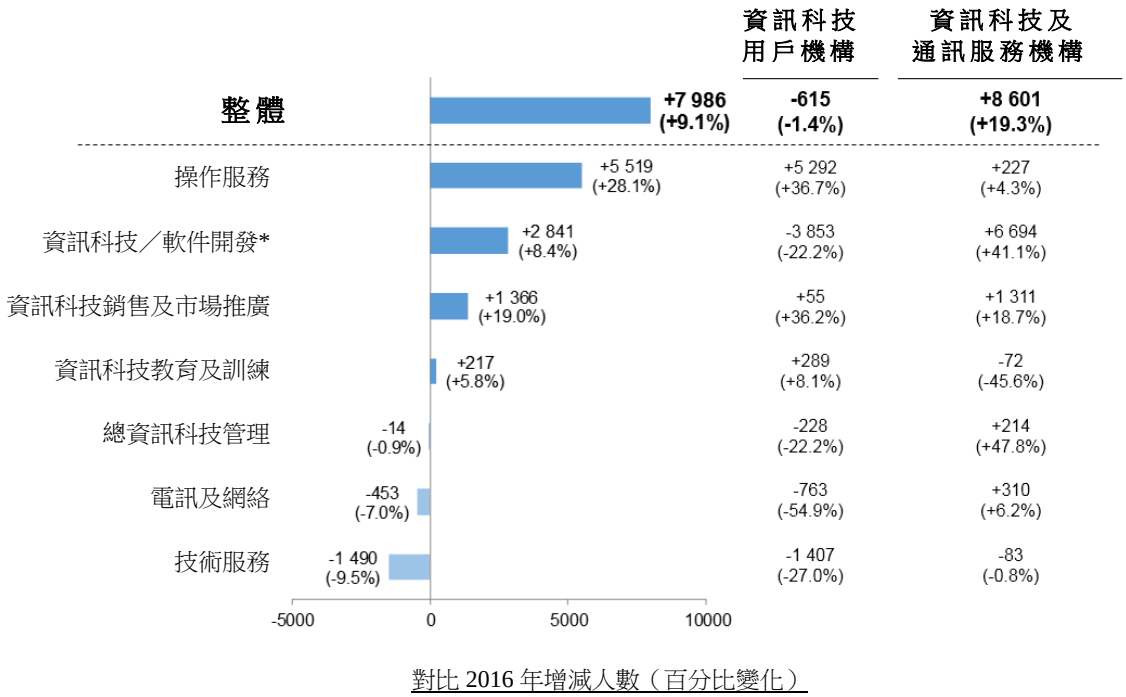


2018 年與 2016 年從承判商公司借調的資訊科技人員數目



4.6 與2016年相比，資訊科技及通訊服務機構需要透過增加資訊科技僱員數目，以提升其內部人手的技術能力，並減少借調的資訊科技員工。另一方面，資訊科技用戶機構則需借調出更多資訊科技員工，以加強提供予用戶的服務。

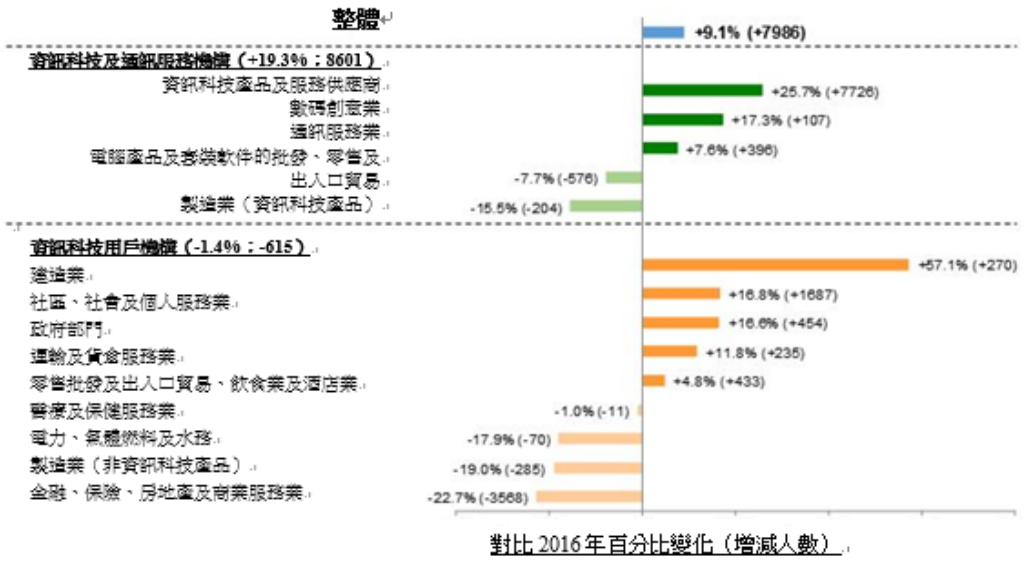
2018 年與 2016 年各技能類別的人力變化



* 包括研究與開發（與資訊科技相關）人員

4.7 本會觀察到，資訊科技服務供應商透過增強資訊科技／軟件開發團隊，以提升產品／服務。而資訊科技用戶機構則精簡資訊科技開發團隊及把工作外判予資訊科技服務供應商；然而，他們亦同時增聘支援人員負責與供應商協調，以加強營運效率。

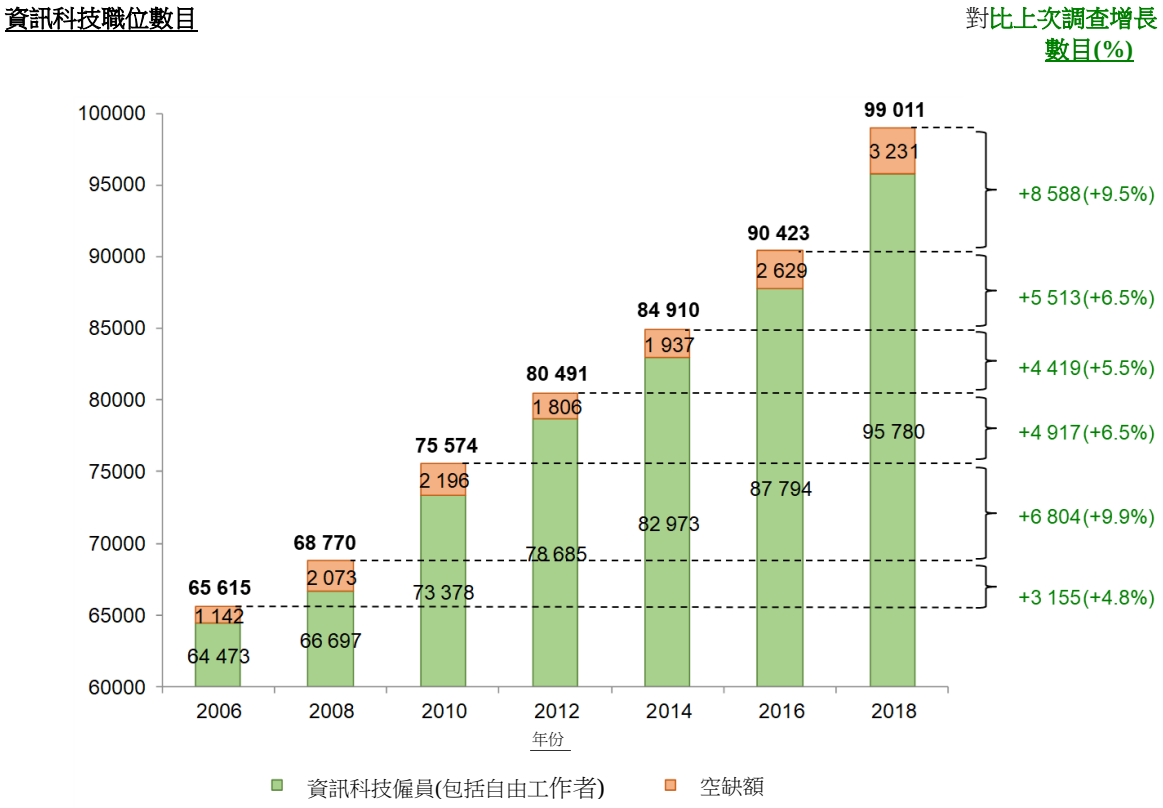
2018 年與 2016 年各行業的人力變化



4.8　　據本會觀察，資訊科技產品及服務供應商的人力增加了25.7%，以強化產品／服務開發，同時壯大市場推廣團隊來加強產品／服務宣傳。社區、社會及個人服務方面，為改善營運與服務，程式編製員與用戶支援人手也相繼增加。另一方面，金融、保險、房地產及商業服務業的人力卻下降22.7%，可能歸因於業界採用強勁的開發軟件工具，並外判與金融科技相關的服務。

4.9　　僱員、自由工作者與空缺額合計，資訊科技職位總數於2006年至2018年間持續穩定增長，其中2016年至2018年錄得顯著增幅（8 588人；9.5%）。

圖 4.2　　資訊科技職位、僱員及空缺總數 (2006 – 2018)



業務前景

全球及本地經濟展望

4.10 根據國際貨幣基金組織2018年10月的更新報告，2016年中期以來，經濟仍然持續穩步擴展，預計2018-19年全球增長率仍將保持在2017年的水平。因應近期經濟情況，2018-19年的全球增長率預計為3.7%，較4月的預測為低。在美國，隨著財政刺激措施持續增加，經濟增長勢頭仍然強勁，但鑑於最近公布的貿易措施，包括對從中國進口的2,000億美元商品徵收關稅，2019年的增長預測已經下調。由於部分歐洲國家貨幣疲弱及出現債務危機，加上英國與北愛爾蘭脫離歐盟出現變數，歐元區及英國的增長預測亦已下調。在新興市場及發展中經濟體，許多能源出口國的增長前景因石油價格上漲而改善。

4.11 受最近公布的貿易措施所影響，中國和若干亞洲經濟體的增長勢頭預計減弱。中國的增長將保持強勁，但預計會逐步放緩，未來數年的國民生產總值(GDP) 預測按年平均增長6-6.5%。內地經濟正經歷結構轉型，並趨向以發展服務業為重點。香港的經濟增長極受中國的經濟情況影響，預計增長前景正面但略為放緩，經濟或可平穩增長達3-4%。

4.12 資訊科技界未來的就業情況仍取決於整體經濟增長及企業創造職位的步伐。面對全球經濟情況多項變數，香港仍然具備競爭優勢，本地資訊及通訊科技基建完善，數碼化準備程度及互聯網接達能力一直位居世界前列[5]。香港政府推出多項措施，促進資訊及通訊科技業發展，包括撥款資助、加強基建、國際合作及人才培育等。2017年12月，政府公布「香港智慧城市藍圖」，勾劃未來五年的智慧城市發展計劃，期望利用創新及科技增強香港可持續發展的能力。總的來說，本地公司進行數碼轉型或採用新科技為業務增值，會帶動未來數年對資訊科技服務的需求，使行業持續增長。

近年政府計劃

4.13 政府在2018年《施政報告》宣布的下列計劃，將影響資訊科技與研發活動從業員的發展。措施包括：

(i) 向研究資助局的研究基金投入 200 億元；成立 30 億元「研究配對補助金計劃」；並推出「傑出學者計劃」，壯大本港創科人才庫。

[5] 香港貿易發展局經貿研究報告：香港資訊及通訊科技業概況，2018年7月5日發表。

(ii) 加速再工業化：提供 20 億元成立「再工業化資助計劃」，資助生產商在港設立智能生產線；並且撥款 20 億元，在工業邨建設先進製造業生產設施。

(iii) 促進技術轉移：對大學的技術轉移處、「大學科技初創企業資助計劃」以及「國家重點實驗室」與「國家工程技術中心香港分中心」增加資助。

(iv) 推行多項措施，例如「本地研究生學費豁免計劃」、「科技人才入境計劃」、「科技專才培育計劃」及優化「實習研究員計劃」，積極吸引及培育科研人才。「科技人才入境計劃」下的「再工業化及科技培訓計劃」已於 2018 年 8 月推出，藉以鼓勵本地僱主培育先進科技方面的人才。

(v) 在香港科學園建設兩個科技創新平台，專注於醫療科技和人工智能及機械人科技研發。

(vi) 開放政府數據，促進智慧城市發展。政府部門將於 2018 年底發布年度開放數據計劃。

4.14 政府近年推出多項支援創新科技發展的措施，預計會為從事資訊科技與研發的人士帶來更多就業機會。為了確保有足夠的幹練技術僱員，應付業界未來數年的需求，本會促請僱主給予進修時間及晉升獎勵的機會，從而鼓勵僱員提升自身技能，掌握嶄新科技的發展與應用。

人力供求分析

4.15 資訊科技業發展一日千里，必須有準確推算人力需求的方法，以便制訂完善的教育和培訓計劃，配合業界所需。教育和培訓業內人才需時數年，有必要及早確定行業需求，把握時間培養合適人才。

4.16 本會採用調節過濾法，推算資訊科技業2019年至2022年間的每年人力需求，如圖4.3所示。這方法根據過往和是次調查的數據來推算人力需求（較近期的數據會給予較大比重）。本會考慮過社會經濟發展和整體行業趨勢、僱主對來年的預測，以及每年僱員流失率等因素，選出最適當的推算數字，然後計算出2019年至2022年間各技能類別的每年額外人力需求，詳情見表4.3。

圖 4.3　　2019 年至 2022 年資訊科技業的人力需求預測
（採用調節過濾法推算）

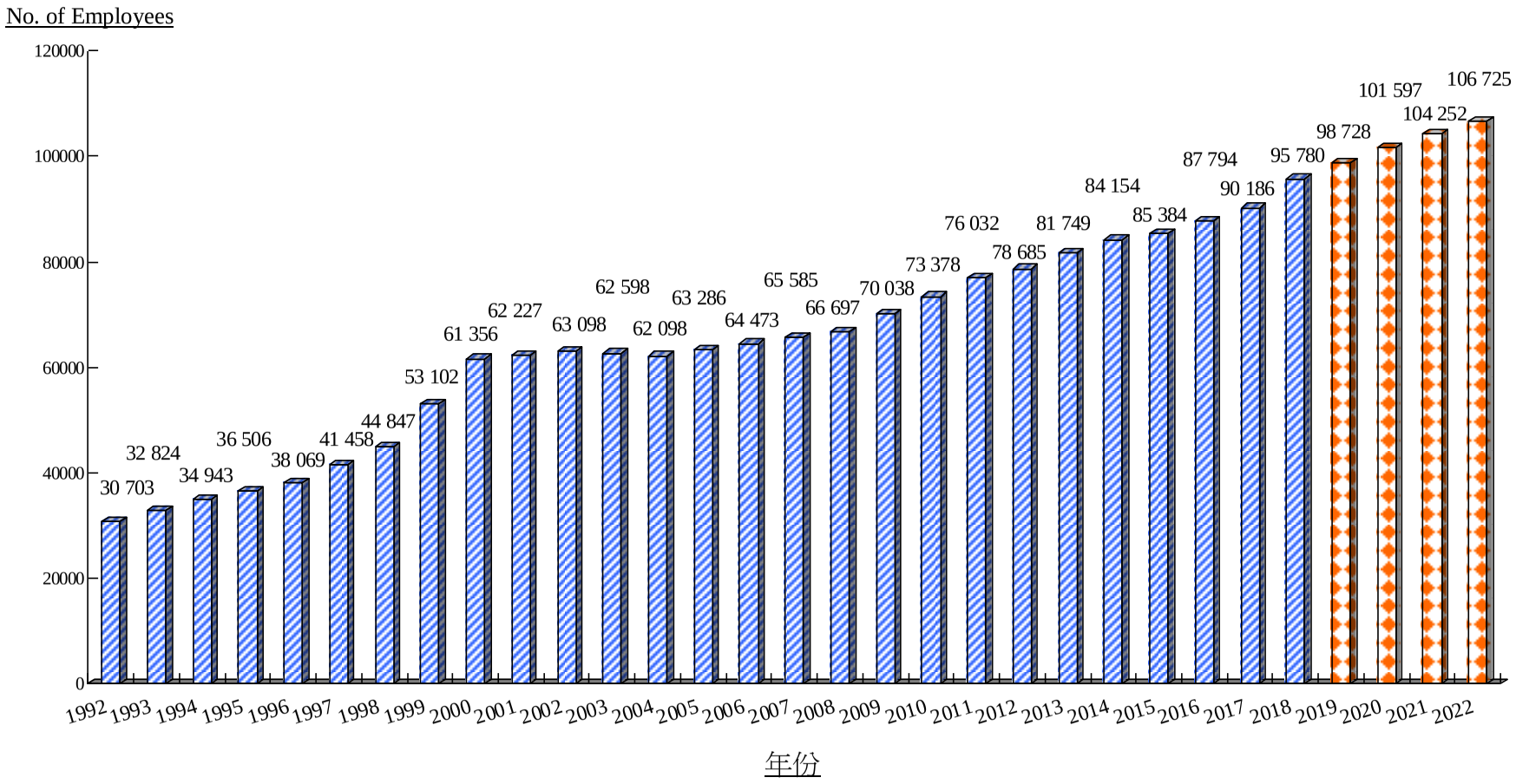


表 4.3　　2019 年至 2022 年各技能類別每年額外人力需求預測

技能類別	預測平均每年人力需求 (A)	預測平均每年人力需求增長 (B)	為填補流失人手而需增聘的僱員人數* (C) = (A) x 0.03	預測每年額外人力需求 (D) = (B) + (C)
資訊科技管理 (1)	6 116	-34	184	150
資訊科技／軟件開發 電訊及網絡 資訊科技保安 資料庫 系統程式編製	49 626	1 666	1 489	3 155
實地支援 資訊科技銷售及市場推廣	16 084	45	483	528
資訊科技教育及訓練	4 175	89	125	214
操作服務	26 826	970	805	1 775
總數	102 827	2 736	3 086	5 822

*　假設各技能類別每年的僱員流失率(2)為 3.0%。

註：　(1)　2018 年調查中，各技能類別的資訊科技管理職稱全部歸入「資訊科技管理」這一類別，令歷年的數據分類保持一致，以便作人力需求推算。

(2)　「流失率」是指相對於資訊科技僱員總數，因轉行、移民或其他原因而離開本業的僱員百分比。

(3)　因四捨五入關係，各項數字相加或與總計數字略有出入。

2019 年至 2022 年按技能類別及宜有學歷劃分的每年額外人力需求預測

4.17 本會根據第3.24段和附錄11的僱員宜有學歷資料，估算2019年至2022年的每年額外人力需求，按技能類別及宜有學歷列載於表4.4。

表 4.4 2019 年至 2022 年每年額外人力需求預測（按技能類別及宜有學歷劃分）

技能類別	研究院（碩士或博士學位或同等學歷）／學士（學士學位或同等學歷）	副學位（副學士、高級文憑、專業文憑或同等學歷）	高中（中四至中六程度、文憑、香港中學文憑或同等學歷）	初中（中一至中三程度或同等學歷）	預測每年額外人力需求
資訊科技管理 (1)	125	23	2	-	150
資訊科技／軟件開發 電訊及網絡 資訊科技保安 資料庫 系統程式編製 實地支援 資訊科技銷售及市場推廣 資訊科技教育及訓練	1 997	1 276	563	61	3 897
操作服務	368	559	735	113	1 775
總數	2 490	1 858	1 300	174	5 822

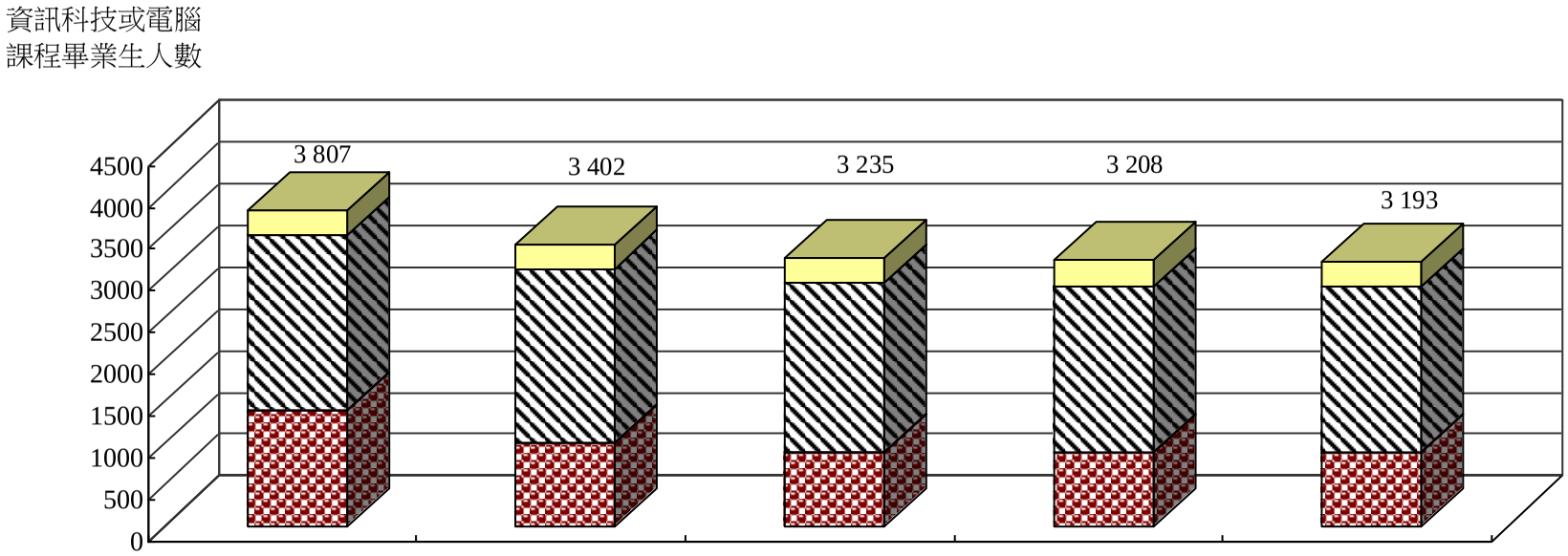
註： (1) 2018 年調查中，各技能類別的資訊科技管理職稱全部歸入「資訊科技管理」這一類別。

(2) 因四捨五入關係，各項數字相加或與總計數字略有出入。

本地院校資訊科技或電腦課程預計畢業生供應人數

4.18 根據大學教育資助委員會（下稱「教資會」）資助院校、香港公開大學、香港大學附屬學院和職業訓練局提供的資料，圖4.4、4.5及附錄18、19列出2018年至2022年教資會／政府資助及自負盈虧的資訊科技或電腦課程預計畢業生人數。

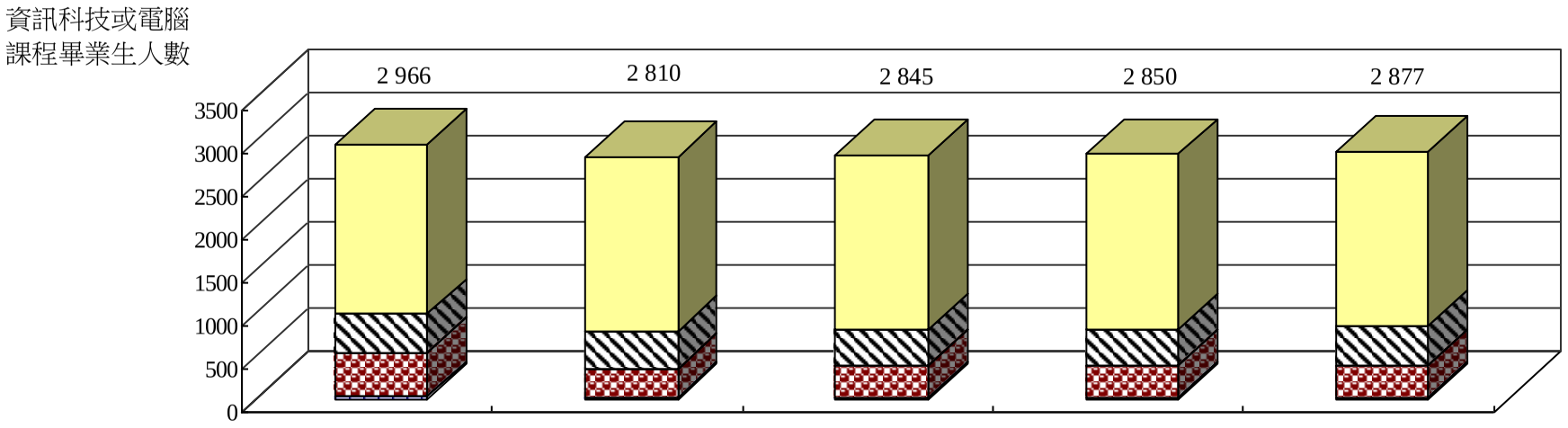
圖 4.4　　2018 年至 2022 年按教育程度劃分的
教資會／政府資助資訊科技或電腦課程預計畢業生人數



年份 / 教育程度	2018	2019	2020	2021	2022
研究院	307	294	305	318	301
學士學位	2 086	2 098	2 037	1 997	1 999
副學位	1 414	1 010	893	893	893
總計	3 807	3 402	3 235	3 208	3 193

資料來源：教資會資助院校及職業訓練局。

圖 4.5　　2018 年至 2022 年按教育程度劃分的自負盈虧資訊科技或電腦課程預計畢業生人數



年份 / 教育程度	2018	2019	2020	2021	2022
研究院	1 980	2 030	2 032	2 033	2 028
學士學位	459	435	424	428	460
副學位	505	331	374	374	374
高中	22	14	15	15	15
總計	2 966	2 810	2 845	2 850	2 877

資料來源：教資會資助院校、香港公開大學、香港大學附屬學院及職業訓練局。

4.19 畢業生供應人數（包括修讀技術提升課程的現職資訊科技僱員）與入職率有關；入職率是指實際投身本業的資訊科技或電腦課程畢業生的百分比。本會參考圖4.6所示的教資會資助院校2016/17學年全日制課程畢業生的就業調查數據後，認為全日制學士學位課程畢業生的成功入職率不會低於74%，而全日制副學位課程畢業生則不會低於60.0%。部分高級文憑、副學士生在畢業後會繼續進修。根據有關數據，可估計本地院校於2018年至2022年，平均每年的資訊科技或電腦課程畢業生的供應人數，詳情載於表4.5。

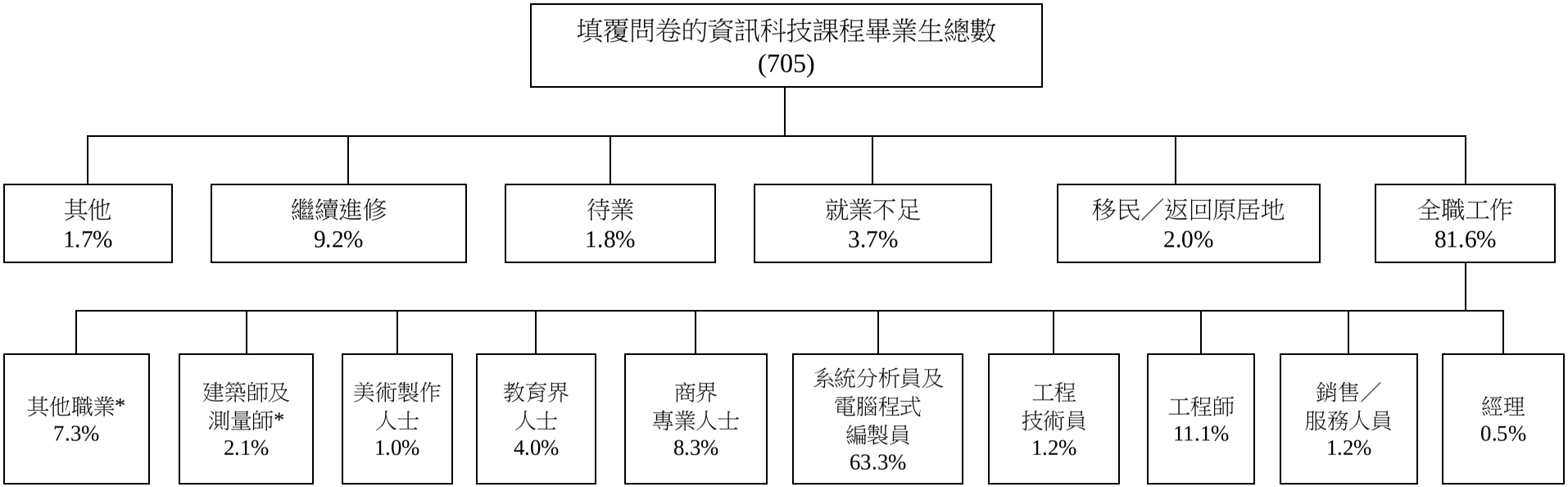
表 4.5 2018 年至 2022 年按教育程度劃分的資訊科技或電腦課程畢業生平均每年供應人數

教育程度	修讀方式	平均每年畢業生人數		平均*成功入職率	平均每年供應人數		
		GF	**SF**		**GF**	**SF**	**總計**
學位							
研究式研究院學位（哲學碩士／哲學博士）(1)	FT/PT	305	16	0.41	125	7	132
修課式研究院學位／文憑／證書（理學碩士／文學碩士）(1)	FT/PT	-	2 004	0.77	-	1 543	1 543
學士學位 (1)	FT/PT	2 043	35	0.74	1 512	26	1 538
學士學位 (3)	FT F2F	-	185	0.75	-	139	139
學士學位 (3)	DL	-	146	0.75	-	110	110
學士學位 (4)	FT	-	76	0.75	-	57	57
小計		*2 348*	*2 462*		*1 637*	*1 882*	*3 519*
副學位							
高級文憑／副學士 (1)	FT	81	185	0.60	49	111	160
高級文憑／副學士 (2)	FT	-	186	0.60	-	112	112
高級文憑 (4)	FT/PTE	940	21	0.72	677	15	692
高級文憑／副學士 (3)	DL/F2F	-	1	0.75	-	1	1
小計		*1 021*	*393*		*726*	*239*	*965*
總計		**3 369**	**2 855**		**2 363**	**2 121**	**4 484**

* 根據 2016/17 學年教資會資助院校、香港公開大學及職業訓練局全日制課程畢業生的就業調查。

備註： FT = 全日制 GF = 教資會／政府資助課程 DL = 遙距課程
PT = 兼讀制 SF = 自負盈虧課程 F2F = 面授課程
PTE= 夜間兼讀制
(1) 教資會資助院校開辦的課程
(2) 香港大學附屬學院開辦的課程
(3) 香港公開大學開辦的課程
(4) 職業訓練局開辦的課程

圖 4.6　　教資會資助全日制資訊科技或電腦學科學士課程畢業生的初期就業情況



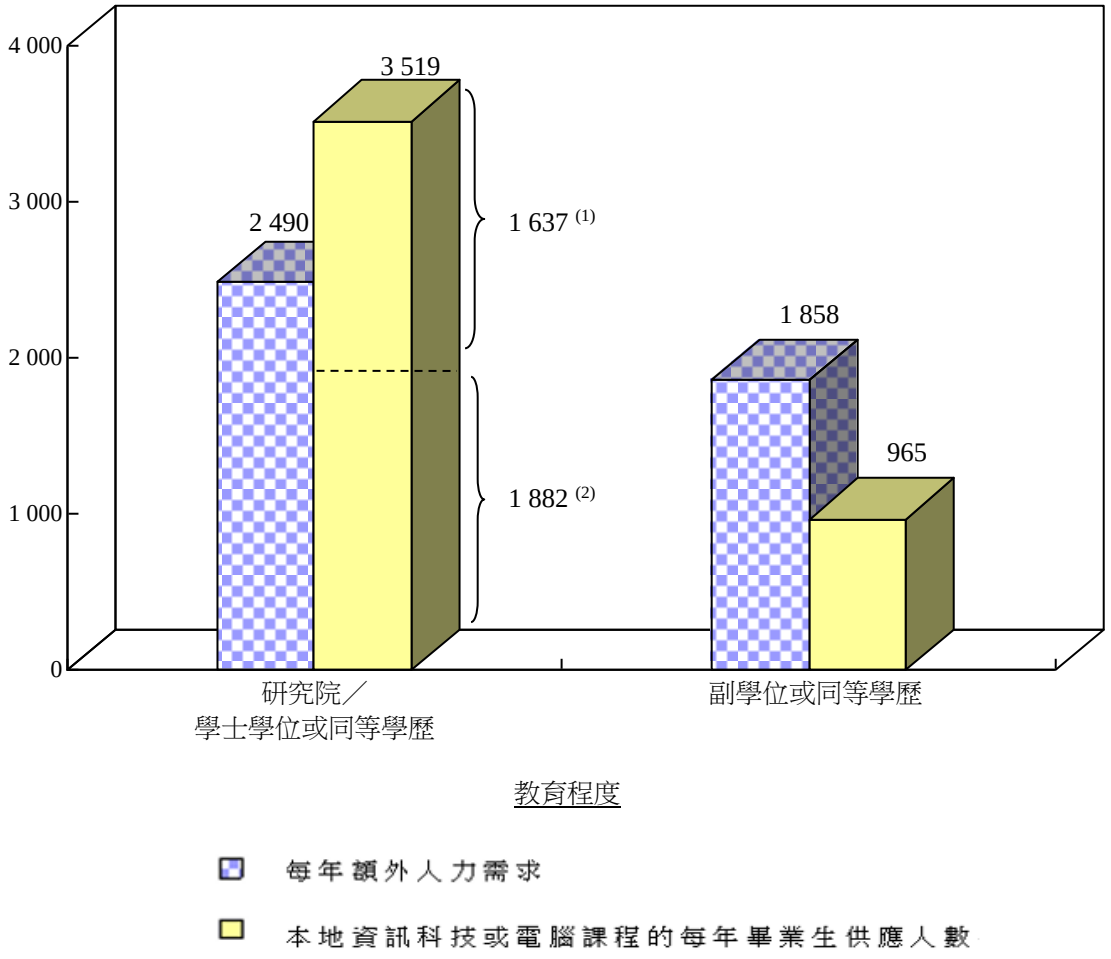
*　與入職率無關的職業不在此列。據此計算，教資會資助全日制學士課程畢業生的成功入職率為 74.0%（即 81.6% x 90.6%）。

