2008 MANPOWER SURVEY REPORT

ELECTRONICS INDUSTRY

電 子 業

二 〇 〇 八 年 人 力 調 查 報 告

ELECTRONICS AND TELECOMMUNICATIONS TRAINING BOARD

VOCATIONAL TRAINING COUNCIL

職 業 訓 練 局

電 子 業 及 電 訊 業 訓 練 委 員 會

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Executive Summary of the 2008 Manpower Survey Report of the Electronics Industry

Introduction

The survey was conducted in April 2008 by the Electronics and Telecommunications Training Board of the Vocational Training Council (VTC) to collect up-to-date manpower information by principal job in the electronics industry.

2. The fieldwork of the manpower survey covered 665 establishments which were selected by means of a stratified random sampling method from a total of some 4 209 establishments. The survey data collected from the selected establishments were scaled up statistically to reflect the overall manpower situation of the industry.

Survey Findings

3. The survey revealed that in April 2008, a total of 103 433 persons were employed in the Hong Kong electronics industry. Of the 103 433 employees, 50 960 were employed in principal jobs of electronics engineering and related disciplines in the electronics industry. The distribution of employees by job level and by sector of the electronics industry is as follows:

Table A : Distribution of Employees by Job Level and by Sector

Sector	Job Level				**Total**
	Technologist	Technician	Craftsman	Operative	
1. Manufacturing	836	2 020	683	2 882	**6 421 (12.6%)**
2. Trading and Services	7 984	14 978	3 337	814	**27 113 (53.2%)**
3. Telecommunications Services	1 871	4 625	814	113	**7 423 (14.5%)**
4. Wholesale	391	1 798	541	64	**2 794 (5.5%)**
5. Design Houses and Relevant Departments in Universities and Government	822	2 303	1 056	147	**4 328 (8.5%)**
6. Retail Shops for Electronics Products (8 large shops)	2	2 810	22	47	**2 881 (5.7%)**
Total (Percentage of Total Manpower)	**11 906 (23.4%)**	**28 534 (56.0%)**	**6 453 (12.6%)**	**4 067 (8.0%)**	**50 960 (100%)**

4. At the time of the survey, employers reported a total of 280 trainees and 1 425 vacancies in electronics engineering and related disciplines, representing 0.55% and 2.8% respectively of the workforce. Besides, employers also forecasted that the industry would require 52 480 workers by April 2009, an increase of 1 520 (3.0%) of the workforce in April 2008.

Manpower Changes

5. The total manpower in principal jobs of electronics and related disciplines of the industry has increased by 5.1% per annum from 48 491 workers in 2006 to 50 960 in 2008. However, if the manpower (2 881) of the new Sector 6 is not counted, the total manpower has recorded an annual decrease of 0.4% from 48 491 workers in 2006 to 48 079 in 2008. It recorded a continued annual but sharp decrease of 17.4% in Sector 1 – Manufacturing, a mild annual increase of 0.2% and 0.6% in Sector 2 and 4 – Trading, Services and Wholesale, and Sector 3 – Telecommunication Services respectively. On the other hand, the survey showed that there was annual drastic increase of 48.6% in Sector 5 – Design Houses and Government Departments.

6. The followings attributed to the manpower changes by sector:

(i) The significant annual manpower decrease in Sector 1 was mainly due to continuous transfer of manufacturing services from Hong Kong to the Mainland and some companies closed their manufacturing services;

(ii) The slightly manpower increase in Sectors 2 and 4 showed that the demand for capital electronics equipment and systems, data processing and tabulating services in the two sectors were stable;

(iii) The mild manpower increase in Sector 3 reflected that the sector was one of the key infrastructures of Hong Kong, which continued to provide new telecommunication services to the public; and

(iv) The drastic manpower increase in Sector 5 was mainly due to the heavy demand for electronics product design and continuous expansion of IC design business in the sector.

Future Manpower Demand

Historical Manpower Requirement

7. Based on the previous historical trend and normal business outlook of the electronics industry, and its capability of manpower absorption, the Training Board forecasts that there will be a steady of manpower increase for the coming 3 years (2009 -2011). Also, the Training Board expects a low turn-over rate of manpower in the coming three years and suggests the normal natural wastage rate of 3% be used for the loss of manpower of industry, i.e. workers leaving the electronics industry through retirement, migration to other industries and other causes. Taking the above forecast into consideration as well as employers' forecast on manpower requirement in 2009 collected from the survey, the Training Board has estimated, by using the Adaptive Filtering Method for the manpower projection, the additional manpower required by the electronics industry for 2009 - 2011 as below:

Table B: Annual Manpower Demand in the Electronics Industry from 2009 to 2011 (Historical Manpower Requirement)

Job Level	Annual Average Additional Demand for Employees
Technologist	680 - 830
Technician	1 237 – 1 511
Craftsman	431 - 527

With Consideration of 2008 Financial Crisis

8. The field work of the 2008 manpower survey completed in September 2008, just before the outbreak of the worldwide financial crisis triggered by the US sub-prime mortgage problems. The crisis later caused major global economies into recession. At present, it seems that there are no indications when the current downturn will end. However, based on the past experience and the measures taken by the Hong Kong SAR Government and the Central Government, the electronics industry will be benefited and will soon be recovered from the economic downturn. The Training Board has a cautious optimistic view that the electronic industry will then start to pick up business. On the other hand, the Training Board has observed that in 2008 there was a significant increase in number of students enrolled in engineering courses at universities. Thus, the Training Board recommends employers to maintain enough and well equipped manpower ready for the economy recovery.

9. Based on Members' experience and knowledge of the manpower characteristics of the industry together with the economic situation and expectation, the Training Board has estimated that the manpower demand of the electronics industry for the coming year, 2009, will be just for the training of wastage (at the wastage rate of 3%) as shown below:

Table C: Estimated Training Requirement for 2009 (with Consideration of 2008 Financial Crisis)

Skill Level	Annual Training Demand
Technologist	321 - 393
Technician	770 - 942
Craftsman	174 - 213

10. Expecting a mild growth in manpower demand of the electronics industry from 2010 to 2011, the Training Board has also estimated the average annual training requirements at technologist, technician and craftsman levels for the 2 years to cover both growth and wastage as shown below:

Table D: Average Annual Estimated Training Requirements for 2010 – 2011 (with Consideration of 2008 Financial Crisis)

Skill Level	Annual Training Demand
Technologist	641 - 784
Technician	1 173 - 1 433
Craftsman	410 - 501

Recommendation

11. The global financial crisis happened in 2008 and continued to impact major global economies in 2009 and it seems that there are no indications when it will come to an end. However, in the meantime, the Hong Kong SAR Government and the Central Government have introduced a series of measures to ensure the stability of financial institution and market to bolster public confidence. In view of these measures and the past experience, the Training Board has a cautious optimistic view that the electronics industry will not be so severely affected and will be the first lot of industries to be recovered from the economic downturn. Thus, the Training Board recommends the following measures for employers to consider preparing for the recovery from present economic downturn:

(i) To re-engineer and streamline business to make company more effective and efficient than before;

(ii) To further strengthen the overall skill level and competency of the staff, especially the technical workforce, through appropriate training in order to emerge from the financial crisis as a much stronger and competitive organisation;

(iii) To continue to explore new business in the most cost effective way so as to strengthen market share;

(iv) To continue to maintain and to deepen strong partnership with important customers and to establish new partnership with potential customers; and

(v) To develop green electronics products consuming less energy and using recyclable components.

12. Regarding the strength of skill and competency of staff, the Training Board suggests that on top of the individual company's training needs, the "Skills an Employee Needed to Enhance" revealed by the survey will be a good reference on various aspects of training for employers. In this particular situation, employers are recommended to step up their training efforts in order to ensure supply of well equipped manpower to meet the business opportunities from the recovery of present financial downturn. The Training Board also recommends the Vocational Training Council and other training organizations to keep a close view on the above training needs of the electronics industry and provide such needs in time.

13. The Training Board will conduct another manpower survey of the electronics industry in 2010 to review and update the manpower requirements of the industry.

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SECTION I

INTRODUCTION

The Training Board

1.1 The Electronics and Telecommunications Training Board of the Vocational Training Council (VTC) is a statutory body appointed by the Government of the Hong Kong Special Administration Region (HKSAR) to be responsible for matters pertaining to manpower training in the electronics industry. The Training Board comprises members nominated by major trade associations, professional bodies, workers unions, training and educational institutions, as well as representatives from government departments. The membership and terms of reference of the Training Board are given in Annexes A and B respectively.

1.2 The Training Board is required by its terms of reference to determine the manpower needs of the electronics industry and to recommend to the VTC the development of vocational education and training facilities to meet such needs.

The Manpower Survey

1.3 The Training Board conducted a survey in April 2008 to collect up-to-date information on the manpower situation of the electronics industry. The survey was conducted with the assistance of the Census and Statistics Department of the HKSAR Government. Follow-up of the fieldwork finished in September and data processing was completed in October 2008.

1.4 The following manpower statistics and information were collected from the survey:

(i) number of employees in various principal jobs at the time of the survey,

(ii) number of existing vacancies,

(iii) number of trainees,

(iv) employers' forecast of the total number of employees by April 2009,

(v) average monthly income of employees, and

(vi) employers' views on the preferred education, training mode and training period of employees.

1.5 Employers were also requested to provide other information such as the number of technologists, technicians and craftsmen who had been promoted in the past 12 months, and also those who had been deployed to work for more than 6 months outside Hong Kong during the 12 months prior to the survey, as well as the skills their needed to enhance.

Scope of Survey

1.6 The survey covered firms, relevant departments in the government and educational institutions in the following six sectors of the industry in which the new Sector 6 — 8 Retail Shops for Electronic Products was first included in the survey:

Sector 1: Manufacturing

Manufacturers of :

(a) computing machinery and equipment (HSIC 3822),

(b) transistorized radios (HSIC 3831),

(c) television receivers and communications equipment (HSIC 3832),

(d) sound reproducing and recording equipment and apparatus (HSIC 3833),

(e) gramophone, records and magnetic tapes (HSIC 3834),

(f) electronic parts and components (HSIC 3840),

(g) electronic toys (HSIC 3852),

(h) electronic industrial apparatus (HSIC 3868), and

(i) electronic products, not elsewhere classified (HSIC 3873).

Sector 2: Trading and Services

Establishments of :

(a) Burglar alarm/intercommunication system installation (HSIC 5516),

(b) Imports and exports of:

(i) scientific and professional instruments and apparatus (HSIC 631805)*,

(ii) telephone system (HSIC 631821)*,

(iii) telecommunications services (HSIC 631822)*,

(iv) electrical goods (HSIC 631823)*,

(v) computer, computer peripherals and software packages (HSIC 631824)*,

(vi) office machines, appliances and equipment (HSIC 631825)*,

(c) Data processing and tabulating services (HSIC 8333)*, and

(d) Other electronics engineering services not included in (a) to (c).

Sector 3: Telecommunication Services

Establishments of :

(a) Wireline based fixed telecommunications network services (HSIC 732101),

(b) Fixed telecommunications network services, nowhere else classified (HSIC 732199),

(c) Radio paging services (HSIC 7322),

(d) Mobile Communications Services (HSIC 732901),

(e) Internet access services (HSIC 732902),

(f) Satellite communications services (HSIC 732903), and

(g) Radio and television stations and studios (HSIC 9411)

Sector 4: Wholesale

Establishments of wholesale of :

(a) Telephone system (HSIC 611821),

(b) Telecommunications equipment (excluding telephone system) (HSIC 611822),

(c) Electrical goods (excluding machinery, office and telecommunications equipment and appliances) (HSIC 611823),

(d) Computer, computer peripherals and software packages (HSIC 611824),

(e) Office machines, appliances and equipment (excluding computer, furniture and fixtures) (HSIC 611825).

Sector 5: Design houses and Relevant Departments in Universities and the Government

(a) Electronics design houses,

(b) Relevant educational institutions, and

(c) Relevant government departments.

Sector 6: Retail Shops for Electronics Products (8 large shops)

Notes: *(1) HSIC denotes Hong Kong Standard Industrial Classification*

*(2) * Excluding those establishments with an employment size below 10 as they are unlikely to have a significant number of technical staff.*

1.7 Prior to the survey, the Census and Statistics Department recorded some 4 209 establishments in the above six sectors of the electronics industry in Hong Kong. In view of the limited resources available, a stratified random sampling method was adopted and a total of 665 samples were selected to be surveyed. The data collected were then processed and scaled up statistically to give an overall picture of the manpower situation of the industry.

Method of the Survey

1.8 Two weeks before the survey, relevant survey documents including questionnaire (Annex C), explanatory notes (Annex D) and list of principal jobs (Annex E) were mailed to the 665 establishments. Prior publicity was also given through the local press and relevant trade and industrial organizations to solicit employers' co-operation in the survey.

1.9 During the survey period, interviewing officers of the Census and Statistics Department visited all 665 establishments to collect the completed questionnaires and, where required, to assist employers in completing them. All returned questionnaires were scrutinized and where necessary, cross checked with the respondents.

Response to the Survey

1.10 Of the 665 establishments, 405 completed the questionnaires and 23 refused to supply information. The remaining 237 establishments had either moved, closed and could not be traced, or no longer engaged in the trade. The effective response rate was 94.6%.

1.11 During the survey, some of the establishments just provided the rough manpower information and did not give details of their employees' monthly income, number of trainees or number of vacancies at the date of survey. The reasons were that they were too busy and not willing to provide confidential information of their organizations.

The Report

1.12 After follow-up of the fieldwork and data processing, the Training Board compiled in November 2008 a statistical report which presented the main manpower data collected from the survey. The statistical report was subsequently mounted onto the VTC web site for public information.

1.13 This report presents all the findings of the survey together with the Training Board's forecast of the training needs of the industry and recommendations on measures to meet these needs. In the report, the terms "employees", "workers" and "manpower" refer to the total number of persons employed in the principal jobs at the time of the survey but excluding trainees and apprentices. The term "trainees" means all persons receiving any form of training including those registered apprentices under a contract of apprenticeship.

1.14 The findings of the survey reflect the manpower situation of the electronics industry at the time of the survey. However, the current uncertainty in global financial markets due to the financial crisis happened in 2008 is likely to have significant impact on the electronics manpower demand. The manpower data and forecast in the report should therefore be read in this context.

SECTION II

SUMMARY OF SURVEY FINDINGS

Number of Persons Employed

2.1 The survey revealed that in April 2008, a total of 103 433 persons were employed in the electronics industry in Hong Kong. Of them, 50 960 were engaged in the principal jobs of electronics engineering and related disciplines. The following paragraphs present only the manpower statistics of those employees employed in the principal jobs.

Distribution of Employees by Job Level and by Sector

2.2 The distribution of employees by job level and by sector of the electronics industry is shown in Table 2.1, Figure 2.1 and Figure 2.2.

Table 2.1 : Distribution of Employees by Job Level and by Sector

Sector	Job Level				**Total**
	Technologist	Technician	Craftsman	Operative	
1. Manufacturing	836	2 020	683	2 882	**6 421 (12.6%)**
2. Trading and Services	7 984	14 978	3 337	814	**27 113 (53.2%)**
3. Telecommunications Services	1 871	4 625	814	113	**7 423 (14.5%)**
4. Wholesale	391	1 798	541	64	**2 794 (5.5%)**
5. Design Houses and Relevant Departments in Universities and Government	822	2 303	1 056	147	**4 328 (8.5%)**
6. Retail Shops for Electronics Products (8 large shops)	2	2 810	22	47	**2 881 (5.7%)**
Total	**11 906**	**28 534**	**6 453**	**4 067**	**50 960**
(Percentage of Total Manpower)	**(23.4%)**	**(56.0%)**	**(12.6%)**	**(8.0%)**	**(100%)**

Figure 2.1 : Distribution of Employees by Job Level

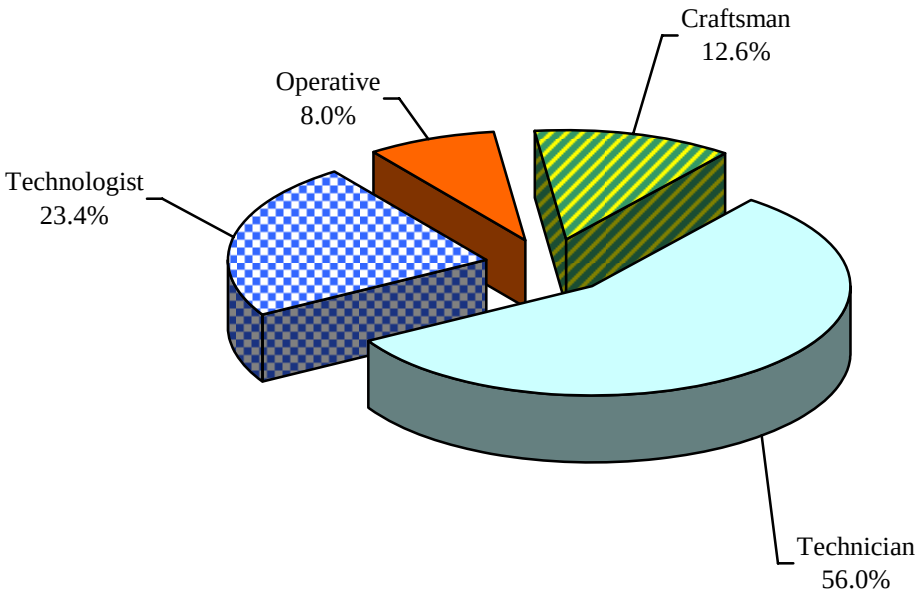
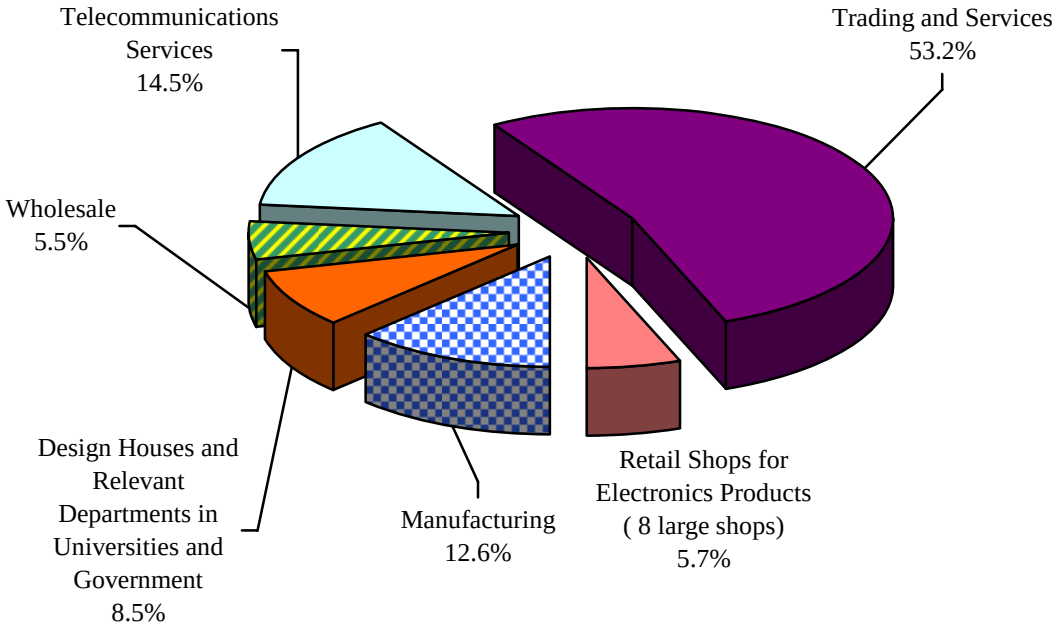


Figure 2.2 : Distribution of Employees by Job Sector



Number of Trainees

2.3 At the time of the survey, there were 280 trainees in the electronics industry. Their distribution by job level is shown in Table 2.2:

Table 2.2 : Distribution of Trainees by Job Level

Job Level	No. of Trainees (a)	No. of Employees (b)	Percentage $\frac{(a)}{(b)} \times 100\%$
Technologist	52	11 906	0.4%
Technician	69	28 534	0.2%
Craftsman	159	6 453	2.5%
Operative	0	4 067	0%
Total	**280**	**50 960**	**0.55%**

Number of Vacancies at Time of Survey and Forecast Manpower by April 2009

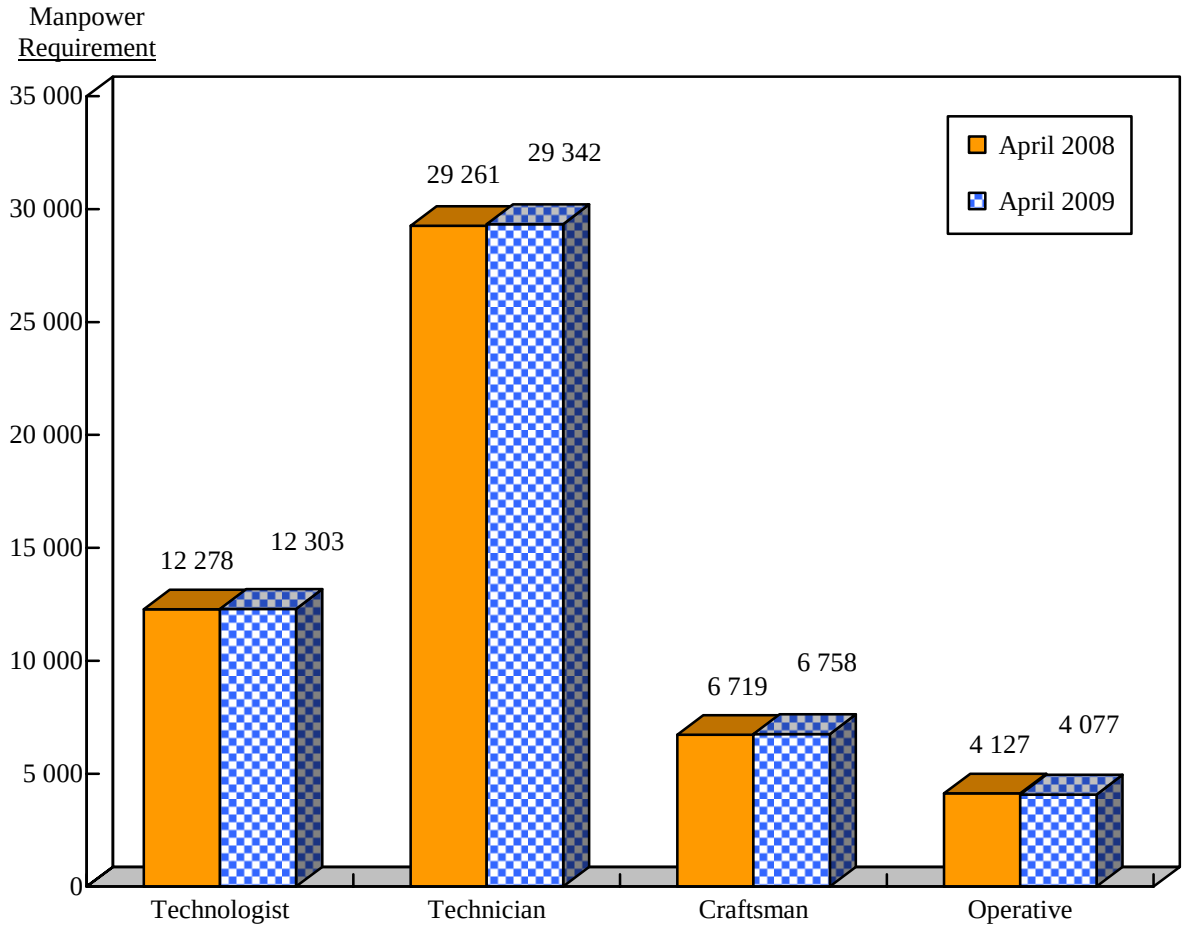
2.4 The total number of job vacancies was 1 425, or 2.8% of the total number employed in the electronics industry at the time of the survey. Employers also forecast that there would be 52 480 employees in the industry by April 2009, which is 1 520 employees (0.2%) more than that in April 2008.