資料來源：2016/17 學年教資會資助全日制課程畢業生的就業調查。

4.20 是項分析主要按僱員教育程度，評估資訊科技業2019年至2022年每年的額外人力供求情況，詳情見圖4.7。

圖 4.7 2019 年至 2022 年按教育程度劃分的每年額外人力供求情況

資訊科技人力



註： (1) 教資會／政府資助本地資訊科技或電腦課程的每年畢業生供應人數。
(2) 自負盈虧本地資訊科技或電腦課程的每年畢業生供應人數。

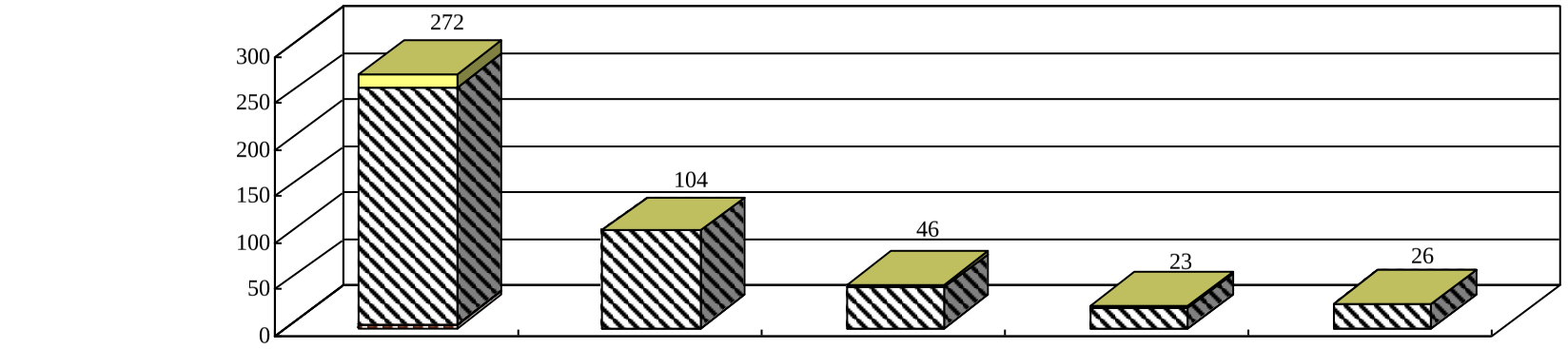
4.21　從表4.3、4.4和圖4.7可見，本地資訊科技或電腦學科學位課程每年平均有3 519名畢業生，可滿足業界對此等學歷僱員每年2 490人的預計額外人力需求。圖4.8按教育程度和學科類別，列出非資訊科技或電腦課程畢業生受僱擔任系統分析員／電腦程式編製員的情況。預期一些並非修讀資訊科技或電腦課程的畢業生，會有意投身資訊科技業發展。

4.22　根據表3.16所載，各行業的資訊科技職位大多由內部晉升的員工或本地招聘的具業內經驗人士擔任，本會相信，這樣會增加各類資訊科技職位空缺，需由剛畢業的大學生填補。

4.23　至於需具副學位學歷的職位，每年額外人力需求預計為1 858人，但本地每年平均只有965名此等學歷的資訊科技或電腦課程畢業生，並不足以應付需求。預計出現的893個空缺一般可由海外返港的資訊科技或電腦課程畢業生，以及受過深入轉職訓練的非資訊科技或電腦課程畢業生填補。很多非資訊科技或電腦相關課程的本地畢業生均願意修讀本地院校開辦的資訊科技課程，然後投身本業。

4.24　至於需具其他程度學歷的職位，本業每年需聘請1 474人擔任各類資訊科技職位，如表4.4所示。有關職位可由高中或以下程度的畢業生填補。不過，這些人員大多需先接受相關技術訓練，始能勝任資訊科技工作。本地教育及訓練機構和僱主會為這些人員提供所需的基本技術訓練。

圖 4.8　非資訊科技或電腦課程畢業生受僱擔任系統分析員／電腦程式編製員的情況(按教育程度和學科類別劃分)



學科類別 / 教育程度	工程與科技	商業與管理學	數學／社會科學	藝術、設計與表演 藝術／物理科學	其他 (1)	總計
研究院	14	-	3	1	1	19
學士學位	255	104	43	22	25	449
副學位	3	-	-	-	-	3
總計	272	104	46	23	26	471

註：　(1)　其他學科類別包括生物科學、大眾傳播及文檔管理、語言及相關學科、人文學科、醫科及教育。

(2)　由於教資會資助院校的部分課程涉及多個學科類別，這些課程的學生人數按有關學科的比例計算分配，因此某些學科類別的學生數目或會出現小數點。上表以四捨五入方式將有關數字化為整數。

資料來源：2016/17 學年教資會資助全日制課程畢業生的就業調查。

V. 建議

概要

5.1 鑑於近來的貿易戰、英國脫歐及部分歐洲國家出現債務危機，加上內地經濟結構轉型，種種因素使全球經濟前景不明朗，香港來年經濟可能較過去多年放緩，估計增長率為 3-4%。

5.2 然而，香港仍然具備競爭優勢。香港的資訊及通訊科技[ICT]基建完善，數碼化準備程度及互聯網接達能力都在全球名列前茅。根據國際電信聯盟 2017 年 11 月發表的「年度全球 ICT 發展指數」，香港在亞洲排名第二，全球排名第六。亞洲經濟體中，只有香港與韓國躋身全球前十名。根據世界經濟論壇編製的「2016 年網絡準備程度指數」，在參與資訊科技發展及獲益程度方面，香港在亞洲排名第三，全球排名第 12。

5.3 香港政府推出多項措施，促進資訊及通訊科技業發展，包括撥款資助、加強基建、促進國際合作及人才培育。2017 年 12 月公布的「香港智慧城市藍圖」，勾劃政府未來五年的智慧城市發展計劃，冀透過創新及科技增強香港可持續發展的能力。基建方面，由香港政府全資擁有的香港科技園公司及數碼港，提供設備完善的研發辦公室、會議場地、技術中心以及專業支援服務，是培育科技公司的重要搖籃。香港政府成立的創新科技基金，為資訊科技業提供另一個資金來源。

5.4 政府近年推出多項支援創新科技發展的措施，預計會為從事資訊科技與研發的人士創造更多就業機會。為了確保未來數年有充足的熟練技術人手供應業界所需，本會促請僱主給予進修時間與晉升獎勵的機會，從而鼓勵僱員提升自身技能，掌握嶄新科技的發展與應用。

每年人力培訓需求

5.5 調查結果反映調查進行期間資訊科技業的人力需求。然而，目前全球經濟前景並不明朗，或會對資訊科技人力需求構成影響。

5.6 根據推算的平均每年人力增長和估計流失率（3%），並考慮資訊科技業最新發展及業內委員的經驗，本會估計 2019 至 2022 年間每年需額外培訓的僱員人數（按技能類別劃分，見表 5.1)。

表 5.1 估計 2019 年至 2022 年間每年需額外培訓各技能類別資訊科技僱員人數

技能類別	估計 2019-2022 年每年需額外培訓人數（資訊科技僱員數目）
資訊科技管理	140 – 170
資訊科技／軟件開發 電訊及網絡 技術服務 資訊科技銷售及市場推廣 資訊科技教育及訓練	3 510 – 4 290
操作服務	1 600 – 1 950
總計	5 250 – 6 410

註： (1) 在 2018 年的調查，各技能類別的資訊科技管理職稱全歸入「資訊科技管理」類別。
(2) 因四捨五入關係，各項數字相加或與總計數字略有出入。

與技術轉移、研發協作及發展相關的機構

5.7 善用公共研發機構及大學的設施與服務，有助提升研究與開發工作。本會促請僱主聯繫下列機構，就拓展研究開發與技術轉移尋求協助：

i. 香港科技園公司；
ii. 數碼港；
iii. 香港研發中心；
iv. 香港生產力促進局；及
v. 本地大學技術轉移處

5.8 附錄 20 載有上述機構的簡介。

協助提升技能的機構／課程

5.9　本會鼓勵僱主善用以下機構／計劃提供的服務或資助，協助提升僱員的技術知識與水平：

i. 職業訓練局開辦的培訓課程；
ii. 再工業化及科技培訓計劃；
vi. 工科畢業生訓練計劃[EGTS]；及
iii. 香港生產力促進局

5.10　有關機構的課程／服務或資助計劃的詳情載於附錄 21。

建議重點培訓範疇

金融科技

5.11　金融科技乃透過資訊科技的應用來提供金融服務。隨着金融危機後監管制度的改革，加上新科技發展迅速，金融科技近年急速冒起。除了現有的金融機構，金融服務業生力軍相繼湧現，包括金融科技初創企業和大型電子商務及科技公司。不少金融科技公司為客戶提供支付及 P2P（點對點）網絡貸款等金融服務。有些公司則嘗試在一系列的服務範圍挑戰現有的金融服務機構，另有公司跟現有的金融服務機構合作，協助他們提升服務。

5.12　區塊鏈是利用先進加密技術和點對點網路構建的軟件平台，透過既合乎成本效益又可靠的方式，提供安全、可靠及可互相協作的應用。這項科技已在不同領域帶來重大影響，例如：加密電子貨幣、支付系統、數碼版權保護和健康檔案管理等。區塊鏈金融技術更有可能顛覆傳統金融系統，減低中間人的昂貴營運費用，並逐步推進數碼化及無紙化。

5.13　香港應用科技研究院有限公司（應科院）也與本港一家大型銀行合作，利用區塊鏈系統來簡化目前以紙張為本和費時的物業估值過程。應科院將繼續與不同的金融機構合作在貿易融資、按揭、數碼認證管理和保險等領域發展區塊鏈系統。

5.14　為了積極推動香港邁向「無現金化」社會，香港金融管理局於 2018 年 9 月宣布推出「轉數快」快速支付系統，以助市民進行即時支付。隨著新系統啟用，用戶數目持續增加，香港有望實現無現金化社會的目標。

網絡保安

5.15　網絡保安的範疇涵蓋保障電腦系統安全，包括軟件硬件及所儲存的資料，免受盜竊或破壞，同時保障服務不受干擾，或利用作不當用途。保障措施包括監控電腦系統硬件的使用、防範可能透過入侵網絡、注入數據或代碼等方式帶來損害，以至防止操作者蓄意或因意外而不當使用電腦，或因掉入黑客圈套而偏離安全操作程序。全球各地愈來愈倚賴電腦系統和互聯網，藍牙及 Wi-Fi 等無綫網絡無遠弗屆，智能電話、電視和物聯網所用的精巧裝置等「智慧」產品漸趨普及，促使網絡保安成為日益重要的課題。

大數據

5.16　數據科學指處理雜亂或系統化的數據，涵蓋數據整理、處理及分析等各個範疇。這門學科統攝統計學、數學、程式編製和解決疑難等學問，透過摘取適當的數據，形成分析問題的洞見；同時去除蕪雜資訊、預備和整合數據。簡言之，數據科學代表分析數據，從中找到資訊和新觀點的一籃子學問。以下是高德納公司 Gartner[6] 對大數據的定義：「大數據變動急速、類型多樣，需要具成本效益和創新的方法處理，協助更透徹分析問題、精明決策和推行程序自動化。」數據分析是檢視原始資料以尋求結論的學問，涉及運用演算法或人手運算。不同行業及機構均可運用數據分析協助決策，以及印證或推翻現存的理論或模型。

人工智能 (AI)

5.17　在銀行金融、零售和市場推廣及製造業等主要行業，企業已利用人工智能進行重要且涉及細膩工序的任務，例如金融交易、以人類語言通訊和回答客戶查詢、收集市場／客戶情報、演繹圖像，以及詮釋大量數據來

[6] Gartner是從事資訊科技研究的公司

歸納市場趨勢、意見回饋及可行的方案，以助進行實時策劃及制訂營運計劃。大勢所趨，人工智能對企業營運模式將帶來翻天覆地的影響。企業當前面對的問題，是能否把人工智能與業務流程有效整合。香港企業已趕上人工智能發展趨勢，不少服務公司持續利用人工智能方案，探討提高營運效益的機會。

雲端運算

5.18　雲端運算是透過互聯網（「雲端」）傳送伺服器、儲存體、資料庫、網路、軟體、分析、智慧功能等運算服務，以促進創新，確保資源靈活，並實現規模經濟。一般來說，用戶企業只需為所使用的雲端服務付費，這有助降低營運成本、更有效率地運用基礎設備，並因應業務需求變更進行調整。雲端運算能免除購置軟硬件及現場資料中心所需設定的資本費用，其中包括伺服器機架、全日無間斷供應系統運作和冷卻設備所需的電力，以及管理基礎設備所需的資訊科技專家。雲端運算服務多以自助及隨選形式提供，因此，即使是大量的運算資源，也可以在幾分鐘內完成部署（通常只須點選幾下滑鼠），讓企業更具靈活性，免除規劃設備容量的壓力。不少雲端供應商已制訂整套政策、技術方案和監控措施，以保障客戶能安全使用服務，並協助保護資料、應用程式和基礎設備不受潛在的威脅侵入。雲端運算服務的效益包括靈活擴充能力，意即可在有需要時從適當的地點，傳送適量的資訊科技資源（例如運算電源、儲存體、頻寬）。部署雲端服務的方式有以下三種：公用雲端、私人雲端或混合式雲端。

智慧城市

5.19　2017 年公布的《香港智慧城市藍圖》提出超過 70 多項措施，包括發展數碼個人身份、智慧燈柱、提升政府公共雲端服務和建立新的大數據分析平台等基礎建設項目。推動智慧城市發展的一個重要目標，是提升政府的創新能力和城市管理水平。

5.20　推行智慧城市計劃必然會提高資訊科技專業人員的需求，以便推行各項計劃與政策，包括：

(i)　智慧出行
(ii)　智慧生活
(iii)　智慧環境
(iv)　智慧市民
(v)　智慧政府
(vi)　智慧經濟

虛擬實境／擴增實境[VR/AR]

5.21　智能電話連同耳機，已是近年最普及使用於體驗虛擬實境，也是讓消費者使用虛擬實境技術最方便可取的切入點。目前市場上虛擬實境的應用較擴增實境更為成熟，用以營造逼真虛擬實境體驗所需的軟件工具與硬件平台亦容易找到。虛擬實境在房地產以至旅遊業等產業應用漸見成效。至於擴增實境，亦已於製造業、保健業及物流業等不同行業應用。然而，市場對更先進軟硬件的需求日漸殷切，特別是動畫演算軟件，待技術逐步成熟，始可廣泛應用於日常生活。

建議

5.22　本會根據短至中期行業前景展望，以及調查結果所得的市場人力供求情況，建議業界持份者可採取以下措施，以配合業界需求：

資訊科技業

(i) 資訊科技業持份者應提高業界整體形象／地位，吸引更多具潛質的人士，尤其是年輕一代入行。另可與資訊科技專業團體合作向學生推行宣傳計劃，從而激發他們投身資訊科技業的興趣。

<u>供僱主參考</u>

建議僱主：

(i) 鼓勵僱員參加不同的資訊科技專業認證考試（例如：資訊系統安全認證專家[CISSP]和 ISO27001 主任審核員證書），並參與指定的培訓課程，以達到認證要求。

(ii) 讓僱員掌握所需的技能與知識，例如網絡保安和雲端運算，在僱員之間營造終身學習的風氣。

(iii) 為實習培訓計劃提供更多支援，例如師友輔導、工作影子、工作實習，協助學生／學員取得職場實務工作經驗。

(iv) 考慮透過科技人才入境計劃(www.itc.your.hk/en/techitas/)，從海外招聘更多富經驗的專才，培訓本地資訊科技人員應用先進行業技術。

<u>供僱員參考</u>

建議僱員：

(i) 善用不同的政府資助培訓計劃，例如再工業化及科技培訓計劃[RTTP]和持續進修基金[CEF]，協助提升個人技能及緊貼先進科技發展。

(ii) 透過不同的學習模式，包括電子學習平台的網上認證課程，掌握新興技術以提升個人技術水平。

<u>供培訓機構參考</u>

建議培訓機構：

(i) 配合市場需要和提升僱員技能而增加培訓名額；並且開辦以加強就業能力、新興資訊科技技術為主的課程，特別是網絡保安、雲端運算技術和資料私隱守則。

(ii) 加強與應科院及其他大型科技企業的合作，向中學生提供有關先進技術（例如人工智能與智慧城市）的課程，從而鼓勵更多學生修讀資訊科技相關的課程，並選擇投身資訊科技業。

(iii) 協助資訊科技業僱主培養僱員掌握先進技能。為資訊科技人員適時提供再培訓課程，裝備他們因應資訊科技技術變化，承擔新的任務。

(iv) 探討為高中層管理人員籌辦資訊科技先進技術認知課程，協助他們了解技術應用，並肯定引入相關技術可為機構帶來的效益。

(v) 考慮為具中學教育程度的青年人開辦職前資訊科技提升課程，使他們掌握資訊科技技能，以備從事操作及支援職務。

研究與開發

(i) 培訓機構或香港特別行政區知識產權署應籌辦及提供更多有關知識產權[IP]管理的培訓課程，讓相關人員獲取有關註冊申請知識產權的知識。

(ii) 就特定技術範疇舉辦更多交流論壇及會議，讓研發人員分享其產品服務，進一步探索合作發展的機會。

(iii) 研發公司應與公營研發中心加強合作，借助相關技術牌照，以及善用中心的測試實驗室設施，以縮短產品開發時間。

(iv) 配合 2018 年《施政報告》倡議推動創新科技，為技術人才提供更多機會、補助與支援，鼓勵他們成立初創公司。

(v) 為了吸引外國投資者在香港成立辦事處，政府應考慮主動動用更多資源，透過再工業化及科技培訓計劃，培育研究與開發人才，並推動香港研發活動的發展。

(vi) 定期進行人力調查，了解業界的人力供求情況。

Membership List

Innovation and Technology Training Board
(As in December 2018)

Chairman:

Mr TAI Chark-tong, Tony	(nominated by Vocational Training Council)

Members:

Dr CHAN Kwok-man, Edward	(nominated by The Chinese Manufacturers' Association of Hong Kong)
Mr CHAN Wai-fung, Raymond	(nominated by the The Hong Kong General Chamber of Commerce)
Mr CHENG Chung-ngam, Rocky	(ad personam)
Mr CHENG Siu-hong, Raymond	(nominated by a company in the financing, insurance, real estate or business services sector)
Dr CHEUNG Chi-chong, Lawrence	(nominated by the Hong Kong Productivity Council)
Mr Argon HO	(nominated by a company in the transport, storage and communication sector)
Dr HUNG Kim-fung, Measure	(nominated by a company in the wholesale/retail or import/export trades, participating in e-commerce)
Dr KAI Sze-fai, Alex	(nominated by an organisation in the community, social or personal services sector)
Dr KWONG Kwok-wah	(nominated by an electronic design company)
Mr Robert LAI	(nominated by the Federation of Hong Kong Industries)
Mr Savio LAI	(nominated by the Design Council of Hong Kong)
Mr LEE King-chung	(nominated by a company in the digital creative industry)

Mr LEUNG Yip-hung	(nominated by a building services/civil engineering company participating in the Engineering Graduate Training Scheme)
Prof MENG Mei-ling, Helen	(nominated by a local education/training institution)
Ms Gracie NG	(nominated by the Hong Kong Science and Technology Parks Corporation)
Ir Dr SZE Lee-wah, George	(nominated by a technology development and support company)
Dr WONG Chung-kiu, MH	(nominated by a technology management company)
Mr YEUNG Chun-lam, Cedric	(nominated by an IT sales and marketing company)
Ir YEUNG Tin-chung, Peter	(nominated by the Hong Kong Institution of Engineers)
Ms CHAN Fung-kwan, Donna	(representing the Government Chief Information Officer)
Mr LI King-lok, Kevin	(representing the Commissioner for Innovation and Technology)
Dr LAU Hing-keung, George Dr LEUNG Hing-pong, Joseph	(representing the Executive Director of the Vocational Training Council)

Secretary:

Mr LEUNG Wing-kwan, Freddy	(Vocational Training Council)

Membership List

Working Party on 2018 Manpower Survey of the Innovation and Technology Sector (As in December 2018)

Convener:

Prof MENG Mei-ling, Helen

Members:

Ms CHAN Fung-kwan, Donna

Dr CHAN Kwok-man, Edward

Mr CHAN Wai-fung, Raymond

Dr CHAU Yat-kwong

Mr CHENG Siu-hong, Raymond

Dr CHEUNG Chi-chong, Lawrence

Mr Argon HO

Dr KAI Sze-fai, Alex

Mr Robert LAI

Mr LEE King-chung

Dr LEUNG Hing-pong, Joseph

Mr LEUNG Yip-hung

Mr LI King-lok Kevin

Mrs MAK TANG Pik-yee, Agnes, MH, JP

Ms Gracie NG

Mr TAM Kwok-kiu, Edwin

Dr WONG Chung-kiu, MH

Dr WONG Pak-kwong, Stanley

Mr YEUNG Chun-lam, Cedric

Secretary:

Mr LEUNG Wing-kwan, Freddy

創新及科技訓練委員會
委員名單

（2018 年 12 月）

主席：

戴澤棠先生	（職業訓練局提名）

委員：

陳國民博士	（香港中華廠商聯合會提名）
陳偉奉先生	（香港總商會提名）
鄭松岩先生	（獨立人士）
鄭小康先生	（金融、保險、地產或商用服務業公司提名）
張梓昌博士	（香港生產力促進局提名）
何偉國先生	（運輸、貨倉及通訊業公司提名）
洪劍峰博士	（業務涉及電子商貿的批發／零售或出入口業公司提名）
紀思輝博士	（社區、社會及個人服務業機構提名）
鄺國華博士	（電子設計公司提名）
黎啟東先生	（香港工業總會提名）
黎易庭先生	（香港設計委員會提名）
李競松先生	（數碼創意行業公司提名）
梁業雄先生	（參與工科畢業生訓練計劃的屋宇裝備／土木工程公司提名）
蒙美玲教授	（本地教育／訓練機構提名）
吳子慧女士	（香港科技園公司提名）
施禮華工程師，博士	（科技開發及支援服務公司提名）

黃仲翹博士，MH	（科技管理公司提名）
楊俊霖先生	（資訊科技銷售及市場推廣公司提名）
楊天寵工程師	（香港工程師學會提名）
陳鳳群女士	（政府資訊科技總監代表）
李敬樂先生	（創新科技署署長代表）
劉慶強博士 梁興邦博士	（職業訓練局執行幹事代表）

秘書：

梁永鈞先生	（職業訓練局）

創新及科技業 2018 年人力調查工作小組
委員名單

（2018 年 12 月）

召集人：

蒙美玲教授

委員：

陳鳳群女士

陳國民博士

陳偉奉先生

周日光博士

鄭小康先生

張梓昌博士

何偉國先生

紀思輝博士

黎啟東先生

李競松先生

梁興邦博士

梁業雄先生

李敬樂先生

麥鄧碧儀女士, MH, JP

吳子慧女士

譚國翹先生

黃仲翹博士, MH

黃伯光博士

楊俊霖先生

秘書：

梁永鈞先生

Terms of Reference

Innovation and Technology Training Board

1. To determine the manpower demand of the industry, including the collection and analysis of relevant manpower and student/trainee statistics and information on socio-economic, technological and labour market developments.

2. To assess and review whether the manpower supply for the industry matches with the manpower demand.

3. To recommend to the Vocational Training Council (the Council) the development of vocational and professional education and training (VPET) facilities to meet the assessed manpower demand.

4. To advise the Council on the strategic development and quality assurance of its programmes in the relevant disciplines.

5. To prescribe job specifications for the principal jobs in the industry defining the skills and knowledge and advise on relevant training programme specifying the time a trainee needs to spend on each skill element.

6. To tender advice in respect of skill assessments, trade tests and certification for in-service workers, apprentices and trainees, for the purpose of ascertaining that the specified skill standards have been attained.

7. To advise on the conduct of skill competitions in key trades in the industry for the promotion of VPET as well as participation in international competitions.

8. To liaise with relevant bodies, including employers, employers' associations, trade unions, professional institutions, training and educational institutions and government departments, on matters pertaining to the development and promotion of VPET in the industry.

9. To organise seminars/conferences/symposia on VPET for the industry.

10. To advise on the publicity relating to the activities of the Training Board and relevant VPET programmes of VTC.

11. To administer relevant training schemes and programmes as commissioned by the Government.

12. To submit to the Council an annual report on the Training Board's work, its recommendations on the strategies for programmes in the relevant disciplines and a business plan of the training schemes and programmes mentioned in 11 above.

13. To undertake any other functions delegated by the Council in accordance with section 7 of the Vocational Training Council Ordinance.

附錄 2

創新及科技訓練委員會

職權範圍

1. 確定業內的人力需求，包括收集、分析相關的人力和學生／學員統計數字，以及關於社會經濟、科技及人力市場發展的資料。

2. 評估及研究本業的人力供求是否平衡。

3. 就發展業內職業專才教育及訓練設施應付人力需求，向職業訓練局（下稱「局方」）提供意見。

4. 就相關學科的課程發展策略及質素保證，向局方提出建議。

5. 擬訂本業主要職務的工作範圍，界定所需的技能及知識，審議訓練方案，包括訂定每種技能所需的訓練期。

6. 對技術評估、技能測驗及認證制度提供意見，以確定從業員、學徒及見習員的技能水平。

7. 就本業主要行業舉辦技能比賽提供意見，以推廣職業專才教育和派員參加國際賽事。

8. 與僱主、僱主聯會、工會、專業團體、訓練及教育機構、政府部門等聯絡，共商本業職業專才教育的發展與推廣事宜。

9. 為本業舉辦有關職業專才教育的研討會和會議。

10. 就訓練委員會工作和相關職業專才教育課程之推廣宣傳，向局方提供意見。

11. 推行政府委辦的相關培訓計劃及課程行政管理。

12. 每年向局方呈交訓練委員會工作報告、相關學科課程發展策略建議，以及上文第 11 條所述培訓計劃及課程的工作方案。

13. 根據《職業訓練局條例》第 7 條，負責局方所委派的其他工作。

Vocational Training Council 職業訓練局

Headquarters (Industry Partnership) 總辦事處(行業合作)
30F, Billion Plaza II, 10 Cheung Yue Street, Cheung Sha Wan, Kowloon, Hong Kong
香港九龍長沙灣長裕街10號億京廣場2期30樓
www.vtc.edu.hk

Telephone No 電話 Facsimile No 傳真 3748 9400

Our Reference 本局檔號 ITTB MPS (2018) Your Reference 來函檔號

Appendix 3

1st April 2018

Dear Sir/Madam,

The 2018 Manpower Survey of the
Innovation and Technology Sector

The Innovation and Technology Training Board (the Training Board) of the Vocational Training Council (VTC), appointed by the Chief Executive of the Hong Kong Special Administrative Region (HKSAR), is responsible for matters pertaining to manpower training in the industry. In order to collect the latest manpower information for formulating recommendations on future manpower training, the Training Board will conduct the captioned survey from April to May 2018. I am writing to enlist your help by providing the relevant information to the survey and your co-operation would be much appreciated.

I enclose the following documents for your reference and completion:

(a) The Questionnaire;
(b) Explanatory Notes (Appendix A);
(c) Job Descriptions for Principal Jobs (Appendix B); and
(d) Types of Training under Column (J) of Question A1 / B1 (Appendix C).

The VTC has appointed **MOV Data Collection Center Ltd. (MOV)** to assist in conducting the above survey. During the survey period, the enumerator of MOV will contact your establishment for the survey and answer the questions you may have. If necessary, visit will be made to your establishment to assist in completing and collecting the questionnaire. Alternatively, you may return the copy of the completed questionnaire to MOV via fax (3900 1122) or email (vtc@mov.com.hk).

I wish to assure you that the information provided will be handled **in strict confidence** and published on aggregate basis without reference to individual establishments.

The Manpower Survey Report will be uploaded onto the VTC website after completion of the survey. Should you have any queries, please do not hesitate to contact the following hotline during 9:30 a.m. to 6:00 p.m. from Monday to Friday.

- ✧ For matters regarding completion and return of questionnaire(s), please contact Ms. Polly CHAN of MOV at 3900 1176.
- ✧ In case you want to approach VTC directly, please contact Mr. Edward CHAN of VTC Manpower Survey (Statistical Team) at 3907 6716.

Yours faithfully,

(TAI Chark-tong, Tony)
Chairman
Innovation and Technology Training Board

Encl.

Vocational Training Council 職業訓練局

Headquarters (Industry Partnership) 總辦事處(行業合作)
30F, Billion Plaza II, 10 Cheung Yue Street, Cheung Sha Wan, Kowloon, Hong Kong
香港九龍長沙灣長裕街10號億京廣場2期30樓
www.vtc.edu.hk

Telephone No 電話　　Facsimile No 傳真　3748 9400

Our Reference 本局檔號　ITTB MPS (2018)　　Your Reference 來函檔號

執事先生／女士：

創新及科技業
二〇一八年人力調查

職業訓練局(VTC)屬下創新及科技訓練委員會(訓練委員會)由香港特別行政區行政長官委任，負責就業內人力訓練事宜提供意見。本會將於二〇一八年四月至五月期間進行調查，蒐集業內人力情況的最新資料，並按此為未來人力訓練制訂適當建議。謹代表訓練委員會致函，懇請 貴機構惠予合作提供相關資料，以便進行上述人力調查。

茲夾附下述文件，供 貴機構參閱及填寫：

(1) 調查問卷；
(2) 附註（附錄 A）；
(3) 主要職務工作說明（附錄 B） ；及
(4) 問題 A1/B1（J）欄內訓練種類說明（附錄 C）。

VTC已委託**米奧特資料搜集中心有限公司＜米奧特＞**協助進行是次人力調查。調查期間，米奧特的統計員將聯絡 貴機構進行訪問及解答相關問題。如有需要，統計員會造訪貴機構協助填寫並收回已填妥的問卷。貴機構亦可將完成的問卷，以傳真(3900 1122) 或電郵(vtc@mov.com.hk) 交回米奧特。

調查所得的資料將**絕對保密**，局方在發表報告時，只會公布合計數字，不會提及 個別機構情況。

人力調查報告將於調查完結後上載本局網頁。如對調查有任何查詢，請於星期一 至五上午九時半至下午六時聯絡以下人士 ：

- ✧ 如查詢有關填寫及寄回問卷事宜，請與米奧特公司陳寶儀小姐聯絡(電話：3900 1176)。
- ✧ 如希望直接與 VTC 聯絡，請致電 VTC 人力調查(統計組) 陳兆銘先生(電話 ：3907 6716)。

創新及科技訓練委員會委員會主席
戴澤棠

二〇一八年四月一日
附件

CONFIDENTIAL WHEN ENTERED WITH DATA	填 入 數 據 後 即 成 機 密 文 件

VOCATIONAL TRAINING COUNCIL
職 業 訓 練 局

THE 2018 MANPOWER SURVEY OF THE INNOVATION AND TECHNOLOGY SECTOR
創 新 及 科 技 業 2018 年 人 力 調 查

The 2018 Manpower Survey of the Innovation and Technology[1] Sector aims at collecting manpower information of the sector concerned for formulating recommendations on future manpower training.
The survey cover the employees engaged in

(i) Information Technology (IT) and

(ii) Research & Development (R&D) activities[2].

Please provide the information of your establishment as at **1st April 2018** by answering the questionnaire. Thank you.

創新及科技業[1] 2018年人力調查旨在蒐集業內人力情況的最新資料，並按此為未來人力訓練制訂適當建議。
這項調查涵蓋從事

(i) 資訊科技及

(ii) 研究與開發活動[2] 的員工。

懇請 貴機構根據**2018年4月1日**的人力情況填寫此問卷。多謝合作。

Notes: 1 "Innovation and Technology" refers to those technologies that create new user experience or improve product performance that bring social and economic value. 創新科技是指那些能夠帶來社會及經濟價值的創新用戶體驗或改良產品效能的科技。
註

2 "Research and Development activities" refers to creative works undertaken on a systematic basis so as to increase the stock of knowledge for devising new or improved products/processes/applications. 研發活動是指在有系統的基礎上進行具創造性的工作。這些工作的目的是為增進知識以發明或改進產品、程序或其相關的用途。

Establishment Information
機構資料

☐ Have staff engaged in R&D but NO staff engaged in IT Activities (Please answer **Part A ONLY**, P.2 -3)
有員工從事研究與開發活動, 但無員工從事資訊科技活動 (只須回答**A部份,** 第2 – 3頁)

☐ Have staff engaged in IT activities but NO staff engaged in R&D activities (Please answer **Part B ONLY,** P.4 - 8)
有員工從事資訊科技活動, 但無員工從事研究與開發活動 (只須回答**B部份,** 第4 – 8頁)

☐ Have staff engaged in BOTH R&D and IT activities (Please answer **full** questionnaire)
有員工從事上述兩方面的活動 (請回答**整份**問卷)

NATURE OF BUSINESS: _____
業 務 性 質

TOTAL NO. OF PERSONS ENGAGED: _____
僱 員 總 人 數

(For official use)
Industry Code _____

Details of Contact Person
聯絡人資料

NAME OF PERSON TO CONTACT: _____ POSITION: _____
聯 絡 人 姓 名 職 位

TEL. NO. : _____ - _____ FAX NO. : _____
電 話 圖 文 傳 真

E-MAIL : _____
電 郵

Survey Reference Date : 1st April 2018
統計日期 : 2018 年4月1日

Part A – Research and Development
A部份 — 研究與開發

Please complete columns 'B' to 'J' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'B' 至 'J'。

A1. Principal Jobs 主要職務

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) (參閱附錄 B)	(B) No. of **Employees** as at Survey Reference Date (Excl. Freelancers#) 在統計日期的僱員人數 (不包括自由工作者#)	(C) No. of **Freelancers**# as at Survey Reference Date 在統計日期的自由工作者#人數	(D) No. of Vacancies as at Survey Reference Date 在統計日期的空缺額	(E) No. of Posts as of April 2017 (Incl. Freelancers#) 在2017年4月的職位數目 (包括自由工作者#)	(F) Forecast No. of Posts as of April 2019 (Incl. Freelancers#) 預計在2019年4月的職位數目 (包括自由工作者#)	(G) Average **Annual** Remuneration Package **每年**平均薪酬 Code 編號 1 $1,080,001 or more 或以上 2 $600,001-$1,080,000 3 $360,001-$600,000 4 $240,001-$360,000 5 $100,001-$240,000 6 $100,000 or below 或以下	(H) Preferred Academic Qualification 僱員宜有學歷 Code 編號 1 Postgraduate 研究院 2 First Degree 學士學位 3 Sub-degree 副學位 4 Senior Secondary 高中 5 Junior Secondary 初中	(I) Preferred Relevant Years of Experience 僱員宜有的相關年資 Code 編號 1 15 yrs or above 十五年或以上 2 10 yrs to less than 15 yrs 十年至十五年以下 3 5 yrs to less than 10 yrs 五年至十年以下 4 2 yrs to less than 5 years 二年至五年以下 5 Less than 2 yrs 二年以下	(J) Training Needs of Existing Employees in the Next 12 Months (Please select up to three options) 未來十二個月現職僱員的訓練需求 (可選最多三項) Code 編號 (See Appendix C) (參閱附錄C)		
		Please enter a zero '0' in the box if no employee/freelancer/vacancy. 如沒有僱員／自由工作者／空缺，請在方格內填入 '0'。											
e.g.: 例子:	**Job Title A (2 employees, 2 freelancers and 1 vacancy) 職位甲 (2名僱員, 2名自由工作者及1個空缺)**	**2**	**2**	**1**	**4**	**5**	**3**	**2**	**4**	**03**	**10**	
	Research and Development (Non-IT related) 研究與開發(與資訊科技不相關)											
001	R&D Researcher/R&D Scientist/R&D Engineer 研發研究員／研發科學家／研發工程師											
002	R&D Technician 研發技術員											
003	R&D Supporting Staff 研發輔助人員											
	Research and Development (IT related) 研究與開發(與資訊科技相關)											
051	R&D Researcher/R&D Scientist/R&D Engineer 研發研究員／研發科學家／研發工程師											
052	R&D Technician 研發技術員											
053	R&D Supporting Staff 研發輔助人員											
	Other Relevant R&D Staff 其他相關研發員工											
	For Official Use											

Note: # A freelancer is a person who pursues a profession without a long-term commitment to any particular employer in the sector. Freelancers may be engaged on a daily, an hourly or a project basis.
註： #「自由工作者」指並無與任何僱主建立長期僱傭關係的人士。自由工作者可以日薪、時薪或按項目收取報酬。

Part A – Research and Development
A部份 — 研究與開發

A2. Please state the relative percentage of source of funding for R&D:
請提供用於研發資金來源的百分比：

(a)	Self-financed 自籌資金	%
(b)	Group company or affiliates 集團公司或附屬公司	%
(c)	Government 政府	%
(d)	Others (Please Specify) 其他（請註明）_____	%
	Total 總數	**100%**

A3. Please state the relative percentage of nature of R&D activities:
請提供研發活動性質的百分比：

(a)	In-house R&D 內部研發	%
(b)	Contract out R&D 以外判形式研發	%
(c)	Collaboration Arrangement 合作安排	%
	Total 總數	**100%**

(d) Please tick "✓" the box if the contracted-out R&D activities involved offshore R&D.
如外判形式之研發有離岸研發成份，請剔"✓"選右方方格。 ☐

A4. Please state the relative percentage of mode of training for R&D staff:
請提供培訓研發員工模式的百分比：

(a)	On-the-job Training/Apprenticeship 在職培訓／學徒	%
(b)	Classroom Training 課堂培訓	%
(c)	On-line Training 網上培訓	%
	Total 總數	**100%**

Part B – Information Technology
B部分 — 資訊科技

Please complete columns 'B' to 'J' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'B' 至 'J'。

B1. Principal Jobs 主要職務

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) (參閱附錄 B)	(B) No. of **Employees** as at Survey Reference Date (Excl. Freelancers#) 在統計日期的僱員人數 (不包括自由工作者#)	(C) No. of **Freelancers**# as at Survey Reference Date 在統計日期的自由工作者#人數	(D) No. of Vacancies as at Survey Reference Date 在統計日期的空缺額	(E) No. of Posts as at April 2017 (Incl. Freelancers#) 在2017年4月的職位數目 (包括自由工作者#)	(F) Forecast No. of Posts as of April 2019 (Incl. Freelancers#) 預計在2019年4月的職位數目 (包括自由工作者#)	(G) Average **Annual** Remuneration Package **每年**平均薪酬 Code 編號 1 $1,080,001 or more 或以上 2 $600,001-$1,080,000 3 $360,001-$600,000 4 $240,001-$360,000 5 $100,001-$240,000 6 $100,000 or below 或以下	(H) Preferred Academic Qualification 僱員宜有學歷 Code 編號 1 Postgraduate 研究院 2 First Degree 學士學位 3 Sub-degree 副學位 4 Senior Secondary 高中 5 Junior Secondary 初中	(I) Preferred Relevant Years of Experience 僱員宜有的相關年資 Code 編號 1 15 yrs or above 十五年或以上 2 10 yrs to less than 15 yrs 十年至十五年以下 3 5 yrs to less than10 yrs 五年至十年以下 4 2 yrs to less than 5 yrs 二年至五年以下 5 Less than 2 yrs 二年以下	(J) Training Needs of Existing Employees in the Next 12 Months (Please select up to three options) 未來十二個月現職僱員的訓練需求 (可選最多三項) Code 編號 (See Appendix C) (參閱附錄C)		
		Please enter a zero '0' in the box if no employee/freelancer/vacancy. 如沒有僱員／自由工作者／空缺，請在方格內填入 '0'。											
e.g. 例子:	**Job Title A (2 employees, 2 freelancers and 1 vacancy) 職位甲 (2名僱員, 2名自由工作者及1個空缺)**	**2**	**2**	**1**	**4**	**5**	**3**	**2**	**4**	**03**	**10**	
	General IT Management 總資訊科技管理											
101	IT Director/MIS Director/ Head of IT/CIO 資訊科技總監／管理資訊系統總監／資訊科技主管／首席資訊主任											
102	CTO 首席技術總監											
	IT/Software Development 資訊科技／軟件開發											
201	Systems Development Manager 系統開發經理											
202	IT Architect/Business Analyst 資訊科技建築師／商業分析員											
203	Project Manager/Project Leader 項目經理／項目組長											
204	UX Designer 用戶體驗設計師											
205	Programmer/Analyst Programmer/Software Engineer 程式編製員／分析程式員／軟件工程師											
206	Web Designer/Developer 網站設計員／開發員											
207	Quality Assurance Specialist/ Software Assurance Specialist/Engineer/ IT Systems Auditor 品質檢查專責經理／軟件品質檢查專責經理／工程師／電腦系統審核經理											
208	Software Product Engineer 軟件產品工程師											
209	Software/Firmware Product Designer/Product Analyst/ Developer/Software Product Manager 軟件／固件產品設計員／產品分析員／開發員／軟件產品經理											

Note: # A freelancer is a person who pursues a profession without a long-term commitment to any particular employer in the sector. Freelancers may be engaged on a daily, an hourly or a project basis.

註： #「自由工作者」指並無與任何僱主建立長期僱傭關係的人士。自由工作者可以日薪、時薪或按項目收取報酬。

Part B – Information Technology
B部分 — 資訊科技

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) (參閱附錄 B)	(B) No. of **Employees** as at Survey Reference Date (Excl. Freelancers#) 在統計日期的僱員人數 (不包括自由工作者#)	(C) No. of **Freelancers**# as at Survey Reference Date 在統計日期的自由工作者#人數	(D) No. of Vacancies as at Survey Reference Date 在統計日期的空缺額	(E) No. of Posts as at April 2017 (Incl. Freelancers#) 在2017年4月的職位數目 (包括自由工作者#)	(F) Forecast No. of Posts as at April 2019 (Incl. Freelancers#) 預計在2019年4月的職位數目 (包括自由工作者#)	(G) Average **Annual** Remuneration Package **每年**平均薪酬 Code 編號 1 $1,080,001 or more 或以上 2 $600,001-$1,080,000 3 $360,001-$600,000 4 $240,001-$360,000 5 $100,001-$240,000 6 $100,000 or below 或以下	(H) Preferred Academic Qualification 僱員宜有學歷 Code 編號 1 Postgraduate 研究院 2 First Degree 學士學位 3 Sub-degree 副學位 4 Senior Secondary 高中 5 Junior Secondary 初中	(I) Preferred Relevant Years of Experience 僱員宜有的相關年資 Code 編號 1 15 yrs or above 十五年或以上 2 10 yrs to less than 15 yrs 十年至十五年以下 3 5 yrs to less than10 yrs 五年至十年以下 4 2 yrs to less than 5 yrs 二年至五年以下 5 Less than 2 yrs 二年以下	(J) Training Needs of Existing Employees in the Next 12 Months (Please select up to three options) 未來十二個月現職僱員的訓練需求 (可選最多三項) Code 編號 (See Appendix C) (參閱附錄C)		
		Please enter a zero '0' in the box if no employee/freelancer/vacancy. 如沒有僱員／自由工作者／空缺，請在方格內填入 '0'。											
	IT/Software Development (Continued) 資訊科技／軟件開發（續）												
210	Technical Writer 技術撰稿員												
211	Computer Game Designer/Artist/Developer/ Computer Graphic Designer/ Artist/ Computer Animator/ Web Graphic Designer/ Visual Effects Designer 電腦遊戲設計／美術／開發員／電腦圖像設計／美術員／電腦動畫設計師／網頁圖像設計師／視覺效果設計師												
	Telecommunications and Networking 電訊及網絡												
301	Telecommunications Manager/ Networking Manager 電訊經理／網絡經理												
302	Telecommunications Consultant /Network Consultant 電訊顧問／網絡顧問												
303	Telecommunications Engineer/ Network Engineer 電訊工程師／網絡工程師												
304	Network Administrator/ Network Officer 網絡管理主任／網絡主任												
	Technical Services 技術服務												
401	IT Security Specialist/ Information Security Specialist/ Information Security Officer 電腦保安專責經理／資訊保安專責經理／資訊保安主任												
402	Database Administrator/ Data Warehouse Administrator/ Database Designer 資料庫管理主任／數據庫管理主任／資料庫設計員												
403	Systems Programmer (in-house/vendor environment)/ Systems Engineer 系統程式編製員（機構內部／電腦供應商）／系統工程師												
404	Customer Engineering Manager/ Services Support Manager 客戶工程經理／服務支援經理												
405	Customer Service Engineer/ Field Engineer 客戶服務工程師／實地服務工程師												
406	Field Technician 實地服務技術員												

Note: # A freelancer is a person who pursues a profession without a long-term commitment to any particular employer in the sector. Freelancers may be engaged on a daily, an hourly or a project basis.

註： #「自由工作者」指並無與任何僱主建立長期僱傭關係的人士。自由工作者可以日薪、時薪或按項目收取報酬。

Part B – Information Technology
B部分 — 資訊科技

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) (參閱附錄 B)	(B) No. of **Employees** as at Survey Reference Date (Excl. Freelancers#) 在統計日期的僱員人數 (不包括自由工作者#)	(C) No. of **Freelancers**# as at Survey Reference Date 在統計日期的自由工作者#人數	(D) No. of Vacancies as at Survey Reference Date 在統計日期的空缺額	(E) No. of Posts as of April 2017 (Incl. Freelancers#) 在2017年4月的職位數目 (包括自由工作者#)	(F) Forecast No. of Posts as of April 2019 (Incl. Freelancers#) 預計在2019年4月的職位數目 (包括自由工作者#)	(G) Average **Annual** Remuneration Package **每年**平均薪酬 Code 編號 1 $1,080,001 or more 或以上 2 $600,001-$1,080,000 3 $360,001-$600,000 4 $240,001-$360,000 5 $100,001-$240,000 6 $100,000 or below 或以下	(H) Preferred Academic Qualification 僱員宜有學歷 Code 編號 1 Postgraduate 研究院 2 First Degree 學士學位 3 Sub-degree 副學位 4 Senior Secondary 高中 5 Junior Secondary 初中	(I) Preferred Relevant Years of Experience 僱員宜有的相關年資 Code 編號 1 15 yrs or above 十五年或以上 2 10 yrs to less than 15 yrs 十年至十五年以下 3 5 yrs to less than10 yrs 五年至十年以下 4 2 yrs to less than 5 yrs 二年至五年以下 5 Less than 2 yrs 二年以下	(J) Training Needs of Existing Employees in the Next 12 Months (Please select up to three options) 未來十二個月現職僱員的訓練需求 (可選最多三項) Code 編號 (See Appendix C) (參閱附錄C)		
		Please enter a zero '0' in the box if no employee/freelancer/vacancy. 如沒有僱員／自由工作者／空缺，請在方格內填入 '0'。											
	Operation Services 操作服務												
501	Computer Operations Manager 電腦操作經理												
502	Help Desk Supervisor 求助台主任												
503	Help Desk Representative/ Customer Service Officer/ Representative 求助台服務員／客戶服務主任／服務員												
504	Computer Operations Supervisor/Operations Support Supervisor 電腦操作主任／ 操作支援主任												
505	Computer Operator/Systems Operator 電腦操作員／系統操作員												
506	User Support/Co-ordinator 用戶支援／統籌員												
	IT Education and Training 資訊科技教育及訓練												
601	Lecturer/Professor/Training Officer 講師／教授／訓練主任												
602	IT Trainer/IT Instructor 資訊科技訓練員／資訊科技教導員												
	IT Sales and Marketing 資訊科技銷售及市場推廣												
701	Sales/Marketing Director/ Account Director/ Sales/Marketing Manager 銷售／市場總監／客戶總監／銷售／市場經理												
702	Sales/Marketing Representative/ Account Manager/ Product Promotion Representative 銷售／市場代表／客戶經理／產品推廣代表												
	Other Relevant IT Staff 其他相關資訊科技員工												
	For Official use												

B2. Number of IT staff seconded from Contractor Company (ies) (On full-time equivalent basis)
從事資訊科技職責之外判公司員工的人數（以全職額計算） **B01**

Note: # A freelancer is a person who pursues a profession without a long-term commitment to any particular employer in the sector. Freelancers may be engaged on a daily, an hourly or a project basis.

註： #「自由工作者」指並無與任何僱主建立長期僱傭關係的人士。自由工作者可以日薪、時薪或按項目收取報酬。

Part B – Information Technology
B部分 — 資訊科技

Sources of Recruitment & Internal Promotion
新聘僱員的來源及僱員的內部晉升

B3. Number of IT employees recruited or promoted in respect of new or existing posts during the past 12 months by source:
過去十二個月內新聘或晉升以填補增設職位或現有空缺的資訊科技僱員人數（按來源分類）：

			No. of employees 僱員人數
Sources of Recruitment 新聘僱員的來源	Fresh Graduate 剛畢業生	(a) Local Institution 本地院校	
		(b) Non-Local Institution 非本地院校	
	Experienced Person 有任何工作經驗的人士	(c) Recruited from Hong Kong 從香港聘請	
		(d) Recruited Outside Hong Kong 從香港以外聘請	
Promotion 晉升	(e) Internal Promotion 內部晉升		

Employees Leaving the Company
僱員離職

B4.

Number of IT employees left your company during the past 12 months. 過去十二個月內離職的資訊科技僱員人數。
(a) Total: 總人數: _____
(b) Due to employer's decision on retrenchment: 因僱主決定縮減開支: _____

Major Difficulties Encountered in Recruitment
主要招聘困難

B5. Please indicate the difficulties encountered in recruiting IT employees in past 12 months.
請指出 貴公司在過去十二個月招聘資訊科技僱員所遇到的困難。

☐ Recruitment was taken place (You may tick "✓" more than one option.)
有招聘（可剔"✓"選多於一項。）

- ☐ (a) Candidates lacked the relevant skills/experience
  應徵者並無相關技能／經驗
- ☐ (b) Candidates lacked the relevant academic qualification and credential
  應徵者未具相關學歷及專業資格
- ☐ (c) Candidates' language skills (including Putonghua) were not up to expectation
  應徵者語文能力（包括普通話）不夠水平
- ☐ (d) Candidates found the remuneration package not attractive
  應徵者認為薪酬欠吸引
- ☐ (e) Others (Please Specify)
  其他（請註明） _____
- ☐ (f) No encountered difficulties
  沒有遇上困難

☐ No recruitment was taken place
沒有招聘

Part B – Information Technology
B部分 — 資訊科技

Job Nature Distribution
工作性質分佈

B6. Please state the percentage of local IT employees & freelancers in your company who have engaged in the following job nature as at Survey Reference Date:
請提供 貴公司在統計日期從事以下工作性質的本地資訊科技僱員比率（包括自由工作者）：

Job Nature 工作性質	Local Employees 本地僱員
(a) Teaching in Academic and Education Institutions 在學術和教育機構從事教學工作	%
(b) Product Development/Engineering (i.e. developing core technologies, products and services) 從事IT核心技術、產品和服務的研究、設計和開發工作	%
(c) Application Development/Engineering (i.e. using technologies, products and services to develop applications to meet business need 從事應用的設計和開發工作 （例如：利用技術、產品和服務開發出適用於不同業務的應用）	%
(d) Operation and Technical Support 操作及技術支援	%
(e) Others (Please Specify) 其他（請註明）_____	%
Total 總數	**100%**

End of Questionnaire. Thank You for Your Co-operation.
問卷完，多謝合作。

The 2018 Manpower Survey of the Innovation and Technology Sector
創新及科技業2018年人力調查

Explanatory Notes
附 註

Part A - Question A1 / Part B – Question B1
A 部份的問題 A1 或 B 部份的問題 B1

1. Principal Jobs - Column 'A'
主要職務 —— 'A' 欄

(a) Please go through column 'A' and mark those principal jobs applicable to your establishment. For detailed job descriptions for principal jobs, please refer to Appendix B.
請瀏覽 'A' 欄，選取適用於 貴機構的主要職務。有關詳細的工作說明，請參閱附錄B。

(b) Please add in column 'A' titles of any principal jobs not mentioned in job descriptions (Appendix B); briefly describe them in respect of the appropriate job categories.
如 貴機構另有技術性主要職務未載於工作說明（附錄B），請一併填入 'A' 欄內，並簡述其所屬的職務類別及等級。

(c) The job titles may not be the same as those adopted by your company, but if the description of a certain job in your company is the same or substantially the same as the job description of, for example, Systems Analyst, then for the purpose of this survey you should regard the job holder as a Systems Analyst regardless of his/her actual title in your company.
調查表所列的職稱可能與 貴公司所採用的有別，但如 貴公司某職務的工作性質與調查表所載職務（例如「系統分析員」）相同或相近，則擔任該職務者不論在 貴公司的實際職稱為何，在是次調查中亦應歸類為「系統分析員」。

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(d) In the event where an employee's duties in your company are split between two or more job titles, please use the job title that best describes his/her principal responsibility.
如 貴公司有員工身兼多項職責，請選用最能反映其主要職責的職稱。

(e) Hardware/software sales and marketing employees with technical knowledge in IT products and services should be included and grouped under the job category "IT Sales and Marketing".
請將具有資訊科技產品／服務專業知識的電腦軟、硬件銷售及市場推廣人員包括在「資訊科技銷售及市場推廣」職務類別之下。

2. Number of Employees as at Survey Reference Date (Excl. Freelancers) – Column 'B'
在統計日期的僱員人數（不包括自由工作者）—— 'B' 欄

For each principal job, please fill in the total number of employees (excluding freelancers) as at survey reference date. The permanent employees include all those under the company's payroll, disregarding whether the employees are deployed to work in other places (including the mainland of China).
請填寫 貴機構於統計日期僱用的每個主要職務的僱員總數（不包括自由工作者）。長期僱員包括在 貴公司人事編制內的所有僱員，不論是否有調往其他地方工作（包括中國內地）。

3. Number of Freelancers as at Survey Reference Date – Column 'C'
在統計日期的自由工作者人數 —— 'C' 欄

For each principal job, please fill in the total number of freelancers as at survey reference date. A freelancer is a person who pursues a profession without a long-term commitment to any particular employer in the sector. Freelancers may be engaged on a daily, an hourly or a project basis.
請填寫 貴機構於統計日期每個主要職務僱用的自由工作者總數。「自由工作者」指並無與任何僱主建立長期僱傭關係的人士。自由工作者可以日薪、時薪或按項目收取報酬。

4. Number of Vacancies as at Survey Reference Date – Column 'D'
在統計日期的空缺額——'D'欄

Please fill in the total number of existing vacancies as at survey reference date. "Existing Vacancies" refer to those unfilled, immediately available job openings for which the company is actively trying to recruit personnel as at survey reference date.
請填上在統計日期每一主要職務的空缺額。「統計日期的空缺額」是指該職位於統計日期仍懸空，須立刻填補，而現正積極招聘人員填補。

5. Number of Posts as at April 2017 (Incl. Freelancers) – Column 'E'
在2017年4月的職位數目（包括自由工作者）——'E'欄

Please fill in the total number of posts (including freelancers) as at April 2017.
請填上在2017年4月每個主要職務的職位總數（包括自由工作者）。

6. Forecast Number of Posts as of April 2019 (Incl. Freelancers) – Column 'F'
預計在2019年4月的職位數目（包括自由工作者）——'F'欄

Please fill in the forecast number of posts as of April 2019 (including freelancers). The number given could be less than that existing number of employees if a contraction is expected.
請填上在2019年4月每個主要職務的預計職位數目（包括自由工作者）。如估計屆時業務將會收縮，此欄所填人數可少於現有僱員人數。

7. Average Annual Remuneration Package – Column 'G'
每年平均薪酬——'G'欄

Please enter the code of the average annual remuneration package for each principal job of employees (excluding freelancers). This should include basic salary, bonus/commission, housing allowance/benefit and other regular allowance etc. If you have more than one employee doing the same job, please enter the average range.
請在'G'欄填入每個主要職務僱員的每年平均薪酬的編號（不包括自由工作者）。每年平均薪酬包括底薪、花紅／佣金、房屋津貼／福利及其他定期津貼等。如 貴公司有多於一名僱員擔任同一主要職務，則請取平均收入。

8. Preferred Academic Qualification/Preferred Relevant Years of Experience – Column 'H' & 'I'
僱員宜有學歷／僱員宜有的相關年資——'H'及'I'欄

Please enter the code showing the preferred academic qualification and preferred relevant years of experience, which your company requires an employee in a particular position.
請在'H'及'I'欄填入編號，以反映 貴公司對個別職務的僱員宜有的學歷(涵蓋範圍請參閱下表)及相關年資的要求。

Definition of Preferred Academic Qualification:
僱員宜有學歷的定義：

- "Postgraduate" refers to Higher degrees (e.g. master degrees) or equivalent.
「研究院」是指高等學位（如碩士學位）或同等教育程度。
- "First Degree" refers to First degree or equivalent.
「學士學位」是指學士學位，或同等教育程度。
- "Sub-degree" refers to Associate Degree, Higher Diploma, Professional Diploma, Higher Certificate or equivalent.
「副學位」是指副學士、高級文憑、專業文憑、高級證書，或同等教育程度。
- "Senior Secondary" refers to Secondary 4-6, Diploma, HKDSE or equivalent.
「高中」是指中四至中六、文憑、香港中學文憑考試，或同等教育程度。
- "Junior Secondary" refers to Secondary 1-3 or equivalent.
「初中」是指中一至中三，或同等教育程度。

9. Training Needs of Existing Employees in the Next 12 Months – Column 'J'
未來十二個月現職僱員的訓練需求 —— 'J' 欄

Please enter the code showing the type of training which your company requires the existing employees of each principal job to have in the next 12 months. For the detailed types of training, please refer to Appendix C.
請在 'J' 欄填入編號，以反映 貴公司對每一主要職務的現職僱員在未來十二個月的訓練需求。訓練種類的詳細說明，請參閱附錄C。

Part A - Research and Development
A部分 – 研究與開發

10. Question (A2),(A3) & (A4) – For Research and Development (R&D)
第（A2）、（A3）及（A4）題 — 從事研究與開發
Please fill in the relative percentage of (i) source of funding, (ii) nature of activities and (iii) mode of training for R&D.
請填上貴公司從事研究與開發的(i)資金來源、(ii)活動性質及(iii)培訓員工模式的百分比。

Part B – Information Technology
B部分 – 資訊科技

11. Question (B2) - Equivalent IT staff from contractor companies
第（B2）題 —從事資訊科技及職責的外判公司人員

Please fill in the number of IT staff seconded from contractor company(ies) to work for your company as at survey reference date (On Full-time equivalent basis).
請填上 貴公司在統計日期，從事資訊科技職責之外判公司員工的人數，並以全職額計算。

12. Question (B3) - Sources of Recruitment & Internal Promotion
第（B3）題 — 新聘僱員的來源及僱員的內部晉升

- Please fill in the number of IT employees recruited/promoted in the past 12 months.
請填入在過去十二個月內新聘／晉升的資訊科技僱員人數。
- Fresh graduate of a Hong Kong Institution/Non-HK Institution should include those senior secondary or above school leavers.
本地／非本地院校剛畢業的，包括高中或以上的離校生。
- "Experienced Person" should be regarded as a person with working experience in any fields.
「有工作經驗人士」指具有任何工作經驗的人士。
- For internal transfer of an IT employee from non-IT field or recruitment of experienced person from local company, he/she should be reckoned as "Experienced Person Recruited from Hong Kong".
公司將原任非資訊科技工作的僱員調任資訊科技工作，或從本地公司招聘具經驗人士，而有關僱員均視作「從香港聘請有工作經驗的」人士。

13. Question (B4) – Number of Employees Leaving the Company
第（B4）題—僱員離職人數

- Please fill in the number of IT employees left during the past 12 months.
請填入在過去十二個月內離職的資訊科技僱員人數。
- "Retrenchment" is defined as employer's decision to down-size or re-organise to cope with the recent financial situation. If an employee left the company after completion of contract, he/she should not be regarded as "retrenchment".
「縮減開支」指僱主決定裁員或重組架構，以應付近年經濟情況。僱員如約滿後離職，應不視作縮減開支例子。

14. Question (B5) - Major Difficulties Encountered in Recruitment
第（B5）題 — 主要招聘困難

Please indicate the difficulties which you have encountered in recruiting IT employees in the past 12 months.
請標示　貴公司在過去十二個月，在招聘資訊科技僱員過程中遇上的困難。

15. Question (B6) - Job Nature Distribution
第（B6）題 — 工作性質分佈

Please fill in the percentage of local IT employees & freelancers by job nature as at survey reference date.
請填上　貴公司在統計日期從事不同工作性質的本地資訊科技僱員比率（包括自由工作者）。

Appendix B
附 錄 B

The 2018 Manpower Survey of the
Innovation and Technology Sector
創新及科技業 2018 年人力調查

Job Descriptions of
Principal Jobs in the Innovation and Technology Sector
創新及科技業主要職務工作說明

Part A – Research and Development
A 部份 — 研究與開發

Code 編號	Principal Job 主要職務	Job Description 工作說明
RESEARCH AND DEVELOPMENT (Non-IT related) 研究與開發(與資訊科技不相關)		
001	R&D Researcher/R&D Scientist/ R&D Engineer 研發研究員／研發科學家／研發工程師	Engages directly in professional work of R&D activities, those professionals with scientific or technological training 直接參與研發活動的專業工作的人員;指曾接受科學或技術訓練的專業人員。
002	R&D Technician 研發技術員	Participates in R&D activities by performing scientific and technical tasks involving the application of concepts and operational methods, and usually under the supervision of researchers/scientists/engineers. 在研究員／科學家／工程師督導下，透過應用概念和運作方法，執行研發工程中的科學及技術任務。
003	R&D Supporting Staff 研發輔助人員	Engages directly with the performance of R&D activities with skilled and semi-skilled technical knowledge. 直接參與研發活動而具有熟練及半熟練技術知識的人員。
RESEARCH AND DEVELOPMENT (IT related) 研究與開發(與資訊科技相關)		
051	R&D Researcher/R&D Scientist/ R&D Engineer 研發研究員／科學家／工程師	Engages directly refer to in professional work of R&D activities, those professionals with scientific or technological training 直接參與研發活動的專業工作的人員;指曾接受科學或技術訓練的專業人員。
052	R&D Technician 研發技術員	Participates in R&D activities by performing scientific and technical tasks involving the application of concepts and operational methods, and usually under the supervision of researchers/scientists/engineers. 在研究員／科學家／工程師督導下，透過應用概念和運作方法，執行研發工程中的科學及技術任務。
053	R&D Supporting Staff 研發輔助人員	Engages directly with the performance of R&D activities with skilled and semi-skilled technical knowledge. 直接參與研發活動而具有熟練及半熟練技術知識的人員。

Part B – Information Technology
B 部分 — 資訊科技

Code 編號	Principal Job 主要職務	Job Description 工作說明
GENERAL MANAGEMENT 總資訊科技管理		
101	IT Director 資訊科技總監 MIS Director 管理資訊系統總監 Head of IT 資訊科技主管 CIO 首席資訊主任	Focuses on strategic planning as well as manages overall IT functions (including application system design and development, office automation and communication networks, services delivery and end user support) to meet the business/organisation objectives in the most cost-effective manner. 負責制定策略及管理所有資訊科技工作，包括：設計及開發應用系統、辦公室自動化及通訊網絡、提供服務、支援終端用戶，以最具成本效益方式達到業務／機構目標。
102	CTO 首席技術總監	Responsible for the technology direction and strategic roadmap of the company's products and services. 負責公司產品和服務的技術方向及發展路向。
IT/SOFTWARE DEVELOPMENT 資料科技／軟件開發		
201	Systems Development Manager 系統開發經理	Analyses of organisation's functions and processes; designs IT applications and systems, and/or customises package solutions to meet business objectives; manages all phases of the development life cycle including feasibility study, development, implementation and support. 分析機構內各種工作及程序；設計電腦應用軟件及系統或制定套裝方案，達致業務目標；管理系統開發各階段的工作，包括進行可行性研究、開發、推行及支援系統。
202	IT Architect 資訊科技建築師 Business Analyst 商業分析員	Develops the strategic direction of the technology that is deployed in the company; performs a quality assurance function to make sure all parts of the organisation adhere to the IT strategy; maintains IT strategy integrity and ensures systems developed according to defined IT strategy to meet the business/organisation objectives; and implements IT strategy to increase the company's revenue and market share. 制定公司的技術策略方向；推行質素保證，確保各部門依循資訊科技策略；維持資訊科技策略完整一致，確保按既定的策略開發系統，以達致商業／機構目標；推行資訊科技策略，以便提高公司的收入及市場佔有率。
203	Project Manager 項目經理 Project Leader 項目組長	Manages specific IT development or services projects based on the user/customer requirements to ensure the implementation is on schedule and within budget; designs the processes that enable the management and service of various user/customer groups are satisfactory to meet the company's standards and requirements. 根據用戶／客戶要求，管理個別電腦開發或項目服務，確保如期推行，不會超出預算；設計工序，確保服務令用戶／客戶滿意，達到公司的標準及要求。
204	UX Designer 用戶體驗設計師	Translates and documents the functional requirements based on user/customer requirements; performs system studies, analysis, design and implementation of computer systems to meet user/customer business and operational needs. 根據用戶／客戶要求，制定及記錄功能規格；負責電腦系統的研究、分析、設計及推行，應付用戶／客戶的業務／運作需要。

Code 編號	Principal Job 主要職務	Job Description 工作說明
IT/SOFTWARE DEVELOPMENT(CONTINUED) 資料科技／軟件開發(續)		
205	Programmer 程式編製員 Analyst Programmer 分析程式員 Software Engineer 軟件工程師	Designs and develops computer programs to meet business needs according to the requirements laid down by the functional and technical specifications; applies appropriate system and programming tools, and hardware to deliver cost efficient business solutions. 根據功能及技術規格，設計及開發電腦程式，應付業務需要；應用合適的系統、程式編製工具及硬件，提供具成本效益的業務方案。
206	Web Designer/Developer 網站設計員／開發員	Uses tool set to design and create Web Pages, animation graphics and/or other multimedia contents for integration to IT applications according to business requirement, strategy and direction in the mixed technical and creative works. 按照業務要求、策略及方向，結合科技與創作，使用工具套設計及製作網頁、動畫或其他多媒體內容，以便配合電腦應用軟件使用。
207	Quality Assurance Specialist 品質檢查專責經理 Software Assurance Specialist/Engineer 軟件品質檢查專責經理／工程師 IT Systems Auditor 電腦系統審核經理	Ensures that the development process and deliverables adhere to the conventions, standards and requirements laid down by the organisation, and/or the system specifications, whichever appropriate, and that the deliverables meet customer business requirements. 確保開發程序及製成品符合機構或系統的規格及要求，及／或製成品符合客戶的業務要求。
208	Software Product Engineer 軟件產品工程師	Works on the development of innovative products and user applications; investigates the use of emerging technology; and involves in collaboration with IT companies and/or user organisations to ensure that the developed product or application meets users' needs. 開發新產品及應用軟件；研究新科技的用途；與電腦公司或用戶機構合作，確保所開發的產品或應用軟件符合用戶需要。
209	Software/Firmware Product Designer 軟件／固件產品設計員 Product Analyst/ Developer 產品分析員／開發員 Software Product Manager 軟件產品經理	Conducts development for software/firmware products; designs new software/firmware products in communication with the users to meet the needs of the market place. 開發軟件／固件產品；與用戶溝通，設計新軟件／固件產品，應付市場需求。
210	Technical Writer 技術撰稿員	Plans, designs and writes user manuals and technical references for the company's range of hardware and software products; and/or involves in the writing of promotional material and newsletters for users. 為公司的軟、硬件產品策劃、設計及編寫用戶手冊及技術指南；及／或參與編寫客戶宣傳資料及通訊。