2.5 A comparison of the manpower requirement at the time of survey and the employers' forecast of the number of employees by April 2009 is shown in Table 2.3 and Figure 2.3:

Table 2.3 : Comparison of Manpower Requirement by April 2008 and April 2009

Job Level	At Time of Survey (April 2008)			Forecast Total No. of Employees by April 2009	Forecast Increase/Decrease in Manpower Requirement
	No. of Employees	No. of Vacancies	Total Manpower Requirement		
Technologist	11 906	372	12 278	12 303	+0.2%
Technician	28 534	727	29 261	29 342	+0.3%
Craftsman	6 453	266	6 719	6 758	+0.6%
Operative	4 067	60	4 127	4 077	-1.2%
Total	**50 960**	**1 425**	**52 385**	**52 480**	**+0.2%**

Figure 2.3 : Comparison of Manpower Requirement by April 2008 and April 2009



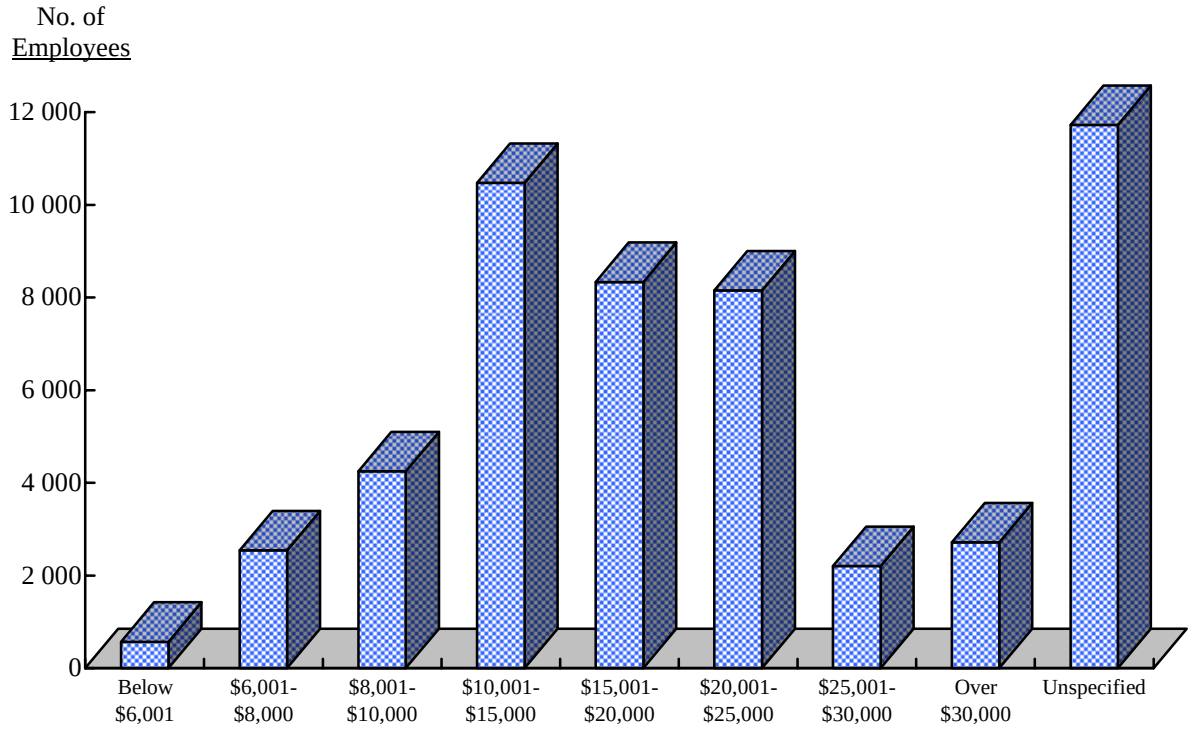
Total Monthly Income Range of Employees

2.6 The distribution of employees by total monthly income range in the electronics industry is shown in Table 2.4 and Figure 2.4:

Table 2.4 : Distribution of Employees by Total Monthly Income Range

Job Level	Below $6,001	$6,001-$8,000	$8,001-$10,000	$10,001-$15,000	$15,001-$20,000	$20,001-$25,000	$25,001-$30,000	Over $30,000	Un-specified
Technologist	-	-	-	448	1 751	2 877	1 272	2 447	3 111
Technician	-	79	1 303	6 823	6 500	5 278	929	269	7 353
Craftsman	-	426	1 924	3 174	84	-	-	-	845
Operative	570	2 034	1 021	29	-	-	-	-	413
Total	**570**	**2 539**	**4 248**	**10 474**	**8 335**	**8 155**	**2 201**	**2 716**	**11 722**

Figure 2.4 : Distribution of Employees by Total Monthly Income Range



Preferred Education, Mode of Training and Period of Training of Employees

2.7 The majority views of employers on the preferred education, mode of training and period of training of their technologists, technicians and craftsmen are shown in Table 2.5:

Table 2.5 : Preferred Education, Mode of Training and Period of Training of Employees

Job Level	Preferred Education	Preferred Mode of Training	Preferred Period of Training
Technologist	Degree	On-the-job Training	2 - 4 years
Technician	Degree/ Higher Diploma	On-the-job Training	2 - 3 years
Craftsman	Craft Certificate	On-the-job Training / Apprenticeship	1 - 3 years

Internal Promotion

2.8 In the twelve months prior to the survey, a total of 362 employees were promoted to higher level jobs in their own companies. Their distributions in each job level are shown below:

Table 2.6 : Internal Promotion

Internal Promotion	No. of Employees Promoted (a)	Total No. of Employees at the Promoted Level (b)	Percentage $\frac{(a)}{(b)}$ x100%
From Technician to Technologist	179	11 906	1.5%
From Craftsman to Technician	158	28 534	0.6%
From Other Levels to Craftsman	25	6 453	0.4%
Total	**362**	**46 893**	**0.8%**

Employees Deployed to Work Outside Hong Kong

2.9 Employers reported the following number of employees who had been deployed to work outside Hong Kong more than 6 months during the 12 months prior to the survey:

Table 2.7 : No. of Employees Deployed to Work Outside Hong Kong

Job Level	No. of Employees Deployed to Work Outside Hong Kong (a)	Total No. of Employees at Same Job Level (b)	Percentage $\frac{(a)}{(b)}$ x100%
Technologist	1 174	11 906	9.9%
Technician	741	28 534	3.0%
Craftsman	5	6 453	0.1%
Total	**1 920**	**46 893**	**4.1%**

Skills Employees Need to Enhance

2.10 The three most important skills that employees need to enhance is shown in Table 2.8:

Table 2.8 : No. of Employees by Skills Need to Enhance

Job Level	The 3 most important skills that employees need to enhance			
	Order	Code	Skills/ Knowledge/ Attributes	No. of Employees
Technologist	1.	103	Project management	1 989
	2.	413	Ability to learn/ adapt new skills/ knowledge	1 936
	3.	107	Leadership Skills	1 570
Technician	1.	411	Customer services skills	8 650
	2.	413	Ability to learn/ adapt new skills/ knowledge	3 926
	3.	102	Marketing management	3 387
Craftsman	1.	411	Customer services skills	2 158
	2.	413	Ability to learn/ adapt new skills/ knowledge	1 875
	3.	302	Written English	1 328

Statistical Tables

2.11 Detailed manpower statistics analysed by principal job and by sector of the electronics industry are shown in Appendices 1 to 7. The distribution of employers by their monthly income range is shown in Appendix 8 and the number of employees by skills need to enhance is shown in Appendix 9.

SECTION III

CONCLUSIONS

3.1 The Training Board has carefully examined the survey findings and is of the view that they generally reflect the employment situation of the electronics industry at the time of the survey.

Addition of a New Sector

3.2 Since the survey conducted in 2002, the scope of the manpower survey of the electronics industry had been revised significantly to include more sectors of the industry to cope with the changes in the industry. In view of many graduates of electronic-related courses had entered the industry as sales technicians, a total of 8 large retail shops for electronics products as “Sector 6” were first included in the 2008 manpower survey scope. Also, a new principal job of “Sales Technician” was created to meet the above need in the industry.

Comparison of Manpower

3.3 The fieldwork of the 2008 manpower was completed in September 2008, just at the outbreak of the worldwide financial crisis triggered by the US sub-prime mortgage problem. From the surveyed data, it seemed that the electronics industry was not yet affected by the financial crisis.

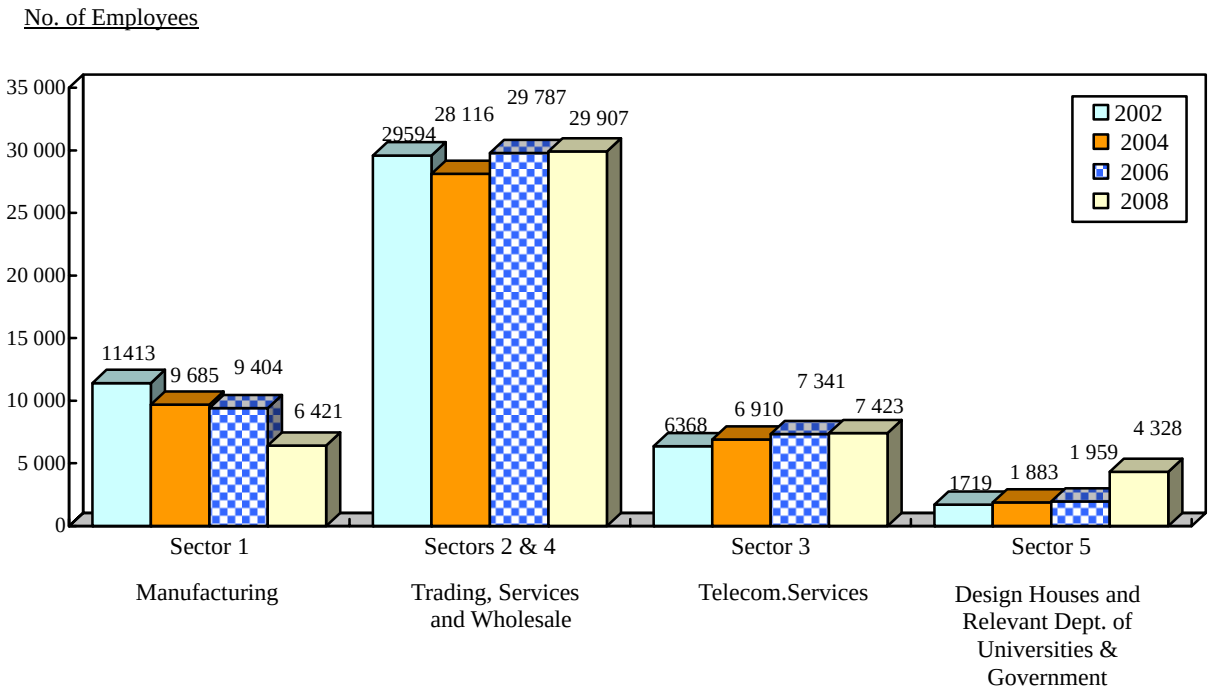
3.4 The total manpower in principal jobs of electronics and related disciplines of the industry has increased by 5.1% per annum from 48 491 workers in 2006 to 50 960 in 2008. However, if the manpower (2 881) of the new Sector 6 is not counted, the total manpower has recorded an annual decrease of 0.4% from 48 491 workers in 2006 to 48 079 in 2008. An analysis of the manpower changes by sector and by skill level is detailed in the following paragraphs. Because of the close business and manpower nature of Sector 2 (Trading & Services) and Sector 4 (Wholesale), they are combined for manpower comparison and analysis purpose. Also, for a better and direct manpower comparison, the new Sector 6 is not included. The distribution and comparison of manpower in 2008 and 2006 by skill level and by sector is summarized in Table 3.1 below:

Table 3.1 : Comparison of Manpower in 2008 by Skill Level and by Sector with the Manpower in 2006 (shown in bracket)

Skill Level	Sector 1	Sectors 2 & 4	Sector 3	Sector 5	Total	
	Manufacturing	Trading, Services and Wholesale	Telecom Services	Design Houses & Govern't Dept.		**Annual Change**
Technologist	836 (1 080)	8 375 (11 111)	1 871 (2 075)	822 (554)	11 904 (14 820)	**-10.4%**
Technician	2020 (2087)	16 776 (13 664)	4 625 (4 311)	2 303 (1 125)	25 724 (21 187)	**+10.2%**
Craftsman	683 (724)	3 878 (3 903)	814 (807)	1 056 (264)	6 431 (5 698)	**+6.2%**
Operative	2882 (5513)	878 (1 109)	113 (148)	147 (16)	4 020 (6 786)	**-23.0%**
Total	6421 (9404)	29 907 (29 787)	7 423 (7 341)	4 328 (1 959)	48 079 (48 491)	**-0.4%**
Annual Change	**-17.4%**	**+0.2%**	**+0.6%**	**+48.6%**	**-0.4%**	

3.5 Figure 3.1 shows the manpower changes by sector of the industry between 2002 and 2008. It also demonstrates the manpower change of the electronics industry during the past several years since the scope of the manpower survey of the industry has been revised significantly.

Figure 3.1 : Manpower Changes by Sector between 2002 and 2008



Manpower Changes by Sector

3.6 Table 3.1 shows that the total manpower of the electronics industry decreased only 412 workers, or by 0.4% over the past two years. It recorded a continued annual but sharp decrease of 17.4% in Sector 1 – Manufacturing, a mild annual increase of 0.2% and 0.6% in Sectors 2 and 4 – Trading, Services and Wholesale, and Sector 3 – Telecommunication Services respectively. On the other hand, the survey showed that there was annual drastic increase of 48.6% in Sector 5 – Design Houses and Government Departments.

3.7 The followings attributed to the manpower changes by sector:

(v) The significant annual manpower decrease in Sector 1 was mainly due to continuous transfer of manufacturing services from Hong Kong to the Mainland and some companies closed their manufacturing services;

(vi) The slightly manpower increase in Sectors 2 and 4 showed that the demand for capital electronics equipment and systems, data processing and tabulating services in the two sectors were stable;

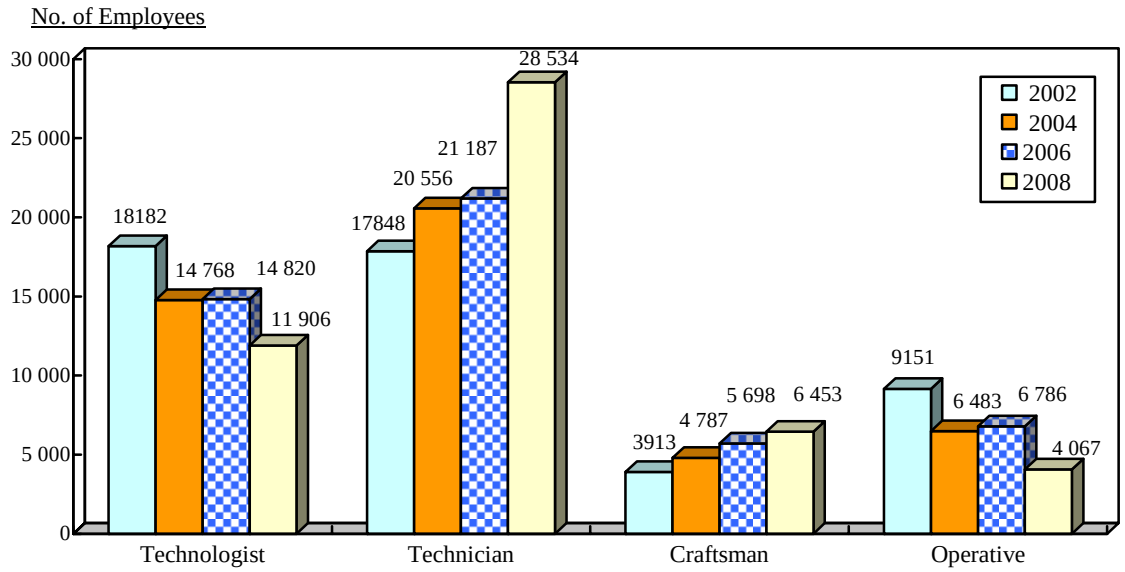
(vii) The mild manpower increase in Sector 3 reflected that the sector was one of the key infrastructures of Hong Kong, which continued to provide new telecommunication services to the public; and

(viii) The drastic manpower increase in Sector 5 was mainly due to the heavy demand for electronics product design and continuous expansion of IC design business in the sector.

Manpower Changes by Job Level

3.8 The manpower change by job level from 2002 to 2008 is shown in Figure 3.2:

Figure 3.2 : Manpower Changes by Job Level between 2002 and 2008



3.9 Figure 3.2 shows the continuous decrease of manpower in technologist and operative workers while the continuous increase in technician and craftsman. The survey also revealed a significant decrease of technologists but high demand for technicians and continuous increase of craftsmen between 2006 and 2008. The followings attributed to such manpower changes by job level:

(i) The annual decrease of 10.4% of technologists might be due to the continuous restructuring of the wage level of technologists and technicians to cope with the business environment of the electronics industry over the past two years, especially in Sectors 1, 2 and 3. In the period, new technicians were usually recruited to replace those technologists who were laid off by companies/retired from work. The only raise of technologists in Sector 5 was the results of high demand of electronics design products and continuous expand of IC design business, which usually required high skill level workers;

(ii) The significant annual increase of 10.2% of technician was attributed by the same reason mentioned in (i) and the increase in business in Sector 5. Besides, the survey also revealed that a total of 2 588 Sales Technicians were employed in the new Sector 6 – 8 large retails shops for electronics products; and

(iii) The annual increase of 6.2% of craftsmen was mainly due to the increase in business in Sector 5.

Business Outlook

Whole Industry

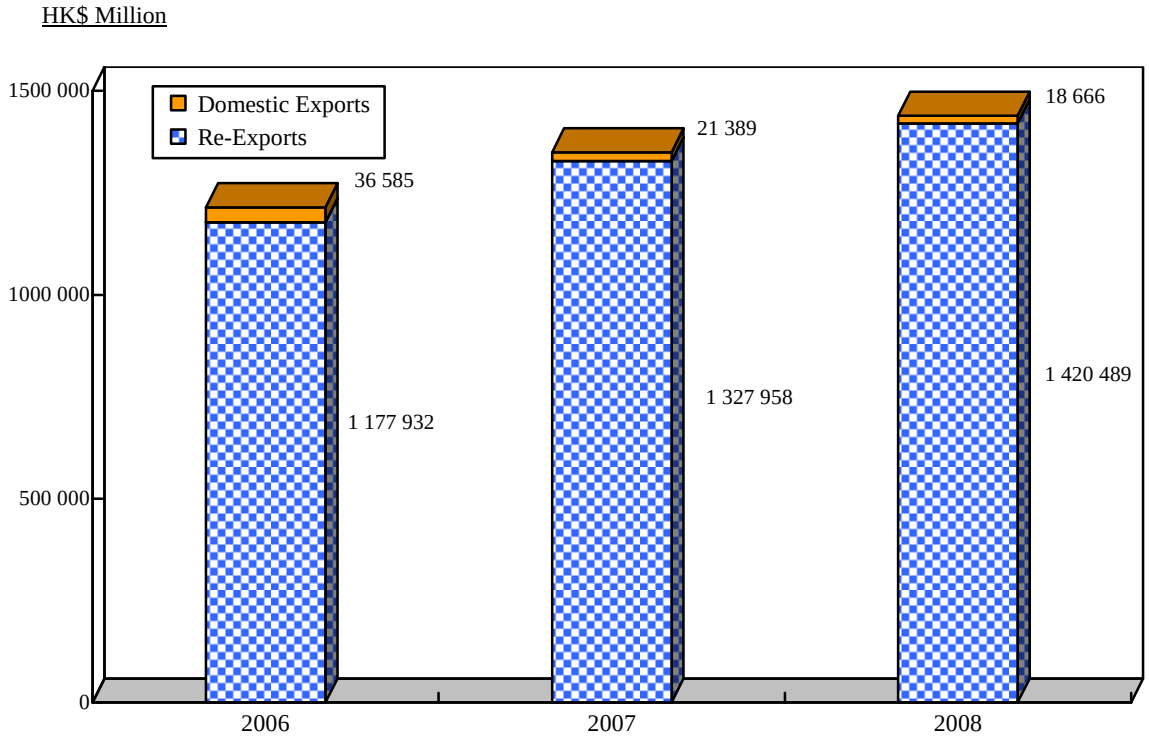
3.10 The electronics industry is still the largest merchandise export earner of Hong Kong. In 2008, the total exports of electronic products surged by 7% over the previous year to HK$1,420,489 million, despite the outbreak of the financial crisis in September 2008. Details of the export values of electronic products between 2004 and 2006 are shown in Table 3.2 and Figure 3.3.

Table 3.2 : Export Values of Electronic Products

Electronic Products	Value (HK$ Million)		
	2006	2007	2008
Domestic Exports	36 585	21 389	18 666
Re-Exports	1 177 932	1 327 958	1 420 489
Total Exports	1 214 517	1 349 347	1 439 155

Source : Hong Kong External Merchandise Trade Statistics, Census and Statistics Department

Figure 3.3 : Export Values of Electronic Products



3.11 The outbreak of the financial crisis in September 2008 caused deteriorating conditions in the worldwide economy and financial system. It also had a great impact on Hong Kong electronics industry. Like the other governments over the world, the Hong Kong Special Administrative Region (HKSAR) Government had imposed specific options to address the challenge raised by the financial crisis to overcome it and tried to turn it into new business opportunities and to enhance Hong Kong's competitiveness. The main specific options include the followings:

(a) The provision of liquidity assistance to the banking system, provision of full deposit guarantee and establishment of a Continent Bank Capital Facility;

(b) The extension of flexibility in the use of the loans under the SME (small and medium enterprises) Loan Guarantee Scheme and the guarantee period for the Working Capital Loan together with the setting up a Special Loan Guarantee Scheme;

(c) Gradually starting the 10 major Infrastructure Projects aiming for economic growth;

(d) The provision of Hong Kong's technological development through financial and infrastructural support, manpower training and co-operation with the Mainland;

(e) Making electronics sector still one of the key development areas in the Science Park Project and the exploration of feasibility of and the development plans for Phase 3 of the Science Park;

(f) The consideration of the potential and feasibility of developing a fourth Industrial Estate; and

(g) The establishment of an $18 billion Research Endowment Fund for increasing research capacity and more high value-added enterprises to Hong Kong.