Code 編號	Principal Job 主要職務	Job Description 工作說明
IT/SOFTWARE DEVELOPMENT (CONTINUED) 資料科技／軟件開發(續)		
211	Computer Game Designer/ Artist/Developer 電腦遊戲設計／美術／開發員 Computer Graphic Designer/Artist 電腦圖像設計／美術員 Computer Animator 電腦動畫設計師 Web Graphic Designer 網頁圖像設計師 Visual Effects Designer 視覺效果設計師	Designs and develops computer games or multimedia products in both programming and creative aspects; prepares creative designs (such as graphic designs, character designs, web designs, and animation designs) for multimedia production, computer game development, computer animation and digital visual effects. 負責電腦遊戲或多媒體產品於程式編寫和創作上的設計和開發；為多媒體製作、電腦遊戲開發、電腦動畫和數碼視覺效果籌劃創意設計 (例如: 圖像設計、角色造型設計、網頁設計和動畫設計)。
TELECOMMUNICATIONS AND NETWORKING 電訊及網絡		
301	Telecommunications Manager 電訊經理 Networking Manager 網絡經理	Manages the data and voice networks through which IT services are delivered securely and effectively to meet the organisation's overall IT strategy, policy and standards; liaises/ manages network carriers and hardware vendors to acquire cost effective telecom services to meet business needs. 管理數據及話音網絡，提供安全有效的資訊科技服務，以便符合機構的整體資訊科技策略、政策及標準；為獲取具成本效益的電訊服務，聯絡／管理網絡及硬件供應商，以便符合業務需求。
302	Telecommunications Consultant 電訊顧問 Network Consultant 網絡顧問	Translates requirements into properly engineered and tested communication solutions as part of the overall information system in the mixed software/hardware area of telecommunications/networks technology. 因應電訊／網絡技術的需要，提供合適並且經過試驗的軟件／硬件，以配合整個資訊系統。
303	Telecommunications Engineer 電訊工程師 Network Engineer 網絡工程師	Plans and designs new communication software; installs new networks and services; analyses current and planned network usages; and recommends solutions to solve networking problems. 策劃及設計新通訊軟件；安裝新網絡及提供服務；分析現時及預計網絡使用率；建議方案解決網絡問題。
304	Network Administrator 網絡管理主任 Network Officer 網絡主任	Administrates the applications network infrastructure and telephony (voice, data, wireless) systems; oversees the design and installation of wiring for these systems. 管理應用網絡基建及電話系統（話音、數據、無線）；監督有關系統的電線設計及安裝。

Code 編號	Principal Job 主要職務	Job Description 工作說明
TECHNICAL SERVICES - IT SECURITY 技術服務 — 資訊保安		
401	IT Security Specialist 電腦保安專責經理 Information Security Specialist 資訊保安專責經理 Information Security Officer 資訊保安主任	Undertakes design, technical support and review on IT/network security, firewalls and intrusion detection; drafts the information security standards, policy and procedures; and ensures the implementation/work plans are always followed by the IT teams and departments. 負責設計、技術支援及檢討資訊／網絡保安、防火牆及侵入偵察設施；擬定資訊保安標準、政策及程序；確保各資訊科技團隊及部門嚴格遵守推行／工作計劃。
TECHNICAL SERVICES - DATABASE 技術服務 — 資料庫		
402	Database Administrator 資料庫管理主任 Data Warehouse Administrator 數據庫管理主任 Database Designer 資料庫設計員	Plans and controls the set-up and maintenance of Database System to ensure a reliable and effective system environment for the development and operation of application systems requiring the database architecture. 策劃及管理資料庫系統，提供完善服務，以便開發及運用應用系統。
TECHNICAL SERVICES - SYSTEMS PROGRAMMING 技術服務 — 系統程式編製		
403	Systems Programmer (in-house/vendor environment) 系統程式編製員（機構內部／電腦供應商） Systems Engineer 系統工程師	Specialises in the system support and maintenance, which enable the use of system software for improving the system performance and quality of service; designs and prepares the use of specialised programs. 專責系統支援及維修，以便提高系統性能及服務質素；設計及編寫專用程式。
TECHNICAL SERVICES - FIELD SUPPORT 技術服務 — 實地支援		
404	Customer Engineering Manager 客戶工程經理 Services Support Manager 服務支援經理	Manages a team of Customer Service Engineers to provide service support in maintaining normal operation of IT systems for clients. 管理一組客戶服務工程師，為客戶提供電腦系統正常操作的服務支援。
405	Customer Service Engineer 客戶服務工程師 Field Engineer 實地服務工程師	Provides hardware services including installation of hardware systems, preventive and remedial maintenance to meet company/ customer service level expectations; provides first level troubleshooting training to customer. 提供符合公司或客戶要求的硬件服務，包括安裝硬件系統、預防及補救性維修；提供第一階段檢修訓練給客戶。
406	Field Technician 實地服務技術員	Carries out hardware services including equipment/PC installation, preventive and remedial maintenance, as directed by Field/Customer Service Engineer, to meet service level expectations. 按實地服務／客戶服務工程師指示，提供合乎要求的硬件服務，包括設備／個人電腦安裝、預防及補救性維修。

Code 編號	Principal Job 主要職務	Job Description 工作說明
OPERATION SERVICES 操作服務		
501	Computer Operations Manager 電腦操作經理	Directs and controls the operations of all data centre equipment and systems in order to provide accurate, secure and timely information processing to support the company business; works with internal colleagues/users on system development and technical services so as to provide efficient IT services to customers; provides vendor management. 監管資訊中心所有設備及系統的運作，提供準確、安全及適時的資訊處理服務，以便支援公司業務；與機構內部同事／用戶共同進行系統開發及技術服務，提供有效率的資訊科技服務給客戶；管理電腦供應商。
502	Help Desk Supervisor 求助台主任	Supervises a team of Help Desk staff in solving technical problems and liaises with service vendors for problem escalation; plans, designs, reviews and implements corporate Help Desk system. 督導求助台職員解決技術問題，如問題惡化，則聯絡服務供應商；為公司策劃、設計、檢討及推行求助台制度。
503	Help Desk Representative 求助台服務員 Customer Service Officer/Representative 客戶服務主任／服務員	Understands and delivers on-line assistance to users in solving technical problems through company Help Desk hotline; maintains and performs call centre operation for ensuring cases are resolved in a timely manner. 透過公司的求助熱線，為用戶解答技術問題；負責求助中心的運作，確保及時解決個案。
504	Computer Operations Supervisor 電腦操作主任 Operations Support Supervisor 操作支援主任	Supervises shift team of operators and manages all areas of data centre operations; follows through Change and Problem Management on hardware, software and environment. 督導需輪班的電腦操作人員及管理資訊中心各方面的運作；貫徹執行硬件、軟件及環境的轉變及問題管理。
505	Computer Operator 電腦操作員 Systems Operator 系統操作員	Operates, monitors and supports computer systems to ensure high system availability and that scheduled events are executed. In small data centres, the responsibilities also include telecommunication and Help Desk. 操作、監控及支援電腦系統，以確保系統在高備用之中及其預定項目能順利執行。在小型資訊中心內，其職責亦包括電訊及求助台服務。
506	User Support/ Co-ordinator 用戶支援／統籌員	Provides technical support services to internal users or external clients, including desktop hardware, system and application software installation; upgrading; problem diagnosis and resolution over the phone/intranet/e-mail; and/or dispatches to user location, if necessary, to help solving the problems. 為機構內部用戶或外間客戶提供技術支援服務，包括：安裝桌面硬件、系統及應用軟件；系統升級；透過電話／內聯網／電郵診斷及解決問題；如有需要，或需造訪用戶協助解決問題。

Code 編號	Principal Job 主要職務	Job Description 工作說明
IT EDUCATION AND TRAINING 資訊科技教育及訓練		
601	Lecturer 講師 Professor 教授 Training Officer 訓練主任	Provides education/training for pre-entry or post-entry IT personnel. 為資訊科技從業員提供職前或在職教育／訓練。
602	IT Trainer 資訊科技訓練員 IT Instructor 資訊科技教導員	Provides training for users of IT systems. 為電腦系統用戶提供訓練。
IT SALES AND MARKETING 資訊科技銷售及市場推廣		
701	Sales/Marketing Director 銷售／市場總監 Account Director 客戶總監 Sales/Marketing Manager 銷售／市場經理	Sets sales/marketing strategy; advises the sales/marketing representatives on ways to improve their sales/marketing performance; maintains contact with dealers and distributors; analyses sales/marketing statistics gathered by their staff to determine IT sales/marketing potential and inventory requirements; monitors the preferences of customers. 設定銷售／市場策略；建議各種方法以改進銷售／市場代表的業績；保持與代理商及經銷商的聯絡；分析從員工所收集的銷售／市場統計，從而確定資訊科技銷售／市場潛力及存貨需求；監測客戶的喜好。
702	Sales/Marketing Representative 銷售／市場代表 Account Manager 客戶經理 Product Promotion Representative 產品推廣代表	Evaluates customers' business needs and determines areas where the company's IT product/services can complement theirs; explains to customers how the IT products/ services can solve their business problems; involves presenting and demonstrating company's IT products/services, checking on proper equipment installation and delivery of services, and working with customers on future needs. 評估客戶業務需要及確定公司各方面的資訊科技產品／服務能配合客戶所需；向客戶說明資訊科技產品／服務如何能解決其業務問題；參與介紹及示範公司的資訊科技產品／服務，檢查設備安裝及服務提供是否正確，及制定客戶未來所需。

Remark: Equivalent titles have the same job code.
註：同等職稱有同一編號。

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Types of Training under Column (J) of Question A1 / B1
問題A1/B1（J）欄內訓練種類

Enter in Column (J) the training needs of existing employees in the next 12 months according to the following codes:
請將　貴機構於未來十二個月對現職僱員的訓練需求，按下列編號填入(J)欄內：

Part A – Research and Development
A 部份 — 研究與開發

Code 編號 Types of Training 訓練種類 (See Page 3 for definition of each type of training) (參閱頁數3有關各項訓練種類的說明)

31 Technical Skills
專業技能

32 Management Skills
管理技能

33 Knowledge related to licensing and patent application
專利受權及註冊申請知識

34 Other R&D Training
其他研究與開發訓練

Part B – Information Technology
B 部分 — 資訊科技

01 Basic Office IT Skills
辦公室資訊科技基本技能

02 Applied Basic IT Tools for Business Processes
基本資訊科技工具在業務的應用

03 Java and Object-Oriented Technology
Java及物件導向技術

04 Linux/Unix & Open Source
Linux/Unix及源碼開放程式

05 .NET Development
.Net 開發

06 Windows Platform Technology
視窗平台技術

07 Service-Oriented Architecture (SOA), Web Services and XML Development
服務導向架構、網上服務與XML開發

08 Multimedia and Computer Graphics
多媒體及電腦圖像

09 Interactive Game Design/Development
互動遊戲設計／開發

10 Internet/Intranet/Web Development
互聯網／內聯網／網絡開發

11 IT Applications in Customer Relationship Management (Digital Marketing, e-Marketing, e-Services)
資訊科技在客戶關係管理的應用（數碼市場推廣、電子市場推廣、電子服務）

12 Information and System Security
資訊及系統保安

13 Database Technology
資料庫科技

14 Networking/Data Communications
網絡／數據通訊

15 Application Development Tools/Languages
應用開發工具／語言

16 Web Tools and Related Applications
萬維網工具及其相關應用

17 Mobile Computing
流動電腦應用

18 IT Infrastructure Library
資訊科技基礎架構標準庫(ITIL)

19 Radio Frequency Identification (RFID) Technologies
射頻識別(RFID)科技

20 IT Applications in Supply Chain Management (e-Logistics, e-Procurement)
資訊科技在供應鏈管理的應用（電子物流、電子採購）

21 IT Applications in Product Design
資訊科技在產品設計的應用

22 e-Learning Technology and Development
網上教學科技及開發

23 Project Management and Design
項目管理及設計

24 Software Quality (Capability Maturity Model Integration)
軟件質素（能力成熟度模型(CMMI)）

25 Understanding IT Practice in the Mainland of China
中國內地資訊科技業概況

26 Virtualisation and Cloud Computing
虛擬化及雲端運算

27 Data Science and Data Analytics
數據科學和數據分析

28 3D printing
3D 打印

29 Augmented Reality (AR) & Virtual Reality (VR)
擴增實境（AR）及虛擬實境（VR）

30 Other IT-related Training
其他與資訊科技有關的訓練

Definition of Type of Training under Column (J) of Question A1 / B1
問題 A1/B1（J）欄內訓練種類的說明

Part A – Research and Development
A 部份 — 研究與開發

31 Technical Skills
專業技能

Technical skills are the knowledge and abilities needed to accomplish mathematical, engineering, scientific or computer-related duties, as well as other specific tasks relating to technology.
專業技能是指完成數學、工程、科學或電腦相關的職務；以及與科技有關的其他特定工作所需具備的知識和能力。

32 Management Skills
管理技能

Relevant skills of people management and leadership including problem solving, decision making, planning, delegation and communication, etc.
人事管理與領導的相關技能，包括解難、決策、規劃、授權和溝通等。

33 Knowledge related to licensing and patent application
專利受權及註冊申請知識

Knowledge related to a patent, a personal property right granted to an inventor under the law through the relevant Patent and Trademark Office. To obtain a patent, the inventor must apply to the Office with a detailed technical description of the invention. The inventor may license the patent to other users, granting them the right to use the technology.
與專利相關的知識，通過相關專利及商標監管機構授予發明人依法享有的個人財產權。要獲得專利，發明人必須向監管機構申請其發明的詳細技術說明。發明人可以將專利授權給其他用戶，授予他們使用該技術的權利。

34 Other R&D Training
其他研究與開發訓練

Part B – Information Technology
B 部分 — 資訊科技

01 Basic Office IT Skills
辦公室資訊科技基本技能

Basic Office IT Skills refer to those skill sets associated with the office automation tools used daily by many of the office staff, faculty and students on the campus to improve or automate their daily tasks and operation workflow. Office automation tools cover mailers, schedulers, browsers, FTP software, databases, word processors and spreadsheets.
辦公室資訊科技基本技能指大部分辦公室人員、院校教職員及學生日常使用自動化工具的技能。這些工具，如郵件工具（mailers）、排程器、瀏覽器、檔案傳輸協定（FTP）軟件、資料庫、文字處理器及電子報表，可改善工作效率，或取代人手處理工序。

02 Applied Basic IT Tools for Business Processes
基本資訊科技工具在業務的應用

This category comprises the use of spreadsheet for automation and planning, database for accounting and business applications, word processor in office publications, and Internet in effective customer's communication to increase the productivity and services of the organisations.
這類科技有助提高生產力和加強服務，例如：利用電子報表取代人手處理及策劃各種步驟；借助資料庫處理賬目及發展業務；以文字處理器協助出版工作；透過互聯網與客戶有效聯繫。

03 Java and Object-Oriented Technology
Java 及物件導向技術

Java technology can be used to create complete applications that may run on a single computer or be distributed among servers and clients in a network. It can also be used to build a small application module or applet for use as part of a Web Page. Object-oriented technology is used in developing a software product that is highly modular, reusable and also the data and the software used to interpret or act upon can be treated as one entity.
Java 技術可用作設計功能全面的應用程式；除能在獨立的電腦上運行，亦適合網絡伺服器及客戶端使用。此外，亦可用於開發小型應用模組及小程式，作為網頁的組成部分。物件導向技術則用於開發高度模組化、可再用的軟件產品；當中具詮釋和執行作用的資料及軟件會視為一個實體。

04 Linux/Unix and Open Source
Linux/Unix 及源碼開放程式

Open source refers to any program whose source code is made available for use or modification as users or other developers see fit. Open source software is usually developed as a public collaboration and made freely available (such as Linux/Unix operating system).
源碼開放程式的特點是其源碼公開，可供運用或修改。源碼開放軟件多由公眾共同開發，同時免費供人使用，例子有 Linux/Unix 操作系統。

05 .NET Development
.Net 開發

.NET is both a business strategy from Microsoft and its collection of programming support for what are known as Web services (i.e. the ability to use the Web rather than your own computer for various services). Microsoft's goal is to provide individual and business users with a seamlessly interoperable and Web-enabled interface for applications and computing devices and to make computing activities increasingly Web browser-oriented. The .NET platform includes servers; building-block services (such as Web-based data storage); and device software.
.Net 既是微軟的業務發展策略，亦指為網上服務提供全面的編程支援（即借助網絡而非本身電腦取得各種服務）。微軟希望透過此項技術，為個人及機構用戶提供無縫兼具相互驅動功能的網上介面，方便操作應用軟件和電腦裝置；同時希望將電腦工作逐步改成瀏覽器導向。.Net 使用的平台包括伺服器、組件式服務（如網上資料儲存）及電腦裝置軟件。

06 Windows Platform Technology
視窗平台技術

Windows platform technology is designed for small business and professional users as well as to the more technical and larger business market. A significant feature is Microsoft's Active Directory, which among other capabilities enables a company to set up virtual private networks, to encrypt data locally or on the network, and to give users access to shared files in a consistent way from any network computer.
視窗平台技術除針對小型企業及專業用家外，亦適合技術要求高、規模較大的機構。這項技術提供的重要功能之一，是微軟動態目錄（Microsoft's Active Directory）。利用這個功能，機構可建立虛擬私有網絡，在本機或網絡進行資料加密，以及容許網絡上的電腦使用者，以一致的方式存取共用檔案。

07 Service-Oriented Architecture (SOA), Web Services and XML Development
服務導向架構、網上服務與 XML 開發

Service-Oriented Architecture (SOA) expresses a perspective of software architectural design that defines the use of 'services' to support the requirements of software users. In a SOA environment, resources on a network are made available as independent 'services' that can be accessed without knowledge of their underlying technologies and implementation details. Web services (sometimes called application services) are services (usually including some combination of programming and data) that are made available from a business's Web server for Web users or other Web-connected programs. Besides the standardisation and wide availability to users and businesses of the Internet itself, Web services are also increasingly enabled by the use of the Extensible Markup Language (XML) as a means of standardising data formats and exchanging data. XML is the foundation for the Web Services Description Language (WSDL).
服務導向架構（SOA）是指針對用戶對軟件使用的個別要求，提供服務，以一組軟體元件透過設計以建構適合的應用程式。在服務導向架構的環境下，網站服務技術將會視為獨立和標準化的元件，用戶毋需明瞭有關的基本技術和執行細節。網上服務（又稱應用服務）指機構的伺服器向網絡使用者或其他接連網絡程式提供的服務（通常結合了編程和資料）。除了提供規範和廣為互聯網使用者及網上業務機構使用外，這類服務亦運用 Extensible Markup Language（XML）程式加入了有關功能，作為釐訂資料格式和交換資料用途。欲學習 Web Services Description Language （WSDL），先要掌握基礎程度的 XML。

08 Multimedia and Computer Graphics
多媒體及電腦圖像

Multimedia and computer graphics involves the use of computer hardware and software to integrate texts, animated graphic images, sound and motion video for presentation of information and other applications. The technologies include digital video, virtual reality/3D image, voice recognition, real-time streaming audio & video, real-time audio & video multicast and broadcast.
多媒體及電腦圖像借助電腦軟、硬件，結合文字、動態圖像、影、音，供陳述資料或其他用途。這類技術有數碼影像、虛擬真實／三維圖像、話音辨識技術、實時影音串流技術，實時影音組播及廣播。

09 Interactive Game Design/Development
互動遊戲設計／開發

This category includes game theory; the design and development cycle of computer-based games; current game delivery systems and software; game development systems and standards; files structure and conversion issues; human-computer interface issues; intellectual property rights; ethical issues including the current game rating system; and emerging technical developments and trends.
這個範疇涉及以下項目：遊戲理論；電腦遊戲設計及開發周期；現行遊戲傳送系統及軟件；遊戲開發系統及標準；檔案結構及轉換；人機合一介面；知識產權；道德問題，如現行的遊戲評級制度；技術發展及趨勢。

10 Internet/Intranet/Web Development
互聯網／內聯網／網絡開發

This category includes web development and programming (such as using JSP, EJB, XML, Java Servlets, PHP scripting, .NET).
此類別包括網絡開發與編程（如使用 JSP、EJB、XML、Java Servlets、PHP 語言編寫、.NET）。

11 IT Applications in Customer Relationship Management (Digital Marketing, e-Marketing, e-Services)
資訊科技在客戶關係管理的應用（數碼市場推廣、電子市場推廣、電子服務）

Customer Relationship Management (CRM) is an information industry term for methodologies, software, and usually Internet capabilities that help an enterprise manages customer relationships in an organised way. IT applications systems have been widely developed and adopted in various aspects of the CRM products/services, which include sales force automation, call centres, help desks, and prospect and customer information databases. The latter are often integrated with "data-mining" technology to allow personalised customer services, adaptive and one-to-one marketing. In a broader sense, this category also includes Digital Marketing which uses digital channels (e.g. search engine optimisation (SEO), social media, etc.) to promote or market products and services to consumers and businesses.
這範疇指企業利用某種方法、軟件及互聯網功能，有系統地維繫客戶關係。已開發的資訊科技應用系統已廣泛應用在各客戶關係管理的產品或服務功能中，包括銷售業務自動化、電話諮詢中心、求助台、前景分析及客戶資料庫。最後一項通常會結合「數據開採」技術，為客戶提供調節式、一對一營銷、及個人化的服務。廣義來說，此類別也包括數碼市場推廣，也即利用數碼渠道（例如搜索引擎優化、社交媒體等）向顧客和商界推廣產品或服務。

12 Information and System Security
資訊及系統保安

This category comprises technologies for Internet Commerce security (such as encryption standards, authentication, public key scheme, and digital signature), anti-virus protection for Windows systems, security for Wireless LAN and servers.
此範疇包括互聯網業務保安（如加密標準、核實、公鑰方案、數碼簽名等）、視窗系統防病毒技術、無線 LAN 及伺服器的保安。

13 Database Technology
資料庫科技

This category includes Database Administration, Database Design, Data and Knowledge Management, Document Image Processing (DIP) Systems, Mapping, Object-oriented Technology, Object Database, Data Warehouse and Mining.
此類科技包括資料庫管理、資料庫設計、資料及知識管理、文件影像處理（DIP）系統、測繪、物件導向技術、物件資料庫、數據倉庫及數據開採。

14 Networking/Data Communications
網絡／數據通訊

This category includes Broadband Networks, Network System Administration, Router/Switch Technology, TCP/IP Communication Protocol, Cable Modem, Asymmetric Digital Subscriber Line (ADSL), Wireless LAN, Bluetooth, 3G/4G Mobile Communications, Near Field Communication (NFC) and Internet of Things (IoT).
此類別包括寬頻網絡、網絡系統管理、路由器／交換器技術、TCP／IP 通訊協定、電纜數據機、不對稱數碼用戶線路（ADSL）、無線區域網絡、藍芽及 3G／4G 流動通訊、近場通訊（NFC）及物聯網（IoT）。

15 Application Development Tools/Languages
應用開發工具／語言

Application development tools/languages are used to design and develop new custom applications or to modify or enhance customised or packaged applications. Java, Visual Basic and C/C++/Visual C++/Objective C are application development tools/languages used in the market place.
用作設計和開發新的應用軟件，亦有用於修改和改良專門或套裝應用軟件。Java、Visual Basic 及 C/C++/Visual C++／Objective C 均屬這類開發工具／語言。

16 Web Tools and Related Applications
萬維網工具及其相關應用

The Web offers rich interaction and collaboration among the users, and rich choices of effective tools. The training in this area can include overview and features of Web tools and their impact on people, such as blog, wiki, podcasting, video sharing websites and social networking websites, real time collaboration using free on-line tools, etc.
萬維網賦予使用者之間豐富的互動和協作，並且具有豐富和有效的工具以供選擇。這方面的訓練內容包括萬維網各種工具的特點及其對人類帶來的衝擊;工具例如「網誌」（blog）、「維基」（wiki）、「播客」（podcasting）、視頻分享網站及社交網站、使用免費網上工具以作實時協作等。

17 Mobile Computing
流動電腦應用

Mobile computing includes wireless and cellular technologies on handheld electronics and portable computer systems. New versions of standards are being continuously developed in an effort to provide higher data rates for advanced mobile services. With the widespread use of smart phones and tablet computers, mobile applications commonly known as Apps become popular as a means to provide entertainment or as a communication tool between corporations and customers.
這範疇包括用於掌上電子裝置及手提電腦的無線及蜂窩式技術。為配合新流動服務的高速傳輸要求，流動電話標準將不斷開發新的版本。隨著智能手機和平板電腦的廣泛使用，受歡迎的流動應用程式俗稱「Apps」已成為一種能提供娛樂或作為企業和客戶之間溝通的工具。

18 IT Infrastructure Library
資訊科技基礎架構標準庫（ITIL）

IT Infrastructure Library (ITIL) was developed by the Office of Government Commerce (OGC) in the U.K., and is recognised as the best practices in IT Service Management worldwide. Many IT operations management tools and processes are now built on ITIL, and its adoption is picking up in Asia.
資訊科技基礎架構標準庫（ITIL）是英國政府商務辦公室（OGC）所制定，及被全球公認為最佳實踐的資訊科技服務管理架構。現在很多的資訊科技操作管理工具及運作是建基於 ITIL，及其架構亦迅速地被亞洲各國所採用。

19 Radio Frequency Identification (RFID) Technologies
射頻識別（RFID）科技

RFID has been proposed to identify the goods being handled. The commonly used barcode scanning has difficulties in identification of products packed in high density within a tolerable time frame while RFID technology can resolve this problem. The applications of RFID technologies for business applications (including management of supply chains or demand chains, and logistics services chains - collectively referred to as business chains) in corporations of different business natures within the company boundary have been widely adopted.
射頻識別科技能夠辨別正在處理中的物品，並能解決一般條碼掃瞄系統無法在短時間內識別嚴密裝箱貨品的問題。RFID 科技已融入於各種商業應用系統中（包括供應鏈、需求鏈及物流服務鏈（統稱為商業鏈）的管理），並廣為不同行業工商機構所採用。

20 IT Applications in Supply Chain Management (e-Logistics, e-Procurement)
資訊科技在供應鏈管理的應用（電子物流、電子採購）

Supply Chain Management (SCM) is the monitoring and control of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. SCM involves coordinating and integrating these flows both within and among companies. As a solution for successful SCM, sophisticated IT application systems with web interfaces are developed and applied for the e-Logistics and e-Procurement which provide part or all of the SCM services for the companies.
供應鏈管理（SCM）是監控在運作過程中（從供應商到製造商，批發商，販商及消費者）的物料、資訊、及財務得到適當的處理。SCM 亦參與協調和整合公司內部及各公司之間的運作流程。SCM 得以成功，有賴開發以網上作為介面的資訊科技應用系統提供電子物流及電子採購等功能，而該等系統現已為各公司提供部份或全部的 SCM 服務。

21 IT Applications in Product Design
資訊科技在產品設計的應用

IT applications are widely used in many design and manufacturing industries like jewellery design, interior design, furniture design, construction industry, etc. This training helps the traditional industry professionals and IT practitioners to pick up the latest design tools available in the market to speed up their design process and enhance the quality of the product.
資訊科技已在各設計和製造行業中被廣泛地應用，如在珠寶設計、室內設計、家具設計及建造業等。這方面的訓練，能幫助傳統行業的專業人士和資訊科技從業員掌握在市場上最新的設計工具，以加快他們的設計程序，及提升產品的質量。

22 e-Learning Technology and Development
網上教學科技及開發

Delivery of e-Learning requires an integrated technology system of hardware, software, and human resources. This category covers the fundamentals of electronic information delivery, including content development and delivery, licensing, managing external contents, address access and intellectual property issues with an online delivery system.
網上教學是電腦軟、硬件及人力資源結合的成果。當中涉及電子訊息傳送基礎理論，如內容開發及傳送、授權使用、外間內容管理、與網上傳送系統有關的位址存取和知識產權事宜。

23 Project Management and Design
項目管理及設計

The project management and design process cover gathering requirements, managing project design process, defining team responsibilities, identifying milestones, scoping timelines, and staging deliverables.
這項技能包括以下環節：收集所需資料；管理項目設計過程；釐清小組權責；確定發展重點；製訂時間表；分階段完成目標。

24 Software Quality (Capability Maturity Model Integration)
軟件質素（能力成熟度模型（CMMI））

This category includes the processes and types of tools that can be used during the implementation of the Capability Maturity Model Integration (CMMI); the cost of quality; the use of several statistical quality tools for process design, analysis, and measurement; risk management plan to control expected risks; and the application of different types of testing and planning that contributing to software product quality.
此項目包括推行「能力成熟度模型」（CMMI）所使用程序及工具種類；質素要求所涉及成本；運用不同質素統計工具作程序設計、分析及評估；監察預計風險的風險管理計劃；提高軟件質素所需測試及規劃。

25 Understanding IT Practice in the Mainland of China
中國內地資訊科技業概況

Understanding IT Practice in the Mainland of China provides IT and practical legal advice to those doing business in the Mainland of China. It brings in-depth related IT knowledge and practical experience to assisting companies in their expansion and operation in the Mainland of China.
這類課程可讓在中國內地營商人士，了解資訊科技及有關法律的情況。深入了解這方面的情況，有助中國內地業務的發展。

26 Virtualisation and Cloud Computing
虛擬化及雲端運算

Virtualisation is an emerging IT paradigm that separates computing functions and technology implementations from physical hardware. Cloud computing, for example, is the virtualisation of computer programs through an Internet connection rather than installing applications on every office computer.
虛擬化是一種新興的資訊科技範式，將有形硬件的計算功能從技術實現中分離。例如，雲端運算是電腦程序通過互聯網的連接虛擬化，而不是每一個辦公室的電腦上安裝應用程序。

27 Data Science and Data Analytics
數據科學和數據分析

Data Science and Data Analytics refer to the use of a combination of processes, methods, systems and enabling technologies to facilitate the extraction of knowledge or insights for business intelligence, data visualisation and other purposes.
數據科學和數據分析是指結合過程、方法、系統和賦能技術，促進提取知識和得到啟發，供商業智能、數據視像化和其他領域使用。

28 3D printing
3D 打印

With the ever-improving price-performance ratio of 3D printers, 3D printing is rapidly revolutionising the way of production and self-actualisation. 3D objects can be "printed" based on digital 3D-models, either by scanning a set of 3D images or drawing using a CAD software. With 3D printing, companies can experiment with new ideas and proof of product concepts with minimal expenses. In fact, 3D printing is going to impact many industries such as medical, automobile and consumer-product industries. It can also allow hobbyists or personal manufacturers to produce personalised prototypes and products with craftsmanship and imaginations.
隨著 3D 打印機的性價比不斷提高，3D 打印正在迅速及徹底地改變着生產和自我實現的方式。 3D 物體的「打印」需要根據掃描一組 3D 圖像或以 CAD 軟件繪製而成的電子 3D 模型。隨著 3D 打印的發展，企業可以用最少的成本測試新的構思和驗證產品概念。事實上，3D 打印將影響許多行業，例如醫療，汽車和消費品行業。它也可以讓業餘愛好者或個人製造商，以工藝精神與想像力，生產出個性化的樣版和產品。

29 Augmented Reality (AR) & Virtual Reality (VR)
擴增實境（AR）及虛擬實境（VR）

Augmented reality (AR) is the integration of digital information with the user's environment in real time by merging the real world with virtual objects to support realistic, intelligent, and personalized experiences. Virtual Reality (VR) is the use of computer technology to generate realistic images, sounds and other sensations that simulate a user's physical presence in a virtual or imaginary environment in such a way that the user suspends belief and accepts it as a real environment.
擴增實境（AR）結合現實和虛擬，在真實實世界的景觀上增添並結合各種虛擬物件、圖像與資訊來加強使用者的視覺經驗。虛擬實境（VR）利用電腦模擬技術產生一個三維空間的虛擬世界，提供使用者關於視覺、聲音等感官的模擬，產生臨場感，創造出一個可體驗的虛擬空間，讓使用者感覺彷彿身歷其境。

30 Other IT-related Training
其他與資訊科技有關的訓練

Number of IT Employees (including Freelancers) by Sector/Branch by Job Category
按行業／業務及技能類別劃分的資訊科技僱員人數（包括自由工作者）