3.12 In December 2008, the Central Government introduced 14 measures to support Hong Kong's financial stability and economic development after its introduction a Renminbi 4-trillion stimulus package in November. Also, with the existing benefit of zero imported tariffs in the Mainland since the implementation of the third phase of the Mainland and Hong Kong Closer Economic partnership Arrangement (CEPA III) in January 2006, and following China's accession to the WTO in December 2001, the opening of the Mainland market still provides considerable opportunities for Hong Kong firms.

3.13 In view of the above measures, supports and opportunities, the Training Board believes that the Hong Kong electronics industry will be benefited. From the past experience, the Training Board also believes that the Hong Kong electronics industry will be the first lot of industries to be recovered from the present financial meltdown.

3.14 However, the Mainland's Labour Contract Law together with Processing Trade Policy and the growing popularity of green concept resulting the tightening of environment laws in China and other countries, including the Directive on WEEE (Waste Electrical and Electronic Equipment) and the Directive on RoHS (Restriction of Hazardous Substances), had imposed great pressure on Sector 1 (Manufacturing) in the past years. It is expected that such pressure will continue in the coming years.

3.15 Also, the sharp increase of the appreciation of Renminbi, rise in wage, taxes and duties, and price increase in energy and materials will still make the operating cost at a high level. On the other hand, other than the Mainland enterprises, other Asian manufacturers have continuously posed a strong competition to Hong Kong electronics manufacturing sector.

3.16 Hong Kong will continue to be a popular sourcing centre for parts and components as well as high-end consumer electronics products. In view of the continuous increase in vehicle production in the Mainland, there will be a growing demand of car audio and related products as well as electronics components in automobiles. Taking the merits of LEDs (Light Emitting Diodes) of light weight, small size, long life operation and energy saving, they are widely used in various application areas like road signage, message board, lighting and displays. In the near future they will become key components in the industry when their price goes down.

3.17 The close business nature of Sector 2 (Trading & Services), Sector 4 (Wholesale) and the new Sector 6 (Retail Shops for Electronics Products) will face the same impact of the financial crisis. However, the Training Board believes that the Sectors will be benefited by measures imposed by the Hong Kong Government and the Central Government that they will be the first sectors recovered from the current economic downturn when it comes to an end. In Sector 3 (Telecommunication Services), the Training Board considers that it will be quite stable as new telecommunication services will continue to provide to the public.

3.18 The Training Board considers that the design houses in Sector 5 also suffer from the financial crisis but they will continue to develop their own products as to maintain their competitiveness in the market. On the other hand, IC design will continue to have valuable contributions to the manufacturing sector. In view of the well protection of intellectual property in Hong Kong and vast design experience with good reputations, the IC design sector will continue to grow in future.

Product Trend

3.19 Amid the rapid growth of broadband Internet access, “wireless connection at anywhere and anytime” is a common wireless application concept in designing electronics products. Wi-Fi (Wireless Fidelity, wireless LAN) technology is a popular choice for wireless access to the Internet. The Hong Kong SAR Government has launched GovWiFi in July 2007 to provide free wireless Internet access service to all citizens by installing Wi-Fi facilities at over 350 designated government premises. On the other hand, HSDPA (High Speed Download Packet Access) and mobile WiMAX (Worldwide Interoperability for Microwave Access) become the proven technology for high speed mobile broadband connection through the Internet. Bluetooth technology is the preference for short-distance wireless communication between different electronics devices like computers and mobile phones. As person-to-person communication grows rapidly, PC and 3G smartphone embedded with HSDPA or WiMAX technology are the prominent products in the coming years. Mobile TV is another potential key product. Also, 3G-LTE (Long Term Evolution) and WiMAX are the potential technology for future 4G mobile phone communication.

3.20 The Internet has been developed as the global as well as local platform for information, communication, interaction and entertainment. IPTV (Internet Protocol Television) digital services and VoIP (Voice over Internet Protocol) for delivery of voice/phone communication over the Internet are in growing demand. On the other hand, on-line game through the Internet becomes more popular. However, with the continuous introduction of new video game stations with popular applications such as e-mail and shopping, the electronics toys and games are still the demanding products both for youngsters and adults.

3.21 Regarding consumer electronics products, especially in the audio-visual sector, digitalization with portability and convergence is still the development trend. In particular, digital camcorders and digital cameras with enhanced features are in strong demand. The other important market is home/personal multimedia entertainment sector. Following the success of DVD player and recorder, the latest development of Blu-ray DVD player and recorder, the well-received MP3, MP4 and digital photo frame installed with various functions like radio, digital voice recording, movie/motion picture playback at different formats and e-book reading, have become customers’ favour.

3.22 Since the digital television broadcasting (DTV) in Hong Kong staring from 31 December 2007, HDTV (high-definition of 1080 resolution) set-top-box and digital TV (iDTV) are still expected in strong demand in the coming years. As the US will phase out its analogue TV broadcasting by early 2009 and most of EU member states will complete the switch of analogue to digital broadcasting by 2010, the related HDTV set-to-box and digital iDTV will be further increased in heavy demand. With the advancement of digital display technology and mature production skill, wide-screen of high-definition TVs employed liquid crystal display and plasma display technology are in great demand.

3.23 In past years, there was a strong demand for computer for business, school and home. PC has become a personal work tool and the Wi-Fi enabled notebook has further developed into a communication device. The requirement of desktop computers has declined and that for notebooks has increased rapidly. Recently, the very attractive pricing for low-cost notebook, known as netbooks, are gradually in a great demand.

Future Manpower Demand

Historical Manpower Requirement

3.24 Based on the previous historical trend and normal business outlook of the electronics industry, and its capability of manpower absorption, the Training Board forecasts that there will be a steady of manpower increase for the coming 3 years (2009 -2011). Also, the Training Board expects a low turn-over rate of manpower in the coming three years and suggests the normal natural wastage rate of 3% used for the loss of manpower of industry, i.e. workers leaving the electronics industry through retirement, migration to other industries and other causes. Taking the above into consideration as well as employers' forecast on manpower requirement in 2009 collected from the survey, the Training Board has estimated, by using the Adaptive Filtering Method for the manpower projection, the additional manpower required by the electronics industry for 2009 - 2011 as below:

Table 3.3: Annual Manpower Demand in the Electronics Industry from 2009 to 2011
(Historical Manpower Requirement)

Job Level	Annual Average Additional Demand for Employees
Technologist	680 - 830
Technician	1 237 – 1 511
Craftsman	431 - 527

With Consideration of 2008 Financial Crisis

3.25 The field work of the 2008 manpower survey completed in September 2008, just before the outbreak of the worldwide financial crisis triggered by the US sub-prime mortgage problems. The crisis later caused major global economies into recession. At present, it seems that there are no indications when the current downturn will end. However, based on the past experience and the measures taken by the Hong Kong SAR Government and the Central Government, the electronics industry will be benefited and will soon be recovered from the economic downturn. The Training Board has a cautious optimistic view that the electronic industry will then start to pick up business. On the other hand, the Training Board has observed that in 2008 there was a significant increase in number of students enrolled in engineering courses at universities. Thus, the Training Board recommends employers to maintain enough and well equipped manpower ready for the economy recovery.

3.26 Based on Members' experience and knowledge of the manpower characteristics of the industry together with the economic situation and expectation, the Training Board has estimated that the manpower demand of the electronics industry for the coming year, 2009, will be just for the training of wastage (at the wastage rate of 3%). It is given in Table 3.4 below. A breakdown of the training requirements into principal jobs is shown in Appendix 10.

Table 3.4: Estimated Training Requirement for 2009 (with Consideration of 2008 Financial Crisis)

Skill Level	Annual Training Demand
Technologist	321 - 393
Technician	770 - 942
Craftsman	174 - 213

3.27 Expecting a mild growth in manpower demand of the electronics industry from 2010 to 2011, the Training Board has also estimated the average annual training requirements at technologist, technician and craftsman levels for the 2 years to cover both growth and wastage. It is shown in Table 3.5 below. A breakdown of the training requirements into principal jobs is shown in Appendix 10.

Table 3.5: Average Annual Estimated Training Requirements for 2010 – 2011 (with Consideration of 2008 Financial Crisis)

Skill Level	Annual Training Demand
Technologist	641 - 784
Technician	1 173 - 1 433
Craftsman	410 - 501

3.28 The Training Board will conduct another manpower survey of the electronics industry in 2010 to review and update the manpower requirements of the industry.

SECTION IV

RECOMMENDATIONS

4.1 The global financial crisis happened in 2008 and continued to impact major global economies in 2009 and it seems that there are no indications when it will come to an end. In the meantime, the Hong Kong SAR Government and the Central Government have introduced a series of measures to ensure the stability of financial institution and market to bolster public confidence. In view of these measures and the past experience, the Training Board has a cautious optimistic view that the electronics industry will not be so severely affected and will be the first lot of industries to be recovered from the economic downturn. Thus, the Training Board recommends the following measures for employers to consider preparing for the recovery from present economic downturn:

(i) To re-engineer and streamline business to make company more effective and efficient than before;

(ii) To further strengthen the overall skill level and competency of the staff, especially the technical workforce, through appropriate training in order to emerge from the financial crisis as a much stronger and competitive organisation;

(iii) To continue to explore new business in the most cost effective way so as to strengthen market share;

(iv) To continue to maintain and to deepen strong partnership with important customers and to establish new partnership with potential customers; and

(v) To develop green electronics products consuming less energy and using recyclable components.

4.2 Regarding the strength of skill and competency of staff, the Training Board suggests that on top of the individual company's training needs, the "Skills an Employee Need to Enhance" at Appendix 9 will be a good reference on various aspects of training for employers. In this particular situation, employers are recommended to step up their training efforts in order to ensure supply of well equipped manpower to meet the business opportunities from the recovery of present financial downturn. The Training Board also recommends Vocational Training Council and other training organizations to keep a close view on the above training needs of the electronics industry and provide such needs in time.

Annual Intake of Trainees

4.3 At the time of the survey, there were only 52, 69 and 159 trainees respectively at the technologist, technician and craftsman levels. Since it normally takes two to four years to train a technologist and three to four years a technician or a craftsman, it is evident that the present training efforts provided by employers are insufficient to satisfy the industry's needs.

4.4 The Training Board recommends that the industry as a whole should embark on a training programme of a scale as set out in paragraph 3.26 for 2009 and paragraph 3.27 for 2010 – 2011. A breakdown of the training requirements into various principal jobs is given at Appendix 10. For manpower planning at the company level, individual employers are requested to note that the volume of training when expressed in terms of existing manpower represents an average annual intake of trainees of about 6.2%, 4.7% and 7.2% respectively of the total number of technologists, technicians and craftsmen presently employed.

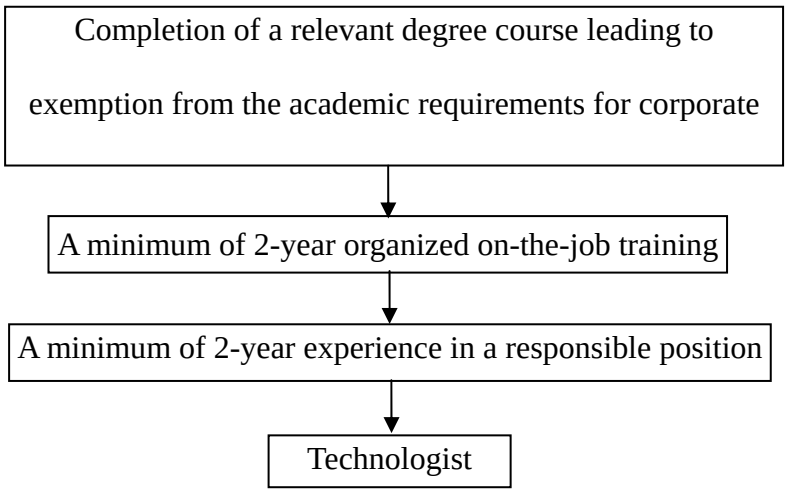
4.5 The recommended training routes for technologists, technicians and craftsmen are outlined in the following paragraphs.

Training of Technologists

4.6 A technologist is a person who has the qualifications and experience equivalent to those required for corporate membership of a professional institution. He should be competent in analyzing and solving a wide range of technical problems. Furthermore, he should be able to assume personal responsibility for the development and application of engineering principles, exercise original thought and judgment, follow progress in his field of technology, apply the latest techniques, supervise and develop his sub-ordinates.

4.7 Technologists play an important role in bringing about improvement in management and technological innovations. The Training Board recommends that technologists should be trained via the following route:

Figure 4.1 : Training of Technologists



4.8 A number of local educational institutions funded by the University Grants Committee (UGC) offer various degree courses in electronic engineering and related disciplines. The following table shows the estimated number of graduates from these full-time engineering degree courses in 2009/10 and 2010/11:

Table 4.1: Estimated Number of Graduates from UGC-funded Institutions

Full-time Degree Programme	Estimated Number of Graduates	
	2009/10	2010/11
Electronic Engineering	400	406
Computer Engineering	195	194
Information engineering	206	224
Electronic and Communication Engineering	94	111
Electronic and Information Engineering	96	98
Information & Communication Engineering	23	32
Internet & Multimedia Technology	53	48
System Engineering & Engineering Management	122	87
Total	1 189	1 190

4.9 The forecast demand for related technologist level jobs (Electronics Engineer, Manufacturing/QA Engineer and System Analyst) in the industry is about 554 – 678 annually in the next three years. The supply of graduates from electronic engineering and related disciplines should be able to meet the forecast demand. In general, the graduates also take up electronics engineering and related jobs in other industries such as electrical and mechanical services, information technology and manufacturing.

Engineering Graduate Training Scheme (EGTS)

4.10 To bring about more well-structured practical training opportunities in local industries for engineering graduates, the Committee on Training of Technologists of the Vocational Training Council is operating a subsidized training scheme to provide engineering graduates with 18 months practical training of a standard acceptable for corporate membership of the Hong Kong Institution of Engineers. Each graduate receiving training under the scheme is granted a subsidy through his employer as part of his salary and the training progress is monitored by the Committee. The Technologist Training Unit of the Council operates a free placement service to help employers recruit graduates, and graduates obtain opportunities for training. The Unit also offers assistance to employers on all matters concerning the training of engineering trainees. The Training Board strongly recommends employers to contact this Unit and to participate in the scheme.

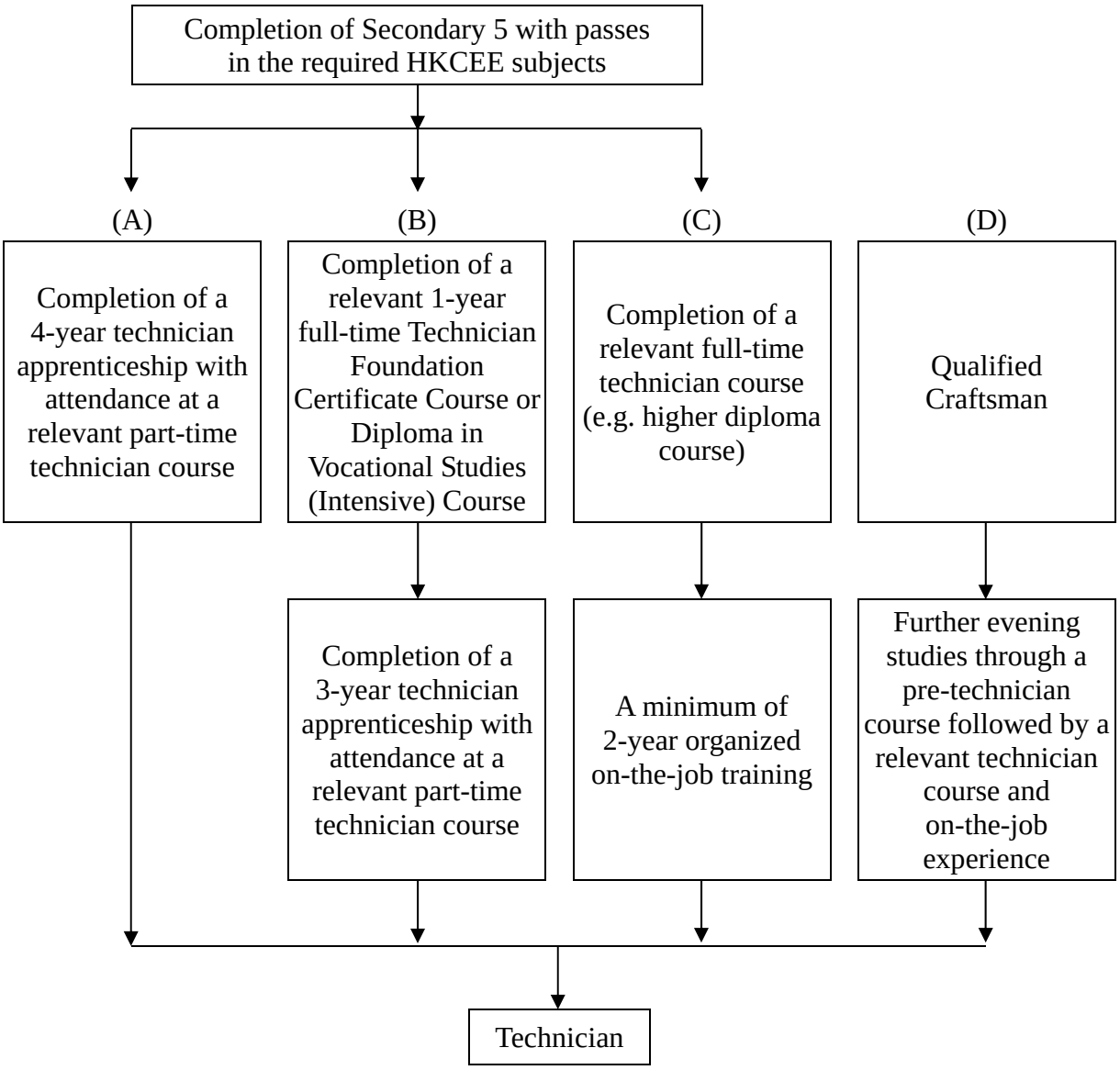
New Technology Training Scheme (NTTS)

4.11 Since 1992, the Vocational Training Council has been operating the New Technology Training Scheme to provide assistance to companies in Hong Kong that wish to have their staff trained in a technology that would be useful to their business. In the context of the scheme, new technologies include those which are not widely applied in Hong Kong and the absorption and application of which will benefit Hong Kong. Any employer in Hong Kong wishing to acquire a new technology for industrial and commercial application may apply for training grant under the Scheme. The Council, with the assistance of the Hong Kong Productivity Council and other organizations, also offers assistance to employers in identifying suitable training opportunities. The Training Board urges employers to make good use of the Scheme.

Training of Technicians

4.12 A technician is one who occupies a position between the technologist and the craftsman. His education, training and practical experience should enable him to apply proven techniques to solve technical problems. His is expected to carry a measure of technical responsibility, normally under the guidance of a technologist. The routes available for training technicians are shown in Figure 4.2.

Figure 4.2: Training of Technicians



4.13 The Hong Kong Polytechnic University and the Hong Kong Institute of Vocational Education (IVE) of the VTC offer a range of higher diploma courses in electronic engineering and related disciplines. The following table shows the estimated number of graduates from the relevant full-time higher diploma courses of these two institutions:

Table 4.2: Estimated Number of Higher Diploma Graduates

Full-time Higher Diploma Programme	Estimated No. of Graduates	
	2009/10	2010/11
Electronic and Communications Engineering	99	102
Electronic & Information Engineering	55	41
Digital TV and Motion Picture Engineering	58	67
Computer and Information Engineering	56	74
Lifestyle Electronics	60	-
Internet/Multimedia Engineering	59	75
Multimedia Design & Technology	116	122
Total	503	481

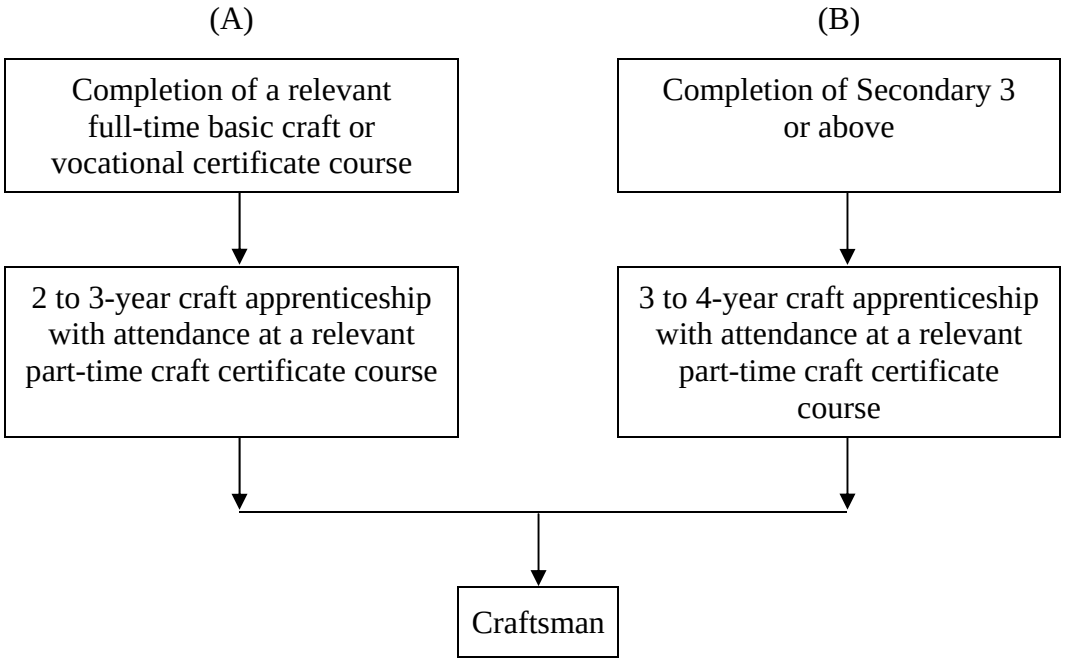
4.14 The Electronics Industry Training Centre of the VTC also offers a 1-year full-time Technician Foundation Certificate Course in Electronics and a 1-year full-time Diploma in Vocational Studies-Telecommunication Support (Intensive) (DVS-I) Course for Secondary 5 school leavers. The estimated number of graduates from these two courses is about 97 in 2009/10 while about 65 and 50 of new technician programme in 2010/2011 and 2011/2012 respectively. In 2009/2010, the training Centre will start to offer a Multi-Entry-Multi-Exit (MEME) Diploma in Vocational Education (DVE) Programme – Digital Electronics Technology Stream. The expected number of graduates from the course is about 50 annually from 2010/2011.