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical @ Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall # [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
IT & Communications Services Organizations 資訊科技及通訊服務機構																							
Manufacturing 製造業	01	Manufacture and repair of computers and peripheral equipment; Manufacture of electronic parts and components for computer and telecommunications equipment 電腦及其周邊設備的製造及修理；電腦及電訊設備所用電子零件及組件的製造	Number 人數	-	-	36	-	138	-	490	-	317	-	-	-	35	-	1 016	-	98	-	1 114	-
			Percentage* 百分率	-	-	3.2%	-	12.4%	-	44.0%	-	28.5%	-	-	-	3.1%	-	1.2%	-	8.8%	-	1.2%	-
Innovative products and services 創新產品及服務	03	Supplementary samples (Innovative products and services) 創新產品及服務	Number 人數	9	-	211	-	-	-	1	-	40	-	-	-	216	-	477	-	675	-	1 152	-
			Percentage* 百分率	0.8%	-	18.3%	-	-	-	0.1%	-	3.5%	-	-	-	18.8%	-	0.5%	-	58.6%	-	1.2%	-

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical @ Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall # [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
Wholesale, Retail and Import/Export Trades of the Computer Products and Software Packages 零售批發及出入口貿易、飲食業及酒店業	06	Export trading, import for wholesale, wholesale and retail sale of computers, computer peripheral equipment and computer software packages 電腦、電腦周邊設備及套裝軟件的出口貿易、進口批發、批發及零售	Number 人數	19	-	926	-	117	-	1 552	-	562	3	20	-	3 675	-	6 871	3	50	-	6 921	3
			Percentage* 百分率	0.3%	-	13.4%	-	1.7%	-	22.4%	-	8.1%	100.0%	0.3%	-	53.1%	-	7.8%	0.2%	0.7%	-	7.4%	0.2%

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical [@] Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall [#] [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
IT Products and Services Suppliers 資訊科技產品及服務供應商	18	IT related products and services (including consultancy, software development, software products, software support and maintenance services; data processing and tabulation services; engineering and technical services of computer facilities management) 與資訊科技相關的產品及服務（包括顧問、軟件開發、軟件產品、軟件支援及修護服務；資料處理及編纂服務；電腦設備管理活動的工程及技術服務）	Number 人數	588	-	15 485	-	3 571	-	6 860	156	3 518	303	66	-	3 005	1	33 093	460	4 186	-	37 279	460
			Percentage* 百分率	1.6%	-	41.5%	-	9.6%	-	18.4%	33.9%	9.4%	65.9%	0.2%	-	8.1%	0.2%	37.6%	27.2%	11.2%	-	39.6%	27.2%
Digital Creative 數碼創意業	24	Digital Creative (Supplementary samples) 數碼創意	Number 人數	8	-	437	44	2	-	8	-	26	-	-	-	35	-	516	44	163	2	679	46
			Percentage* 百分率	1.2%	-	64.4%	95.7%	0.3%	-	1.2%	-	3.8%	-	-	-	5.2%	-	0.6%	2.6%	24.0%	4.3%	0.7%	2.7%

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical [@] Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall [#] [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
Communications Services 通訊服務業	13	Internet access services 互聯網接駁服務	Number 人數	14	-	52	-	86	-	149	-	72	-	-	-	282	-	655	-	-	-	655	-
			Percentage* 百分率	2.1%	-	7.9%	-	13.1%	-	22.7%	-	11.0%	-	-	-	43.1%	-	0.7%	-	-	-	0.7%	-
	14	Communication services (except internet access services) 通訊服務（互聯網接駁服務除外）	Number 人數	24	-	604	-	1 432	-	1 184	-	622	5	-	-	1 087	-	4 953	5	6	-	4 959	5
			Percentage* 百分率	0.5%	-	12.2%	-	28.9%	-	23.9%	-	12.5%	100.0%	-	-	21.9%	-	5.6%	0.3%	0.1%	-	5.3%	0.3%
Sub-total 小計			**Number 人數**	**662**	**-**	**17 751**	**44**	**5 346**	**-**	**10 244**	**156**	**5 157**	**311**	**86**	**-**	**8 335**	**1**	**47 581**	**512**	**5 178**	**2**	**52 759**	**514**
			Percentage* 百分率	**1.3%**	**-**	**33.6%**	**8.6%**	**10.1%**	**-**	**19.4%**	**30.4%**	**9.8%**	**60.5%**	**0.2%**	**-**	**15.8%**	**0.2%**	**54.1%**	**30.3%**	**9.8%**	**0.4%**	**56.1%**	**30.4%**
IT Users Organizations 資訊科技用戶機構																							
Other Manufacturing 其他製造業	02	Other manufacturing (non-IT products) 其他製造業（非資訊科技產品）	Number 人數	41	-	284	-	-	-	80	-	811	-	-	-	-	-	1 216	-	-	-	1 216	-
			Percentage* 百分率	3.4%	-	23.4%	-	-	-	6.6%	-	66.7%	-	-	-	-	-	1.4%	-	-	-	1.3%	-
Innovative products and services 創新產品及服務	03	Supplementary samples (Innovative products and services) 創新產品及服務	Number 人數	4	-	131	2	12	-	15	-	72	-	-	-	41	2	275	4	150	-	425	4
			Percentage* 百分率	0.9%	-	30.8%	50.0%	2.8%	-	3.5%	-	16.9%	-	-	-	9.6%	50.0%	0.3%	0.2%	35.3%	-	0.5%	0.2%
Electricity, Gas and Water 電力、氣體燃料及水務	04	Electricity, gas and water supply 電力、燃氣及自來水供應	Number 人數	8	-	167	-	15	-	66	-	64	-	-	-	-	-	320	-	-	-	320	-
			Percentage* 百分率	2.5%	-	52.2%	-	4.7%	-	20.6%	-	20.0%	-	-	-	-	-	0.4%	-	-	-	0.3%	-
Construction 建造業	05	Construction 建造	Number 人數	16	-	131	-	36	-	27	-	528	-	-	-	-	-	738	-	5	-	743	-
			Percentage* 百分率	2.2%	-	17.6%	-	4.8%	-	3.6%	-	71.1%	-	-	-	-	-	0.8%	-	0.7%	-	0.8%	-

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical [@] Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall [#] [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業	07	Other import and export trades (except import and export trades of computers, computer peripherals and software packages) 其他出入口貿易（電腦、電腦周邊設備及套裝軟件的出入口貿易除外）	Number 人數	155	-	1 112	-	20	-	734	-	3 220	-	-	-	153	-	5 394	-	-	-	5 394	-
			Percentage* 百分率	2.9%	-	20.6%	-	0.4%	-	13.6%	-	59.7%	-	-	-	2.8%	-	6.1%	-	-	-	5.7%	-
	08	Other wholesale and retail (except wholesale and retail sales of computers, computer peripherals and software packages); Accommodation and food service activities 其他批發及零售（電腦、電腦周邊設備及套裝軟件的批發及零售除外）；住宿及膳食服務活動	Number 人數	70	-	768	-	81	-	219	10	1 964	920	2	-	-	-	3 104	930	-	-	3 104	930
			Percentage* 百分率	2.3%	-	24.7%	-	2.6%	-	7.1%	1.1%	63.3%	98.9%	0.1%	-	-	-	3.5%	55.0%	-	-	3.3%	55.0%

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical [@] Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall [#] [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
Transport and Storage Services 運輸及貨倉服務業	09	Airline companies 航空公司	Number 人數	10	-	285	-	4	-	19	-	82	-	-	-	-	-	400	-	-	-	400	-
			Percentage* 百分率	2.5%	-	71.3%	-	1.0%	-	4.8%	-	20.5%	-	-	-	-	-	0.5%	-	-	-	0.4%	-
	10	Railway and cable transport; Public bus services; Licensed and franchised ferry services; Vehicular tunnel, bridge and highway operators 鐵路及纜索運輸；公共巴士服務；持牌及專營渡輪服務；汽車隧道、橋樑及高速公路營運者	Number 人數	6	-	125	-	7	-	18	-	58	-	-	-	-	-	214	-	-	-	214	-
			Percentage* 百分率	2.8%	-	58.4%	-	3.3%	-	8.4%	-	27.1%	-	-	-	-	-	0.2%	-	-	-	0.2%	-
	11	Air cargo forwarding services 航空貨運代理服務	Number 人數	-	-	88	-	4	-	43	2	374	6	-	-	-	-	509	8	-	-	509	8
			Percentage* 百分率	-	-	17.3%	-	0.8%	-	8.4%	25.0%	73.5%	75.0%	-	-	-	-	0.6%	0.5%	-	-	0.5%	0.5%
	12	Other transport and storage services 其他運輸及貨倉服務業	Number 人數	4	-	282	-	9	-	29	-	678	92	-	-	-	-	1 002	92	-	-	1 002	92
			Percentage* 百分率	0.4%	-	28.1%	-	0.9%	-	2.9%	-	67.7%	100.0%	-	-	-	-	1.1%	5.4%	-	-	1.1%	5.4%

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical @ Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall # [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業	15	Domestic banking units 本地銀行單位	Number 人數	84	-	3 097	-	79	-	732	-	1 687	-	-	-	-	-	5 679	-	-	-	5 679	-
			Percentage* 百分率	1.50%	-	54.50%	-	1.40%	-	12.90%	-	29.70%	-	-	-	-	-	6.50%	-	-	-	6.00%	-
	16	Real estate brokerage and agency 地產經紀及代理	Number 人數	9	-	146	-	1	-	10	-	317	-	-	-	-	-	483	-	-	-	483	-
			Percentage* 百分率	1.9%	-	30.2%	-	0.2%	-	2.1%	-	65.6%	-	-	-	-	-	0.5%	-	-	-	0.5%	-
	17	Others (Financing, Insurance, Real Estate and Business Services) 其他（金融、保險、房地產及商業服務業）	Number 人數	98	-	1 459	-	87	-	948	-	3 384	-	-	-	-	-	5 976	-	20	-	5 996	-
			Percentage* 百分率	1.6%	-	24.3%	-	1.5%	-	15.8%	-	56.4%	-	-	-	-	-	6.8%	-	0.3%	-	6.4%	-
Medical and Health Care Services 醫療及保健服務	19	Medical, dental, and other health care services (including Hospital Authority) 醫療、牙科及其他保健服務（包括醫院管理局）	Number 人數	9	-	858	-	8	-	11	-	180	-	-	-	-	-	1 066	-	-	-	1 066	-
			Percentage* 百分率	0.8%	-	80.5%	-	0.8%	-	1.0%	-	16.9%	-	-	-	-	-	1.2%	-	-	-	1.1%	-

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical [@] Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall [#] [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
Community, Social and Personal Services 社區、社會及個人服務業	20	Universities and post-secondary colleges; Research and scientific institutes and Hong Kong Examination and Assessment Authority 大學及專上學院、科研機構；香港考試及評核局	Number 人數	49	-	771	10	82	-	410	-	1 074	21	1 193	10	6	-	3 585	41	753	-	4 338	41
			Percentage* 百分率	1.1%	-	17.8%	24.4%	1.9%	-	9.5%	-	24.8%	51.2%	27.5%	24.4%	0.1%	-	4.1%	2.4%	17.4%	-	4.6%	2.4%
	21	Educational institutes other than universities, post-secondary colleges (excluding Hong Kong Examination and Assessment Authority) 其他院校（大學及專上學院、香港考試及評核局除外）	Number 人數	73	-	-	-	-	-	71	-	2 367	5	2 653	-	-	-	5 164	5	-	-	5 164	5
			Percentage* 百分率	1.4%	-	-	-	-	-	1.4%	-	45.8%	100.0%	51.4%	-	-	-	5.9%	0.3%	-	-	5.5%	0.3%
	22	Motion pictures and other entertainment services; and Television / Radio Stations & Studios 電影及其他娛樂服務；電視台、電台及製作室	Number 人數	1	-	512	-	17	-	64	-	234	-	-	-	-	-	828	-	-	-	828	-
			Percentage* 百分率	0.1%	-	61.8%	-	2.1%	-	7.7%	-	28.3%	-	-	-	-	-	0.9%	-	-	-	0.9%	-

Sector 行業	Branch 業務			General IT Management 總資訊科技管理		IT/Software Development 資訊科技／軟件開發		Telecommunications and Networking 電訊及網絡		Technical [@] Services 技術服務		Operation Services 操作服務		IT Education and Training 資訊科技教育及訓練		IT Sales and Marketing 資訊科技銷售及市場推廣		Overall 總計 (IT) (資訊科技)		Research and Development (IT related) 研究與開發(與資訊科技相關)		Overall [#] [IT and R&D(IT)] 總計 (資訊科技及研究與開發(與資訊科技相關))	
				EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL	EM	FL
	23	Others (Community, Social and Personal Services); Hong Kong Productivity Council & Hong Kong Trade Development Council 其他（社區、社會及個人服務業）；香港生產力促進局、香港貿發局	Number 人數	37	-	312	-	18	-	162	-	780	37	-	-	5	-	1 314	37	-	-	1 314	37
			Percentage* 百分率	2.8%	-	23.7%	-	1.4%	-	12.3%	-	59.4%	100.0%	-	-	0.4%	-	1.5%	2.2%	-	-	1.40%	2.20%
Government Bureaux/ Departments 政府部門	25	Government Bureaux/Departments 政府部門	Number 人數	127	-	1 952	46	139	8	138	2	756	5	-	-	-	-	3 112	61	22	-	3 134	61
			Percentage* 百分率	4.1%	-	62.3%	75.4%	4.4%	13.1%	4.4%	3.3%	24.1%	8.2%	-	-	-	-	3.5%	3.6%	0.7%	-	3.30%	3.60%
Sub-total 小計			**Number 人數**	**801**	**-**	**12 480**	**58**	**619**	**8**	**3 796**	**14**	**18 630**	**1 086**	**3 848**	**10**	**205**	**2**	**40 379**	**1 178**	**950**	**-**	**41 329**	**1 178**
			Percentage* 百分率	**1.90%**	**-**	**30.2%**	**4.9%**	**1.5%**	**0.7%**	**9.2%**	**1.2%**	**45.1%**	**92.2%**	**9.3%**	**0.8%**	**0.5%**	**0.2%**	**45.9%**	**69.7%**	**2.3%**	**-**	**43.9%**	**69.6%**
Total 總計			**Number 人數**	**1 463**	**-**	**30 231**	**102**	**5 965**	**8**	**14 040**	**170**	**23 787**	**1 397**	**3 934**	**10**	**8 540**	**3**	**87 960**	**1 690**	**6 128**	**2**	**94 088**	**1 692**
			Percentage* 百分率	**1.60%**	**-**	**32.1%**	**6.0%**	**6.3%**	**0.5%**	**14.9%**	**10.0%**	**25.3%**	**82.6%**	**4.2%**	**0.6%**	**9.1%**	**0.2%**	**100.0%**	**100.0%**	**6.5%**	**0.1%**	**100.0%**	**100.0%**

Changes in Number of IT Employees by Type of Organisations by Branch Between 2016 and 2018
2016 年及 2018 年資訊科技僱員人數之變化（按機構類別及業務劃分）

Branch 業務		Number of employees and freelancers 僱員及自由工作者人數			
		2016	2018	Increase/ Decrease 增／減	% Changes 百分比變化
IT & Communications Services Organisations 資訊科技及通訊服務機構					
01	Manufacture and repair of computers and peripheral equipment; Manufacture of electronic parts and components for computer and telecommunications equipment 電腦及周邊設備的製造及修理；電腦及電訊設備電子零件及組件的製造	1 318	1 114	- 204	-15.5%
03	Innovative products and services 創新產品及服務	N/A 不適用	1 152	N/A 不適用	N/A 不適用
06	Export trading, import for wholesale, wholesale and retail sale of computers, computer peripheral equipment and computer software packages 電腦、電腦周邊設備及套裝軟件的出口貿易、進口批發、批發及零售	7 500	6 924	- 576	-7.7%
13	Internet access services 互聯網接駁服務	665	655	- 10	-1.5%
14	Communication services (except internet access services) 通訊服務（互聯網接駁服務除外）	4 558	4 964	406	8.9%
18	IT related products and services (including consultancy, software development, software products, software support and maintenance services; data processing and tabulation services; engineering and technical services of computer facilities management) 與資訊科技相關的產品及服務（包括顧問、軟件開發、軟件產品、軟件支援及修護服務；資料處理及編纂服務；電腦設備管理的工程及技術服務）	30 013	37 739	7 726	25.7%
24	Digital Creative 數碼創意	618	725	107	17.3%
	Sub-total 小計	44 672	53 273	8 601	19.3%
IT Users Organisations 資訊科技用戶機構					
02	Other manufacturing (non-IT products) 其他製造業（非資訊科技產品）	1 690	1 216	- 285	-19.0%
03	Innovative products and services 創新產品及服務	N/A 不適用	429	N/A 不適用	N/A 不適用

Branch 業務		Number of employees and freelancers 僱員及自由工作者人數			
		2016	2018	Increase/ Decrease 增／減	% Changes 百分比變化
04	Electricity, gas and water supply 電力、燃氣及自來水供應	390	320	- 70	-17.9%
05	Construction 建造	473	743	270	57.1%
07	Other import and export trades (except import and export trades of computers, computer peripherals and software packages) 其他出入口貿易（電腦、電腦周邊設備及套裝軟件的出入口貿易除外）	5 987	5 394	- 593	-9.9%
08	Other wholesale and retail (except wholesale and retail sales of computers, computer peripherals and software packages); Accommodation and food service activities 其他批發及零售（電腦、電腦周邊設備及套裝軟件的批發及零售除外）；住宿及膳食服務活動	3 008	4 034	1 026	34.1%
09	Airline companies 航空公司	456	400	- 56	-12.3%
10	Railway and cable transport; Public bus services; Licensed and franchised ferry services; Vehicular tunnel, bridge and highway operators 鐵路及纜索運輸；公共巴士服務；持牌及專營渡輪服務；汽車隧道、橋樑及高速公路營運者	241	214	- 27	-11.2%
11	Air cargo forwarding services 航空貨運代理服務	317	517	200	63.1%
12	Other transport and storage services 其他運輸及貨倉服務	976	1 094	118	12.1%
15	Domestic banking units 本地銀行單位	7 787	5 679	-2 108	-27.1%
16	Real estate brokerage and agency 地產經紀及代理	248	483	235	94.8%
17	Others (Financing, Insurance, Real Estate and Business Services) 其他（金融、保險、房地產及商業服務）	7 691	5 996	-1 695	-22.0%
19	Medical, dental, and other health care services (including Hospital Authority) 醫療、牙科及其他保健服務（包括醫院管理局）	1 077	1 066	- 11	-1.0%
20	Universities and post-secondary colleges; Research and scientific institutes and Hong Kong Examination and Assessment Authority 大學及專上學院；科研機構；香港考試及評核局	3 358	4 379	1 021	30.4%
21	Educational institutes other than universities, post-secondary colleges (excluding Hong Kong Examination	4 887	5 169	282	5.8%

Branch 業務		Number of employees and freelancers 僱員及自由工作者人數			
		2016	2018	Increase/ Decrease 增／減	% Changes 百分比變化
	and Assessment Authority) 其他院校（大學及專上學院、香港考試及評核局除外）				
22	Motion pictures and other entertainment services; and Television / Radio Stations & Studios 電影及其他娛樂服務；電視台、電台及製作室	608	828	220	36.2%
23	Others (Community, Social and Personal Services); Hong Kong Productivity Council & Hong Kong Trade Development Council 其他（社區、社會及個人服務）；香港生產力促進局；香港貿易發展局	1 187	1 351	164	13.8%
25	Government Bureaux/Departments 政府部門	2 741	3 195	454	16.6%
	Sub-total 小計	43 122	42 507	- 615	-1.4%

Number of IT Employees (including Freelancers) by Job Category/Title by Sector/Branch
按技能類別／職稱及行業／業務劃分的資訊科技僱員人數（包括自由工作者）

	Principal Job 主要職務	Overall 總計	Manufacturing 製造業		Innovative products and services 創新產品及服務	Electricity, Gas and Water 電力、氣體燃料及水務	Construction 建造業	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業			Transport and Storage Services 運輸及貨倉服務業				Communications Services 通訊服務業		Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業			IT Products and Services Suppliers 資訊科技產品及服務供應商	Medical and Health Care Services 醫療及保健服務	Community, Social and Personal Services 社區、社會及個人服務業				Digital Creative 數碼創意業	Government Bureaux/ Departments 政府部門
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
General IT Management 總資訊科技管理																											
101	IT Director/MIS Director/ Head of IT/CIO 資訊科技總監/管理資訊系統總監/資訊科技主管/首席資訊主任	1 313	-	40	10	6	16	19	155	70	10	3	-	4	12	21	82	9	76	480	9	48	73	1	37	6	126
102	CTO 首席資訊主任	150	-	1	3	2	-	-	-	-	-	3	-	-	2	3	2	-	22	108	-	1	-	-	-	2	1
	Sub-total 小計	1 463	-	41	13	8	16	19	155	70	10	6	-	4	14	24	84	9	98	588	9	49	73	1	37	8	127
IT/Software Development 資訊科技／軟件開發																											
201	Systems Development Manager 系統開發經理	1 726	1	8	22	10	9	45	159	38	4	21	2	20	1	12	177	3	154	639	79	120	-	6	24	6	166
202	IT Architect/Business Analyst 資訊科技建築師/商業分析員	865	-	1	5	45	1	211	-	29	8	3	-	-	2	17	60	1	36	211	3	16	-	-	18	-	198
203	Project Manager/ Project Leader 項目經理/項目組長	3 975	7	65	23	32	16	222	111	94	108	3	38	67	16	160	773	7	188	1 603	3	94	-	8	68	38	231
204	UX Designer 用戶體驗設計師	2 703	-	-	10	-	8	107	-	146	71	7	-	51	-	29	335	13	22	1 204	333	62	-	30	-	4	271
205	Programmer/Analyst/ Programmer/ Software Engineer 程式編製員/分析員/程式編製員/軟件工程師	16 281	26	187	148	74	96	262	842	415	92	89	42	143	17	277	1 541	78	954	8 660	440	460	-	94	161	116	1 067
206	Web Designer/Developer 網站設計員/開發員	1 319	-	20	6	-	-	-	-	45	2	2	-	-	2	7	39	16	13	1 064	-	24	-	26	34	11	8

	Principal Job 主要職務	Overall 總計	Manufacturing 製造業		Innovative products and services 創新產品及服務	Electricity, Gas and Water 電力、氣體燃料及水務	Construction 建造業	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業			Transport and Storage Services 運輸及貨倉服務業				Communications Services 通訊服務業		Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業			IT Products and Services Suppliers 資訊科技產品及服務供應商	Medical and Health Care Services 醫療及保健服務	Community, Social and Personal Services 社區、社會及個人服務業				Digital Creative 數碼創意業	Government Bureaux/ Departments 政府部門
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
207	Quality Assurance Specialist/Software Assurance Specialist/ Engineer/IT Systems Auditor 品質檢查專責經理/軟件品質檢查專責經理/工程師/電腦系統審核經理	613	-	-	10	6	-	28	-	1	-	-	-	1	8	56	119	-	2	372	-	1	-	-	6	3	-
208	Software Product Engineer 軟件產品工程師	435	1	-	3	-	-	-	-	-	-	-	-	-	6	42	24	20	-	317	-	4	-	-	-	8	10
209	Software/Firmware Product Designer/ Product Analyst/ Developer/Software Product Manager 軟件/固件產品設計員/產品分析員/開發員/軟件產品經理	855	1	-	39	-	-	49	-	-	-	-	6	-	-	4	9	8	90	600	-	-	-	-	-	4	45
210	Technical Writer 技術撰稿員	150	-	2	1	-	-	-	-	-	-	-	-	-	-	-	20	-	-	127	-	-	-	-	-	-	-
211	Computer Game Designer/Artist/Developer / Computer Graphic Designer/Artist/ Computer Animator/Web Graphic Designer/ Visual Effects Designer 電腦遊戲設計/美術/開發員/電腦圖像設計/美術員/電腦動畫設計師/網頁圖像設計師/視覺效果設計師	1 411	-	1	77	-	1	2	-	-	-	-	-	-	-	-	-	-	-	688	-	-	-	348	1	291	2
	Sub-total 小計	30 333	36	284	344	167	131	926	1 112	768	285	125	88	282	52	604	3 097	146	1 459	15 485	858	781	-	512	312	481	1 998
	Telecommunications and Networking 電訊及網絡																										
301	Telecommunications Manager/Networking Manager 電訊經理/網絡經理	335	-	-	2	2	2	7	-	1	-	1	-	3	16	97	39	1	12	117	-	20	-	5	1	-	9

	Principal Job 主要職務	Overall 總計	Manufacturing 製造業		Innovative products and services 創新產品及服務	Electricity, Gas and Water 電力、氣體燃料及水務	Construction 建造業	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業			Transport and Storage Services 運輸及貨倉服務業				Communications Services 通訊服務業		Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業			IT Products and Services Suppliers 資訊科技產品及服務供應商	Medical and Health Care Services 醫療及保健服務	Community, Social and Personal Services 社區、社會及個人服務業				Digital Creative 數碼創意業	Government Bureaux/ Departments 政府部門
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
302	Telecommunications Consultant/Network Consultant 電訊顧問/網絡顧問	889	-	-	-	2	-	56	-	39	-	1	-	-	7	303	11	-	-	454	-	7	-	-	5	1	3
303	Telecommunications Engineer/Network Engineer 電訊工程師/網絡工程師	2 306	30	-	-	5	5	41	20	2	4	2	-	3	49	859	5	-	40	1 170	3	12	-	5	-	-	51
304	Network Administrator/ Network Officer 網絡管理主任/網絡主任	2 443	108	-	10	6	29	13	-	39	-	3	4	3	14	173	24	-	35	1 830	5	43	-	7	12	1	84
	Sub-total 小計	5 973	138	-	12	15	36	117	20	81	4	7	4	9	86	1 432	79	1	87	3 571	8	82	-	17	18	2	147
	Technical Services 技術服務																										
401	IT Security Specialist/ Information Security Specialist/Information Security Officer 電腦保安專責經理/資訊保安專責經理/資訊保安主任	1 118	1	-	-	13	3	10	-	3	-	4	-	1	1	67	243	-	161	539	-	11	-	-	23	3	35
402	Database Administrator/ Data Warehouse Administrator/Database Designer 資料庫管理主任/數據庫管理主任/資料庫設計員	652	-	-	2	2	-	33	2	52	6	1	-	3	2	6	62	-	93	299	-	39	-	2	32	-	16
403	Systems Programmer (in-house/vendor environment)/Systems Engineer 系統程式編製員（機構內部/電腦供應商）/系統工程師	4 191	75	72	13	43	3	73	606	110	13	5	43	2	11	78	426	2	535	1 861	11	57	-	62	32	5	53
404	Customer Engineering Manager/ Services Support Manager 客戶工程經理/服務支援經理	860	8	-	1	2	11	18	40	10	-	3	-	3	9	89	1	-	42	574	-	42	-	-	1	-	6

	Principal Job 主要職務	Overall 總計	Manufacturing 製造業		Innovative products and services 創新產品及服務	Electricity, Gas and Water 電力、氣體燃料及水務	Construction 建造業	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業			Transport and Storage Services 運輸及貨倉服務業				Communications Services 通訊服務業		Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業			IT Products and Services Suppliers 資訊科技產品及服務供應商	Medical and Health Care Services 醫療及保健服務	Community, Social and Personal Services 社區、社會及個人服務業				Digital Creative 數碼創意業	Government Bureaux/ Departments 政府部門
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
405	Customer Service Engineer/Field Engineer 客戶服務工程師/實地服務工程師	1 479	20	-	-	6	8	420	60	8	-	5	-	-	63	222	-	8	21	602	-	10	-	-	-	-	26
406	Field Technician 實地服務技術員	5 910	386	8	-	-	2	998	26	46	-	-	2	20	63	722	-	-	96	3 141	-	251	71	-	74	-	4
	Sub-total 小計	14 210	490	80	16	66	27	1 552	734	229	19	18	45	29	149	1 184	732	10	948	7 016	11	410	71	64	162	8	140
	Operation Services 操作服務																										
501	Computer Operations Manager 電腦操作經理	939	2	19	12	6	5	45	211	67	5	7	11	10	2	57	141	3	129	56	4	45	14	2	44	1	41
502	Help Desk Supervisor 求助台主任	369	2	-	8	-	3	16	-	3	-	1	4	11	1	1	193	-	23	59	-	9	4	6	4	-	21
503	Help Desk Representative/ Customer Service Officer/Representative 求助台服務員/客戶服務主任/服務員	1 641	3	12	21	8	24	80	-	9	-	4	14	40	45	247	197	-	24	689	-	30	2	46	24	7	115
504	Computer Operations Supervisor/Operations Support Supervisor 電腦操作主任/操作支援主任	1 341	2	115	3	11	6	12	1	43	5	9	-	9	4	41	247	40	145	119	4	274	105	1	46	1	98
505	Computer Operator/ Systems Operator 電腦操作員/系統操作員	2 343	14	114	2	34	-	88	240	168	20	6	-	63	1	16	209	5	60	469	52	203	120	13	65	2	379
506	User Support/ Co-ordinator 用戶支援/統籌員	18 551	294	551	66	5	490	324	2 768	2 594	52	31	351	637	19	265	700	269	3 003	2 429	120	534	2 127	166	634	15	107
	Sub-total 小計	25 184	317	811	112	64	528	565	3 220	2 884	82	58	380	770	72	627	1 687	317	3 384	3 821	180	1 095	2 372	234	817	26	761
	IT Education and Training 資訊科技教育及訓練																										
601	Lecturer/Professor/ Training Officer 講師/教授/訓練主任	2 427	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	830	1 597	-	-	-	-

	Principal Job 主要職務	Overall 總計	Manufacturing 製造業		Innovative products and services 創新產品及服務	Electricity, Gas and Water 電力、氣體燃料及水務	Construction 建造業	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業			Transport and Storage Services 運輸及貨倉服務業				Communications Services 通訊服務業		Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業			IT Products and Services Suppliers 資訊科技產品及服務供應商	Medical and Health Care Services 醫療及保健服務	Community, Social and Personal Services 社區、社會及個人服務業				Digital Creative 數碼創意業	Government Bureaux/ Departments 政府部門
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
602	IT Trainer/IT Instructor 資訊科技訓練員/資訊科技教導員	1 517	-	-	-	-	-	20	-	2	-	-	-	-	-	-	-	-	-	66	-	373	1 056	-	-	-	-
	Sub-total 小計	3 944	-	-	-	-	-	20	-	2	-	-	-	-	-	-	-	-	-	66	-	1 203	2 653	-	-	-	-
	IT Sales and Marketing 資訊科技銷售及市場推廣																										
701	Sales/Marketing Director/ Account Director/ Sales/Marketing Manager 銷售/市場總監/客戶總監/銷售/市場經理	1 756	7	-	35	-	-	586	17	-	-	-	-	-	39	449	-	-	-	611	-	1	-	-	2	9	-
702	Sales/Marketing Representative/Account Manager/Product Promotion Representative 銷售/市場代表/客戶經理/產品推廣代表	6 787	28	-	224	-	-	3 089	136	-	-	-	-	-	243	638	-	-	-	2 395	-	5	-	-	3	26	-
	Sub-total 小計	8 543	35	-	259	-	-	3 675	153	-	-	-	-	-	282	1 087	-	-	-	3 006	-	6	-	-	5	35	-
	Total (IT) 總計 (資訊科技)	**89 650**	**1 016**	**1 216**	**756**	**320**	**738**	**6 874**	**5 394**	**4 034**	**400**	**214**	**517**	**1 094**	**655**	**4 958**	**5 679**	**483**	**5 976**	**33 553**	**1 066**	**3 626**	**5 169**	**828**	**1 351**	**560**	**3 173**
	Research and Development (IT related) 研究與開發(與資訊科技相關)																										
051	R&D Researcher/R&D Scientist/R&D Engineer 研發研究員/研發科學家/研發工程師	2 432	27	-	62	-	5	20	-	-	-	-	-	-	-	4	-	-	-	1 739	-	537	-	-	-	32	6
052	R&D Technician 研發技術員	2 703	71	-	658	-	-	30	-	-	-	-	-	-	-	2	-	-	20	1 634	-	192	-	-	-	80	16
053	R&D Supporting Staff 研發輔助人員	995	-	-	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	813	-	24	-	-	-	53	-
	Sub-total 小計	**6 130**	**98**	**-**	**825**	**-**	**5**	**50**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6**	**-**	**-**	**20**	**4 186**	**-**	**753**	**-**	**-**	**-**	**165**	**22**
Total (IT and R&D(IT)) 總計（資訊科技及研究與開發（與資訊科技相關））		**95 780**	**1 114**	**1 216**	**1 581**	**320**	**743**	**6 924**	**5 394**	**4 034**	**400**	**214**	**517**	**1 094**	**655**	**4 964**	**5 679**	**483**	**5 996**	**37 739**	**1 066**	**4 379**	**5 169**	**828**	**1 351**	**725**	**3 195**

Number of IT Employees (including Freelancers) by Employment Size of Company by Sector
按行業及公司規模劃分（包括自由工作者）的資訊科技僱員人數