4.15 The forecast demand for related technician level jobs (Electronics Technician, Sales technician, Draughtsman, Manufacturing/QA Technician, Programmer, and Web Developer/Designer) in the industry for 2010/2011 is 1 038 – 1 268 annually. The total supply of Higher Diploma graduates and training centre technician course graduates is about 546 – 600 which is lower than the forecast demand. However, some of the technician jobs may be filled by the training of secondary school leavers through apprenticeship and internal promotion of experienced craftsmen. It is noted that there were 69 technician trainees in the industry at the time of the survey, and a total of 158 employees were promoted to the technician level jobs in the twelve months prior to the survey.

Training of Craftsmen

4.16 A craftsman is a skilled worker who is able to apply a wide range of skills to his work with minimum direction and supervision. He requires not only practical skills but also related theoretical knowledge to enable him to adapt himself to new technologies. A proper craft apprenticeship would contain both components. The common routes for training craftsmen are shown in Figure 4.3:

Figure 4.3: Training of Craftsmen



4.17 The Training Board recommends route (A) because the apprenticeship period is shorter and the apprentices have already undergone proper basic training and would be productive right from the start of their apprenticeship.

4.18 The Electronics Industry Training Centre also offers a MEME DVE Programme – Digital Electronics Technology Stream for Secondary 3 school leavers. Some 50 students of the DVE Programme are trained on competence and award of craft for respective jobs in the electronics industry. The forecast demand for related craft jobs (Cable Jointer/Wireman, and Electronics Craftsman) in the industry for 2010/2011 is 306 – 374 annually. The output from the training centre falls short of the projected demand for craftsmen. However, the shortage can be alleviated by training of Secondary 3 school leavers through apprenticeship. It is noted that there were 80 craft trainees in the industry at the time of the survey.

Educational and Training Institutions

4.19 The Hong Kong Institute of Vocational Education of the VTC and Electronics Industry Training Centre, as well as several tertiary institutions offer a wide range of pre-employment and in-service training courses for workers in the electronics industry. The Training Board strongly urges employers in the industry to make full use of the training facilities in these institutions by recruiting their graduates as apprentices/trainees and sponsoring employees to attend relevant upgrading courses.

Hong Kong Science and Technology Parks Corporation

4.20 The Hong Kong Science and Technology Parks Corporation (HKSTP) was established in 2001 by the HKSAR Government to offer one-stop infrastructural support services to technology-based companies and activities in a synergetic manner, ranging from nurturing start-ups through incubation programmes, providing premises and services in the Science Park for applied research and development activities, creating and sustaining a design cluster in the InnoCentre, to offering land and premises in industrial estates for production. The park provides an effective research and development environment and support services to facilitate collaboration and synergy among its tenants under four clusters – electronics, information technology and telecommunications, biotechnology and precision engineering. Advanced facilities include an IC Design Centre, an IC Development Support Centre, a Photonics Centre and a Wireless Communication Test Laboratory. The Training Board urges employers to make good use of the facilities and services offered by the HKSTP, especially those for IC design.

Training Services of the Vocational Training Council

4.21 The Vocational Training Council offers free services to help employers organize the statutory apprenticeship training schemes through which technicians and craftsmen can be effectively trained to meet the needs of the industry. The Training Board recommends employers to contact the Council for assistance in setting up training schemes and recruiting apprentices/trainees.

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電子業
2008 年人力調查報告摘要

緒論

職業訓練局（下稱「VTC」）轄下電子業及電訊業訓練委員會（下稱「本會」）於 2008 年 4 月進行電子業人力調查，以蒐集業內主要職務的最新人力資料。

2. 本會以分層隨機抽樣法，從總數約 4 209 間的業內機構選出 665 間，進行實地調查。從選出機構蒐集所得的調查資料其後以統計方法倍大，以反映業內的整體人力情況。

調查結果

3. 調查發現，2008 年 4 月時本港共有 103 433 名電子業僱員；其中 50 960 名受僱擔任電子工程及相關行業主要職務。按技能等級及機構類別劃分，擔任電子工程及相關行業主要職務的僱員分布如下：

表 A： 各類機構各技能等級的僱員分布情況

門類	技能等級				**總數**
	技師	技術員	技工	操作工	
7. 製造	836	2 020	683	2 882	**6 421 (12.6%)**
8. 貿易及服務	7 984	14 978	3 337	814	**27 113 (53.2%)**
9. 電訊服務	1 871	4 625	814	113	**7 423 (14.5%)**
10. 批發	391	1 798	541	64	**2 794 (5.5%)**
11. 設計公司、有關大學院系及政府部門	822	2 303	1 056	147	**4 328 (8.5%)**
12. 8間大型電子產品零售公司	2	2 810	22	47	**2 881 (5.7%)**
總數 (所佔總人力百分率)	**11 906 (23.4%)**	**28 534 (56.0%)**	**6 453 (12.6%)**	**4 067 (8.0%)**	**50 960 (100%)**

4. 調查期間，僱主填報電子工程及相關行業共有受訓者 280 人，空缺則有 1 425 個，分別佔業內勞動力的 1.0%及 2.8%。僱主亦預測，至 2009 年 4 月時，業內需求 52 480 名從業員，較 2008 年 4 月時增加 1 520 人(3.0%)。

人力變化

5. 電子業在電子及相關學科的主要職務，僱員總數每年增加5.1%，由2006年的48 491人增至2008年的50 960人；不過，若撇除新增的門類六的僱員（2 881人），電子業的僱員總數錄得0.4%的按年減幅，由2006年的48 491人減至2008年的48 079人。行業在門類一（製造）持續每年錄得17.4%的急劇跌幅，至於門類二及門類四（貿易、服務及批發），以及門類三（電訊服務），則分別每年錄得0.2% 和 0.6%輕微增長。另一方面，調查顯示，門類五（設計公司及政府部門）的僱員人數每年激增48.6%。

6 各門類的人手變化原因如下：

(i) 門類一僱員人數每年顯著減少，主因是製造業持續從香港轉移至內地，亦有一些公司結束製造業務；

(ii) 門類二及門類四輕微增加人手，顯示這兩個門類的電子設備及系統，以及資料處理及編製圖表服務，享有穩定的需求；

(iii) 門類三人手溫和增長，反映此門類爲香港主要基礎建設之一，繼續推陳出新，爲市民提供電訊服務；及

(iv) 門類五人手急劇增長，主因是此門類渴求電子產品設計人才，並且不斷擴展集成電路設計業務。

未來人力需求

以往人力需求

7. 依照過往數據、正常的業務前景，以及業界所能吸納的人力資源，本會預測未來三年（2009 至 2011 年）業界所需求的人手會穩步增加。此外，本會又預期同期業界的員工流動率會偏低，建議以正常的 3%自然流失率來估計業界的員工流失情況（即員工因退休、轉業或其他原因而離職）。基於上述情況及調查所得，以及僱主對 2009 年的人力需求預測，本會採用調節過濾法來推算行業的人力需求，估計電子業於 2009 至 2011 年需要增聘人手如下：

表 B： 2009至2011年電子業每年的人力需求
（按過往人力需求推算）

職級	每年平均需增僱員人數
技師	680 - 830
技術員	1 237 – 1 511
技工	431 - 527

2008 年金融危機

8. 是次的電子業人力調查工作於 2008 年 9 月完成，剛好在美國次級按揭問題觸發全球金融危機之前。金融危機後來導致全球多個主要經濟體系步入衰退。目前，仍然未有跡象顯示經濟何時復甦。不過，憑藉過往經驗及香港特區政府和中央政府採取的措施，電子業將會受惠，不久就會復原。本會持審慎樂觀的看法，認爲電子業屆時會重拾升軌。另一方面，2008 年在大學修讀工程學科的學生人數顯著上升，因此建議僱主維持足夠的幹練人手，以迎接經濟復甦。

9. 根據本會委員的經驗及對業界人力性質的認識，以及目前經濟狀況及展望，本會估計電子業來年（2009 年）只會培訓足夠人手來填補流失的員工（按流失率 3%計算），見下表：

表 C: 2009 年的預計培訓需求
（顧及 2008 年金融危機）

技能等級	技能等級
技師	321 - 393
技術員	770 - 942
技工	174 - 213

10. 本會預期電子業的人力需求在 2010 至 2011 年會輕微增長，據此估計這兩年爲應付業務增長和填補流失而需培訓的人手。平均每年需培訓的技師、技術員和技工人數見下表：

表 D: 2010 至 2011 年的每年平均預計培訓需求
（顧及 2008 年金融危機）

技能等級	每年培訓需求
技師	641 - 784
技術員	1 173 - 1 433
技工	410 - 501

建議

11. 全球金融危機在 2008 年爆發，2009 年繼續衝擊著全球主要的經濟體系，現仍未見任何消退跡象。同時，香港特區政府和中央政府推出了一系列措施來穩定金融機構和市場，以增強市民的信心。鑑於這些措施和過往經驗，本會持着審慎樂觀的看法，相信電子業不會受到嚴重影響，將會是率先從經濟不景氣中恢復過來的行業之一。因此，本會建議僱主考慮採取以下措施，以備行業從目前低迷的經濟中復甦：

(i) 重整及精簡業務流程，加強公司運作成效和效率；

(ii) 透過適當培訓進一步提升員工的整體技術水平和能力，尤其是技術人員，令機構能應付金融危機，大增實力和競爭力；

(iii) 繼續以最具成本效益的方式開拓新業務，提高市場佔有率；

(iv) 繼續維繫和加強與重要客戶的伙伴關係，並與潛在客戶建立伙伴關係；及

(v) 開發節能且以可再造零件製造的電子產品，更符合環保原則。

12. 至於員工的技術和能力水平，本會認爲在個別公司的培訓需求之外，報告書內列載的「僱員需要加強培訓的技能」項目甚爲值得僱主參考。在目前的環境，僱主宜加強培訓，以確保經濟復甦再遇商機之時不乏幹練員工。此外，本會建議職訓局及其他培訓機構緊密留意上述的電子業培訓需求，適時配合。

13. 本會將於 2010 年進行另一次電子業人力調查，檢討業內人力需求並更新有關數據。

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第一章

緒　論

電子業及電訊業訓練委員會

1.1　電子業及電訊業訓練委員會是隸屬職業訓練局的法定委員會，由香港特別行政區政府委任，負責與電子業人力培訓有關事宜。本會委員乃由主要行業公會、專業學會、工會、訓練及教育機構，以及政府部門提名代表出任。本會委員名單及職權範圍分別載於附件 A 及 B。

1.2　本會按職權規定，負責確定電子業的人力需求，並向職訓局提出建議，以發展專業教育及培訓設施，應付有關需要。

人力調查

1.3　本會於 2008 年 4 月，爲電子業進行人力調查，收集最新資料。是次調查在政府統計處協助下進行，實地調查後的跟進工作於 2008 年 9 月完成，並於 10 月完成數據處理。

1.4　是次調查蒐集到下列人力統計數據及資料:

(i) 調查期間各主要職務的僱員人數；

(ii) 現有空缺額；

(iii) 受訓僱員人數；

(iv) 僱主預測 2009 年 4 月時的僱員總數；

(v) 僱員的每月平均收入；及

(vi) 僱主認爲僱員宜有的教育程度、訓練方式及訓練期。

1.5　本會亦請僱主填報調查進行前十二個月內，獲得晉升或派往香港以外地區工作超過六個月的技師、技術員及技工人數，以及僱員最需要加強培訓的技能。

調查範圍

1.6 是次調查包括以下六類公司、政府有關部門及教育機構，當中第六類－8 間大型電子產品零售公司爲首先納入的：

第一類：製造

下列產品的製造商：

(i) 計算機及計算設備(HSIC 3822)；

(ii) 晶體管收音機(HSIC 3831) ；

(iii) 電視機及通訊設備(HSIC 3832) ；

(iv) 音響重播及錄音器材(HSIC 3833) ；

(v) 唱機、唱片及錄音帶(HSIC 3834) ；

(vi) 電子零件及元件(HSIC 3840) ；

(vii) 電子玩具(HSIC 3852) ；

(viii) 工業用電子器材(HSIC 3868) ；

(ix) 其他電子產品(HSIC 3873)。

第二類：貿易及服務

(a) 防盜警鐘及內部通訊系統裝置公司(HSIC 5516),

(b) 下列產品的進出口貿易公司：

(i) 科學及專業儀器(HSIC 631805)*；

(ii) 電話系統(HSIC 631821)*；

(iii) 電訊服務(HSIC 631822)*；

(iv) 電器(HSIC 631823)*；

(v) 電腦、電腦週邊設施及套裝軟件 (HSIC 631824)*；

(vi) 辦公室器材(HSIC 631825)*；

(c) 資料處理及製表服務公司(HSIC 8333)*；

(d) (a)至(c)以外的其他電子工程服務公司。

第三類：電訊服務

(a) 有線固定通訊網絡服務公司(HSIC 732101)；

(b) 其他固定通訊網絡服務公司(HSIC 732199)；

(c) 傳呼服務公司(HSIC 7322)；

(d) 流動通訊服務(HSIC 732901)；

(e) 互聯網接駁服務公司(HSIC 732902)；

(f) 衛星通訊服務公司(HSIC 732903)；

(g) 電台、電視台及錄製室(HSIC 9411)。

第四類：批發

下列批發公司：

(a) 電話系統(HSIC 611821)；

(b) 電訊設備（不包括電話系統）(HSIC 611822)；

(c) 電器（不包括機械、辦公室及電訊器材）(HSIC 611823)；

(d) 電腦、電腦週邊設施及套裝軟件(HSIC 611824)；

(e) 辦公室器材（不包括電腦、傢具及固定裝置）(HSIC 611825)。

第五類：設計公司、有關大學院系及政府部門

(a) 電子設計公司；

(b) 有關教育機構；

(c) 有關政府部門。

第六類：零售(8 間大型電子產品零售公司)

附註： *(1) HSIC — 香港標準行業分類*

*(2) * 不包括僱用 10 名以下職員的機構，因這些機構技術人員不多。*

1.7 調查前，政府統計處錄得香港電子業六大門類約共有 4 209 間機構。鑑於資源有限，本會採用分層隨機抽樣方法，選出共 665 間機構爲調查對象。調查資料其後以統計方法倍大，以反映業內的整體人力情況。

調查方法

1.8 實地調查進行前兩星期，本會將有關調查文件，包括調查表(附件 C)、附註(附件 D)及主要職務工作說明（附件 E）寄予選出的 665 間機構。本會亦透過本地報章，以及向有關工商組織宣傳，促請僱主合作。

1.9 實地調查期間，政府統計處派員到全部 665 間機構收回填妥的調查表，並於有需要時，協助僱主填寫表格。收回的調查表均經詳細審核，如有需要，會與填覆機構核對。

調查反應

1.10 665 間選出的機構中，405 間填覆調查表，23 間拒絕作答，而其餘 237 間，則已搬遷、結束營業、未能聯絡，或已改變業務性質。是次調查的實際填覆率約 94.6%。

1.11 部分機構只提供粗略的資料，並無詳細列出調查進行時的僱員每月收入、受訓者數目和空缺數目。他們的理由是業務繁忙和不願披露機構的機密資料。

調查報告

1.12 本會於跟進實地調查及處理數據後，於 2008 年 11 月編製統計報告，呈列調查蒐集所得重要人力數據。統計報告其後上載職訓局網站，以便公眾人士參考。

1.13 本報告書詳載是次調查結果、本會對業內的培訓需求預測，以及針對這些需求所提出的建議。報告書內，「僱員」、「從業員」及「人力」均指調查期間所列各主要職務的僱員總數，但不包括受訓者及學徒。「受訓者」指正在接受各種形式訓練的人士，包括已簽署學徒合約的註冊學徒。

1.14　　調查結果反映調查進行期間的電子業人力需求。然而，目前全球金融市場不明朗，可能對電子業人力需求構成明顯影響。參閱報告中的人力資料及推算時應考慮有關背景。

第二章

調查結果摘要

僱員人數

2.1 是次調查顯示，2008 年 4 月時，本港電子業共僱用 103 433 人，其中 50 960 人擔任電子工程及有關學科的主要職務。下列各段只呈列從事主要職務的人力統計數字。

各類機構各技能等級的僱員分布情況

2.2 電子業各類機構各技能等級的僱員分布情況見表 2.1 及圖 2.1、2.2。

表 2.1： 各類機構各技能等級的僱員分布情況

門類	技能等級				總數
	技師	技術員	技工	操作工	
1. 製造	836	2 020	683	2 882	**6 421 (12.6%)**
2. 貿易及服務	7 984	14 978	3 337	814	**27 113 (53.2%)**
3. 電訊服務	1 871	4 625	814	113	**7 423 (14.5%)**
4. 批發	391	1 798	541	64	**2 794 (5.5%)**
5. 設計公司、有關大學院系及政府部門	822	2 303	1 056	147	**4 328 (8.5%)**
6. 零售(8 間大型電子產品公司)	2	2 810	22	47	**2 881 (5.7%)**
總數 (佔僱員總數百分比)	**11 906 (23.4%)**	**28 534 (56.0%)**	**6 453 (12.6%)**	**4 067 (8.0%)**	**50 960 (100%)**

圖 2.1： 各技能等級的僱員分布情況

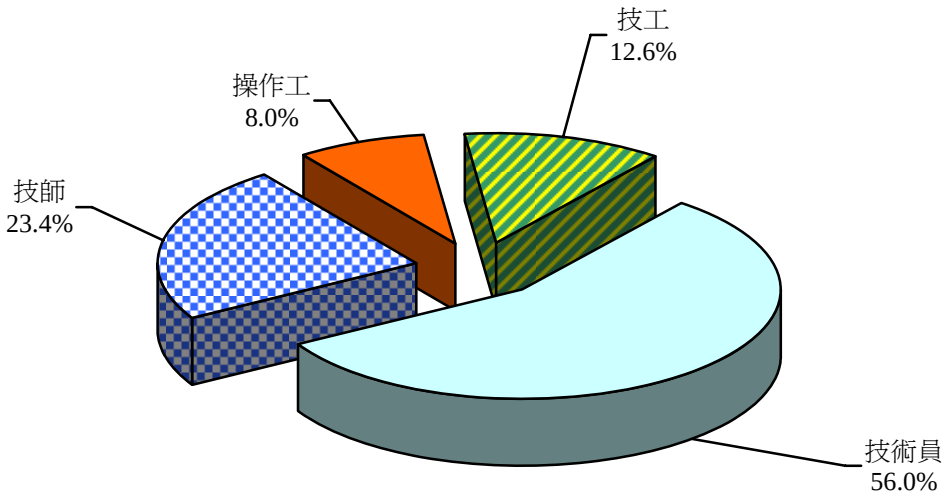
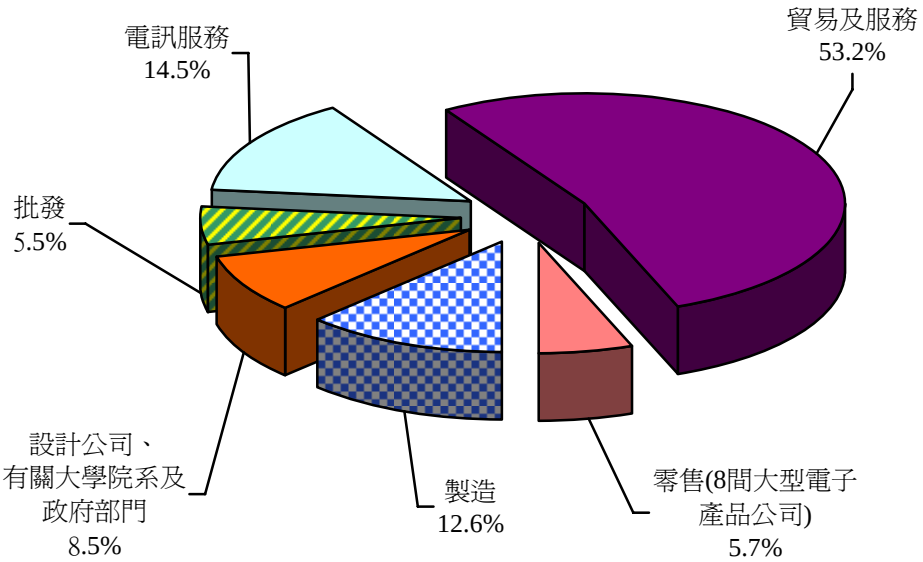


圖 2.2： 各類機構的僱員分布情況



受訓者人數

2.3 調查期間，業內共有受訓者 280 人，各技能等級的受訓者分布情況如下：

表 2.2： 各技能等級的受訓者分布情況

技能等級	受訓者人數(a)	僱員總數(b)	百分率 $\frac{(a)}{(b)} \times 100\%$
技 師	52	11 906	0.4%
技術員	69	28 534	0.2%
技 工	159	6 453	2.5%
操作工	0	4 067	0%
總 數	**280**	**50 960**	**0.55%**

調查期間空缺數目及預測至
2009 年 4 月時的人力

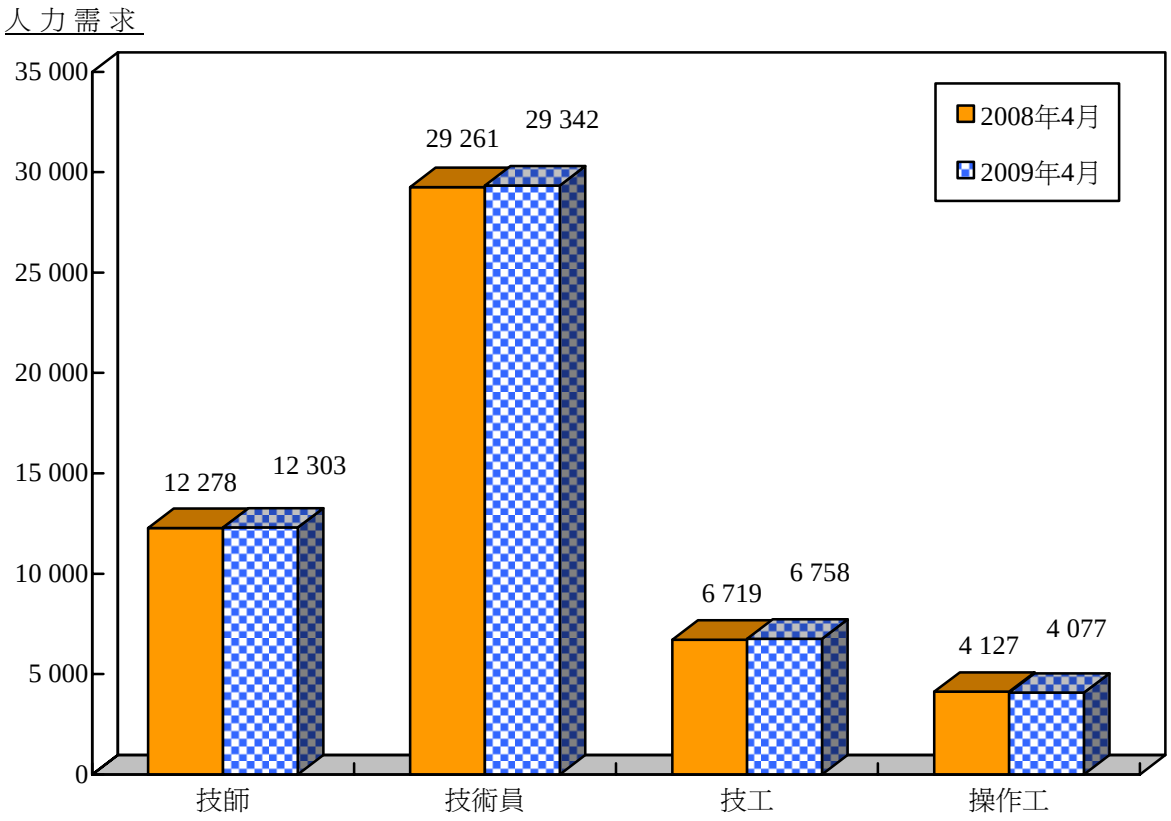
2.4 調查期間，電子業的空缺數目有 1 425 個，佔僱員總數的 2.8%。僱主亦預測至 2009 年 4 月時共有 52 480 名僱員，較 2008 年 4 月增加 1 520 名（0.2%）。

2.5 調查期間的人力需求對比僱主預測至 2009 年 4 月的僱員人數，比較數字見表 2.3 及圖 2.3：

表 2.3： 2008 年 4 月與 2009 年 4 月的人力需求比較

技能等級	調查期間 (2008 年 4 月)			預測至 2009 年 4 月時的僱員總數	預測人力需求增減
	僱員人數	空缺數目	總人力需求		
技 師	11 906	372	12 278	12 303	+0.2%
技術員	28 534	727	29 261	29 342	+0.3%
技 工	6 453	266	6 719	6 758	+0.6%
操作工	4 067	60	4 127	4 077	-1.2%
總 數	**50 960**	**1 425**	**52 385**	**52 480**	**+0.2%**

圖 2.3： 2008 年 4 月與 2009 年 4 月
人力需求的比較



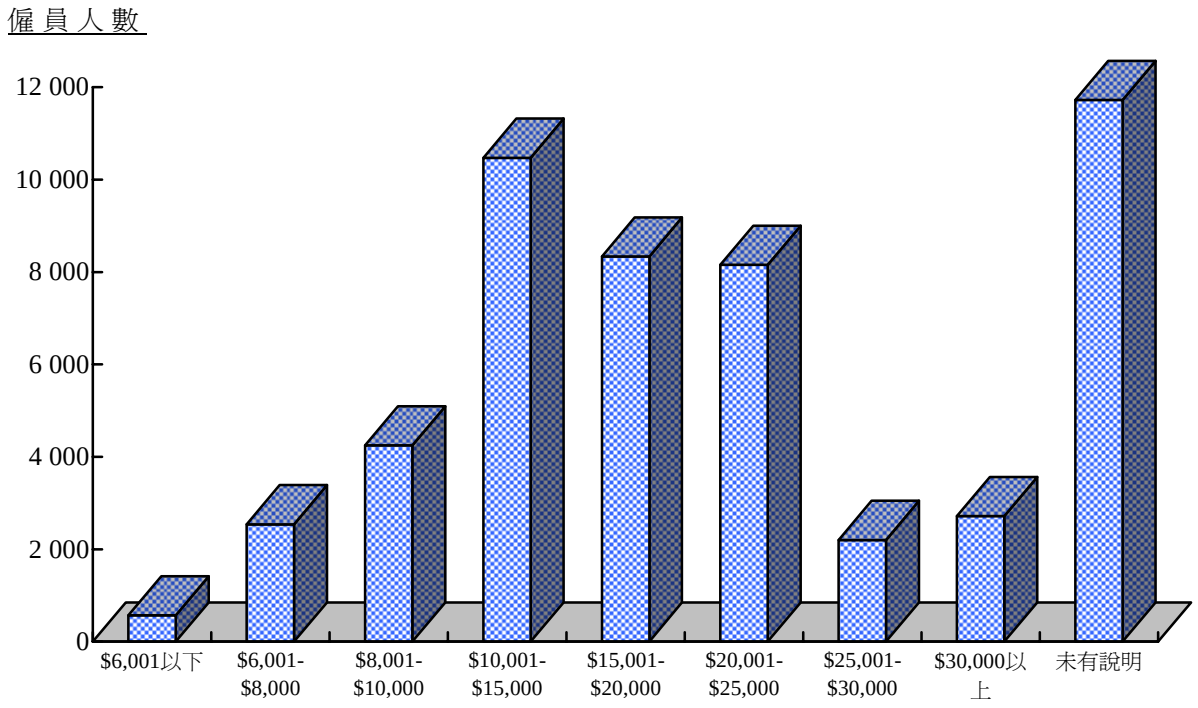
僱員每月總收入幅度

2.6 電子業內僱員每月總收入幅度的分布情況，見表 2.4 及圖 2.4：

表 2.4： 僱員每月總收入幅度的
分布情況

技能等級	$6,001 以下	$6,001-$8,000	$8,001-$10,000	$10,001-$15,000	$15,001-$20,000	$20,001-$25,000	$25,001-$30,000	$30,000 以上	未有說明
技師	-	-	-	448	1 751	2 877	1 272	2 447	3 111
技術員	-	79	1 303	6 823	6 500	5 278	929	269	7 353
技工	-	426	1 924	3 174	84	-	-	-	845
操作工	570	2 034	1 021	29	-	-	-	-	413
總數	**570**	**2 539**	**4 248**	**10 474**	**8 335**	**8 155**	**2 201**	**2 716**	**11 722**

圖 2.4： 僱員每月總收入幅度的分布情況



僱員宜有的教育程度、訓練模式及訓練期

2.7 大部分僱主認爲技師、技術員及技工級僱員宜有的教育程度、訓練模式及訓練期如下：

表 2.5： 僱員宜有的教育程度、訓練模式及訓練期

技能等級	宜有教育程度	宜有訓練模式	宜有訓練期
技師	學士學位	在職訓練	2 至 4 年
技術員	學士學位／高級文憑	在職訓練	2 至 3 年
技工	技工證書	在職訓練／學徒訓練	1 至 3 年

內部晉升情況

2.8 調查前十二個月內，業內共有 362 名僱員獲內部晉升，擔任較高技能等級的工作，各技能等級的分布情況如下：

表 2.6： 內部晉升情況

內部晉升	獲晉升 僱員人數 (a)	晉升職級的 僱員總數 (b)	百分率 $\frac{(a)}{(b)}$ x100%
由技術員 晉升至技師	179	11 906	1.5%
由技工 晉升至技術員	158	28 534	0.6%
由其他技能等級 晉升至技工	25	6 453	0.4%
總 數	**362**	**46 893**	**0.8%**

派駐香港以外地區工作的僱員

2.9 僱主填覆，調查前的十二個月內，曾在香港以外地區工作超過六個月的僱員人數如下：

表 2.7： 曾在香港以外地區工作的僱員人數

技能等級	曾在香港 以外地區工作 的僱員人數 (a)	同一技能等級 的僱員總數 (b)	百分率 $\frac{(a)}{(b)}$ x100%
技師	1 174	11 906	9.9%
技術員	741	28 534	3.0%
技工	5	6 453	0.1%
總數	**1 920**	**46 893**	**4.1%**

僱員最需要加強培訓的技能

2.10　　機構認爲現有僱員最需要加強培訓的三項技能如下：

表 2.8：　僱員最需要加強培訓的技能

技能等級	僱員最需要加強培訓的 3 項技能			
	次序	編號	技能/知識/個人特質	僱員人數
技　師	1.	103	計劃管理	1 989
	2.	413	學習或適應新科技、新知識的能力	1 936
	3.	107	領導能力	1 570
技術員	1.	411	客戶服務技巧	8 650
	2.	413	學習或適應新科技、新知識的能力	3 926
	3.	102	經銷管理	3 387
技　工	1.	411	客戶服務技巧	2 158
	2.	413	學習或適應新科技、新知識的能力	1 875
	3.	302	英文書寫能力	1 328

統計表

2.11　　電子業各類機構各主要職務的詳細人力統計數字分析載於附錄 1 至 7。僱員的每月收入幅度分布情況見附錄 8 及現有僱員最需要加強培訓的技能見附錄 9。

第三章

結　論

3.1　　本會已審視調查結果，認爲有關數據大致能反映調查期間業內的就業情況。

新增門類

3.2　　自 2002 年進行調查之後，本會大幅修訂電子業人力調查的範圍，納入更多門類，以配合業界的轉變。鑑於眾多電子學科相關課程的畢業生入職爲推銷技術員，2008 年的人力調查範圍亦首度涵蓋共八間大型電子產品零售公司，歸類爲「門類六」。同時，調查亦新增「推銷技術員」這項主要職務，以適應業界所需。

人力情況比較

3.3　　2008 年人力調查的實地調查工作於 2008 年 9 月完成，正值美國次級按揭問題觸發全球金融危機。根據調查數據，電子業看來仍未受到金融危機所影響。

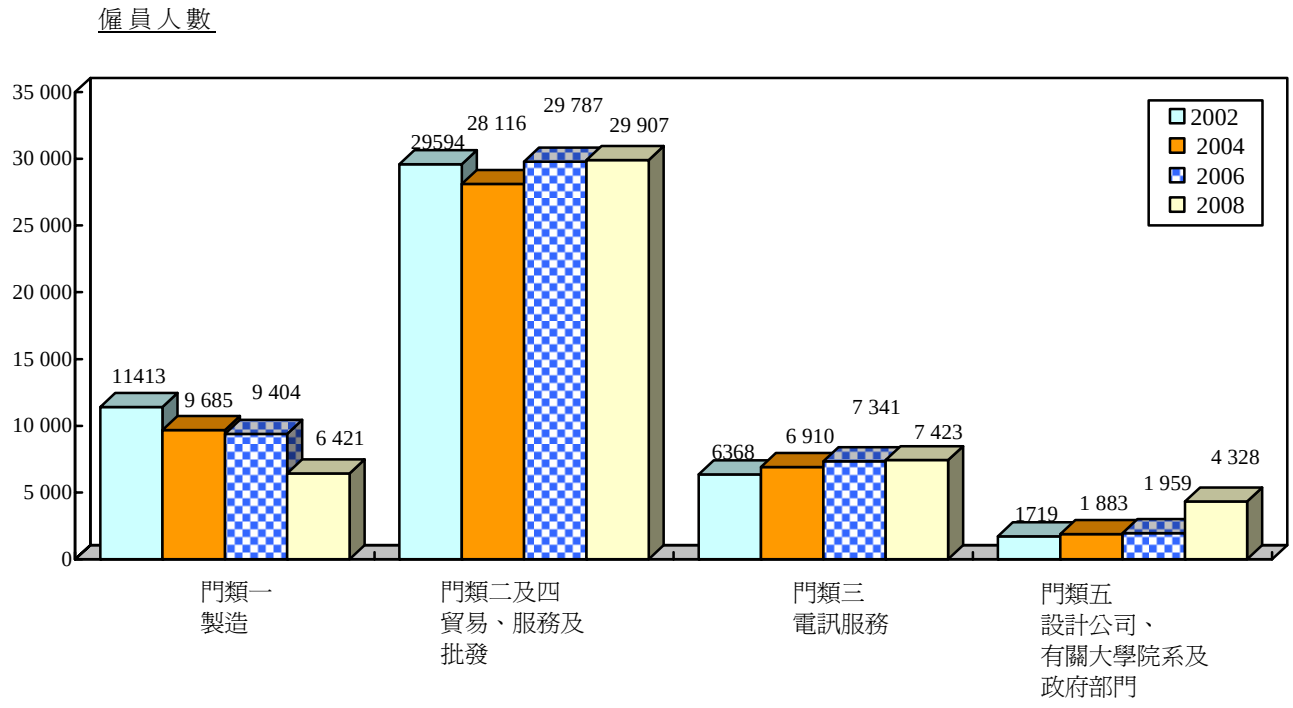
3.4　　電子業在電子及相關學科的主要職務，僱員總數每年增加 5.1%，由 2006 年的 48 491 人增至 2008 年的 50 960 人；不過，若撇除新增的門類六的僱員（2 881 人），電子業的僱員總數錄得 0.4%的按年減幅，由 2006 年的 48 491 人減至 2008 年的 48 079 人。以下段落會按門類及技能等級詳細分析業界的人力變化。由於門類二（貿易及服務）及門類四（批發）的業務及人力性質相似，在比較和分析人力情況時，兩者將會合併考慮；再者，爲更貼切地直接比較各門類的人力情況，新增的門類六並不包括在內。下列表 3.1 按技能等級及門類，撮錄了電子業在 2008 年及 2006 年的人力分布及變化。

表 3.1： 各技能等級及門類 2006 年與 2008 年的人力情況比較
（括弧內爲 2006 年數據）

技能等級	門類一	門類二及四	門類三	門類五	總數	
	製造	貿易、服務及批發	電訊服務	設計公司、有關大學院系及政府部門		**按年變化**
技師	836 (1 080)	8 375 (11 111)	1 871 (2 075)	822 (554)	11 904 (14 820)	**-10.4%**
技術員	2020 (2087)	16 776 (13 664)	4 625 (4 311)	2 303 (1 125)	25 724 (21 187)	**+10.2%**
技工	683 (724)	3 878 (3 903)	814 (807)	1 056 (264)	6 431 (5 698)	**+6.2%**
操作工	2882 (5513)	878 (1 109)	113 (148)	147 (16)	4 020 (6 786)	**-23.0%**
總數	6421 (9404)	29 907 (29 787)	7 423 (7 341)	4 328 (1 959)	48 079 (48 491)	**-0.4%**
按年變化	**-17.4%**	**+0.2%**	**+0.6%**	**+48.6%**	**-0.4%**	

3.5　　圖 3.1 顯示 2002 至 2008 年期間電子業各類機構的人力變化，並反映電子業的人力調查範圍大幅修訂以後，業界在過去幾年的人力變化。

圖 3.1：　2002 至 2008 年電子業各門類的人力變化



各門類的人力變化

3.6 根據表3.1所示，電子業在過去兩年的僱員總數僅減少412人，即0.4%。行業在門類一（製造）持續每年錄得17.4%的急劇跌幅，至於門類二及門類四（貿易、服務及批發），以及門類三（電訊服務），則分別每年錄得0.2% 和 0.6%輕微增長。另一方面，調查顯示，門類五（設計公司及政府部門）的僱員人數每年激增48.6%。

3.7 各門類的人手變化原因如下：

(i) 門類一僱員人數每年顯著減少，主因是製造業持續從香港轉移至內地，亦有一些公司結束製造業務；

(ii) 門類二及門類四輕微增加人手，顯示這兩個門類的電子設備及系統，以及資料處理及編製圖表服務，享有穩定的需求；

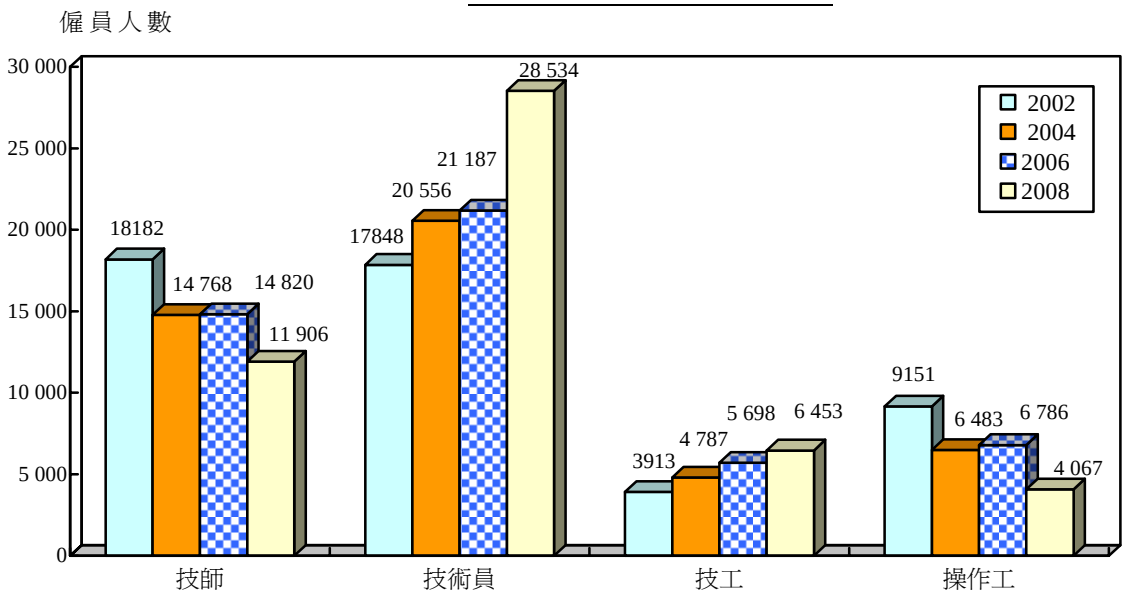
(iii) 門類三人手溫和增長，反映此門類爲香港主要基礎建設之一，繼續推陳出新，爲市民提供電訊服務；及

(iv) 門類五人手急劇增長，主因是此門類渴求電子產品設計人才，並且不斷擴展集成電路設計業務。

各職級的人力情況變化

3.8　　圖 3.2 按職級顯示 2002 至 2008 年期間的人力情況變化：

圖 3.2：　2002至2008年電子業
各職級的人力變化



3.9　　圖 3.2 顯示，技師和操作工的人數持續減少，相反技術員和技工則不斷增加。調查亦發現，2006 至 2008 年期間，技師人數顯著減少，但對技術員的需求卻很大，對技工的需求也持續增加。各職級的人力變化，可歸因於：

(i)　技師人數每年減少 10.4%，可能是由於過去兩年爲適應電子業的營商環境，技師和技術員的薪酬水平不斷調整，情況尤以門類一、門類二及門類三爲甚。在這段期間，機構通常聘請技術員替代被裁或退休的技師。技師人數惟於門類五有所增加，因爲此門類需要大量電子產品設計人員，並且需要高技術人員的集成電路設計業務不斷擴展；

(ii)　技術員人數每年顯著增加 10.2%，可歸因於(i)所述原因及門類五的業務增長。此外，調查又發現，新增的門類六（八間大型電子產品零售公司）共僱用 2 588 名推銷技術員；及

(iii) 技工人數每年增加 6.2%，主要是由於門類五的業務有所增長。

業務前景

行業整體

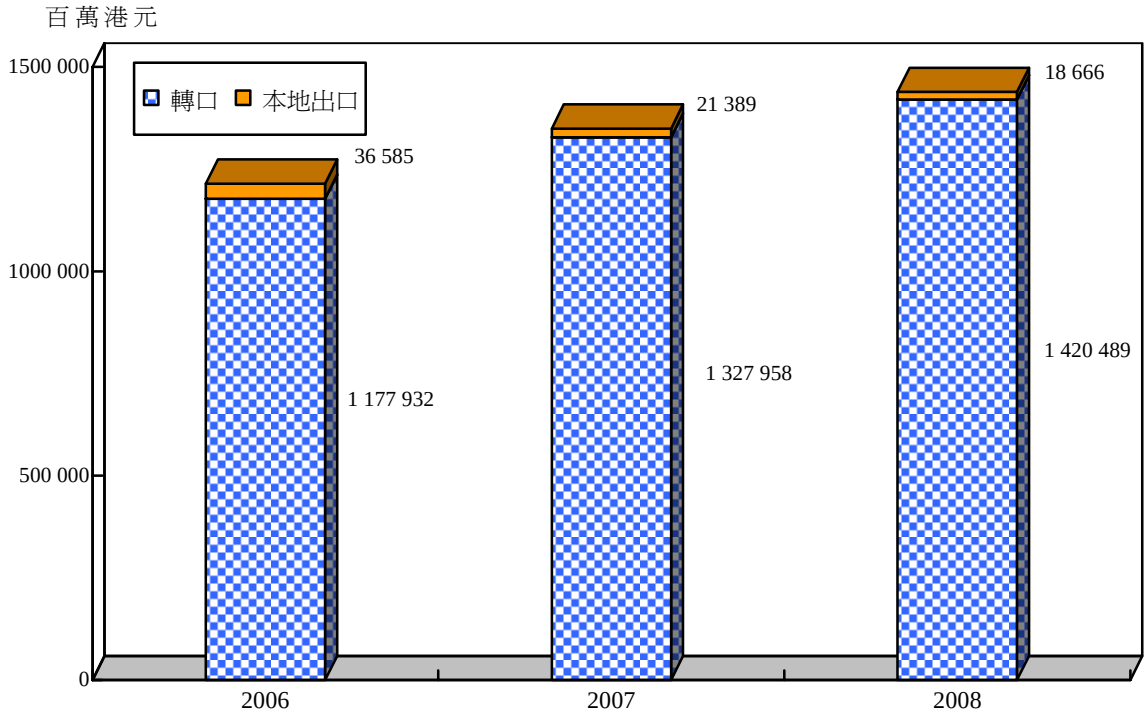
3.10 電子業目前仍是香港賺取最大利潤的商品出口行業。2008 年，縱使 9 月爆發金融危機，但電子產品的出口總值仍較上一年飚升 7%，達 14,204.89 億港元。2004 至 2006 年電子產品的出口貨值詳見表 3.2 及圖 3.3。

表 3.2： 電子產品出口貨值

電子產品	貨值 (百萬港元)		
	2006	2007	2008
本地出口	36 585	21 389	18 666
轉口	1 177 932	1 327 958	1 420 489
總出口	1 214 517	1 349 347	1 439 155

資料來源 ： 政府統計處《香港對外商品貿易統計》

圖 3.3： 電子產品出口貨值



3.11 2008 年 9 月爆發金融危機，令全球經濟及金融體系情況惡化，香港電子業亦受到重大衝擊。正如世界各地政府一樣，香港特區政府採取了特別措施應付金融危機帶來的挑戰，將之轉化而增強香港的競爭力。特別措施主要包括以下各項：