Employment size 僱員人數		Overall 總計	Sector 行業													
			Manufacturing 製造業 (Branches 1-2)	Innovative products and services 創新產品及服務 (Branch 3)	Electricity, Gas and Water 電力、氣體燃料及水務 (Branch 4)	Construction 建造業 (Branch 5)	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業 (Branches 6-8)	Transport and Storage Services 運輸及貨倉服務業 (Branches 9-12)	Communications Services 通訊服務業 (Branches 13-14)	Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業 (Branches 15-17)	IT Products and Services Suppliers 資訊科技產品及服務供應商 (Branch 18)	Medical and Health Care Services 醫療及保健服務 (Branch 19)	Community, Social and Personal Services 社區、社會及個人服務業 (Branches 20-23)	Digital Creative 數碼創意業 (Branch 24)	Government Bureaux/ Departments 政府部門 (Branch 25)
IT 資訊科技																
1-4 1 至 4 人	Number 人數	7 286	630	1	-	-	175	101	25	-	6 308	1	4	41	-
	Percentage* 百分率	100.00%	8.60%	0.01%	-	-	2.40%	1.40%	0.30%	-	86.60%	0.01%	0.10%	0.60%	-
5-9 5 至 9 人	Number 人數	4 945	394	28	1	-	978	34	200	701	2 350	1	175	83	-
	Percentage* 百分率	100.00%	8.00%	0.60%	0.02%	-	19.80%	0.70%	4.00%	14.20%	47.50%	0.02%	3.50%	1.70%	-
10-19 10 至 19 人	Number 人數	11 090	148	52	-	86	2 019	82	527	919	6 626	-	471	160	-
	Percentage* 百分率	100.00%	1.30%	0.50%	-	0.80%	18.20%	0.70%	4.80%	8.30%	59.70%	-	4.20%	1.40%	-
20-49 20 至 49 人	Number 人數	15 354	86	106	2	68	3 596	278	470	612	8 691	2	1 341	100	2
	Percentage* 百分率	100.00%	0.60%	0.70%	0.01%	0.40%	23.40%	1.80%	3.10%	4.00%	56.60%	0.01%	8.70%	0.70%	0.01%
50-99 50 至 99 人	Number 人數	12 009	112	211	-	24	4 226	151	152	750	3 038	33	3 253	42	17
	Percentage* 百分率	100.00%	0.90%	1.80%	-	0.20%	35.20%	1.30%	1.30%	6.20%	25.30%	0.30%	27.10%	0.30%	0.10%
100-199 100 至 199 人	Number 人數	7 271	325	142	-	215	1 162	275	499	1 406	1 999	12	1 111	86	39
	Percentage* 百分率	100.00%	4.50%	2.00%	-	3.00%	16.00%	3.80%	6.90%	19.30%	27.50%	0.20%	15.30%	1.20%	0.50%
200-499 200 至 499 人	Number 人數	6 059	153	188	-	1	923	194	752	1 080	2 235	12	337	48	136
	Percentage* 百分率	100.00%	2.50%	3.10%	-	0.02%	15.20%	3.20%	12.40%	17.80%	36.90%	0.20%	5.60%	0.80%	2.20%

* As a percentage of number of IT employees (including freelancers) by employment size of company.
* 佔該類公司（按規模劃分）資訊科技僱員總數（包括自由工作者）的百分率。

Note: Figures may not add up to the total due to rounding.
註：因四捨五入關係，各項數字相加或與總計數字略有出入。

Employment size 僱員人數		Overall 總計	Sector 行業												
			Manufacturing 製造業 (Branches 1-2)	Innovative products and services 創新產品及服務 (Branch 3)	Electricity, Gas and Water 電力、氣體燃料及水務 (Branch 4)	Construction 建造業 (Branch 5)	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業 (Branches 6-8)	Transport and Storage Services 運輸及貨倉服務業 (Branches 9-12)	Communications Services 通訊服務業 (Branches 13-14)	Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業 (Branches 15-17)	IT Products and Services Suppliers 資訊科技產品及服務供應商 (Branch 18)	Medical and Health Care Services 醫療及保健服務 (Branch 19)	Community, Social and Personal Services 社區、社會及個人服務業 (Branches 20-23)	Digital Creative 數碼創意業 (Branch 24)	Government Bureaux/ Departments 政府部門 (Branch 25)
500&over 500 人及以上	Number 人數	25 636	384	28	317	344	3 223	1 110	2 988	6 670	2 306	1 005	4 282	-	2 979
	Percentage* 百分率	100.00%	1.50%	0.10%	1.20%	1.30%	12.60%	4.30%	11.70%	26.00%	9.00%	3.90%	16.70%	-	11.60%
Total 總計	**Number 人數**	**89 650**	**2 232**	**756**	**320**	**738**	**16 302**	**2 225**	**5 613**	**12 138**	**33 553**	**1 066**	**10 974**	**560**	**3 173**
	Percentage* 百分率	**100.0%**	**2.5%**	**0.8%**	**0.4%**	**0.8%**	**18.2%**	**2.5%**	**6.3%**	**13.5%**	**37.4%**	**1.2%**	**12.2%**	**0.6%**	**3.5%**
IT and R&D (IT) 資訊科技及研究與開發(與資訊科技相關)															
1-4 1 至 4 人	Number 人數	8 130	630	25	-	-	175	101	25	-	7 062	1	65	46	-
	Percentage* 百分率	100.00%	7.70%	0.31%	-	-	2.20%	1.20%	0.30%	-	86.90%	0.01%	0.80%	0.60%	-
5-9 5 至 9 人	Number 人數	6 878	394	55	1	-	978	34	200	701	4 102	1	325	87	-
	Percentage* 百分率	100.00%	5.70%	0.80%	0.01%	-	14.20%	0.50%	2.90%	10.20%	59.60%	0.01%	4.70%	1.30%	-
10-19 10 至 19 人	Number 人數	11 971	196	76	-	86	2 069	82	527	919	7 385	-	471	160	-
	Percentage* 百分率	100.00%	1.60%	0.60%	-	0.70%	17.30%	0.70%	4.40%	7.70%	61.70%	-	3.90%	1.30%	-
20-49 20 至 49 人	Number 人數	16 036	86	159	2	68	3 596	278	476	612	9 305	2	1 341	109	2
	Percentage* 百分率	100.00%	0.50%	1.00%	0.01%	0.40%	22.40%	1.70%	3.00%	3.80%	58.00%	0.01%	8.40%	0.70%	0.01%
50-99 50 至 99 人	Number 人數	12 197	112	305	-	24	4 226	151	152	750	3 132	33	3 253	42	17
	Percentage* 百分率	100.00%	0.90%	2.50%	-	0.20%	34.60%	1.20%	1.20%	6.10%	25.70%	0.30%	26.70%	0.30%	0.10%
100-199 100 至 199 人	Number 人數	7 442	375	208	-	215	1 162	275	499	1 426	2 034	12	1 111	86	39
	Percentage* 百分率	100.00%	5.00%	2.80%	-	2.90%	15.60%	3.70%	6.70%	19.20%	27.30%	0.20%	14.90%	1.20%	0.50%

* As a percentage of number of IT employees (including freelancers) by employment size of company.
* 佔該類公司（按規模劃分）資訊科技僱員總數（包括自由工作者）的百分率。

Note: Figures may not add up to the total due to rounding.
註：因四捨五入關係，各項數字相加或與總計數字略有出入。

Employment size 僱員人數		Overall 總計	Sector 行業												
			Manufacturing 製造業 (Branches 1-2)	Innovative products and services 創新產品及服務 (Branch 3)	Electricity, Gas and Water 電力、氣體燃料及水務 (Branch 4)	Construction 建造業 (Branch 5)	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業 (Branches 6-8)	Transport and Storage Services 運輸及貨倉服務業 (Branches 9-12)	Communications Services 通訊服務業 (Branches 13-14)	Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業 (Branches 15-17)	IT Products and Services Suppliers 資訊科技產品及服務供應商 (Branch 18)	Medical and Health Care Services 醫療及保健服務 (Branch 19)	Community, Social and Personal Services 社區、社會及個人服務業 (Branches 20-23)	Digital Creative 數碼創意業 (Branch 24)	Government Bureaux/ Departments 政府部門 (Branch 25)
200-499 200 至 499 人	Number 人數	6 385	153	188	-	1	923	194	752	1 080	2 413	12	338	195	136
	Percentage* 百分率	100.00%	2.40%	2.90%	-	0.02%	14.50%	3.00%	11.80%	16.90%	37.80%	0.20%	5.30%	3.10%	2.10%
500&over 500 人及以上	Number 人數	26 741	384	565	317	349	3 223	1 110	2 988	6 670	2 306	1 005	4 823	-	3 001
	Percentage* 百分率	100.00%	1.40%	2.10%	1.20%	1.30%	12.10%	4.20%	11.20%	24.90%	8.60%	3.80%	18.00%	-	11.20%
Total 總計	**Number 人數**	**95 780**	**2 330**	**1 581**	**320**	**743**	**16 352**	**2 225**	**5 619**	**12 158**	**37 739**	**1 066**	**11 727**	**725**	**3 195**
	Percentage* 百分率	**100.0%**	**2.4%**	**1.7%**	**0.3%**	**0.8%**	**17.1%**	**2.3%**	**5.9%**	**12.7%**	**39.4%**	**1.1%**	**12.2%**	**0.8%**	**3.3%**

* As a percentage of number of IT employees (including freelancers) by employment size of company.
* 佔該類公司（按規模劃分）資訊科技僱員總數（包括自由工作者）的百分率。

Note: Figures may not add up to the total due to rounding.
註：因四捨五入關係，各項數字相加或與總計數字略有出入。

Number of IT Employees (including Freelancers) by Job Nature by Sector/Branch
按工作性質及行業／業務劃分的資訊科技僱員人數（包括自由工作者）

Sector 行業			Manufacturing 製造業		Innovative products and services 創新產品及服務	Electricity, Gas and Water 電力、氣體燃料及水務	Construction 建造業	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業			Transport and Storage Services 運輸及貨倉服務業				Communications Services 通訊服務業		Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業			IT Products and Services Suppliers 資訊科技產品及服務供應商	Medical and Health Care Services 醫療及保健服務	Community, Social and Personal Services 社區、社會及個人服務業				Digital Creative 數碼創意業	Government Bureaux/ Departments 政府部門
		Overall 總計	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Teaching and Research in Academic and Education Institutions 在學術和教育機構從事教學和科研工作	Number 人數	4 692	-	-	-	-	-	6	-	2	-	-	-	-	-	-	-	-	-	169	-	1 498	3 017	-	-	-	-
	Percentage* 百分率	4.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	0.00%	34.20%	58.40%	0.00%	0.00%	0.00%	0.00%
Product Development/ Engineering (i.e. developing core technologies, products and services) 從事 IT 核心技術、產品和服務的研究、設計和開發工作	Number 人數	6 604	47	36	126	-	12	375	655	58	-	2	-	62	16	44	69	73	369	3 940	18	181	-	198	16	164	143
	Percentage* 百分率	6.90%	4.20%	3.00%	8.00%	0.00%	1.60%	5.40%	12.10%	1.40%	0.00%	0.90%	0.00%	5.70%	2.40%	0.90%	1.20%	15.10%	6.20%	10.40%	1.70%	4.10%	0.00%	23.90%	1.20%	22.60%	4.50%

* As a Percentage* of number of IT employees by branch.
* 佔該業務資訊科技僱員人數的百分率。

Note: Figures may not add up to the total due to rounding.
註：因四捨五入關係，各項數字相加或與總計數字略有出入。

Sector 行業			Manufacturing 製造業		Innovative products and services 創新產品及服務	Electricity, Gas and Water 電力、氣體燃料及水務	Construction 建造業	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業			Transport and Storage Services 運輸及貨倉服務業				Communications Services 通訊服務業		Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業			IT Products and Services Suppliers 資訊科技產品及服務供應商	Medical and Health Care Services 醫療及保健服務	Community, Social and Personal Services 社區、社會及個人服務業				Digital Creative 數碼創意業	Government Bureaux/ Departments 政府部門
		Overall 總計	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Application Development/ Engineering (i.e. using technologies, products and services to develop applications to meet the business needs) 從事應用的設計和開發工作（例如：利用 IT 技術、產品和服務開發出適用於不同業務的應用）	Number 人數	26 052	39	301	226	174	110	474	799	691	277	84	88	148	94	1 548	3 327	75	1 208	12 059	667	925	-	350	352	307	1 729
	Percentage* 百分率	27.20%	3.50%	24.80%	14.30%	54.40%	14.80%	6.80%	14.80%	17.10%	69.30%	39.30%	17.00%	13.50%	14.40%	31.20%	58.60%	15.50%	20.10%	32.00%	62.60%	21.10%	0.00%	42.30%	26.10%	42.30%	54.10%
Operation and Technical Support 操作及技術支援	Number 人數	43 947	902	879	153	137	610	2 763	3 815	3 283	123	109	429	884	268	2 051	2 198	335	4 399	14 537	373	1 013	2 152	280	977	74	1 203
	Percentage* 百分率	45.90%	81.00%	72.30%	9.70%	42.80%	82.10%	39.90%	70.70%	81.40%	30.80%	50.90%	83.00%	80.80%	40.90%	41.30%	38.70%	69.40%	73.40%	38.50%	35.00%	23.10%	41.60%	33.80%	72.30%	10.20%	37.70%
Others 其他	Number 人數	8 355	28	-	251	9	6	3 256	125	-	-	19	-	-	277	1 315	85	-	-	2 848	8	9	-	-	6	15	98
	Percentage* 百分率	8.70%	2.50%	0.00%	15.90%	2.80%	0.80%	47.00%	2.30%	0.00%	0.00%	8.90%	0.00%	0.00%	42.30%	26.50%	1.50%	0.00%	0.00%	7.50%	0.80%	0.20%	0.00%	0.00%	0.40%	2.10%	3.10%
Research and Development (IT related) 研究與開發(與資訊科技相關)	Number 人數	6 130	98	-	825	-	5	50	-	-	-	-	-	-	-	6	-	-	20	4 186	-	753	-	-	-	165	22
	Percentage* 百分率	6.40%	8.80%	0.00%	52.20%	0.00%	0.70%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.30%	11.10%	0.00%	17.20%	0.00%	0.00%	0.00%	22.80%	0.70%
Total 總計	**Number 人數**	95 780	1 114	1 216	1 581	320	743	6 924	5 394	4 034	400	214	517	1 094	655	4 964	5 679	483	5 996	37 739	1 066	4 379	5 169	828	1 351	725	3 195
	Percentage* 百分率	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* As a percentage of number of IT employees by branch.
* 佔該業務資訊科技僱員人數的百分率。

Note: Figures may not add up to the total due to rounding.
註：因四捨五入關係，各項數字相加或與總計數字略有出入。

Number of Existing IT Vacancies by Sector/Branch by Job Category
按行業／業務及技能類別劃分的現有資訊科技空缺數目

Sector 行業	Branch 業務			Overall (IT) 總計 (資訊科技)	Job category 技能類別								Overall (IT and R&D(IT)) 總計 (資訊科技及研究與開發(與資訊科技相關))
					General IT Management 總資訊科技管理	IT/Software Development 資訊科技／軟件開發	Telecommunications and Networking 電訊及網絡	Technical @ Services 技術服務	Operation Services 操作服務	IT Education and Training 資訊科技教育及訓練	IT Sales and Marketing 資訊科技銷售及市場推廣	Research and Development (IT related) 研究與開發 (與資訊科技相關)	
IT & Communications Services Organizations 資訊科技及通訊服務機構													
Manufacturing 製造業	01	Manufacture and repair of computers and peripheral equipment; Manufacture of electronic parts and components for computer and telecommunications equipment 電腦及其周邊設備的製造及修理；電腦及電訊設備所用電子零件及組件的製造	Number 數目	38	-	-	-	32	6	-	-	6	44
			Percentage* 百分率	3.6%	-	-	-	6.1%	1.9%	-	-	5.8%	3.8%
Innovative products and services 創新產品及服務	03	Innovative products and services 創新產品及服務	Number 數目	24	-	17	-	-	-	-	7	-	24
			Percentage* 百分率	4.8%	-	7.5%	-	-	-	-	3.1%	-	2.0%
Wholesale, Retail and Import/Export Trades of the Computer Products and Software Packages 零售批發及出入口貿易、飲食業及酒店業	06	Export trading, import for wholesale, wholesale and retail sale of computers, computer peripheral equipment and computer software packages 電腦、電腦周邊設備及套裝軟件的出口貿易、進口批發、批發及零售	Number 數目	112	-	19	2	27	-	-	64	-	112
			Percentage* 百分率	1.6%	-	2.0%	1.7%	1.7%	-	-	1.7%	-	1.6%

@ Technical services include job categories of IT security, database, systems programming and field support.
@ 技術服務包括各技能類別的資訊科技保安、資料庫、系統程式編製及實地支援。

* As a percentage of number of IT posts by sector/branch by job category.
* 佔該行業／業務該技能類別資訊科技職位數目的百分率。

Sector 行業	Branch 業務			Overall (IT) 總計(資訊科技)	Job category 技能類別								Overall (IT and R&D(IT)) 總計(資訊科技及研究與開發(與資訊科技相關))
					General IT Management 總資訊科技管理	IT/Software Development 資訊科技／軟件開發	Telecommunications and Networking 電訊及網絡	Technical @ Services 技術服務	Operation Services 操作服務	IT Education and Training 資訊科技教育及訓練	IT Sales and Marketing 資訊科技銷售及市場推廣	Research and Development (IT related) 研究與開發(與資訊科技相關)	
IT Products and Services Suppliers 資訊科技產品及服務供應商	18	IT related products and services (including consultancy, software development, software products, software support and maintenance services; data processing and tabulation services; engineering and technical services of computer facilities management) 與資訊科技相關的產品及服務（包括顧問、軟件開發、軟件產品、軟件支援及修護服務；資料處理及編纂服務；電腦設備管理活動的工程及技術服務）	Number 數目	1 534	-	880	100	254	95	-	205	189	1 723
			Percentage* 百分率	4.4%	-	5.4%	2.7%	3.5%	2.4%	-	6.4%	4.3%	4.4%
Digital Creative 數碼創意業	24	Digital Creative 數碼創意業	Number 數目	51	-	47	-	-	-	-	4	3	54
			Percentage* 百分率	8.3%	-	8.9%	-	-	-	-	10.3%	1.8%	6.9%
Communications Services 通訊服務業	13	Internet access services 互聯網接駁服務	Number 數目	22	-	-	4	12	-	-	6	-	22
			Percentage* 百分率	3.2%	-	-	4.4%	7.5%	-	-	2.1%	-	3.2%
	14	Communication services (except internet access services) 通訊服務（互聯網接駁服務除外）	Number 數目	69	-	25	33	-	11	-	-	-	69
			Percentage* 百分率	1.4%	-	4.0%	2.3%	-	1.7%	-	-	-	1.4%
Sub-total 小計			**Number 數目**	**1 850**	-	**988**	**139**	**325**	**112**	-	**286**	**198**	**2 048**
			Percentage* 百分率	**3.7%**	-	**5.3%**	**2.5%**	**3.0%**	**2.0%**	-	**3.3%**	**3.7%**	**3.7%**

@ Technical services include job categories of IT security, database, systems programming and field support.

@ 技術服務包括各技能類別的資訊科技保安、資料庫、系統程式編製及實地支援。

* As a percentage of number of IT posts by sector/branch by job category.

* 佔該行業／業務該技能類別資訊科技職位數目的百分率。

Sector 行業	Branch 業務			Overall (IT) 總計(資訊科技)	Job category 技能類別								Overall (IT and R&D(IT)) 總計(資訊科技及研究與開發(與資訊科技相關))
					General IT Management 總資訊科技管理	IT/Software Development 資訊科技／軟件開發	Telecommunications and Networking 電訊及網絡	Technical @ Services 技術服務	Operation Services 操作服務	IT Education and Training 資訊科技教育及訓練	IT Sales and Marketing 資訊科技銷售及市場推廣	Research and Development (IT related) 研究與開發(與資訊科技相關)	
IT Users Organizations 資訊科技用戶機構													
Other Manufacturing 其他製造業	02	Other manufacturing (non-IT products) 其他製造業（非資訊科技產品）	Number 數目	28	-	12		4	12	-	-	-	28
			Percentage* 百分率	2.3%	-	4.1%	-	4.8%	1.5%	-	-	-	2.3%
Innovative products and services 創新產品及服務	03	Innovative products and services 創新產品及服務	Number 數目	16	-	8	1	-	5	-	2	1	17
			Percentage* 百分率	5.4%	-	5.7%	7.7%	-	6.5%	-	4.4%	0.7%	3.8%
Electricity, Gas and Water 電力、氣體燃料及水務	04	Electricity, gas and water supply 電力、燃氣及自來水供應	Number 數目	10	-	4	-	6	-	-	-	-	10
			Percentage * 百分率	3.0%	-	2.3%	-	8.3%	-	-	-	-	3.0%
Construction 建造業	05	Construction 建造	Number 數目	45	-	9	-	-	36	-	-	-	45
			Percentage* 百分率	5.7%	-	6.4%	-	-	6.4%	-	-	-	5.7%
Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業	07	Other import and export trades (except import and export trades of computers, computer peripherals and software packages) 其他出入口貿易（電腦、電腦周邊設備及套裝軟件的出入口貿易除外）	Number 數目	204	-	60	-	5	137	-	2	-	204
			Percentage* 百分率	3.6%	-	5.1%	-	0.7%	4.1%	-	1.3%	-	3.6%

@ Technical services include job categories of IT security, database, systems programming and field support.

@ 技術服務包括各技能類別的資訊科技保安、資料庫、系統程式編製及實地支援。

* As a percentage of number of IT posts by sector/branch by job category.

* 佔該行業／業務該技能類別資訊科技職位數目的百分率。

Sector 行業	Branch 業務			Overall (IT) 總計(資訊科技)	Job category 技能類別								Overall (IT and R&D(IT)) 總計(資訊科技及研究與開發(與資訊科技相關))
					General IT Management 總資訊科技管理	IT/Software Development 資訊科技／軟件開發	Telecommunications and Networking 電訊及網絡	Technical @ Services 技術服務	Operation Services 操作服務	IT Education and Training 資訊科技教育及訓練	IT Sales and Marketing 資訊科技銷售及市場推廣	Research and Development (IT related) 研究與開發(與資訊科技相關)	
	08	Other wholesale and retail (except wholesale and retail sales of computers, computer peripherals and software packages); Accommodation and food service activities 其他批發及零售（電腦、電腦周邊設備及套裝軟件的批發及零售除外）；住宿及膳食服務活動	Number 數目	50	2	7	-	1	40	-	-	-	50
			Percentage* 百分率	1.2%	2.8%	0.9%	-	0.4%	1.4%	-	-	-	1.2%
Transport and Storage Services 運輸及貨倉服務業	09	Airline companies 航空公司	Number 數目	1	-	1	-	-	-	-	-	-	1
			Percentage* 百分率	0.2%	-	0.3%	-	-	-	-	-	-	0.2%
	10	Railway and cable transport; Public bus services; Licensed and franchised ferry services; Vehicular tunnel, bridge and highway operators 鐵路及纜索運輸；公共巴士服務；持牌及專營渡輪服務；汽車隧道、橋樑及高速公路營運者	Number 數目	2	-	2	-	-	-	-	-	-	2
			Percentage* 百分率	0.9%	-	1.6%	-	-	-	-	-	-	0.9%
	11	Air cargo forwarding services 航空貨運代理服務	Number 數目	6	-	-	-	-	6	-	-	-	6
			Percentage* 百分率	1.1%	-	-	-	-	1.6%	-	-	-	1.1%
	12	Other transport and storage services 其他運輸及貨倉服務業	Number 數目	-	-	-	-	-	-	-	-	-	-
			Percentage* 百分率	-	-	-	-	-	-	-	-	-	-

@ Technical services include job categories of IT security, database, systems programming and field support.
@ 技術服務包括各技能類別的資訊科技保安、資料庫、系統程式編製及實地支援。

* As a percentage of number of IT posts by sector/branch by job category.
* 佔該行業／業務該技能類別資訊科技職位數目的百分率。

Sector 行業	Branch 業務			Overall (IT) 總計(資訊科技)	Job category 技能類別								Overall (IT and R&D(IT)) 總計(資訊科技及研究與開發(與資訊科技相關))
					General IT Management 總資訊科技管理	IT/Software Development 資訊科技／軟件開發	Telecommunications and Networking 電訊及網絡	Technical @ Services 技術服務	Operation Services 操作服務	IT Education and Training 資訊科技教育及訓練	IT Sales and Marketing 資訊科技銷售及市場推廣	Research and Development (IT related) 研究與開發(與資訊科技相關)	
Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業	15	Domestic banking units 本地銀行單位	Number 數目	330	-	204	7	33	86	-	-	-	330
			Percentage* 百分率	5.5%	-	6.2%	8.1%	4.3%	4.9%	-	-	-	5.5%
	16	Real estate brokerage and agency 地產經紀及代理	Number 數目	-	-	-	-	-	-	-	-	-	-
			Percentage* 百分率	-	-	-	-	-	-	-	-	-	-
	17	Others (Financing, Insurance, Real Estate and Business Services) 其他（金融、保險、房地產及商業服務業）	Number 數目	127	-	63	-	16	48	-	-	-	127
			Percentage* 百分率	2.1%	-	4.1%	-	1.7%	1.4%	-	-	-	2.1%
Medical and Health Care Services 醫療及保健服務	19	Medical, dental, and other health care services (including Hospital Authority) 醫療、牙科及其他保健服務（包括醫院管理局）	Number 數目	35	-	24	-	-	11	-	-	-	35
			Percentage* 百分率	3.2%	-	2.7%	-	-	5.8%	-	-	-	3.2%
Community, Social and Personal Services 社區、社會及個人服務業	20	Universities and post-secondary colleges; Research and scientific institutes; Hong Kong Examination and Assessment Authority 大學及專上學院、科研機構；香港考試及評核局	Number 數目	29	2	14	1	2	2	8	-	28	57
			Percentage* 百分率	0.8%	3.9%	1.8%	1.2%	0.5%	0.2%	0.7%	-	3.6%	1.3%
	21	Educational institutes other than universities, post-secondary colleges (excluding Hong Kong Examination and Assessment Authority) 其他院校（大學及專上學院、香港考試及評核局除外）	Number 數目	97	-	-	-	-	97	-	-	-	97
			Percentage* 百分率	1.8%	-	-	-	-	3.9%	-	-	-	1.8%

@ Technical services include job categories of IT security, database, systems programming and field support.
@ 技術服務包括各技能類別的資訊科技保安、資料庫、系統程式編製及實地支援。

* As a percentage of number of IT posts by sector/branch by job category.
* 佔該行業／業務該技能類別資訊科技職位數目的百分率。

Sector 行業	Branch 業務			Overall (IT) 總計 (資訊科技)	Job category 技能類別								Overall (IT and R&D(IT)) 總計 (資訊科技及研究與開發(與資訊科技相關))
					General IT Management 總資訊科技管理	IT/Software Development 資訊科技／軟件開發	Telecommunications and Networking 電訊及網絡	Technical @ Services 技術服務	Operation Services 操作服務	IT Education and Training 資訊科技教育及訓練	IT Sales and Marketing 資訊科技銷售及市場推廣	Research and Development (IT related) 研究與開發(與資訊科技相關)	
	22	Motion pictures and other entertainment services; and Television / Radio Stations & Studios 電影及其他娛樂服務；電視台、電台及製作室	Number 數目	6	-	5	-	1	-	-	-	-	6
			Percentage* 百分率	0.7%	-	1.0%	-	1.5%	-	-	-	-	0.7%
	23	Others (Community, Social and Personal Services); Hong Kong Productivity Council & Hong Kong Trade Development Council 其他（社區、社會及個人服務業）；香港生產力促進局、香港貿發局	Number 數目	42	-	3	1	2	35	-	1	-	42
			Percentage* 百分率	3.0%	-	1.0%	5.3%	1.2%	4.1%	-	16.7%	-	3.0%
Government Bureaux/ Departments 政府部門	25	Government Bureaux/Departments 政府部門	Number 數目	125	11	98	4	4	8	-	-	1	126
			Percentage* 百分率	3.8%	8.0%	4.7%	2.6%	2.8%	1.0%	-	-	4.3%	3.8%
Sub-total 小計			**Number 數目**	**1 153**	**15**	**514**	**14**	**74**	**523**	**8**	**5**	**30**	**1 183**
			Percentage* 百分率	**2.7%**	**1.8%**	**3.9%**	**2.2%**	**1.9%**	**2.6%**	**0.2%**	**2.4%**	**3.1%**	**2.7%**
Total 總計			**Number 數目**	**3 003**	**15**	**1 502**	**153**	**399**	**635**	**8**	**291**	**228**	**3 231**
			Percentage# 百分率	**3.2%**	**1.0%**	**4.7%**	**2.5%**	**2.7%**	**2.5%**	**0.2%**	**3.3%**	**3.6%**	**3.3%**

@ Technical services include job categories of IT security, database, systems programming and field support.

@ 技術服務包括各技能類別的資訊科技保安、資料庫、系統程式編製及實地支援。

* As a percentage of number of IT posts by sector/branch by job category.

* 佔該行業／業務該技能類別資訊科技職位數目的百分率。

Appendix 10
附錄 10

Average Annual Remuneration Package of IT Employees (Excluding Freelancers) by Job Title
各職位資訊科技僱員（不包括自由工作者）的每年平均薪酬福利

Number of IT Employees
資訊科技僱員數目

Principal Job 主要職務		Overall* 總計	$1,080,001 or more 或以上	$600,001-$1,080,000	$360,001-$600,000	$240,001-$360,000	$100,001-$240,000	$100,000 or below 或以下	Unspecified 未有說明
General IT Management 總資訊科技管理									
101	IT Director/MIS Director/Head of IT/CIO 資訊科技總監/管理資訊系統總監/資訊科技主管/首席資訊主任	100.0%	14.3%	20.6%	13.3%	1.4%	0.0%	0.0%	50.3%
102	CTO 首席技術總監	100.0%	10.7%	18.7%	52.0%	0.7%	0.0%	0.0%	18.0%
Sub-total 小計		**100.0%**	**13.9%**	**20.4%**	**17.3%**	**1.4%**	**0.0%**	**0.0%**	**47.0%**
IT/Software Development 資訊科技／軟件開發									
201	Systems Development Manager 系統開發經理	100.0%	10.9%	22.5%	14.9%	13.5%	0.3%	0.0%	37.9%
202	IT Architect/Business Analyst 資訊科技建築師/商業分析員	100.0%	0.1%	57.8%	16.9%	11.6%	5.8%	0.0%	7.9%
203	Project Manager/Project Leader 項目經理/項目組長	100.0%	2.5%	25.6%	28.9%	11.8%	0.6%	0.0%	30.7%
204	UX Designer 用戶體驗設計師	100.0%	0.0%	27.5%	20.3%	24.4%	0.8%	0.0%	27.0%

Principal Job 主要職務		Overall* 總計	$1,080,001 or more 或以上	$600,001-$1,080,000	$360,001-$600,000	$240,001-$360,000	$100,001-$240,000	$100,000 or below 或以下	Unspecified 未有說明
205	Programmer/Analyst/Programmer/ Software Engineer 程式編製員/分析員/程式編製 員/軟件工程師	100.0%	0.1%	2.7%	26.4%	42.0%	3.0%	0.0%	25.7%
206	Web Designer/Developer 網站設計員/開發員	100.0%	0.0%	2.8%	9.8%	59.4%	9.0%	0.0%	19.0%
207	Quality Assurance Specialist/Software Assurance Specialist/Engineer/IT Systems Auditor 品質檢查專責經理/軟件品質檢查專責 經理/工程師/電腦系統審核經理	100.0%	1.3%	1.5%	32.3%	13.9%	13.1%	0.0%	38.0%
208	Software Product Engineer 軟件產品工程師	100.0%	1.4%	2.3%	35.6%	18.2%	22.1%	0.0%	20.5%
209	Software/Firmware Product Designer/Product Analyst/ Developer/Software Product Manager 軟件/固件產品設計員/產品分析員/開發員/ 軟件產品經理	100.0%	0.0%	1.1%	32.9%	20.4%	9.2%	0.0%	36.5%
210	Technical Writer 技術撰稿員	100.0%	0.0%	0.0%	5.3%	0.0%	17.3%	0.0%	77.3%
211	Computer Game Designer/Artist/Developer/ Computer Graphic Designer/Artist/Computer Animator/Web Graphic Designer/Visual Effects Designer 電腦遊戲設計/美術/開發員/電腦圖像設計/ 美術員/電腦動畫設計師/網頁圖像設計師/ 視覺效果設計師	100.0%	0.0%	0.1%	2.3%	58.2%	20.6%	0.0%	18.8%
Sub-total 小計		**100.0%**	**1.0%**	**10.4%**	**23.8%**	**33.8%**	**4.2%**	**0.0%**	**26.8%**

Principal Job 主要職務		Overall* 總計	$1,080,001 or more 或以上	$600,001-$1,080,000	$360,001-$600,000	$240,001-$360,000	$100,001-$240,000	$100,000 or below 或以下	Unspecified 未有說明
Telecommunications and Networking 電訊及網絡									
301	Telecommunications Manager/Networking Manager 電訊經理/網絡經理	100.0%	1.5%	5.1%	67.5%	7.5%	0.0%	0.0%	18.5%
302	Telecommunications Consultant/Network Consultant 電訊顧問/網絡顧問	100.0%	0.0%	0.8%	19.2%	27.2%	1.7%	0.0%	51.1%
303	Telecommunications Engineer/Network Engineer 電訊工程師/網絡工程師	100.0%	0.04%	2.1%	8.3%	56.3%	2.6%	0.0%	30.7%
304	Network Administrator/Network Officer 網絡管理主任/網絡主任	100.0%	0.0%	0.5%	3.7%	29.4%	18.6%	0.0%	47.7%
Sub-total 小計		**100.0%**	**0.1%**	**1.4%**	**11.4%**	**38.2%**	**8.9%**	**0.0%**	**40.0%**
Technical Services 技術服務									
401	IT Security Specialist/Information Security Specialist/Information Security Officer 電腦保安專責經理/資訊保安專責經理/資訊保安主任	100.0%	0.0%	4.4%	34.3%	21.6%	0.4%	0.0%	39.4%
402	Database Administrator/Data Warehouse Administrator/Database Designer 資料庫管理主任/數據庫管理主任/資料庫設計員	100.0%	0.0%	6.6%	1.5%	46.0%	22.2%	0.0%	23.6%
403	Systems Programmer (in-house/vendor environment)/Systems Engineer 系統程式編製員（機構內部/電腦供應商）/系統工程師	100.0%	0.0%	8.0%	30.2%	28.8%	6.3%	0.0%	26.7%
404	Customer Engineering Manager/Services Support Manager 客戶工程經理/服務支援經理	100.0%	0.8%	2.3%	61.4%	8.3%	10.1%	0.0%	17.1%