(i) 爲銀行體系提供流動資金貸款，提供百分百存款擔保，並制訂「備用銀行資本安排」；

(ii) 更靈活地運用「中小企業信貸保證計劃」的貸款，延長「營運資金信貸」的擔保期，並設立「特別信貸保證計劃」；

(iii) 逐步展開十大基建項目，以促進經濟發展；

(iv) 透過財務及基建支援、人力培訓及與內地合作，推動香港的科技發展；

(v) 讓科學園計劃仍然重點發展電子業，並探討發展科學園第三期的可行性，及研究有關的發展計劃；

(vi) 考慮及研究發展第四個工業邨的可能性和可行性；及

(vii) 成立 180 億港元的研究基金，以提升香港的研發能力和增加高增值的企業。

3.12 2008 年，中央政府繼 11 月推出四萬億人民幣刺激方案之後，12 月又採取 14 項措施，以鞏固香港金融體系的穩定性，支援本地經濟發展。自從 2006 年 1 月實施第三階段《內地與香港關於建立更緊密經貿關係的安排》（CEPA III）以來，香港一直享受零關稅優惠。而中國亦已於 2001 年 12 月加入世貿組織，因此，內地市場開放，仍會給予香港企業不少商機。

3.13 本會相信，有了上述的措施、支援和商機，香港的電子業將會受惠。根據以往經驗，本會亦相信香港電子業將會是率先從目前金融危機中恢復過來的行業之一。

3.14 然而，內地實施「勞動合同法」和「加工貿易政策」，同時環保意識日趨普及，導致中國及其他國家的環境法規不斷收緊，其中包括《廢棄電器及電子設備指令》（WEEE）及《限制電器及電子設備使用有害物質指令》（RoHS），令到門類一（製造）在過去數年承受巨大壓力，預期這種情況在未來數年將會持續。

3.15 此外，人民幣大幅升值、工資上漲、稅項增加，以及能源和原材料價格上升，將會令到營運成本居高不下。另一方面，除內地企業外，亞洲其他地區的製造商，一直以來都是香港電子製造業的強勁對手。

3.16 香港仍會是零部件及高檔次電子消費產品的熱門採購中心。由於內地的汽車產量不斷增加，汽車音響器材及相關產品，以及汽車的電子零件，需求將會日增。另一方面，發光二極管（LED）輕巧纖細，耐用節能，因而用途廣泛，例如用於道路標誌、招牌、照明設備和顯示器。在不久的將來，當其價格下調，發光二極管就會成爲電子業的重要零件。

3.17 業務性質相近的門類二（貿易及服務）、門類四（批發），以及新增的門類六（電子產品零售公司），在金融危機中將會面對相同的衝擊。不過，本會相信，此等門類會受惠於香港政府和中央政府推行的措施，當經濟復原，就會首先恢復過來。至於門類三（電訊服務），本會認爲將會相當穩定，繼續爲公眾提供創新的電訊服務。

3.18　　本會認爲，門類五中的設計公司也受金融危機拖累，但會繼續開發產品，以保持在市場的競爭力。另一方面，製造業仍會因集成電路設計而獲益良多。由於在香港設有周全的知識產權保護法例和措施，加上業界的設計經驗豐富，信譽昭著，集成電路設計業日後將會持續發展。

產品趨勢

3.19　　寬頻上網服務現正迅速發展，設計電子產品時，「隨時隨地無線接駁」是一個通行的無線應用概念。Wi-Fi（Wireless Fidelity，無線上網、無線區域網）科技，在無線上網服務方面相當流行。香港特區政府於 2007 年 7 月推出 GovWiFi，在逾 350 個指定的政府場地安裝 Wi-Fi 設備，爲全港市民免費提供無線上網服務。另一方面，HSDPA（High Speed Download Packet Access，高速下載分組接入）及流動 WiMAX（Worldwide Interoperability for Microwave Access，微波存取全球互通），已是高速流動寬頻上網服務方面實證有效的科技。另外，藍牙科技是不同類型電子設備如電腦及流動電話，互相進行短途無線通訊時的首選。隨著人際通訊急增，採用 HSDPA 或 WiMAX 科技的個人電腦和 3G smartphone（智能電話），日後將是重點產品。流動電視也是極具潛力成爲另一項重點產品。此外，3G-LTE（Long Term Evolution，長期演進）及 WiMAX 可能成爲未來 4G 流動電話通訊採用的科技。

3.20　　互聯網已發展爲資訊、通訊、互動及娛樂方面的全球及本地平台。IPTV（網絡電視）數碼服務，以及透過互聯網提供話音／電話通訊服務的 VoIP（網絡電話），需求不斷增加。此外，網上遊戲亦日益流行。另一方面，具備電郵及購物等受歡迎功能的新穎電子遊戲機源源不絕應市，以應青少年和成年人均對電子玩具及遊戲有所需求。

3.21　　至於電子消費產品，尤其是視聽器材，發展趨勢仍以可攜性及數碼匯流爲本。具有增強功能的數碼攝錄機及數碼相機尤其銷情暢旺。另一重要市場是家庭／個人多媒體娛樂。繼 DVD 播放機及錄影機廣受歡迎，新近發展的 Blu-ray DVD（藍光光碟）播放機及錄影機、具備各種功能的 MP3、MP4 及數碼相架亦銷情理想，深受消費者喜愛，其功能包括收音機、數碼錄音、播放不同制式的電影，以及電子書等。

3.22　　自從數碼電視（DTV）廣播於 2007 年 12 月 31 日開始在香港實施以來，HDTV（高清晰度電視，達 1080 解像度的高清晰度）機頂盒及數碼電視機（iDTV）預期在未來數年仍會需求甚殷。由於美國將於 2009 年初或以前逐步終止模擬電視廣播，而大部分歐盟成員國亦會於 2010 年或以前從模擬廣播完全轉換爲數碼廣播，有關的 HDTV 機頂盒及數碼電視機，需求將會更爲殷切。隨著數碼顯示器的科技不斷發展，生產技術日趨成熟，採用液晶顯示及等離子顯示科技的寬屏高清晰度電視機，需求量會很大。

3.23　　在過去幾年中，無論是辦公室、學校或家居，對電腦的需求也甚爲熱切。電腦已成爲個人工具，而具 Wi-Fi 功能的筆記簿型電腦，更已發展爲通訊工具。桌上電腦的需求減退，反之手提簿型電腦（notebook）的銷量則迅速增長。最近，定價極爲吸引、名爲 netbook 的低價筆記簿型電腦銷情日趨暢旺。

未來人力需求

過往正常之需求

3.24　　如依照以往數據、正常的業務前景，以及業界所能吸納的人力，本會預測未來三年（2009 至 2011 年）業界人手穩步增加。此外，本會又預期同期的人手流動率會偏低，建議以正常的 3%自然流失率，來估計業界的員工自然流失情況（即員工因退休、轉業或其他原因而離開行業之工作）。基於上述情況，及於調查時收集僱主對 2009 年的人力需求預測，本會採用調節過濾法(Adaptive Filtering Method)來推算行業的人力需求，估計電子業於 2009 至 2011 年需要增聘人手如下：

表 3.3： 2009至2011年電子業每年的人力需求
（按過往正常人力需求推算）

職級	每年平均需增僱員人數
技師	680 - 830
技術員	1 237 – 1 511
技工	431 - 527

2008 年金融危機

3.25 是次的電子業人力調查工作於 2008 年 9 月完成，剛好在美國次級按揭問題觸發全球金融危機之前。金融危機後來導致全球多個主要經濟體系步入衰退。目前，仍然未有跡象顯示經濟何時復甦。不過，憑著過往經驗及香港特區政府和中央政府採取的措施，電子業將會受惠，不久就會復原。本會持審慎樂觀的看法，認爲電子業屆時會重拾升軌。另一方面，2008 年在大學修讀工程學科的學生人數有顯著上升。因此，本會建議僱主維持足夠的幹練人手，以迎接經濟復甦。

3.26 根據本會委員的經驗和對業界人力性質的認識，以及目前經濟狀況與展望，本會估計電子業來年（2009 年）只需要培訓足夠人手，來填補自然流失的員工（按正常流失率 3%計算），詳情見表 3.4。附錄 10 則列載了按主要職務劃分的培訓人力需求。

表 3.4： 2009 年的預計培訓人力需求
（顧及 2008 年金融危機）

技能等級	是年需培訓人數
技師	321 - 393
技術員	770 - 942
技工	174 - 213

3.27 本會預期電子業的人力需求在 2010 至 2011 年會輕微增長，據此估計這兩年爲應付業務增長和填補流失而需培訓的人手。平均每年需培訓的技師、技術員和技工人數詳見下表 3.5。附錄 10 則列載了按主要職務劃分的培訓人力需求。

表 3.5： 2010 至 2011 年的每年平均預計培訓人力需求
（顧及 2008 年金融危機）

技能等級	每年平均需培訓人數
技師	641 - 784
技術員	1 173 - 1 433
技工	410 - 501

3.28 本會將於 2010 年進行下一次電子業人力調查，以檢討行業的人力需求和更新有關數據。

第四章

建　議

4.1　全球金融危機在 2008 年爆發，又繼續在 2009 年衝擊著全球主要的經濟體系，現仍未見任何消退跡象。同時，香港特區政府和中央政府推出了一系列措施來穩定金融機構和市場，以增強市民的信心。鑑於這些措施和過往經驗，本會持着審慎樂觀的看法，相信電子業不致受到嚴重影響，且會是率先從經濟不景氣中恢復過來的行業之一。因此，本會建議僱主考慮採取以下措施，以備行業從目前低迷的經濟中復甦：

(i) 重整及精簡業務流程，加強公司運作成效和效率；

(ii) 透過適當培訓，進一步提升員工的整體技術水平和能力；尤其是技術人員，令機構能應付金融危機，更具實力和競爭力；

(iii) 繼續以最具成本效益的方式開拓新業務，提高市場佔有率；

(iv) 繼續維繫和加強與重要客戶的伙伴關係，並與潛在客戶建立伙伴關係；及

(v) 開發節能且以可再造零件製造的電子產品，更符合環保原則。

4.2　至於員工的技術和能力水平，本會認爲在個別公司的培訓需求之外，於附錄 9 列載的「僱員需要加強培訓的技能」項目甚爲值得僱主參考。在目前的環境，僱主宜加強培訓，以確保經濟復甦再遇商機之時不乏幹練員工。此外，本會建議職訓局及其他培訓機構緊密留意上述的電子業培訓需求，適時配合。

每年的受訓人數

4.3 在調查期間，技師、技術員及技工級的受訓者分別只有 52、69 和 159 人。由於培訓技師通常需時兩至四年，培訓技術員或技工則需要三至四年，目前僱主提供的培訓，明顯未敷行業需求。

4.4 本會建議，整個行業於 2009 年以第 3.26 段所述的規模推行培訓計劃，而 2010 至 2011 年則參照第 3.27 段。各主要職務的培訓需求載於附錄 10。僱主爲機構策劃人力時，應留意平均每年需要受訓的人數，按現有的人手計算，分別約佔現職技師、技術員及技工總數的 6.2%, 4.7% 和 7.2%。

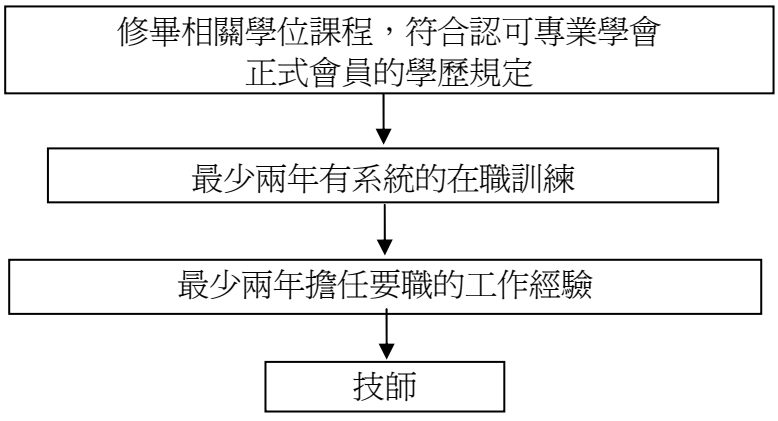
4.5 下文概述技師、技術員及技工的建議培訓途徑。

技師訓練

4.6 技師須具備相當於專業學會正式會員所需的學歷和經驗，且能夠分析和解決各種技術問題。此外，技師亦須負責發展及應用工程原理，具創見和判斷力，緊貼行業的科技發展，採用最新技術，並督導和培訓下屬。

4.7 在改善管理和革新科技方面，技師肩負重任。本會建議循以下途徑訓練技師：

圖 4.1： 技師訓練



4.8 若干由大學教育資助委員會（下稱「教資會」）資助的本地院校，均有開辦各類電子工程及相關學科的學位課程。下表列出這些全日制工程科學位課程在2009/10及2010/11年度的畢業生預計人數：

表 4.1： 預計教資會院校畢業生人數

全日制學位課程	畢業生預計人數	
	2009/10	2010/11
電子工程	400	406
電腦工程	195	194
資訊工程	206	224
電子及通訊工程	94	111
電子及資訊工程	96	98
資訊及通訊工程	23	32
互聯網及多媒體科技	53	48
系統工程與工程管理	122	87
總數	1 189	1 190

4.9 預測未來三年，業界每年約需要招聘554至678名有關的技師級人員（電子工程師、製造／品質保證工程師及系統分析員）。電子工程及相關學科的畢業生人數應可滿足預測需求。這些畢業生普遍亦會在其他如機電工程、資訊科技及製造行業，從事電子工程及相關工作。

工科畢業生訓練計劃（EGTS）

4.10 爲了讓工程科畢業生在本地行業更有系統地實習，職業訓練局轄下的技師訓練委員會現正推行一項資助訓練計劃－工科畢業生訓練計劃（Engineering Graduate Training Scheme, EGTS），爲這些畢業生提供十八個月的實習訓練，程度符合香港工程師學會正式會員的資格要求。受訓者可透過僱主獲得津貼，作爲部分薪金，而實習進度則由技師訓練委員會負責監察。此外，職訓局的技師訓練組免費安排實習，協助僱主招聘畢業生，又幫助畢業生獲取實習機會；該組亦就所有訓練事宜爲僱主提供協助。本會籲請僱主聯絡該組，參與是項計劃。

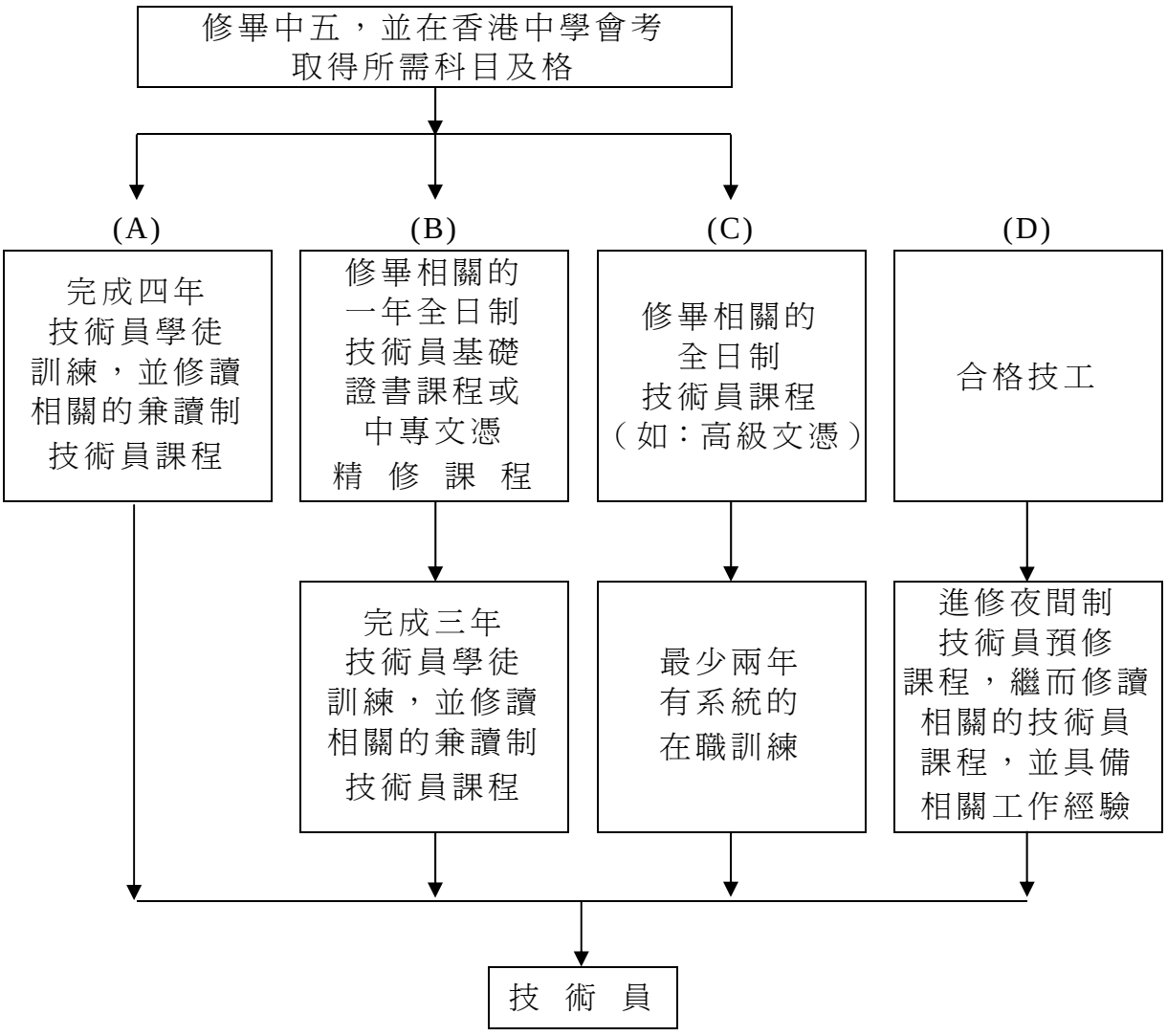
新科技培訓計劃（NTTS）

4.11　　自1992年起，職業訓練局一直開辦「新科技培訓計劃」（New Technology Training Scheme, NTTS），爲有意讓員工接受新科技培訓的本地公司提供協助，冀能有利業務發展。就是項計劃而言，「新科技」指未在香港廣泛應用的科技，而吸納和應用這些科技有助本港工商業發展。本地僱主如欲引進新科技作工商業用途，可申請計劃的訓練津貼。此外，職訓局在香港生產力促進局及其他機構協助下，亦會幫助僱主爲員工提供合適培訓。本會敦請僱主充分利用是項計劃。

技術員訓練

4.12　　技術員的職級介乎技師與技工之間，以其學歷、訓練和實踐經驗，應能運用行之有效的技巧來解決技術問題。技術員一般應能在技師督導下擔當一些技術職責。技術員的訓練途徑見圖4.2。

圖 4.2：技術員訓練



4.13　　香港理工大學及職訓局轄下的香港專業教育學院（IVE）開辦多項電子工程及相關學科的高級文憑課程。下表列出兩間院校的相關學科全日制高級文憑課程畢業生的預計人數：

表 4.2：高級文憑課程畢業生預計人數

全日制高級文憑課程	畢業生預計人數	
	2009/10	20010/11
電子及通訊工程	99	102
電子及資訊工程	55	41
數碼電視及動態影像工程	58	67
電腦及資訊工程	56	74
生活時尚電子產品	60	-
互聯網／多媒體工程	59	75
多媒體設計及科技	116	122
總數	503	481

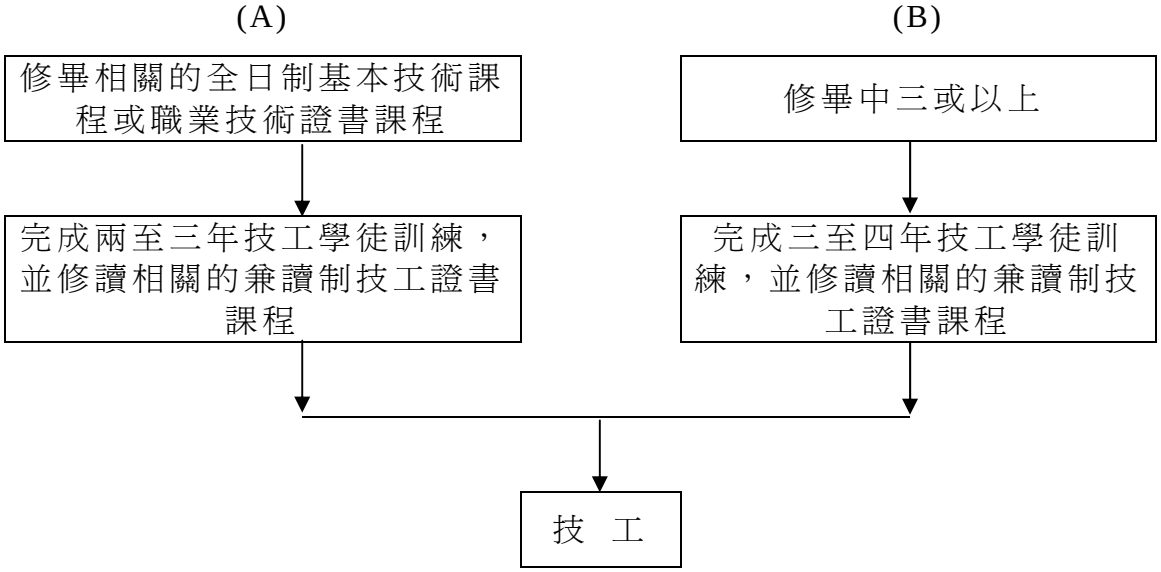
4.14　　職訓局轄下的電子業訓練中心亦爲中五離校生開辦一年全日制電子技術員基礎證書課程，以及一年全日制中專文憑（電訊支援服務）精修課程。兩個課程於2009/10年度預計約有97名畢業生，而於2010/2011 及2011/2012年度，新開辦的技術員課程分別約有65及50名畢業生。電子業訓練中心將於2009/2010年度首次開辦中專教育文憑（數碼電子科技）課程，採取多階進出的修讀模式，預期自2010/2011年度開始，每年約有50名畢業生。

4.15 根據預測，電子業在2010及2011年每年需要招聘1 038 至1 268名技術員級人員（電子技術員、推銷技術員、繪圖員、製造／品質保證技術員、程序編製員及網站開發員／設計員），但高級文憑課程及訓練中心技術員課程的畢業生合共約爲546 至 600人，少於預測的人力需求。不過，部分技術員職位可由參加學徒訓練計劃的中學離校生，以及內部晉升的經驗技工來填補。在調查期間，電子業有69名見習技術員，而調查之前的十二個月內，共有158名僱員晉升爲技術員。

技工訓練

4.16 技工是指有熟練技術的從業員，工作上只須在極少指導和監督下，已懂得運用多種技能。技工除實用技能外，還須具備有關的理論知識，才能適應科技發展，完備的技工學徒訓練會兩者兼顧。圖4.3展示訓練技工的一般途徑：

圖 4.3： 技工訓練



4.17 本會推薦途徑(A)，因爲訓練期較短，而且學徒已接受適當的基本訓練，於學徒訓練之始，即可工作。

4.18 電子業訓練中心採取多階進出的修讀模式，爲中三離校生開辦中專教育文憑（數碼電子科技）課程，約 50 名學員受訓後獲頒技工證書，可以擔任電子業技工。電子業於 2010/2011 年間，估計每年需要招聘 306 至 374 名技工（電纜接駁技工／駁線技工及電子技工），而訓練中心培訓的技工不足此數。不過，可透過學徒訓練計劃，培訓中三離校生舒緩人手短缺。在調查期間，電子業有 80 名見習技工。

教育及培訓機構

4.19 職訓局轄下的香港專業教育學院及電子業訓練中心，以及幾所大專院校，均爲電子從業員提供多類職前及在職培訓課程。本會促請業內僱主聘請這些院校的畢業生爲學徒或見習員，並資助僱員修讀有關的技能提升課程，以充分利用以上的培訓設施。

香港科技園公司

4.20 香港特區政府於2001年成立香港科技園公司（香港科學園），以協作形式爲以科技爲主業的公司及有關活動提供一站式基礎支援服務，包括透過培育計劃培育新成立的科技公司、在科學園內爲應用研發活動提供各種設備和服務、於創新中心開辦設計中心，以及在各個工業邨內提供進行生產所需的用地和廠房。香港科學園提供良好的研發環境及支援服務，以便分屬四個科技領域的入駐公司互相合作並發揮協同效應，這四個領域爲電子、資訊科技及電訊、生物科技，以及精密工程。科學園內的先進設施包括集成電路設計中心、集成電路開發支援中心、光電子開發支援中心，以及無線通訊測試中心。電子業僱主應善用香港科技園公司提供的設施和服務，尤其是集成電路設計方面。

職業訓練局的培訓服務

4.21 職業訓練局免費協助僱主籌辦法定的學徒訓練計劃，藉此有效地培訓技術員和技工，配合行業所需。僱主可聯絡職訓局，就成立訓練計劃及招聘學徒／見習員事宜得到協助。

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Appendices and Annexes

附 錄 及 附 件

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MANPOWER STATISTICS OF THE ELECTRONICS INDUSTRY
電子業人力統計數字
Sector 1: Manufacturing (門類一：製造)

Job Title 職稱	Number of Workers Employed 僱員人數	Number of Trainees 受訓者人數	Number of Vacancies at Date of Survey 調查期間空缺數目	Forecast of Total Workers by April 2009 預測至二〇〇九年四月時的僱員總數
TECHNOLOGIST LEVEL 技師級				
Electronics Engineer 電子工程師	337	-	18	355
Electrical Engineer 電機工程師	49	-	15	64
Mechanical Engineer 機械工程師	124	-	15	139
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	228	-	2	230
Chemical Engineer 化學工程師	12	-	0	12
Product/Graphic Designer 產品／平面設計員	55	-	0	55
System Analyst 系統分析員	31	-	2	33
Sub-total 小 計	836	-	52	888
TECHNICIAN LEVEL 技術員級				
Electronics Technician 電子技術員	656	3	22	681
Mechanical Technician 機械技術員	308	-	9	317
Draughtsman 繪圖員	3	-	-	3
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	242	-	3	245
Supervisor/Foreman/Leader 監督／管工／組長	447	-	-	447
Programmer 程序編製員	53	-	5	58
Web Developer/Designer 網站開發員／設計員	3	-	-	3
Sales Technician 推銷技術員	308	-	34	342
Sub-total 小 計	2 020	3	73	2 096
CRAFTSMAN LEVEL 技工級				
Cable Jointer/Wireman 電纜接駁技工／駁線技工	-	-	-	-
Electronics Craftsman 電子技工	518	6	8	532
Electrician 電氣技工	26	-	1	27
Mechanic 技工	139	-	-	139
Sub-total 小 計	683	6	9	698
OPERATIVE LEVEL 操作工級				
Operator 生產線操作工	2 882	-	48	2 930
Sub-total 小 計	2 882	-	48	2 930
GRAND TOTAL 總 計	**6 421**	**9**	**182**	**6 612**

MANPOWER STATISTICS OF THE ELECTRONICS INDUSTRY
電子業人力統計數字
Sector 2: Trading and Services (門類二：貿易及服務)

Job Title 職稱	Number of Workers Employed 僱員人數	Number of Trainees 受訓者人數	Number of Vacancies at Date of Survey 調查期間空缺數目	Forecast of Total Workers by April 2009 預測至二〇〇九年四月時的僱員總數
TECHNOLOGIST LEVEL 技師級				
Electronics Engineer 電子工程師	4 198	14	104	4 317
Electrical Engineer 電機工程師	291	3	2	293
Mechanical Engineer 機械工程師	483	-	-	483
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	894	-	25	918
Chemical Engineer 化學工程師	4	-	2	6
Product/Graphic Designer 產品／平面設計員	319	-	24	356
System Analyst 系統分析員	1 795	-	86	1 881
Sub-total 小 計	7 984	17	243	8 254
TECHNICIAN LEVEL 技術員級				
Electronics Technician 電子技術員	5 728	57	131	5 854
Mechanical Technician 機械技術員	463	1	20	484
Draughtsman 繪圖員	32	-	2	34
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	421	3	24	448
Supervisor/Foreman/Leader 監督／管工／組長	657	-	1	658
Programmer 程序編製員	2 057	-	170	2 227
Web Developer/Designer 網站開發員／設計員	313	-	-	313
Sales Technician 推銷技術員	5 307	-	106	5 413
Sub-total 小 計	14 978	61	454	15 431
CRAFTSMAN LEVEL 技工級				
Cable Jointer/Wireman 電纜接駁技工／駁線技工	292	18	-	292
Electronics Craftsman 電子技工	2 564	81	96	2 683
Electrician 電氣技工	445	41	-	456
Mechanic 技工	36	-	-	36
Sub-total 小 計	3 337	140	96	3 467
OPERATIVE LEVEL 操作工級				
Operator 生產線操作工	814	-	-	764
Sub-total 小 計	814	-	-	764
GRAND TOTAL 總 計	**27 113**	**218**	**793**	**27 916**

MANPOWER STATISTICS OF THE ELECTRONICS INDUSTRY
電子業人力統計數字
Sector 3: Telecommunications Services (門類三：電訊服務)

Job Title 職稱	Number of Workers Employed 僱員人數	Number of Trainees 受訓者人數	Number of Vacancies at Date of Survey 調查期間空缺數目	Forecast of Total Workers by April 2009 預測至二〇〇九年四月時的僱員總數
TECHNOLOGIST LEVEL 技師級				
Electronics Engineer 電子工程師	1 608	35	17	1 626
Electrical Engineer 電機工程師	24	-	-	23
Mechanical Engineer 機械工程師	9	-	-	9
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	49	-	-	49
Chemical Engineer 化學工程師	-	-	-	-
Product/Graphic Designer 產品／平面設計員	-	-	-	-
System Analyst 系統分析員	181	-	-	181
Sub-total 小 計	1 871	35	17	1 888
TECHNICIAN LEVEL 技術員級				
Electronics Technician 電子技術員	3 690	-	18	3 709
Mechanical Technician 機械技術員	12	-	-	12
Draughtsman 繪圖員	68	-	-	68
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	3	-	-	3
Supervisor/Foreman/Leader 監督／管工／組長	259	-	1	260
Programmer 程序編製員	314	-	2	315
Web Developer/Designer 網站開發員／設計員	77	-	1	77
Sales Technician 推銷技術員	202	-	5	207
Sub-total 小 計	4 625	-	27	4 651
CRAFTSMAN LEVEL 技工級				
Cable Jointer/Wireman 電纜接駁技工／駁線技工	57	-	-	57
Electronics Craftsman 電子技工	696	-	2	697
Electrician 電氣技工	51	-	2	53
Mechanic 技工	10	-	1	11
Sub-total 小 計	814	-	5	818
OPERATIVE LEVEL 操作工級				
Operator 生產線操作工	113	-	1	114
Sub-total 小 計	113	-	1	114
GRAND TOTAL 總 計	**7 423**	**35**	**50**	**7 471**

MANPOWER STATISTICS OF THE ELECTRONICS INDUSTRY
電子業人力統計數字
Sector 4: Wholesale (門類四：批發)

Job Title 職稱	Number of Workers Employed 僱員人數	Number of Trainees 受訓者人數	Number of Vacancies at Date of Survey 調查期間空缺數目	Forecast of Total Workers by April 2009 預測至二〇〇九年四月時的僱員總數
TECHNOLOGIST LEVEL 技師級				
Electronics Engineer 電子工程師	325	-	2	327
Electrical Engineer 電機工程師	4	-	-	4
Mechanical Engineer 機械工程師	-	-	-	-
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	6	-	-	6
Chemical Engineer 化學工程師	-	-	-	-
Product/Graphic Designer 產品／平面設計員	14	-	-	14
System Analyst 系統分析員	42	-	-	42
Sub-total 小 計	391	-	2	393
TECHNICIAN LEVEL 技術員級				
Electronics Technician 電子技術員	584	-	6	590
Mechanical Technician 機械技術員	14	-	-	14
Draughtsman 繪圖員	2	-	-	2
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	4	-	-	4
Supervisor/Foreman/Leader 監督／管工／組長	5	-	-	5
Programmer 程序編製員	34	-	-	34
Web Developer/Designer 網站開發員／設計員	-	-	-	-
Sales Technician 推銷技術員	1 155	5	54	1 240
Sub-total 小 計	1 798	5	60	1 889
CRAFTSMAN LEVEL 技工級				
Cable Jointer/Wireman 電纜接駁技工／駁線技工	-	-	-	-
Electronics Craftsman 電子技工	455	13	63	518
Electrician 電氣技工	86	-	-	86
Mechanic 技工	-	-	-	-
Sub-total 小 計	541	13	63	604
OPERATIVE LEVEL 操作工級				
Operator 生產線操作工	64	-	-	64
Sub-total 小 計	64	-	-	64
GRAND TOTAL 總 計	**2 794**	**18**	**125**	**2 950**

MANPOWER STATISTICS OF THE ELECTRONICS INDUSTRY
電子業人力統計數字
Sector 5: Design Houses, Relevant Departments in Educational Institutions and Government
(門類五：設計公司、教育院校及政府有關部門)

Job Title 職稱	Number of Workers Employed 僱員人數	Number of Trainees 受訓者人數	Number of Vacancies at Date of Survey 調查期間空缺數目	Forecast of Total Workers by April 2009 預測至二〇〇九年四月時的僱員總數
TECHNOLOGIST LEVEL 技師級				
Electronics Engineer 電子工程師	529	-	33	559
Electrical Engineer 電機工程師	187	-	21	208
Mechanical Engineer 機械工程師	3	-	-	3
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	10	-	1	11
Chemical Engineer 化學工程師	7	-	-	7
Product/Graphic Designer 產品／平面設計員	25	-	-	25
System Analyst 系統分析員	61	-	3	65
Sub-total 小 計	822	-	58	878
TECHNICIAN LEVEL 技術員級				
Electronics Technician 電子技術員	968	-	33	1 001
Mechanical Technician 機械技術員	156	-	1	172
Draughtsman 繪圖員	4	-	-	4
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	38	-	2	40
Supervisor/Foreman/Leader 監督／管工／組長	958	-	52	1 044
Programmer 程序編製員	111	-	18	130
Web Developer/Designer 網站開發員／設計員	37	-	-	36
Sales Technician 推銷技術員	31	-	2	33
Sub-total 小 計	2 303	-	108	2 460
CRAFTSMAN LEVEL 技工級				
Cable Jointer/Wireman 電纜接駁技工／駁線技工	-	-	-	-
Electronics Craftsman 電子技工	225	-	18	243
Electrician 電氣技工	338	-	46	384
Mechanic 技工	493	-	29	522
Sub-total 小 計	1 056	-	93	1 149
OPERATIVE LEVEL 操作工級				
Operator 生產線操作工	147	-	11	158
Sub-total 小 計	147	-	11	158
GRAND TOTAL 總 計	**4 328**	**-**	**270**	**4 645**

MANPOWER STATISTICS OF THE ELECTRONICS INDUSTRY
電子業人力統計數字
Sector 6: Supplementary Samples of 8 Large Retail Shops for Electronics Products (門類六：零售－8 間大型電子產品零售公司)

Job Title 職稱	Number of Workers Employed 僱員人數	Number of Trainees 受訓者人數	Number of Vacancies at Date of Survey 調查期間空缺數目	Forecast of Total Workers by April 2009 預測至二〇〇九年四月時的僱員總數
TECHNOLOGIST LEVEL 技師級				
Electronics Engineer 電子工程師	2	-	-	2
Electrical Engineer 電機工程師	-	-	-	-
Mechanical Engineer 機械工程師	-	-	-	-
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	-	-	-	-
Chemical Engineer 化學工程師	-	-	-	-
Product/Graphic Designer 產品／平面設計員	-	-	-	-
System Analyst 系統分析員	-	-	-	-
Sub-total 小 計	2	-	-	2
TECHNICIAN LEVEL 技術員級				
Electronics Technician 電子技術員	210	-	2	212
Mechanical Technician 機械技術員	-	-	-	-
Draughtsman 繪圖員	-	-	-	-
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	-	-	-	-
Supervisor/Foreman/Leader 監督／管工／組長	12	-	-	12
Programmer 程序編製員	-	-	-	-
Web Developer/Designer 網站開發員／設計員	-	-	-	-
Sales Technician 推銷技術員	2 588	-	3	2 591
Sub-total 小 計	2 810	-	5	2 815
CRAFTSMAN LEVEL 技工級				
Cable Jointer/Wireman 電纜接駁技工／駁線技工	-	-	-	-
Electronics Craftsman 電子技工	22	-	-	22
Electrician 電氣技工	-	-	-	-
Mechanic 技工	-	-	-	-
Sub-total 小 計	22	-	-	22
OPERATIVE LEVEL 操作工級				
Operator 生產線操作工	47	-	-	47
Sub-total 小 計	47	-	-	47
GRAND TOTAL 總 計	**2 881**	**-**	**5**	**2 886**

Appendix 7
附錄 7

MANPOWER STATISTICS OF THE ELECTRONICS INDUSTRY (ALL SECTORS)
電子業人力統計數字（各門類）

Job Title 職稱	Number of Workers Employed 僱員人數	Number of Trainees 受訓者人數	Number of Vacancies at Date of Survey 調查期間空缺數目	Forecast of Total Workers by April 2009 預測至二〇〇九年四月時的僱員總數
TECHNOLOGIST LEVEL 技師級				
Electronics Engineer 電子工程師	6 999	49	174	7 186
Electrical Engineer 電機工程師	555	3	38	592
Mechanical Engineer 機械工程師	619	-	15	634
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	1 187	-	28	1 214
Chemical Engineer 化學工程師	23	-	2	25
Product/Graphic Designer 產品／平面設計員	413	-	24	450
System Analyst 系統分析員	2 110	-	91	2 202
Sub-total 小 計	11 906	52	372	12 303
TECHNICIAN LEVEL 技術員級				
Electronics Technician 電子技術員	11 836	60	212	12 047
Mechanical Technician 機械技術員	953	1	30	999
Draughtsman 繪圖員	109	-	2	111
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	708	3	29	740
Supervisor/Foreman/Leader 監督／管工／組長	2 338	-	54	2 426
Programmer 程序編製員	2 569	-	195	2 764
Web Developer/Designer 網站開發員／設計員	430	-	1	429
Sales Technician 推銷技術員	9 591	5	204	9 826
Sub-total 小 計	28 534	69	727	29 342
CRAFTSMAN LEVEL 技工級				
Cable Jointer/Wireman 電纜接駁技工／駁線技工	349	18	-	349
Electronics Craftsman 電子技工	4 480	100	187	4 695
Electrician 電氣技工	946	41	49	1 006
Mechanic 技工	678	-	30	708
Sub-total 小 計	6 453	159	266	6 758
OPERATIVE LEVEL 操作工級				
Operator 生產線操作工	4067	-	60	4 077
Sub-total 小 計	4067	-	60	4 077
GRAND TOTAL 總 計	**50 960**	**280**	**1 425**	**52 480**

DISTRIBUTION OF EMPLOYEES BY MONTHLY INCOME RANGE (ALL SECTORS)
根據每月總收入幅度的僱員人數分布情況（各門類）

Job Title 職稱	Unspecified 未有說明	Below $6,001 以下	$6,001 - $8,000	$8,001 - $10,000	$10,001 - $15,000	$15,001 - $20,000	$20,001 - $25,000	$25,001 - $30,000	Over $30,000 以上
TECHNOLOGIST LEVEL 技師級									
Electronics Engineer 電子工程師	1 952	-	-	-	122	915	1 978	546	1 486
Electrical Engineer 電機工程師	52	-	-	-	-	78	98	218	109
Mechanical Engineer 機械工程師	88	-	-	-	1	101	241	110	78
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	119	-	-	-	25	214	328	113	388
Chemical Engineer 化學工程師	2	-	-	-	-	6	2	6	7
Product/Graphic Designer 產品／平面設計員	49	-	-	-	-	285	68	6	5
System Analyst 系統分析員	849	-	-	-	300	152	162	273	374
Sub-total 小 計	3 111	-	-	-	448	1 751	2 877	1 272	2 447
TECHNICIAN LEVEL 技術員級									
Electronics Technician 電子技術員	4 066	-	-	327	3 573	2 014	1 230	507	119
Mechanical Technician 機械技術員	54	-	-	120	210	418	140	3	8
Draughtsman 繪圖員	78	-	1	20	6	-	-	4	-
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	89	-	-	78	225	165	151	-	-
Supervisor/Foreman/Leader 監督／管工／組長	309	-	-	36	430	1 366	183	14	-
Programmer 程序編製員	1 084	-	-	276	321	512	362	10	4
Web Developer/Designer 網站開發員／設計員	327	-	-	2	45	42	9	5	-
Sales Technician 推銷技術員	1 346	-	78	444	2 013	1 983	3 203	386	138
Sub-total 小 計	7 353	-	79	1 303	6 823	6 500	5 278	929	269
CRAFTSMAN LEVEL 技工級									
Cable Jointer/Wireman 電纜接駁技工／駁線技工	8	-	49	24	268	-	-	-	-
Electronics Craftsman 電子技工	751	-	377	1 376	1 894	82	-	-	-
Electrician 電氣技工	53	-	-	413	479	1	-	-	-
Mechanic 技工	33	-	-	111	533	1	-	-	-
Sub-total 小 計	845	-	426	1 924	3 174	84	-	-	-
OPERATIVE LEVEL 操作工級									
Operator 生產線操作工	413	570	2 034	1 021	29	-	-	-	-
Sub-total 小 計	413	570	2 034	1 021	29	-	-	-	-
GRAND TOTAL 總 計	**11 722**	**570**	**2 539**	**4 248**	**10 474**	**8 335**	**8 155**	**2 201**	**2 716**

Appendix 9
附錄 9

SKILLS EMPLOYEES NEED TO ENHANCE
僱員需要加強培訓的技能

Skills 技能	No. of Employees 僱員人數			
	Technologist 技師	Technician 技術員	Craftsman 技工	All 總數
Management Skills 管理技能				
101 Production and engineering management 工業生產及工程管理	992	417	14	1 423
102 Marketing management 經銷管理	220	3 387	-	3 607
103 Project management 計劃管理	1 989	866	3	2 858
104 Quality management 品質管理	616	910	-	1 526
105 Purchasing management 採購管理	254	2 516	102	2 872
106 People management 人事管理	774	309	-	1 083
107 Leadership skills 領導能力	1 570	150	-	1 720
China-related Knowledge and World Vision 有關中國的知識及世界視野				
201 Social and economic development in China 在中國內地的社會和經濟發展	159	341	15	515
202 Laws and regulatory restrictions to China 進入中國市場的法律和規條限制	227	355	-	582
203 Trade practices in the mainland of China 在中國內地的營商常規	476	256	-	732
204 Cross-cultural knowledge 跨文化的知識	44	34	102	180
205 World vision 世界視野	457	242	-	699
Language Skills 語文能力				
301 Spoken English 英語會話	420	1 570	669	2 659
302 Written English 英文書寫能力	306	2 391	1 328	4 025
303 Putonghua 普通話	527	1 449	252	2 228
304 Written Chinese 中文書寫能力	81	58	11	150
Interpersonal and Intrapersonal Skills for the Workplace 工作間的人際及個人才能				
401 Problem solving 解決問題	589	2 555	297	3 441
402 Creativity 創意力	898	2 061	1	2 960
403 Critical thinking 批判思考能力	70	310	51	431
404 Communication skills 溝通技巧	978	1 664	560	3 202
405 Team building 團隊建立	991	1 918	508	3 417
406 Time management skills 時間管理技巧	76	962	20	1 058
407 Optimism/Positive 樂觀/積極	42	104	242	388
409 Perseverance 毅力	19	6	8	33
410 Change management skills 變革管理技巧	374	31	-	405
411 Customer services skills 客戶服務技巧	504	8 650	2 158	11 312
413 Ability to learn/adapt new skills/knowledge 學習或適應新科技、新知識的能力	1 936	3 926	1 875	7 737
Others 其他				
699 Others 其他	23	242	3	268

RECOMMENDED NUMBER OF TRAINEES
TO BE TAKEN ON ANNUALLY FOR THE NEXT FEW YEARS
建議未來幾年應取錄的受訓者人數

Job Title 職稱	No. of Workers Employed at Time of Survey (2008) 調查期間（二〇〇八年）僱員人數	Recommended Number of Trainees to be Taken in 2009 建議在二〇〇九年取錄的受訓者人數	Recommended Number of Trainees to be Taken on Annually Starting from 2010 建議由二〇一〇年起每年取錄的受訓者人數
TECHNOLOGIST LEVEL 技師級			
Electronics Engineer 電子工程師	6 999	189 - 231	377 - 461
Electrical Engineer 電機工程師	555	15 - 19	30 - 36
Mechanical Engineer 機械工程師	619	16 - 20	33 - 41
Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	1 187	32 - 40	64 - 78
Chemical Engineer 化學工程師	23	1	2
Product/Graphic Designer 產品／平面設計員	413	11 - 13	23 - 27
System Analyst 系統分析員	2 110	57 - 69	113 - 139
Sub-total 小 計	**11 906**	**321 - 393**	**642 - 784**
TECHNICIAN LEVEL 技術員級			
Electronics Technician 電子技術員	11 836	319 - 391	487 - 595
Mechanical Technician 機械技術員	953	26 - 32	39 - 47
Draughtsman 繪圖員	109	3	5
Manufacturing/Quality Assurance Technician 製造／品質保證技術員	708	19 - 23	29 - 35
Supervisor/Foreman/Leader 監督／管工／組長	2 338	63 - 77	96 - 118
Programmer 程序編製員	2 569	69 - 85	105 - 129
Web Developer/Designer 網站開發員／設計員	430	12 - 14	18 - 22
Sales Technician 推銷技術員	9 591	259 - 317	394 - 482
Sub-total 小 計	**28 534**	**770 - 942**	**1 173 - 1 433**
CRAFTSMAN LEVEL 技工級			
Cable Jointer/Wireman 電纜接駁技工／駁線技工	349	10 - 12	22 - 26
Electronics Craftsman 電子技工	4 480	122 - 148	284 - 348
Electrician 電氣技工	946	25 - 31	60 - 74
Mechanic 技工	678	18 - 22	43 - 53
Sub-total 小 計	**6 453**	**175 - 213**	**409 - 501**