Principal Job 主要職務		Overall* 總計	$1,080,001 or more 或以上	$600,001-$1,080,000	$360,001-$600,000	$240,001-$360,000	$100,001-$240,000	$100,000 or below 或以下	Unspecified 未有說明
405	Customer Service Engineer/Field Engineer 客戶服務工程師/實地服務工程師	100.0%	0.0%	2.0%	16.9%	29.8%	33.3%	0.0%	18.1%
406	Field Technician 實地服務技術員	100.0%	0.0%	2.2%	8.3%	20.6%	50.2%	0.0%	18.8%
Sub-total 小計		**100.0%**	**0.0%**	**4.3%**	**20.6%**	**24.5%**	**27.8%**	**0.0%**	**22.8%**
Operation Services 操作服務									
501	Computer Operations Manager 電腦操作經理	100.0%	1.7%	18.3%	25.3%	23.4%	3.5%	0.0%	27.7%
502	Help Desk Supervisor 求助台主任	100.0%	0.0%	10.6%	17.9%	44.7%	12.2%	0.0%	14.6%
503	Help Desk Representative/Customer Service Officer/Representative 求助台服務員/客戶服務主任/服務員	100.0%	0.0%	0.0%	7.3%	30.7%	29.6%	0.0%	32.4%
504	Computer Operations Supervisor/Operations Support Supervisor 電腦操作主任/操作支援主任	100.0%	0.0%	2.0%	30.7%	31.5%	2.6%	0.0%	33.2%
505	Computer Operator/Systems Operator 電腦操作員/系統操作員	100.0%	0.0%	0.2%	15.8%	35.7%	27.9%	0.0%	20.4%
506	User Support/Co-ordinator 用戶支援/統籌員	100.0%	0.0%	0.0%	4.2%	27.7%	37.4%	0.9%	29.7%
Sub-total 小計		100.0%	0.1%	1.0%	7.9%	28.9%	32.5%	0.7%	28.9%
IT Education and Training 資訊科技教育及訓練									
601	Lecturer/Professor/Training Officer 講師/教授/訓練主任	100.0%	3.9%	58.6%	11.3%	2.5%	0.0%	0.0%	23.7%

Principal Job 主要職務		Overall* 總計	$1,080,001 or more 或以上	$600,001-$1,080,000	$360,001-$600,000	$240,001-$360,000	$100,001-$240,000	$100,000 or below 或以下	Unspecified 未有說明
602	IT Trainer/IT Instructor 資訊科技訓練員/資訊科技教導員	100.0%	0.0%	0.2%	28.5%	41.6%	1.6%	0.0%	28.0%
Sub-total 小計		100.0%	2.4%	36.1%	18.0%	17.5%	0.6%	0.0%	25.4%
IT Sales and Marketing 資訊科技銷售及市場推廣									
701	Sales/Marketing Director/Account Director/ Sales/Marketing Manager 銷售/市場總監/客戶總監/銷售/市場經理	100.0%	2.2%	1.8%	27.4%	36.4%	5.6%	0.0%	26.7%
702	Sales/Marketing Representative/Account Manager/Product Promotion Representative 銷售/市場代表/客戶經理/產品推廣代表	100.0%	5.3%	0.3%	1.3%	38.5%	35.9%	0.0%	18.7%
Sub-total 小計		**100.0%**	**4.6%**	**0.6%**	**6.7%**	**38.1%**	**29.7%**	**0.0%**	**20.3%**
Total (IT) 總計 (資訊科技)		**100.0%**	**1.2%**	**6.5%**	**16.0%**	**30.4%**	**18.4%**	**0.2%**	**27.3%**
Research and Development (IT related) 研究與開發(與資訊科技相關)									
051	R&D Researcher/R&D Scientist/R&D Engineer 研發研究員/研發科學家/研發工程師	100.0%	4.2%	26.7%	10.3%	43.2%	0.6%	0.0%	15.0%
052	R&D Technician 研發技術員	100.0%	0.0%	19.2%	8.4%	9.2%	13.7%	0.0%	49.6%
053	R&D Supporting Staff 研發輔助人員	100.0%	0.0%	0.0%	62.7%	23.3%	3.7%	0.0%	10.3%
Sub-total 小計		**100.0%**	**1.6%**	**19.1%**	**18.0%**	**25.0%**	**6.9%**	**0.0%**	**29.5%**
Total (IT and R&D(IT)) 總計 (資訊科技及研究與開發(與資訊科技相關))		**100.0%**	**1.2%**	**7.3%**	**16.1%**	**30.1%**	**17.7%**	**0.2%**	**27.4%**

Appendix 11
附錄 11

Preferred Academic Qualification of IT Posts by Job Title
各職位資訊科技僱員宜有的學歷

Number of IT Posts
資訊科技職位數目

	Principal Job 主要職務	Overall* 總計	Postgraduate 研究院	First Degree 學士學位	Sub-degree 副學位	Senior Secondary 高中	Junior Secondary 初中	Unspecified 未有說明
General IT Management 總資訊科技管理								
101	IT Director/MIS Director/Head of IT/CIO 資訊科技總監/管理資訊系統總監/資訊科技主管/首席資訊主任	10.00%	5.5%	69.6%	14.7%	-	-	10.2%
102	CTO 首席技術總監	100.0%	2.0%	96.7%	1.3%	-	-	-
	Sub-total 小計	100.0%	5.1%	72.4%	13.3%	-	-	9.2%
IT/Software Development 資訊科技／軟件開發								
201	Systems Development Manager 系統開發經理	100.0%	1.3%	79.8%	6.0%	0.1%	-	12.9%
202	IT Architect/Business Analyst 資訊科技建築師/商業分析員	100.0%	6.4%	80.7%	7.3%	-	-	5.7%
203	Project Manager/Project Leader 項目經理／項目組長	100.0%	1.1%	69.9%	10.2%	0.1%	-	18.8%
204	UX Designer 用戶體驗設計師	100.0%	-	54.5%	43.1%	-	-	2.4%
205	Programmer/Analyst/ Programmer/ Software Engineer 程式編製員／分析員／程式編製員／軟件工程師	100.0%	0.2%	48.7%	36.2%	9.5%	-	5.4%
206	Web Designer/Developer 網站設計員／開發員	100.0%	-	47.6%	43.1%	3.2%	-	6.1%

	Principal Job 主要職務	Overall* 總計	Postgraduate 研究院	First Degree 學士學位	Sub-degree 副學位	Senior Secondary 高中	Junior Secondary 初中	Unspecified 未有說明
207	Quality Assurance Specialist/Software Assurance Specialist/Engineer/IT Systems Auditor 品質檢查專責經理／軟件品質檢查專責經理／工程師／電腦系統審核經理	100.0%	0.2%	41.8%	37.4%	9.8%	-	10.9%
208	Software Product Engineer 軟件產品工程師	100.0%	-	63.0%	32.4%	-	-	4.6%
209	Software/Firmware Product Designer/Product Analyst/ Developer/Software Product Manager 軟件／固件產品設計員／產品分析員／開發員／軟件產品經理	100.0%	-	50.6%	44.4%	3.2%	-	1.8%
210	Technical Writer 技術撰稿員	100.0%	-	82.7%	0.7%	16.7%	-	-
211	Computer Game Designer/Artist/ Developer/ Computer Graphic Designer/Artist/ Computer Animator/Web Graphic Designer/ Visual Effects Designer 電腦遊戲設計／美術／開發員／電腦圖像設計／美術員／電腦動畫設計師／網頁圖像設計師／視覺效果設計師	100.0%	-	22.5%	59.7%	2.6%	0.9%	14.3%
	Sub-total 小計	100.0%	0.5%	53.7%	32.3%	5.8%	-	**7.6%**
	Telecommunications and Networking 電訊及網絡							
301	Telecommunications Manager/ Networking Manager 電訊經理／網絡經理	100.0%	1.5%	87.2%	6.3%	-	-	5.1%
302	Telecommunications Consultant/ Network Consultant 電訊顧問／網絡顧問	100.0%	0.1%	27.8%	33.9%	-	-	38.2%

	Principal Job 主要職務	Overall* 總計	Postgraduate 研究院	First Degree 學士學位	Sub-degree 副學位	Senior Secondary 高中	Junior Secondary 初中	Unspecified 未有說明
303	Telecommunications Engineer/ Network Engineer 電訊工程師／網絡工程師	100.0%	0.3%	55.3%	26.1%	-	-	18.2%
304	Network Administrator/Network Officer 網絡管理主任／網絡主任	100.0%	-	27.0%	15.6%	11.8%	2.4%	43.2%
	Sub-total 小計	100.0%	0.3%	41.4%	21.8%	4.8%	1.0%	30.7%
	Technical Services 技術服務							
401	IT Security Specialist/ Information Security Specialist/Information Security Officer 電腦保安專責經理／資訊保安專責經理／資訊保安主任	100.0%	1.3%	67.0%	17.6%	0.4%	-	13.8%
402	Database Administrator/Data Warehouse Administrator/Database Designer 資料庫管理主任／數據庫管理主任／資料庫設計員	100.0%	0.5%	66.7%	21.8%	3.7%	-	7.4%
403	Systems Programmer (in-house/vendor environment)/Systems Engineer 系統程式編製員（機構內部／電腦供應商）／系統工程師	100.0%	0.1%	49.3%	43.0%	0.6%	-	7.0%
404	Customer Engineering Manager/ Services Support Manager 客戶工程經理／服務支援經理	100.0%	0.9%	51.5%	39.3%	0.5%	-	7.8%
405	Customer Service Engineer/Field Engineer 客戶服務工程師／實地服務工程師	100.0%	0.3%	29.4%	38.9%	23.3%	-	8.1%
406	Field Technician 實地服務技術員	100.0%	-	8.9%	21.8%	55.7%	2.9%	10.7%
	Sub-total 小計	100.0%	0.2%	32.7%	30.6%	26.0%	1.2%	9.2%

	Principal Job 主要職務	Overall* 總計	Postgraduate 研究院	First Degree 學士學位	Sub-degree 副學位	Senior Secondary 高中	Junior Secondary 初中	Unspecified 未有說明
Operation Services 操作服務								
501	Computer Operations Manager 電腦操作經理	100.0%	6.4%	67.7%	11.4%	2.0%	-	12.5%
502	Help Desk Supervisor 求助台主任	100.0%	0.3%	30.6%	22.2%	32.5%	-	14.4%
503	Help Desk Representative/Customer Service Officer/Representative 求助台服務員／客戶服務主任／服務員	100.0%	0.3%	9.9%	32.9%	32.0%	2.6%	22.3%
504	Computer Operations Supervisor/Operations Support Supervisor 電腦操作主任／操作支援主任	100.0%	2.2%	52.6%	18.3%	11.3%	0.3%	15.4%
505	Computer Operator/Systems Operator 電腦操作員／系統操作員	100.0%	-	21.3%	16.4%	32.7%	-	29.6%
506	User Support/Co-ordinator 用戶支援／統籌員	100.0%	0.1%	11.5%	28.9%	39.5%	3.4%	16.5%
	Sub-total 小計	100.0%	0.5%	16.9%	26.7%	35.4%	2.7%	17.9%
IT Education and Training 資訊科技教育及訓練								
601	Lecturer/Professor/Training Officer 講師／教授／訓練主任	100.0%	10.2%	86.5%	0.8%	-	-	2.4%
602	IT Trainer/IT Instructor 資訊科技訓練員／資訊科技教導員	100.0%	2.2%	71.7%	22.1%	0.7%	-	3.3%
	Sub-total 小計	100.0%	7.1%	80.8%	9.0%	0.3%	-	2.8%

	Principal Job 主要職務	Overall* 總計	Postgraduate 研究院	First Degree 學士學位	Sub-degree 副學位	Senior Secondary 高中	Junior Secondary 初中	Unspecified 未有說明
IT Sales and Marketing 資訊科技銷售及市場推廣								
701	Sales/Marketing Director/ Account Director/ Sales/Marketing Manager 銷售／市場總監／客戶總監／銷售／市場經理	100.0%	0.2%	37.0%	38.0%	10.3%	-	14.6%
702	Sales/Marketing Representative/ Account Manager/Product Promotion Representative 銷售／市場代表／客戶經理／產品推廣代表	100.0%	-	13.7%	39.8%	37.3%	0.8%	8.3%
	Sub-total 小計	100.0%	0.1%	18.5%	39.4%	31.8%	0.6%	9.6%
	Total 總計	100.0%	0.8%	37.4%	29.1%	19.4%	1.1%	12.3%
Research and Development (IT related) 研究與開發(與資訊科技相關)								
051	R&D Researcher/R&D Scientist/ R&D Engineer 研發研究員/研發科學家/研發工程師	100.0%	22.1%	62.3%	2.3%	0.5%	-	12.8%
052	R&D Technician 研發技術員	100.0%	4.9%	67.9%	7.6%	6.4%	-	13.1%
053	R&D Supporting Staff 研發輔助人員	100.0%	-	80.9%	17.6%	0.2%	-	1.3%
	Sub-total 小計	100.0%	10.9%	67.8%	7.1%	3.1%	-	11.1%
Total (IT and R&D(IT)) 總計（資訊科技及研究與開發（與資訊科技相關)）		100.0%	1.4%	39.3%	27.7%	18.3%	1.0%	12.3%

Preferred IT Experience of IT Posts by Job Title
各職位資訊科技僱員宜有的資訊科技工作經驗

Number of IT Posts
資訊科技職位數目

	Principal Job 主要職務	Overall* 總計	15 yrs or above 15年或以上	10 yrs to less than 15 yrs 10年至15年以下	5 yrs to less than10 yrs 5年至10年以下	2 yrs to less than 5 yrs 2年至5年以下	Less than 2 yrs 2年以下	Unspecified 未有說明
General IT Management 總資訊科技管理								
101	IT Director/MIS Director/ Head of IT/CIO 資訊科技總監/管理資訊系統總監/資訊科技主管/首席資訊主任	100.0%	12.9%	13.9%	41.7%	17.4%	-	14.2%
102	CTO 首席技術總監	100.0%	6.0%	11.3%	82.7%	-	-	-
Sub-total 小計		**100.0%**	**12.2%**	**13.6%**	**45.9%**	**15.6%**	**-**	**12.7%**
IT/Software Development 資訊科技/軟件開發								
201	Systems Development Manager 系統開發經理	100.0%	3.8%	19.5%	56.0%	6.4%	0.1%	14.3%
202	IT Architect/Business Analyst 資訊科技建築師/商業分析員	100.0%	0.2%	1.5%	41.3%	15.7%	11.3%	29.9%
203	Project Manager/Project Leader 項目經理/項目組長	100.0%	1.1%	8.1%	35.6%	23.5%	8.9%	22.7%
204	UX Designer 用戶體驗設計師	100.0%	-	2.9%	39.0%	44.7%	10.6%	2.8%
205	Programmer/Analyst Programmer/ Software Engineer 程式編製員/分析程式員/軟件工程師	100.0%	-	1.4%	17.1%	55.1%	20.4%	6.0%
206	Web Designer/Developer 網站設計員/開發員	100.0%	-	3.9%	14.7%	67.2%	8.0%	6.1%
207	Quality Assurance Specialist/ Software Assurance Specialist/ Engineer/IT Systems Auditor 品質檢查專責經理/軟件品質檢查專責經理/工程師/電腦系統審核經理	100.0%	-	0.5%	14.4%	42.7%	30.7%	11.7%
208	Software Product Engineer 軟件產品工程師	100.0%	-	6.4%	49.4%	23.0%	14.7%	6.4%
209	Software/Firmware Product Designer/Product Analyst/ Developer/Software Product Manager 軟件/固件產品設計員/產品分析員/開發員/軟件產品經理	100.0%	23.2%	5.1%	29.6%	27.7%	12.6%	1.8%
210	Technical Writer 技術撰稿員	100.0%	-	-	5.3%	8-	14.7%	-

* As a percentage of number of IT posts by job title.
* 佔該職稱資訊科技職位的百分率。

Note : Figures may not add up to the total due to rounding.
因四捨五入關係，各項數字相加或與總計數字略有出入。

	Principal Job 主要職務	Overall* 總計	15 yrs or above 15 年或以上	10 yrs to less than 15 yrs 10 年至 15 年以下	5 yrs to less than10 yrs 5 年至 10 年以下	2 yrs to less than 5 yrs 2 年至 5 年以下	Less than 2 yrs 2 年以下	Unspecified 未有說明
211	Computer Game Designer/Artist/ Developer/ Computer Graphic Designer/Artist/ Computer Animator/Web Graphic Designer/ Visual Effects Designer 電腦遊戲設計/美術/開發員/電腦圖像設計/美術員/電腦動畫設計師/網頁圖像設計師/視覺效果設計師	100.0%	-	0.1%	7.0%	49.0%	29.6%	14.3%
Sub-total 小計		100.0%	1.0%	3.6%	24.5%	45.0%	16.4%	9.5%
Telecommunications and Networking 電訊及網絡								
301	Telecommunications Manager/ Networking Manager 電訊經理/網絡經理	100.0%	1.5%	9.3%	74.3%	5.4%	0.6%	9.0%
302	Telecommunications Consultant/ Network Consultant 電訊顧問/網絡顧問	100.0%	-	0.7%	19.5%	35.4%	3.9%	40.5%
303	Telecommunications Engineer/ Network Engineer 電訊工程師/網絡工程師	100.0%	-	1.3%	11.6%	48.0%	19.4%	19.6%
304	Network Administrator/ Network Officer 網絡管理主任/網絡主任	100.0%	-	9.5%	11.1%	31.4%	3.8%	44.1%
Sub-total 小計		100.0%	0.1%	5.0%	16.1%	37.0%	9.7%	32.2%
Technical Services 技術服務								
401	IT Security Specialist/ Information Security Specialist/Information Security Officer 電腦保安專責經理/資訊保安專責經理/資訊保安主任	100.0%	-	2.4%	26.6%	54.5%	0.5%	16.0%
402	Database Administrator/ Data Warehouse Administrator/ Database Designer 資料庫管理主任/數據庫管理主任/資料庫設計員	100.0%	-	4.6%	10.9%	57.5%	17.5%	9.5%
403	Systems Programmer (in-house/vendor environment)/ Systems Engineer 系統程式編製員（機構內部/電腦供應商）/系統工程師	100.0%	-	6.4%	31.1%	47.0%	7.7%	7.8%
404	Customer Engineering Manager/ Services Support Manager 客戶工程經理/服務支援經理	100.0%	-	1.7%	22.6%	28.1%	34.3%	13.3%
405	Customer Service Engineer/ Field Engineer 客戶服務工程師/實地服務工程師	100.0%	-	-	15.1%	43.8%	26.4%	14.7%

* As a percentage of number of IT posts by job title.
* 佔該職稱資訊科技職位的百分率。

Note : Figures may not add up to the total due to rounding.
因四捨五入關係，各項數字相加或與總計數字略有出入。

	Principal Job 主要職務	Overall* 總計	15 yrs or above 15 年或以上	10 yrs to less than 15 yrs 10 年至 15 年以下	5 yrs to less than10 yrs 5 年至 10 年以下	2 yrs to less than 5 yrs 2 年至 5 年以下	Less than 2 yrs 2 年以下	Unspecified 未有說明
406	Field Technician 實地服務技術員	100.0%	-	-	24.4%	17.9%	44.0%	13.7%
Sub-total 小計		100.0%	-	2.4%	24.8%	34.5%	26.2%	12.0%
Operation Services 操作服務								
501	Computer Operations Manager 電腦操作經理	100.0%	1.4%	9.4%	48.2%	22.4%	3.9%	14.7%
502	Help Desk Supervisor 求助台主任	100.0%	-	0.5%	51.5%	27.6%	5.4%	14.9%
503	Help Desk Representative/ Customer Service Officer/ Representative 求助台服務員/客戶服務主任/ 服務員	100.0%	-	0.1%	5.9%	40.3%	24.6%	29.1%
504	Computer Operations Supervisor/ Operations Support Supervisor 電腦操作主任/操作支援主任	100.0%	0.1%	12.1%	15.7%	40.4%	2.5%	29.2%
505	Computer Operator/Systems Operator 電腦操作員/系統操作員	100.0%	-	0.5%	13.5%	28.4%	43.4%	14.2%
506	User Support/Co-ordinator 用戶支援/統籌員	100.0%	-	2.4%	8.7%	40.1%	29.5%	19.3%
Sub-total 小計		100.0%	0.1%	2.8%	11.5%	38.2%	27.8%	19.7%
IT Education and Training 資訊科技教育及訓練								
601	Lecturer/Professor/Training Officer 講師/教授/訓練主任	100.0%	-	17.4%	48.9%	17.5%	4.8%	11.5%
602	IT Trainer/IT Instructor 資訊科技訓練員/資訊科技 教導員	100.0%	-	0.1%	1.8%	70.4%	22.8%	4.9%
Sub-total 小計		100.0%	-	10.8%	30.8%	37.8%	11.7%	9.0%
IT Sales and Marketing 資訊科技銷售及市場推廣								
701	Sales/Marketing Director/Account Director/ Sales/Marketing Manager 銷售/市場總監/客戶總監/ 銷售/市場經理	100.0%	0.2%	6.5%	39.4%	25.9%	8.7%	19.2%
702	Sales/Marketing Representative/ Account Manager/Product Promotion Representative 銷售/市場代表/客戶經理/ 產品推廣代表	100.0%	0.3%	0.1%	14.4%	53.0%	22.6%	9.6%
Sub-total 小計		100.0%	0.3%	1.4%	19.6%	47.5%	19.7%	11.6%
Total (IT) 總計 (資訊科技)		100.0%	0.6%	3.6%	20.5%	40.3%	20.5%	14.5%

* As a percentage of number of IT posts by job title.
* 佔該職稱資訊科技職位的百分率。

Note : Figures may not add up to the total due to rounding.
因四捨五入關係，各項數字相加或與總計數字略有出入。

	Principal Job 主要職務	Overall* 總計	15 yrs or above 15 年或以上	10 yrs to less than 15 yrs 10 年至 15 年以下	5 yrs to less than10 yrs 5 年至 10 年以下	2 yrs to less than 5 yrs 2 年至 5 年以下	Less than 2 yrs 2 年以下	Unspecified 未有說明
Research and Development (IT related) 研究與開發(與資訊科技相關)								
051	R&D Researcher/R&D Scientist/R&D Engineer 研發研究員/研發科學家/研發工程師	100.0%	-	22.4%	15.0%	40.7%	-	22.0%
052	R&D Technician 研發技術員	100.0%	0.5%	2.6%	38.0%	4.8%	16.3%	37.9%
053	R&D Supporting Staff 研發輔助人員	100.0%	-	-	69.7%	21.0%	2.8%	6.4%
Sub-total 小計		100.0%	0.2%	10.0%	34.0%	21.7%	7.7%	26.5%
Total (IT and R&D(IT)) 總計 (資訊科技及研究與開發(與資訊科技相關))		100.0%	0.6%	4.0%	21.3%	39.1%	19.7%	15.3%

* As a percentage of number of IT posts by job title.
* 佔該職稱資訊科技職位的百分率。

Note : Figures may not add up to the total due to rounding.
因四捨五入關係，各項數字相加或與總計數字略有出入。

Percentage of Companies Having Encountered Difficulties in Recruitment of IT Employees in the Past 12 Months by Employment Size of Company
過往 12 個月招聘資訊科技僱員時遇到困難的公司所佔百分率（按公司規模劃分）

Difficulties Encountered in Recruitment of IT Employees 招聘資訊科技僱員所遇到的困難	Overall 總計	Employment size 僱員人數							
		1-4 1 至 4 人	5-9 5 至 9 人	10-19 10 至 19 人	20-49 20 至 49 人	50-99 50 至 99 人	100-199 100 至 199 人	200-499 200 至 499 人	500 & over 500 人及以上
Candidates lacked the relevant skills/experience 應徵者並無相關技能／知識	44.7%	29.5%	55.1%	54.3%	52.4%	36.2%	23.5%	7.3%	47.1%
Candidates lacked the relevant academic qualification and credential 應徵者未具相關學歷及專業資格	10.2%	29.2%	3.4%	1.6%	16.3%	8.6%	2.2%	39.6%	14.4%
Candidates' language skills (including Putonghua) were not up to expectation 應徵者語文能力（包括普通話）不夠水平	2.2%	0.3%	0.2%	0.1%	6.6%	3.0%	0.8%	2.6%	5.2%
Candidates found the remuneration package not attractive 應徵者認為薪酬欠吸引	13.9%	0.3%	1.7%	3.4%	6.6%	59.1%	30.8%	48.4%	30.7%
Others # 其他	1.7%	-	1.0%	1.6%	0.9%	3.9%	1.8%	1.6%	5.9%

Notes: 註

$$\%^{*} = \frac{\text{No. of companies giving the respective answers 填覆公司數目}}{\text{Total no. of companies having recruited /tried to recruit IT employees in the past 12 months 過往 12 個月曾招聘／嘗試招聘資訊科技僱員的公司總數}} \times 100\%$$

Others difficulties reported:
其他填報困難：

In companies with 5-9 & 20-49 employees
僱員人數介乎 5-9 人及 20-49 人的公司

1. Candidates found the IT sector not attractive.
1. 應徵者認為資訊科技業並不吸引。

In companies with 50-99 & 100-199 employees
僱員人數介乎 50-99 人及 100-199 人的公司

2. Candidates found the IT sector lacked of promotion opportunity.
2. 應徵者認為資訊科技業缺乏晉升機會。

Percentage of Companies Having Encountered Difficulties in Recruitment of IT Employees in the Past 12 Months by Sector
過往 12 個月各行業招聘資訊科技僱員時遇到困難的公司所佔百分率（按行業劃分）

Difficulties Encountered in Recruitment of IT Employees 招聘資訊科技僱員所遇到的困難	Overall 總計	Sector 行業												
		Manufacturing 製造業 (Branches 1-2)	Innovative Products and Services 創新產品及服務 (Branch 3)	Electricity, Gas and Water 電力、氣體燃料及水務 (Branch 4)	Construction 建造業 (Branch 5)	Wholesale, Retail and Import/Export Trades (WRIE), Catering and Hotels 零售批發及出入口貿易、飲食業及酒店業 (Branches 6-8)	Transport and Storage Services 運輸及貨倉服務業 (Branches 9-12)	Communications Services 通訊服務業 (Branches 13-14)	Financing, Insurance, Real Estate and Business Services 金融、保險、房地產及商業服務業 (Branches 15-17)	IT Products and Services Suppliers 資訊科技產品及服務供應商 (Branch 18)	Medical and Health Care Services 醫療及保健服務 (Branch 19)	Community, Social and Personal Services 社區、社會及個人服務業 (Branches 20-23)	Digital Creative 數碼創意業 (Branch 24)	Government Bureaux/ Departments 政府部門 (Branch 25)
Candidates lacked the relevant skills/ experience 應徵者並無相關技能／知識	44.7%	46.3%	64.7%	-	39.5%	25.0%	28.2%	43.6%	15.1%	67.2%	50.0%	13.3%	65.0%	43.6%
Candidates lacked the relevant academic qualification and credential 應徵者未具相關學歷及專業資格	10.2%	12.2%	29.4%	-	57.9%	2.3%	35.9%	27.3%	28.5%	9.8%	-	4.2%	25.0%	10.3%
Candidates' language skills (including Putonghua) were not up to expectation 應徵者語文能力（包括普通話）不夠水平	2.2%	2.4%	8.8%	-	28.9%	0.5%	2.6%	20.0%	0.7%	2.6%	-	0.3%	5.0%	-
Candidates found the remuneration package not attractive 應徵者認為薪酬欠吸引	13.9%	12.2%	11.8%	-	31.6%	13.9%	33.3%	56.4%	22.4%	6.6%	33.3%	36.7%	15.0%	12.8%
Others # 其他	1.7%	-	14.7%	-	31.6%	-	-	10.9%	1.0%	1.7%	-	1.5%	25.0%	5.1%

Notes: %* = 註

$$\frac{\text{No. of companies giving the respective answers 填覆公司數目}}{\text{Total no. of companies having recruited/tried to recruit IT employees in the past 12 months 過往 12 個月曾招聘／嘗試招聘資訊科技僱員的公司總數}} \times 100\%$$

Other difficulties reported :
其他填報困難：

For companies in sector of WRIE, Catering and Hotels, and Digital Creative
屬零售批發及出入口貿易、飲食業及酒店業，以及數碼創意業的公司

1. Candidates found the IT sector not attractive.
1. 應徵者認為資訊科技業並不吸引。

For companies in sector of Community, Social and Personal Services
屬社區、社會及個人服務業的公司

2. Candidates found the IT sector lacked of promotion opportunity.
2. 應徵者認為資訊科技業缺乏晉升機會。

Top Three Training Needs of Existing IT Employees in the next 12 months by Principal Job
未來 12 個月現職資訊科技僱員的首選 3 項訓練需求（按主要職務劃分）

Principal Job 主要職務		Top 1 首位	Top 2 第二位	Top 3 第三位
General IT Management 總資訊科技管理				
101	IT Director/MIS Director/ Head of IT/CIO 資訊科技總監/管理資訊系統總監/資訊科技主管/首席資訊主任	Information and System Security 資訊及系統保安	Project Management and Design 項目管理及設計	Virtualisation and Cloud Computing 虛擬化及雲端運算
102	CTO 首席技術總監	Networking/Data Communications 網絡/數據通訊	Application Development Tools/Languages 應用開發工具/語言	Project Management and Design 項目管理及設計 Augmented Reality (AR) & Virtual Reality (VR) 擴增實境（AR）及虛擬實境（VR）
IT/Software Development 資訊科技/軟件開發				
201	Systems Development Manager 系統開發經理	Mobile Computing 流動電腦應用	Information and System Security 資訊及系統保安	Virtualisation and Cloud Computing 虛擬化及雲端運算
202	IT Architect/Business Analyst 資訊科技建築師/商業分析員	Virtualisation and Cloud Computing 虛擬化及雲端運算	Mobile Computing 流動電腦應用	Project Management and Design 項目管理及設計
203	Project Manager/ Project Leader 項目經理/項目組長	Project Management and Design 項目管理及設計	Virtualisation and Cloud Computing 虛擬化及雲端運算	Information and System Security 資訊及系統保安
204	UX Designer 用戶體驗設計師	Information and System Security 資訊及系統保安	Java and Object-Oriented Technology Java 及物件導向技術	Service-Oriented Architecture (SOA), Web Services and XML Development 服務導向架構，網上服務與 XML 開發
205	Programmer/Analyst Programmer/Software Engineer 程式編製員/分析程式員/軟件工程師	Java and Object-Oriented Technology Java 及物件導向技術	Virtualisation and Cloud Computing 虛擬化及雲端運算	Information and System Security 資訊及系統保安
206	Web Designer/Developer 網站設計員/開發員	Internet/Intranet/Web Development 互聯網/內聯網/網絡開發	Multimedia and Computer Graphics 多媒體及電腦圖像	Java and Object-Oriented Technology Java 及物件導向技術
207	Quality Assurance Specialist/ Software Assurance Specialist/Engineer/ IT Systems Auditor 品質檢查專責經理/軟件品質檢查專責經理/工程師/電腦系統審核經理	Web 2.0 Tools and Related Applications Web 2.0 工具及其相關應用	Mobile Computing 流動電腦應用	Virtualisation and Cloud Computing 虛擬化及雲端運算

Principal Job 主要職務		Top 1 首位	Top 2 第二位	Top 3 第三位
208	Software Product Engineer 軟件產品工程師	IT Applications in Product Design 資訊科技在產品設計的應用	Virtualisation and Cloud Computing 虛擬化及雲端運算	Data Science and Data Analytics 數據科學和數據分析 Other IT-related Training 其他與資訊科技有關的訓練
209	Software/Firmware Product Designer/Product Analyst/ Developer/Software Product Manager 軟件/固件產品設計員/產品分析員/開發員/軟件產品經理	Project Management and Design 項目管理及設計	IT Applications in Product Design 資訊科技在產品設計的應用	Software Quality (Capability Maturity Model Integration) 軟件質素（能力成熟度模型(CMMI)）
210	Technical Writer 技術撰稿員	Internet/Intranet/ Web Development 互聯網/內聯網/網絡開發 IT Applications in Customer Relationship Management (Digital Marketing, e-Marketing, e-Services) 資訊科技在客戶關係管理的應用（數碼市場推廣、電子市場推廣、電子服務）		Project Management and Design 項目管理及設計
211	Computer Game Designer/ Artist/Developer/Computer Graphic Designer/Artist/ Computer Animator/Web Graphic Designer/Visual Effects Designer 電腦遊戲設計/美術/開發員/電腦圖像設計/美術員/電腦動畫設計師/網頁圖像設計師/視覺效果設計師	Interactive Game Design/Development 互動遊戲設計/開發	Multimedia and Computer Graphics 多媒體及電腦圖像	Augmented Reality (AR) & Virtual Reality (VR) 擴增實境（AR）及虛擬實境（VR）
Telecommunications and Networking 電訊及網絡				
301	Telecommunications Manager/ Networking Manager 電訊經理/網絡經理	Networking/Data Communications 網絡/數據通訊	Information and System Security 資訊及系統保安	Mobile Computing 流動電腦應用
302	Telecommunications Consultant/Network Consultant 電訊顧問/網絡顧問	Networking/Data Communications 網絡/數據通訊	Information and System Security 資訊及系統保安	Virtualisation and Cloud Computing 虛擬化及雲端運算
303	Telecommunications Engineer/ Network Engineer 電訊工程師/網絡工程師	Internet/Intranet/Web Development 互聯網/內聯網/網絡開發	Networking/Data Communications 網絡/數據通訊	Virtualisation and Cloud Computing 虛擬化及雲端運算
304	Network Administrator/ Network Officer 網絡管理主任/網絡主任	Internet/Intranet/ Web Development 互聯網/內聯網/網絡開發	Networking/Data Communications 網絡/數據通訊	Information and System Security 資訊及系統保安

	Principal Job 主要職務	Top 1 首位	Top 2 第二位	Top 3 第三位
	Technical Services 技術服務			
401	IT Security Specialist/ Information Security Specialist/Information Security Officer 電腦保安專責經理/資訊保安專責經理/資訊保安主任	Information and System Security 資訊及系統保安	Virtualisation and Cloud Computing 虛擬化及雲端運算	Networking/Data Communications 網絡/數據通訊
402	Database Administrator/ Data Warehouse Administrator/Database Designer 資料庫管理主任/數據庫管理主任/資料庫設計員	Database Technology 資料庫科技	Basic Office IT Skills 辦公室資訊科技基本技能 Applied Basic IT Tools for Business Processes 基本資訊科技工具在業務的應用	
403	Systems Programmer (in-house/vendor environment)/Systems Engineer 系統程式編製員（機構內部/電腦供應商）/系統工程師	Information and System Security 資訊及系統保安	Service-Oriented Architecture (SOA), Web Services and XML Development 服務導向架構，網上服務與 XML 開發	.NET Development .Net 開發
404	Customer Engineering Manager/Services Support Manager 客戶工程經理/服務支援經理	Information and System Security 資訊及系統保安	Applied Basic IT Tools for Business Processes 基本資訊科技工具在業務的應用	Windows Platform Technology 視窗平台技術
405	Customer Service Engineer/Field Engineer 客戶服務工程師/實地服務工程師	Windows Platform Technology 視窗平台技術	Virtualisation and Cloud Computing 虛擬化及雲端運算 Data Science and Data Analytics 數據科學和數據分析	
406	Field Technician 實地服務技術員	Project Management and Design 項目管理及設計	Networking/Data Communications 網絡/數據通訊 IT Infrastructure Library 資訊科技基礎架構標準庫(ITIL)	
	Operation Services 操作服務			
501	Computer Operations Manager 電腦操作經理	Information and System Security 資訊及系統保安	Project Management and Design 項目管理及設計	Networking/Data Communications 網絡/數據通訊
502	Help Desk Supervisor 求助台主任	Information and System Security 資訊及系統保安	Windows Platform Technology 視窗平台技術	IT Infrastructure Library 資訊科技基礎架構標準庫(ITIL)
503	Help Desk Representative/ Customer Service Officer/ Representative 求助台服務員/客戶服務主任/服務員	Windows Platform Technology 視窗平台技術	Information and System Security 資訊及系統保安	Basic Office IT Skills 辦公室資訊科技基本技能
504	Computer Operations Supervisor/Operations Support Supervisor 電腦操作主任/操作支援主任	Networking/Data Communications 網絡/數據通訊	Information and System Security 資訊及系統保安	Application Development Tools/Languages 應用開發工具/語言

Principal Job 主要職務		Top 1 首位	Top 2 第二位	Top 3 第三位
505	Computer Operator/Systems Operator 電腦操作員/系統操作員	Windows Platform Technology 視窗平台技術	Applied Basic IT Tools for Business Processes 基本資訊科技工具在業務的應用	Information and System Security 資訊及系統保安
506	User Support/Co-ordinator 用戶支援/統籌員	Database Technology 資料庫科技	Basic Office IT Skills 辦公室資訊科技基本技能	Windows Platform Technology 視窗平台技術
IT Education and Training 資訊科技教育及訓練				
601	Lecturer/Professor/Training Officer 講師/教授/訓練主任	e-Learning Technology and Development 網上教學科技及開發	Internet/Intranet/Web Development 互聯網/內聯網/網絡開發	IT Applications in Product Design 資訊科技在產品設計的應用
602	IT Trainer/IT Instructor 資訊科技訓練員/資訊科技教導員	e-Learning Technology and Development 網上教學科技及開發		
IT Sales and Marketing 資訊科技銷售及市場推廣				
701	Sales/Marketing Director/ Account Director/ Sales/Marketing Manager 銷售/市場總監/客戶總監/銷售/市場經理	Virtualisation and Cloud Computing 虛擬化及雲端運算 Data Science and Data Analytics 數據科學和數據分析 Other IT-related Training 其他與資訊科技有關的訓練		
702	Sales/Marketing Representative/ Account Manager/Product Promotion Representative 銷售/市場代表/客戶經理/產品推廣代表	Other IT-related Training 其他與資訊科技有關的訓練	Virtualisation and Cloud Computing 虛擬化及雲端運算 Data Science and Data Analytics 數據科學和數據分析	

Number of Posts (Employees Freelancers and Vacancies) of 2017, 2018 and 2019 by Principal Job
2017 年、2018 年及 2019 年的職位數目
(自由工作者及空缺)

Principal Job 主要職務		Number of IT Posts as of April 2017 在 2017 年 4 月的職位數目	Number of Employees and Freelancers as of April 2018 在 2018 年 4 月的僱員及自由工作者人數	Number of Vacancies as of April 2018 在 2018 年 4 月的空缺額	Forecasted Number of IT Posts as of April 2019 預計在 2019 年 4 月的職位數目
General IT Management 總資訊科技管理					
101	IT Director/MIS Director/Head of IT/CIO 資訊科技總監/管理資訊系統總監/資訊科技主管/首席資訊主任	1 322	1 313	15	1 329
102	CTO 首席資訊主任	150	150	-	150
Sub-total 小計		1 472	1 463	15	1 479
IT/Software Development 資訊科技/軟件開發					
201	Systems Development Manager 系統開發經理	1 727	1 726	38	1 770
202	IT Architect/Business Analyst 資訊科技建築師/商業分析員	732	865	19	854
203	Project Manager/Project Leader 項目經理/項目組長	4 039	3 975	96	4 079
204	UX Designer 用戶體驗設計師	2 805	2 703	123	2 836
205	Programmer/Analyst Programmer/ Software Engineer 程式編製員/分析程式員/軟件工程師	17 082	16 281	1 019	17 366
206	Web Designer/Developer 網站設計員/開發員	1 335	1 319	49	1 371
207	Quality Assurance Specialist/Software Assurance Specialist/Engineer/IT Systems Auditor 品質檢查專責經理/軟件品質檢查專責經理/工程師/電腦系統審核經理	660	613	51	666
208	Software Product Engineer 軟件產品工程師	437	435	6	451
209	Software/Firmware Product Designer/Product Analyst/ Developer/ Software Product Manager 軟件/固件產品設計員/產品分析員/開發員/軟件產品經理	870	855	32	888
210	Technical Writer 技術撰稿員	148	150	8	158

	Principal Job 主要職務	Number of IT Posts as of April 2017 在 2017 年 4 月的職位數目	Number of Employees and Freelancers as of April 2018 在 2018 年 4 月的僱員及自由工作者人數	Number of Vacancies as of April 2018 在 2018 年 4 月的空缺額	Forecasted Number of IT Posts as of April 2019 預計在 2019 年 4 月的職位數目
211	Computer Game Designer/Artist/ Developer/Computer Graphic Designer/ Artist/Computer Animator/Web Graphic Designer/Visual Effects Designer 電腦遊戲設計/美術/開發員/電腦圖像設計/美術員/電腦動畫設計師/網頁圖像設計師/視覺效果設計師	1 457	1 411	61	1 482
Sub-total 小計		31 292	30 333	1 502	31 921
	Telecommunications and Networking 電訊及網絡				
301	Telecommunications Manager/ Networking Manager 電訊經理/網絡經理	335	335	5	340
302	Telecommunications Consultant/ Network Consultant 電訊顧問/網絡顧問	881	889	7	896
303	Telecommunications Engineer/ Network Engineer 電訊工程師/網絡工程師	2 425	2 306	128	2 434
304	Network Administrator/Network Officer 網絡管理主任/網絡主任	2 442	2 443	13	2 456
Sub-total 小計		6 083	5 973	153	6 126
	Technical Services 技術服務				
401	IT Security Specialist/Information Security Specialist/Information Security Officer 電腦保安專責經理/資訊保安專責經理/資訊保安主任	1 134	1 118	36	1 154
402	Database Administrator/Data Warehouse Administrator/Database Designer 資料庫管理主任/數據庫管理主任/資料庫設計員	655	652	9	661
403	Systems Programmer (in-house/vendor environment)/Systems Engineer 系統程式編製員（機構內部/電腦供應商）/系統工程師	4 223	4 191	74	4 274
404	Customer Engineering Manager/ Services Support Manager 客戶工程經理/服務支援經理	901	860	36	896
405	Customer Service Engineer/Field Engineer 客戶服務工程師/實地服務工程師	1 551	1 479	47	1 527
406	Field Technician 實地服務技術員	6 092	5 910	197	6 107
Sub-total 小計		14 556	14 210	399	14 619
	Operation Services 操作服務				
501	Computer Operations Manager 電腦操作經理	946	939	8	944
502	Help Desk Supervisor 求助台主任	372	369	9	378

Principal Job 主要職務		Number of IT Posts as of April 2017 在 2017 年 4 月的職位數目	Number of Employees and Freelancers as of April 2018 在 2018 年 4 月的僱員及自由工作者人數	Number of Vacancies as of April 2018 在 2018 年 4 月的空缺額	Forecasted Number of IT Posts as of April 2019 預計在 2019 年 4 月的職位數目
503	Help Desk Representative/Customer Service Officer/Representative 求助台服務員/客戶服務主任/服務員	1 643	1 641	41	1 685
504	Computer Operations Supervisor/Operations Support Supervisor 電腦操作主任/操作支援主任	1 360	1 341	33	1 374
505	Computer Operator/Systems Operator 電腦操作員/系統操作員	2 374	2 343	20	2 373
506	User Support/Co-ordinator 用戶支援/統籌員	19 030	18 551	524	19 076
Sub-total 小計		25 725	25 184	635	25 830
IT Education and Training 資訊科技教育及訓練					
601	Lecturer/Professor/Training Officer 講師/教授/訓練主任	2 435	2 427	8	2 435
602	IT Trainer/IT Instructor 資訊科技訓練員/資訊科技教導員	1 518	1 517	-	1 517
	Sub-total 小計	3 953	3 944	8	3 952
	IT Sales and Marketing 資訊科技銷售及市場推廣				
701	Sales/Marketing Director/Account Director/ Sales/Marketing Manager 銷售/市場總監/客戶總監/銷售/市場經理	1 780	1 756	60	1 816
702	Sales/Marketing Representative/ Account Manager/Product Promotion Representative 銷售/市場代表/客戶經理/產品推廣代表	6 818	6 787	231	7 028
Sub-total 小計		8 598	8 543	291	8 844
Total (IT) 總計 (資訊科技)		**91 679**	**89 650**	**3 003**	**92 771**
Research and Development (IT related) 研究與開發(與資訊科技相關)					
051	R&D Researcher/R&D Scientist/ R&D Engineer 研發研究員/研發科學家/研發工程師	2 489	2 432	62	2 483
052	R&D Technician 研發技術員	2 738	2 703	158	2 869
053	R&D Supporting Staff 研發輔助人員	1 003	995	8	1 003
Sub-total 小計		**6 230**	**6 130**	**228**	**6 355**
Total (IT and R&D(IT)) 總計 (資訊科技及研究與開發(與資訊科技相關))		**97 909**	**95 780**	**3 231**	**99 126**

Number of R&D Employees (including Freelancers) by Type of Organization
各機構類別研發僱員人數（包括自由工作者）

Principal Job 主要職務		Overall 整體			Type of Organizations 機構類別					
					IT & Communications Services Organizations 資訊科技及通訊服務機構			IT Users Organizations 資訊科技用戶機構		
		Overall 整體	Employees 僱員	Freelancers 自由工作者	Overall 整體	Employees 僱員	Freelancers 自由工作者	Overall 整體	Employees 僱員	Freelancers 自由工作者
Research and Development (Non-IT related) 研究與開發（與資訊科技不相關）										
001	R&D Researcher/R&D Scientist/R&D Engineer 研發研究員／研發科學家／研發工程師	2 072	2 048	24	4	4	-	2 068	2 044	24
002	R&D Technician 研發技術員	1 610	1 584	26	37	37	-	1 573	1 547	26
003	R&D Supporting Staff 研發輔助人員	820	804	16	8	8	-	812	796	16
Sub-total 小計		**4 502**	**4 436**	**66**	**49**	**49**	**-**	**4 453**	**4 387**	**66**
Research and Development (IT related) 研究與開發（與資訊科技相關）										
051	R&D Researcher/R&D Scientist/R&D Engineer 研發研究員／研發科學家／研發工程師	2 432	2 432	-	1 864	1 864	-	568	568	-
052	R&D Technician 研發技術員	2 703	2 702	1	2 393	2 392	1	310	310	-
053	R&D Supporting Staff 研發輔助人員	995	994	1	923	922	1	72	72	-
Sub-total 小計		**6 130**	**6 128**	**2**	**5 180**	**5 178**	**2**	**950**	**950**	**-**
Total 總計		**10 632**	**10 564**	**68**	**5 229**	**5 227**	**2**	**5 403**	**5 337**	**66**

Planned Output of Graduates from UGC/Government–Funded IT or Computing Programmes
獲大學教育資助委員會／政府資助開辦的資訊科技／電腦課程的預計畢業人數

Institute	院校	2018			2019			2020			2021			2022		
		HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD
The Hong Kong Polytechnic University	**香港理工大學**															
Computing/Enterprise Information Systems/Information Technology/ Computing and Management/ Financial Technology	電子計算／企業信息管理／資訊科技／電子計算及管理／金融科技	-	364	24	-	322	42	-	352	40	-	351	38	-	353	30
HD/D	HD															
Electronic and Information Engineering	電子及資訊工程學	79	-	-	60	-	-	88	-	-	88	-	-	88	-	-
City University of Hong Kong	**香港城市大學**															
Information Management/Global Business Systems Management/ Marketing Information Management/ Information Systems/Computer Science/ Creative Media/e-Logistics and Technology Management/Computer Engineering/Information Engineering/ Electronic and Communication Engineering/Computer and Data Engineering	資訊管理／環球商業系統管理／營銷資訊管理／資訊系統／電腦科學／創意媒體／電子物流及科技管理／電子計算機工程學／資訊工程學／電子及通訊工程學／電子計算機及數據工程學	-	697	35	-	629	38	-	631	35	-	558	35	-	557	35
The University of Hong Kong	**香港大學**															
Computer Science/Computer Engineering	計算機科學／計算機工程學	-	100	23	-	130	23	-	170	23	-	170	23	-	170	23

Institute	院校	2018			2019			2020			2021			2022		
		HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD
The Chinese University of Hong Kong	**香港中文大學**															
Computer Engineering/Computer Science/Information Engineering/ Mathematics and Information Engineering/Computer Science and Engineering/Systems Engineering and Engineering Management/Financial Technology	計算機工程學／計算機科學／信息工程學／數學與信息工程學／計算機科學與工程學／系統工程與工程管理學／金融科技	-	375	103	-	440	74	-	348	84	-	402	96	-	400	86
The Hong Kong University of Science and Technology	**香港科技大學**															
Computer Science/Computer Engineering/Information Systems/ Computer Engineering and BBA in General Business Management/ Computer Science and BBA in General Business Management/Computer Science and Engineering/Electronic and Computer Engineering	計算機科學／計算機工程學／資訊系統學／計算機工程學及綜合商業管理學／計算機科學及綜合商業管理學／計算機科學及工程／電子及計算機工程	-	395	104	-	389	107	-	386	109	-	366	112	-	369	113
Hong Kong Baptist University	**香港浸會大學**															
Information Systems and e-Business Management/Applied and Computational Mathematics/Computer Science/ Computing and Information Systems	資訊系統及電子商貿學／應用及計算數學／計算機科學／計算機及資訊系統	-	155	16	-	188	8	-	150	13	-	150	13	-	150	13
Lingnan University	**嶺南大學**															
Business	商學	-	-	2	-	-	2	-	-	1	-	-	1	-	-	1

Institute	院校	2018			2019			2020			2021			2022		
		HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD	HD	DEG	PgD
Hong Kong Institute of Vocational Education/Hong Kong Design Institute	**香港專業教育學院／香港知專設計學院**															
HD	HD															
Cloud and Data Centre Administration/ Games and Animation/Game Software Development/Information and Network Security/Mobile Applications Development/Multimedia/Software Engineering/ Telecommunications and Networking/Data Science and Analytics/ Theme Park and Theatre Creative Technology	雲端系統及數據中心管理／遊戲及動畫／遊戲軟件開發／資訊及網絡安全／智能手機軟件開發／多媒體創作／軟件工程／電訊及網絡科技／數據科學及分析／主題公園及劇場創意科技	1 335	-	-	950	-	-	805	-	-	805	-	-	805	-	-
Total	**總數**	**1 414**	**2 086**	**307**	**1 010**	**2 098**	**294**	**893**	**2 037**	**305**	**893**	**1 997**	**318**	**893**	**1 999**	**301**
Year Total	**全年總數**		**3 807**			**3 402**			**3 235**			**3 208**			**3 193**	

HD - Higher Diploma 高級文憑
DEG - First Degree 學士學位
PgD - Postgraduate Degree/Diploma/Certificate 研究院學位／文憑／證書

Planned Output of Graduates from Self-Financed IT or Computing Programmes
以自負盈虧方式開辦的資訊科技/電腦課程的預計畢業人數

Institute	院校	2018			2019			2020			2021			2022		
		HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD
The Hong Kong Polytechnic University	**香港理工大學**															
Electronic Engineering/ Information Technology/ Software Technology/ E-Commerce/Electronic and Information Engineering	電子工程學／資訊科技／軟件科技／電子商貿／電子及資訊工程學	-	2	262	-	-	259	-	-	259	-	-	258	-	-	257
City University of Hong Kong	**香港城市大學**															
Information Management/ Business Information Systems/ Electronic Business and Knowledge Management/ Computer Science/Electronic Commerce/Electronic and Information Engineering/ Multimedia Information Technology/Information Security	資訊管理／商務資訊系統／電子商業及知識管理／電腦科學／電子商貿／電子及資訊工程學／多媒體資訊科技／資訊保安	-	30	545	-	30	532	-	30	531	-	30	531	-	30	531
AD Information Systems Development/Network and Systems Administration	AD 資訊系統／網絡及系統管理	267	-	-	113	-	-	150	-	-	150	-	-	150	-	-
The University of Hong Kong	**香港大學**															
Computer Science/Electronic Commerce and Internet Computing	計算機科學／電子商貿及互聯網工程	-	3	255	-	5	245	-	5	245	-	5	245	-	5	245

Institute	院校	2018			2019			2020			2021			2022		
		HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD
HKU SPACE Community College	**香港大學附屬學院**															
HD/AD	HD/AD															
Computer Engineering/ Computer Science/ Information Technology/ Information Security/ Engineering	電腦工程／電腦科學／資訊科技／資訊保安／工程	191	-	-	184	-	-	184	-	-	184	-	-	184	-	-
The Chinese University of Hong Kong	**香港中文大學**															
Computer Science/Information Engineering/Systems Engineering and Engineering Management/E-Commerce and Logistics Technologies/Financial Technology	計算機科學／信息工程學／系統工程與工程管理學／電子商貿與物流技術／金融科技	-	-	303	-	-	381	-	-	380	-	-	380	-	-	380
The Hong Kong University of Science and Technology	**香港科技大學**															
Electronic Engineering/ IC Design Engineering/ Information Systems Management/Information Technology/ Telecommunications	電子工程學／集成電路設計工程／資訊系統管理學／資訊科技／電信學	-	-	307	-	-	305	-	-	314	-	-	317	-	-	316
Hong Kong Baptist University	**香港浸會大學**															
Information Technology Management/Advanced Information Systems/ Computer Science	資訊科技管理／高級信息系統／計算機科學	12	-	236	17	-	235	20	-	235	20	-	235	20	-	235

Institute	院校	2018			2019			2020			2021			2022		
		HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD
AD/D	AD／D															
Mobile Information Technology/Information Systems	流動資訊科技／資訊系統	22	-		14	-	-	15	-	-	15	-	-	15	-	-
Lingnan University	**嶺南大學**															
e-Business and Supply Chain Management	電子商務與供應鏈管理	-	-	58	-	-	50	-	-	50	-	-	50	-	-	50
HD	HD															
Creative Media Design	創意媒體設計	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
The Open University of Hong Kong	**香港公開大學**															
Information Technology with Internet Applications /Electronic Commerce/Internet Technology and Applications/ Information Technology Multimedia and Internet Technology/Computer Engineering/Computing and Networking/Communications Technology/Computing/ Electronics and Computer Engineering/Computing and Interactive Entertainment	資訊科技與互聯網應用／電子商業／互聯網科技及應用／資訊科技／多媒體與互聯網科技／電腦工程學／電腦及網絡學／通訊科技學／電腦學／電子及電腦工程／電腦及互動娛樂	-	339	14	-	345	23	-	329	18	-	323	17	-	315	14

Institute	院校	2018			2019			2020			2021			2022		
		HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD	HD/AD	DEG	PgD
HD/AD	HD/AD															
Digital Communication/Mobile Communications Technology/ Information Technology/ Electronic Commerce/ Computer and Communications Technology	數碼通訊／流動通訊科技／資訊科技／電子商業／電腦及通訊科技	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
Technological and Higher Education Institute of Hong Kong/Hong Kong Institute of Vocational Education/ Hong Kong Design Institute	**香港高等科技教育學院／香港專業教育學院／香港知專設計學院**															
Multimedia Technology and Innovation/Information and Communications Technology	創新及多媒體科技／資訊及通訊科技	-	85	-	-	55	-	-	60	-	-	70	-	-	110	-
HD	HD															
Computer Systems Administration/Web Design and Development/ Audio-Visual Entertainment Technology/Stage and Live Entertainment Technology	電腦系統管理／網頁設計及開發／視聽娛樂科藝／舞台及娛樂科技	30	-	-	15	-	-	20	-	-	20	-	-	20	-	-
Total	**總數**	**527**	**459**	**1 980**	**345**	**435**	**2 030**	**389**	**424**	**2 032**	**389**	**428**	**2 033**	**389**	**460**	**2 028**
Year Total	**全年總數**		**2 966**			**2 810**			**2 845**			**2 850**			**2 877**	

D - Diploma 文憑
HD - Higher Diploma 高級文憑
AD - Associate Degree 副學士
DEG - First Degree 學士學位
PgD - Postgraduate Degree/Diploma/Certificate 研究院學位／文憑／證書

Relevant Organisations for Technology Transfer, R&D Collaboration and Development

Hong Kong Science and Technology Parks Corporation

The Hong Kong Science and Technology Parks Corporation (HKSTPC) provides 20 laboratory-fitted buildings offering 220 000 square meter office space – an effective research and development environment and support services to facilitate collaboration and synergy among its 700 tenant and incubate companies. Its technology focuses are under five clusters – Biomedical Technology, Electronics, Green Technology, Information and Communications Technology and Material and Precision Engineering. Advanced facilities and services provided by the Innovation Centres and Laboratories include AI and Robotics Labs, Smart City Innovation Centre, IC Failure Analysis Services, and Biomedical Technology Support Centre. The Training Board urges employers to make good use of the facilities and services offered by the HKSTPC.

Cyperport

After over a decade of dedicated effort, Cyperport has developed into a mature and vibrant digital technology ecosystem, now home to more than 900 technology enterprises, including MNCs such as Microsoft, Lenovo, and IBM. Cyperport also houses over 200 FinTech companies that are engaged in such diverse areas as blockchain, cybersecurity, AI, big data, wealth management and transaction engineering. Cyberport actively engages worldwide regulators, industry leaders, financial institutions, accelerators and academia to enhance the entrepreneurial environment for FinTech. Together with the many FinTech events held, Cyberport is the centre of Hong Kong's FinTech activities, and the FinTech hub of Asia.

The Hong Kong R&D Centres

The Hong Kong R&D Centre Programme is the core initiative driven by the Innovation and Technology Commission of HKSAR Government with the aim to harness Hong Kong’s advantages in applied research, intellectual property protection, business-friendly environment and proximity to the manufacturing based in the Pearl River Delta (PRD) region, to thrive as a regional technology service hub.

In April 2006, Government set up five R&D Centres to drive and coordinate applied R&D in selected focus areas and to promote commercialisation of R&D results and technology transfer:

(a) Automotive Parts and Accessory Systems R&D Centre;

(b) Hong Kong Research Institute of Textiles and Apparel;

(c) Logistics and Supply Chain MultiTech R&D Centre;

(d) Nano and Advanced Materials Institute; and

(e) Hong Kong Applied Science and Technology Research Institute (ASTRI), designated as the R&D Centre for Information and Communications Technologies.

ASTRI has a rich portfolio of commercially viable technologies readily available for customers' deployment. The number of technology transfers conducted through research contract, technology licensing and other forms of partnership has been growing and ASTRI had filed more than 1 000 patents with over 700 granted. The Training Board urges employers to seek assistance from ASTRI for R&D development and technology transfers.

Hong Kong Productivity Council

Hong Kong Productivity Council (HKPC) and its subsidiaries' consulting and technical professionals provide a multitude of services in technology transfer, consultancy, training and other support services in the areas of manufacturing technology, information technology, environmental technology and management systems. To benefit more sectors through product innovation and technology transfer, HKPC is committed to commercializing a variety of market-driven patents and technologies. Ample opportunities abound for licensing and technology transfer, both locally and overseas. HKPC is one of the designated local public research institutes under the Innovation and Technology Support Programme (ITSP) of Innovation and Technology Commission (ITC), actively collaborating with companies in different industries in Research & Development (R&D) projects as well as providing laboratory testing support.

Technology Transfer Offices of the Local Universities

University Technology Transfer Offices (TTOs) are responsible for technology transfer and other aspects of the commercialisation of research that takes place in a university. An important task of many TTOs is to create and maintain industry partnerships that may be crucial for collaboration and bringing technologies to market. As a strategic partner of the business and industrial sectors, TTO normally adopts four major modes of knowledge transfer: consultancy, collaborative research, technology licensing, and spin-off/start-up companies.

In the 2018 Policy Address, the SAR Government has increased the funding support for the TTOs of the local Universities and the Technology Start-up Support Scheme to support scientific research and commercialisation of the innovated products.

與技術轉移、研發協作及發展相關的機構

香港科技園公司

香港科技園公司（下稱「科技園」）建有 20 幢具實驗室配套的大樓，辦公空間面積達 220 000 平方米，提供有效的研發環境及支援服務，促進 700 個租戶及初創公司互相協作，創造協同效應。科技園重點發展五大領域：生物醫藥科技、電子、綠色科技、資訊及通訊科技、物料與精密工程。多個創新中心及實驗室提供的先進設施及服務包括：人工智能及機械人實驗室、智慧城市創新中心、集成電路失效分析服務及生物醫藥科技支援中心。本會籲請僱主善用科技園提供的設施及服務。

數碼港

數碼港過去十多年不斷努力，已發展為成熟且富有活力的數碼科技生態圈，現時雲集超過 900 間科技公司，包括微軟[Microsoft]、聯想[Lenovo]及國際商業機器公司[IBM]等跨國企業，亦有逾 200 間金融科技公司，業務範圍涵蓋區塊鏈、網絡安全、人工智能、大數據，財富管理和交易工程。數碼港積極聯繫世界各地的監管人員、業界領袖、金融機構、初創加速器及學者，鞏固創業環境，促進金融科技發展。數碼港匯聚香港各大金融科技活動，不單是本地金融科技中心，更是亞洲金融科技樞紐。

香港研發中心

香港研發中心計劃是香港特區政府創新科技署推行的重點措施，憑藉香港的應用科研能力、知識產權保護、有利經商的環境及鄰近珠江三角州生產基地的優勢，發展本港成為區內科技服務樞紐。

2006 年 4 月，政府成立五所研發中心，推動和統籌有關選定重點範疇的應用研發工作，促進研發成果商品化及技術轉移：

(a) 汽車零部件研究及發展中心；

(b) 香港紡織及成衣研發中心；

(c) 物流及供應鏈多元技術研發中心；

(d) 納米及先進材料研發院；以及

(e) 資訊及通訊技術研發中心，由香港應用科技研究院（簡稱「應科院」）擔任。

應科院擁有大量商業上可行的技術，可隨時供客戶應用。透過研究合約、技術授權及其他合作形式的技術轉移項目正增加，應科院亦已申請超過 1 000 項專利項目，當中逾 700 項獲頒授專利。本會籲請僱主從應科院取得協助，促進研發工作及技術轉移。

香港生產力促進局

香港生產力促進局（下稱「生產力局」）及旗下附屬公司的專業顧問及技術人員，提供技術轉移、顧問、培訓及各項支援服務，涵蓋生產科技、資訊科技、環境科技及管理系統等範疇，致力透過產品創新及技術轉移，將按市場需要而研發的多項專利及技術轉化成商品，從而惠及更多行業。本地及海外均有大量授權及技術轉移的機遇。生產力局亦是創新科技署「創新及科技支援計劃」其中一間指定的本地公營科研機構，積極與各行各業的公司共同推展研發項目，並提供實驗室測試支援。

本地大學技術轉移處

大學技術轉移處（下稱「技術轉移處」）負責大學內技術轉移及研究項目商品化的相關事宜。大部分技術轉移處的重要任務之一，是創造並維繫業界伙伴合作，藉以促成協作，望能將技術轉移至市場。技術轉移處通常採用的知識轉移模式主要有四種：顧問、協作研究、技術授權及分拆／初創公司。

香港特區政府在 2018 年《施政報告》宣布，為本地大學技術轉移處及「大學科技初創企業資助計劃」增加撥款，支持科學研究，將創新產品轉化成商品。

Relevant Organisations/Programmes for Skill Upgrading

Training Programmes offered by VTC

The Training Programmes offered by various Discipline Units and the Institute of Professional Education And Knowledge (PEAK) of the VTC provide an array of part-time and tailor-made training programmes to working adults to enhance their professional capabilities to meet the ever-changing needs of the engineering field. Some of the professional diploma and certificate courses are subsidised by various government subsidised schemes.

Reindustrialisation and Technology Training Programme

Reindustrialisation and Technology Training Programme (RTTP) is a funding programme under the Technology Talent Admission Scheme that aims at subsidising local companies on a 2:1 matching basis to train their staff in advanced technologies, especially those related to "Industry 4.0". The technologies covered by the training courses should be advanced in nature and not yet widely adopted in Hong Kong. The adoption of such technologies should also benefit the economy of Hong Kong. Both relevant local and non-local courses can be supported. The employee nominated is a Hong Kong permanent resident with the necessary background / experience relevant to the advanced technology of the training course. Each company is subject to a funding ceiling of HK$500,000 in each financial year. The Training Board recommends the local employers to upgrade the technical skills of their workforce by making use of the RTTP.

Engineering Graduate Training Scheme (EGTS)

To bring about more well-structured practical training opportunities for engineering graduates, the Innovation and Technology Training Board of the VTC is operating a subsidy scheme in providing engineering graduates with 18 months of practical training of a standard acceptable to the Hong Kong Institution of Engineers for corporate membership. Each graduate receiving training under the scheme is granted a subsidy through his employer as part of his salary. The Training Board strongly recommends employers to make use of the scheme in training their employees.

Hong Kong Productivity Council

Administered by HKPC, the HKPC Academy offers public training programmes, workshops, study missions and customized corporate training services for diversified sectors. The programmes and services are tailor made to the needs of industry, enterprises and individuals. The training programmes cover eight key areas: Information & Communication Technology, Engineering Design and Management, Advanced Manufacturing Technology, Logistics & Supply Chain Management, Sustainability Management, International Standards and Risk Management, Business Management and Creative Design.

協助提升技能的機構／課程

職業訓練局開辦的培訓課程

職業訓練局[VTC]各學科及高峰進修學院[PEAK]為在職人士開辦一系列兼讀制培訓課程，內容特別度身設計，協助在職人士提升專業才能，應付工程界不斷轉變的需要。當中部分專業文憑及證書課程獲政府不同的資助計劃提供學費資助。

再工業化及科技培訓計劃

「再工業化及科技培訓計劃」[RTTP]是「科技專才培育計劃」下的資助項目，以 2:1 的配對形式資助本地企業人員接受高端科技培訓，尤其是與「工業 4.0」有關的培訓。培訓課程涵蓋的科技必須屬高端性質，並且未在本港廣泛採用，而採用相關技術應可令香港經濟受惠。本地及非本地的相關課程均能申請資助。獲提名的僱員必須為香港永久居民，並擁有與高端科技培訓課程相關的背景／經驗。每一個財政年度內，每間公司可獲的資助上限為港幣 50 萬元。本會建議本地僱主善用 RTTP 提升員工的技術技能。

工科畢業生訓練計劃

此資助計劃由 VTC 創新及科技訓練委員會推行，為工科畢業生提供具系統的實習培訓機會，經過 18 個月的實踐訓練，可獲香港工程師學會認可為符合正式會員的資格。每名透過本計劃接受培訓的畢業生會經由其僱主獲發津貼，作為薪金的一部分。本會極為推薦僱主利用本計劃為員工提供培訓。

香港生產力促進局

香港生產力促進局轄下生產力學院提供公開培訓課程、工作坊及考察團，並為不同行業度身訂造企業培訓服務。課程及服務因應行業、企業及個別人士的需要而設計。培訓課程涵蓋八大主要範疇：信息及通訊技術、工程設計及管理、先進製造技術、物流及供應鏈管理、可持續發展管理、國際標準及危機管理、企業管理及創意設計。