Annex A
附件甲

Membership of the Electronics and Telecommunications Training Board
(March 2009)

電子業及電訊業訓練委員會委員名單
(2009 年 3 月)

Chairman:
主席

Mr NG Kwok-ho, Victor 吳國豪先生	(nominated by the Hong Kong Electronic Industries Association Limited) （香港電子業商會提名）

Vice-Chairman:
副主席

Mr MAK Moon-kuen 麥滿權先生	(nominated by an Electronics Manufacturing Company (Semi-Conductor)) （一間半導體製造公司提名）

Members:
委員

Mr CHAI Ngai-chiu, Sunny 查毅超先生	(nominated by the Federation of Hong Kong Industries) （香港工業總會提名）
Mr CHAN Cheuk-man, Edmond 陳焯民先生	(nominated by an Electronics Manufacturing Company (Consumer Products)) （一間電子消費產品製造公司提名）
Prof CHEUNG Ying-sheung, Paul 張英相教授	(nominated by a Local University) （本地一大學提名）
Ms HUI Ching-yee, Rita 許清儀女士	(nominated by a Telecommunication Company (The Mobile Telecommunicaton Network Services Sector)) （一間流動電訊網絡服務公司提名）
Mr LAI Yuen-lung 黎元龍先生	(nominated by the Hong Kong & Kowloon Electronics Industry Employees' General Union) （港九電子工業職工總會提名）
Mr LAM Lum-lee, Mark 林倫理先生	(nominated by an Electronics Manufacturing Company (Components/ Parts)) （一間電子元件及配件製造公司提名）

Mr LEUNG Wai-boon 梁維本先生	(nominated by a Broadcasting Company) （一間廣播公司提名）
Mr LEUNG Wai-ming, Frank 梁偉明先生	(nominated by the Hong Kong Productivity Council) （香港生產力促進局提名）
Ir Dr LI Chi-kwong 李志光博士	(nominated by the Hong Kong Institution of Engineers) （香港工程師學會提名）
Mr NG Wing-ka, Jimmy 吳永嘉先生	(nominated by the Chinese Manufacturers' Association of Hong Kong) （香港中華廠商聯合會提名）
Mr TONG Wai-kwok, Aaron 唐偉國先生	(Ad Personam) （獨立人士）
Mr TSANG Hon-chung 曾漢中先生	(nominated by an Electronics Trading/ Engineering Services Company) （一間電子貿易／工程服務公司提名）
Mr TSE Pui-tak, Daniel 謝培德先生	(nominated by an Electronics Manufacturing Company (Telecommunications)) （一間電訊器材製造公司提名）
Mr WONG Chi-chiu, Albert 黃志超先生	(nominated by a Telecommunication Company (The Fixed Telecommunicaton Network Services Sector)) （一間固定電訊網絡服務公司提名）
Mr CHAN Ping-sun 陳炳新先生	(representative of the Director of Electrical and Mechanical Services) （機電工程署署長代表）
Mr CHAN Tze-yee 陳子儀先生	(representative of the Director-General of Telecommunications) （電訊管理局總監代表）
Mr CHU Kwai-luen, Albert 朱桂鑾先生	(representative of the Executive Director of the Vocational Training Council) （職業訓練局執行幹事代表）
Miss TING Mui-yee, Judy 丁梅綺女士	(representative of the Director-General of Telecommunications) （工業貿易署署長代表）

In Attendance:
列席者

Dr CHIU Ping-kuen, Peter 趙炳權博士	Head of Department (Electronic & Information Engineering), Hong Kong Institute of Vocational Education (Shatin) 香港專業教育學院(沙田分校)電子及資訊工程系系主任
Mr HUI Chi-kwok 許志國先生	Manager-In-Charge, Electronics Industry Training Centre 電子業訓練中心 中心主管
Mr NG Chiu-hung, Stephen 吳超雄先生	Acting Head of Department (Electronic & Information Engineering), Hong Kong Institute of Vocational Education (Kwun Tong) 香港專業教育學院(觀塘分校)電子及資訊工程系署理系主任

Adviser:
顧問

Mr LAM Kwok-luen 林國聯先生	Vice President (Broadcasting & Engineering Operations), Hong Kong Cable Television Ltd. 香港有線娛樂有限公司 副總裁 廣播運作及工程部

Secretary:
秘書

Mr CHENG Tai-man 鄭泰民先生	(Vocational Training Council) （職業訓練局）

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Annex B

Electronics and Telecommunications Training Board

Terms of Reference

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 (VTC) the development of vocational education and training facilities to meet the assessed manpower demand.

4. To advise the Hong Kong Institute of Vocational Education (IVE) and training & development centres on the direction and strategic development of their programmes in the relevant disciplines.

5. To advise on the course planning, curriculum development and quality assurance systems of the IVE and training & development centres.

6. To prescribe job specifications for the principal jobs in the industry defining the skills, knowledge and training required.

7. To advise on training programmes for the principal jobs in the industry specifying the time a trainee needs to spend on each skill elements.

8. 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.

9. To advise on the conduct of skill competitions in key trades in the industry for the promotion of vocational education and training as well as participation in international competitions.

10. 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 vocational education and training in the industry.

11. To organize seminars/conferences/symposia on vocational education and training for the industry.

12. To advise on the publicity relating to the activities of the Training Board and relevant vocational education and training programmes of the VTC.

13. To submit to the Council an annual report on the Training Board's work and its recommendations on the strategies for programmes in the relevant disciplines.

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

電子業及電訊業訓練委員會

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. 就發展業內專業教育及訓練設施應付人力需求，向職業訓練局(職訓局)提供意見。
4. 就相關學科的課程發展方向及策略，向香港專業教育學院(IVE)、訓練及發展中心提出建議。
5. 就 IVE、訓練及發展中心的課程策劃、課程發展及質素保證制度提供意見。
6. 擬訂本業主要職務的工作範圍，界定所需的技能、知識及訓練。
7. 建議本業主要職務訓練方案，訂定每種技能所需的訓練期。
8. 對技術評估、技能測驗及證書頒發制度提供意見，以確定從業員、學徒及見習員的技能水平。
9. 就本業主要行業舉辦技能比賽提供意見，以推廣專業教育與訓練和派員參加國際賽事。
10. 就本業專業教育及訓練的發展與推廣事宜，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。
11. 爲本業舉辦有關專業教育及訓練的研討會與會議。
12. 就業內訓練委員會工作、有關職訓局專業教育及訓練課程的宣傳事宜提供意見。
13. 每年向局方呈交訓練委員會工作報告，以及相關學科課程發展策略建議。
14. 根據《職業訓練局條例》第 7 條，負責局方所委派的其他工作。

Annex C
附件丙

CONFIDENTIAL
WHEN DATA ENTERED
填入數據後即成
機密文件

VOCATIONAL TRAINING COUNCIL
職業訓練局

THE 2008 MANPOWER SURVEY OF THE ELECTRONICS INDUSTRY
電子業二零零八年人力調查

QUESTIONNAIRE
調查表

PLEASE READ THE EXPLANATORY NOTES BEFORE COMPLETING THIS QUESTIONNAIRE
填表前，請參閱附註

For official use only: 此欄毋須填寫	Rec. Type	Survey Code	Industry Code	Establishment No.	Enumerator's No.	Editor's No.	Check Digit	No. of Employees Covered by the Questionnaire
	1	0 5						
	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 26 27

NAME OF ESTABLISHMENT: _____
機構名稱

ADDRESS: _____
地址

TYPE OF PRODUCT/SERVICE: _____
產品／服務

TOTAL NUMBER OF PERSONS ENGAGED: _____
僱員總人數

NAME OF PERSON TO CONTACT: _____ (28 – 47)
聯絡人姓名

POSITION: _____
職位

TEL. NO.: _____ (48 – 55) - _____ (56 – 63)
電話

FAX NO.: _____
圖文傳真

E-MAIL: _____ (64 – 98)
電郵

VTC-EC-01

Part I 第一部份

	(A) Job 工作			(B) Average Monthly Income 每月平均收入	(C) Number Employed at Date of Survey (excl. trainees) 現有僱員人數（受訓者除外）	(D) Forecast of Number Employed 12 Months from Now (excl. trainees) 預計十二個月後僱員人數（受訓者除外）	(E) Number of Vacancies at Date of Survey (excl. trainees) 現有空缺額(受訓者除外)	(F) Number of Trainees at Date of Survey 現有受訓者人數
	Title 職稱	Rec. Type	Job Code 職位編號	Code 編號				
	For Official Use Only → 此欄毋須填寫		8-10	11	12-15	16-19	20-22	23-25
	TECHNOLOGIST LEVEL 技師級							
1	Electronics Engineer 電子工程師	2	1 0 1					
2	Electrical Engineer 電機工程師	2	1 0 2					
3	Mechanical Engineer 機械工程師	2	1 0 3					
4	Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	2	1 0 4					
5	Chemical Engineer 化學工程師	2	1 0 5					
6	Product/Graphic Designer 產品／平面設計員	2	1 0 6					
7	System Analyst 系統分析員	2	1 0 7					
	TECHNICIAN LEVEL 技術員級							
8	Electronics Technician 電子技術員	2	2 0 1					
9	Mechanical Technician 機械技術員	2	2 0 2					
10	Draughtsman 繪圖員	2	2 0 3					
11	Manufacturing/Quality Assurance Technician 製造／品質保證技術員	2	2 0 4					
12	Supervisor/Foreman/Leader 監督／管工／組長	2	2 0 5					
13	Programmer 程式編製員	2	2 0 6					
14	Web Developer/Designer 網站開發員／設計員	2	2 0 7					
15	Sales Technician 推銷技術員	2	2 0 8					
	CRAFTSMAN LEVEL 技工級							
16	Cable Jointer/Wireman 電纜接駁技工／駁線技工	2	3 0 1					
17	Electronics Craftsman 電子技工	2	3 0 2					
18	Electrician 電氣技工	2	3 0 3					
19	Mechanic 技工	2	3 0 4					
	OPERATIVE LEVEL 操作工級							
20	Operator 生產線操作工	2	4 0 1					
21		2						
22		2						
23		2						
24		2						
25		2						

Average Monthly Income 每月平均收入

Enter in column B employee's average monthly income range according to the following codes :

請將僱員的每月平均收入幅度按照下列類別編號填入B欄內：

Code 編號	Average Monthly Income Range 每月平均收入幅度
1	Under $6,001 以下
2	$6,001 - $8,000
3	$8,001 - $10,000
4	$10,001 - $15,000
5	$15,001 - $20,000
6	$20,001 - $25,000
7	$25,001 - $30,000
8	Over $30,000 以上

Remark 備註

Note 1 If additional lines are necessary, please tick here ☐ and enter on supplementary sheet(s).
附註一 如此頁填滿，請先將（✓）號填入此 ☐ 內，然後在附頁繼續填寫 。

Note 2 The term 'trainees' includes all trainees receiving any form of training and apprentices under a contract of apprenticeship.
附註二 「受訓者」包括正在接受各種訓練的人士，以及簽有學徒合約的登記學徒。

Part II 第二部份

1. Internal Promotion
內部晉升

Please fill in the number of internal promotion in the past 12 months
請填寫過去十二個月內，內部晉升的人數

Rec. Type	From Technician to Technologist 由技術員晉升至技師	From Craftsman to Technician 由技工晉升至技術員	From Others to Craftsman 由其他職級晉升至技工	For official use only 此欄毋須填寫
3				
1	8 9 10	11 12 13	14 15 16	17

2. Hong Kong Technical Personnel Dispatched Outside Hong Kong
遣派香港以外的香港技術人員

Please enter below the number of technical personnel paid by Hong Kong who had been dispatched to work for more than half year outside Hong Kong during the 12 months prior to the survey.
請填寫調查前十二個月內，由香港支薪而被派往外地工作超過半年的技術人員數目

Number of Technologists 技師人數	Number of Technicians 技術員人數	Number of Craftsmen 技工人數	For official use only 此欄毋須填寫
18 19 20 21	22 23 24 25	26 27 28 29	30

3. Education and Training an Employee Should Have
僱員宜有的教育及訓練

Technologist 技師			Technician 技術員			Craftsman 技工		
Education 教育	Training Mode 訓練方式	Training Period 訓練時間	Education 教育	Training Mode 訓練方式	Training Period 訓練時間	Education 教育	Training Mode 訓練方式	Training Period 訓練時間
31	32	33	34	35	36	37	38	39

Please enter in the boxes the education and training an employee should have according to the following codes:
請將僱員宜有的教育及訓練按照下列類別編號填入格內：

Code 編號	Education 教育
1	Degree/Associateship or equivalent 大學學位／院士或同等學歷
2	Higher Diploma 高級文憑
3	Diploma 文憑
4	Higher Certificate 高級證書
5	Certificate 證書
6	Secondary 5 中五
7	Craft Certificate 技工證書
8	Secondary 3 or below 中三或以下

Code 編號	Training Mode 訓練方式
1	Graduate traineeship 工科畢業生訓練
2	On-the-job training 在職訓練
3	Apprenticeship 學徒訓練
4	Off-the-job training 職外訓練
5	Others 其他

Code 編號	Training Period 訓練時間
1	4 years or above 四年或以上
2	3 to less than 4 years 三年至四年以下
3	2 to less than 3 years 二年至三年以下
4	1 to less than 2 years 一年至二年以下
5	6 to less than 12 months 六至十二個月以下
6	Below 6 months 六個月以下

Part III 第三部份

1. Recruitment
招聘

Please fill in the number of new recruits in the past 12 months
請填寫過去十二個月內，新招聘的僱員人數

Number of Technologists 技師人數	Number of Technicians 技術員人數	Number of Craftsmen 技工人數	Number of Operatives 操作工人數	For official use only 此欄毋須填寫
40 41 42 43	44 45 46 47	48 49 50 51	52 53 54 55	56

2. Employees Left
僱員離職

Please fill in the number of employees who had left your establishment in the past 12 months
請填寫過去十二個月內，離職的僱員人數

Number of Technologists 技師人數	Number of Technicians 技術員人數	Number of Craftsmen 技工人數	Number of Operatives 操作工人數	For official use only 此欄毋須填寫
57 58 59 60	61 62 63 64	65 66 67 68	69 70 71 72	73

3. Skills an Employee Need to Enhance
僱員需加強培訓的技能

Please indicate the three most important skills that your employees need to enhance. (Please see the table on the right for the choice of skills.)
你認爲貴機構現有僱員在那三方面技能最需要加強培訓。(請參閱右面的編號表以選擇技能。)

Technologist 技師	74 75 76	77 78 79	80 81 82
Technician 技術員	83 84 85	86 87 88	89 90 91
Craftsman 技工	92 93 94	95 96 97	98 99 100

Code 編號 — Types of skills / knowledge / attributes 技能/知識/個人特質的類別

Management skills 管理技能
- 101 Production and engineering management 工業生產及工程管理
- 102 Marketing management 經銷管理
- 103 Project management 計劃管理
- 104 Quality management 品質管理
- 105 Purchasing management 採購管理
- 106 People management 人事管理
- 107 Leadership skills 領導能力

China-related knowledge and world vision 有關中國的知識及世界視野
- 201 Social and economic development in the mainland of China 在中國內地的社會和經濟發展
- 202 Laws and regulatory restrictions for access to China's market 進入中國市場的法律和規條限制
- 203 Trade practices in the mainland of China 在中國內地的營商常規
- 204 Cross-cultural knowledge 跨文化的知識
- 205 World vision 世界視野

Language skills 語文技能
- 301 Spoken English 英語會話
- 302 Written English 英文書寫能力
- 303 Putonghua 普通話
- 304 Written Chinese 中文書寫能力

Interpersonal and intrapersonal skills for the workplace 工作間的人際及個人才能
- 401 Problem solving 解決問題
- 402 Creativity 創意力
- 403 Critical thinking 批判思考能力
- 404 Communication skills 溝通技巧
- 405 Team building 團隊建立
- 406 Time management skills 時間管理技巧
- 407 Optimism/Positive 樂觀／積極
- 408 Self-esteem 自尊
- 409 Perseverance 毅力
- 410 Change management skills 變革管理技巧
- 411 Customer services skills 客戶服務技巧
- 412 Numerical skills 數學運用技巧
- 413 Ability to learn/adapt new skills/knowledge 學習或適應新技能、新知識的能力

- 699 Others * 其他 *

* Please specify if skills code = '699'.
* 若技能編號 = '699'， 請說明。

For official use only
此欄毋須填寫

Est No. _____

Annex D
附 件 丁

The 2008 Manpower Survey of the Electronics Industry
電 子 業 二 零 零 八 年 人 力 調 查

Explanatory Note
附 註

1. Please ignore the numbers of the row immediately beneath the headings. They are purely for data processing.
每行標題下的號碼只供資料處理用，請毋須理會。

2. Before completing the questionnaire, please read carefully the job titles and job descriptions in Appendix C.
填寫調查表前，請先詳閱附錄 C 所列的職稱與工作說明。

3. Please complete the columns ('A' to 'F') of the questionnaire and insert a zero (0) for any column not applicable to your establishment.
請填寫表內各欄（「A」至「F」），並在不適用於貴機構的各欄內填入（0）符號。

4. Please fill in information as accurate as possible because the information collected from this survey is vital for determining the manpower requirements of the industry in order that the Electronics and Telecommunications Industry Training Board can make meaningful recommendations to Government on how to meet training needs.
請填入準確資料，因是項資料對於確定本業的人力需求極爲重要，而電子業及電訊業訓練委員會亦將以此爲根據，向政府提供解決訓練需求的建議。

5. Job Titles - Column 'A'
職稱 —— 「A」欄
   (a) The job titles and code numbers are pre-printed.
   職稱及職務編號已代爲印上。
   (b) Please add in column 'A' titles of any technical jobs not mentioned in Appendix C, and briefly describe them and indicate their skill levels.
   如貴機構另有技術性職務名稱未載於附錄 C 者，請一併填入「A」欄內，並扼要說明其工作性質及技能等級。
   (c) Please classify an employee according to his/her main duty irrespective of any additional secondary duties he/she may be required to perform (e.g. a technician, who works mainly as an electronics technician but is also required to perform the work of a draughtsman occasionally, should be classified as an electronics technician and not as a draughtsman).
   請根據僱員的主要職務分類，而不以其兼任的其他職務分類（例如，一名技術員的主要職務爲電子技術員，但有時須擔任繪圖員的工作，則應歸類爲電子技術員而非繪圖員）。

6. Average Monthly Income - Column 'B'
每月平均收入 —— 「B」欄
Please enter into this column the code for average monthly income range for each type of employees. The income should include basic wages, guranteed year-end bonus, regular overtime pay, cost of living allowance, meal allowance etc., if any. If you have more than one employee doing the same job, please enter the average figure. (Please refer to the codes in the last column of the questionnaire.)
請在「B」欄填入每類僱員的每月平均收入編號，這包括底薪固定發放的年終花紅、定期超時工作工資、生活津貼、膳食津貼等。若從事同類工作的僱員多於一名，則請取其平均數字。（請參閱調查表最後一欄的類別編號）

7. Number Employed at Date of Survey (Excluding Trainees) - Column 'C'
現有僱員人數（受訓者除外） —— 「C」欄
Please fill in the total number of employees (excluding trainees and apprentices) in your establishment.
請將貴機構目前所僱用的全部僱員人數（受訓者及學徒除外）填入此欄。

8. Forecast of Number Employed 12 Months from Now (Excluding Trainees) - Column 'D'
預計十二個月後的僱員人數（受訓者除外） —— 「D」欄
The forecast of number employed means the likely number of employees (excluding trainees and apprentices) you will be employing 12 months from now.
預計僱員人數指貴機構於十二個月後可能僱用的員工總數（受訓者及學徒除外）。

9. Number of Vacancies at Date of Survey (Excluding Trainees) - Column 'E'
現有空缺額（受訓者除外） —— 「E」欄
Please fill in the number of existing vacancies (excluding those for trainees and apprentices).
請填入貴機構現有的空缺額（受訓者及學徒的空缺數目除外）。
'Existing vacancies' refer to those unfilled, immediately available job openings for which the establishment is actively trying to recruit personnel at date of survey.
「現有空缺額」是指該職位仍懸空，須立刻填補，而現正積極招聘人員填補。

10. Number of Trainees at Date of Survey - Column 'F'
現有受訓者人數 —— 「F」欄
Please fill in the total number of employees undergoing training.
請將正在受訓的僱員人數填入此欄。

11. Internal Promotion
內部晉升
An internal promotion is the promotion of an employee to a higher level job by virtue of his/her performance or abilities. Please fill in the no. of internal promotion from "Technician to Technologist", from "Craftsman to Technician" and from "Others to Craftsman" in the past 12 months in the respective columns.
內部晉升指一名僱員由於表現良好或具工作才能而獲晉升至較高級職位。請將過去十二個月貴機構內部由技術員晉升至技師、由技工晉升至技術員，以及由其他職級晉升至技工的人數填入所屬欄內。

12. Hong Kong Technical Personnel Dispatched Outside Hong Kong
遣派香港以外的香港技術人員
Please enter the number of technologists, technicians and craftsmen paid by Hong Kong who had been dispatched to work for more than half year outside Hong Kong during the 12 months prior to the survey.
請填寫調查前十二個月內，由香港支薪而被遣派往外地，工作超過半年的技師、技術員及技工數目。

13. Education and Training an Employee Should Have
僱員宜有的教育及訓練
The purpose of this column is to solicit your view on the education and training which an employee in a particular job should have if he/she were to carry out his/her work competently. (Please refer to the codes in the same page of the questionnaire.)
此欄目的在調查貴機構的意見：各類職位的僱員宜具備何種教育及訓練，才能勝任其工作。（請參閱調查表同一頁的類別編號）。

14. Recruitment
招聘
Please enter the number of new recruits in the past 12 months.
請填寫過去十二個月內，貴機構新招聘的僱員人數。

15. Employees Left
僱員離職
Please enter the number of employees who had left your establishment in the past 12 months.
請填寫過去十二個月內，貴機構離職的僱員人數。

16. Skills an Employee Need to Enhance
僱員需加強培訓的技能
Please indicate the three most important skills that your employees need to enhance. (Please refer to the codes in the same page of the questionnaire.)
此欄目的在調查貴機構的意見：各類職位的僱員在那三方面技能最需要加強培訓。（請參閱調查表同一頁的類別編號）。

17. Example
例子
To facilitate proper completion, an example is given below for your reference.
爲協助閣下填表，現將例子附錄於後，以供參考。

Example
例子

	(A) Job 工作 Title 職稱	Rec. Type	Job Code 職位編號	(B) Average Monthly Income 每月平均收入 Code 編號	(C) Number Employed at Date of Survey (excl. trainees) 現有僱員人數（受訓者除外）	(D) Forecast of Number Employed 12 Months from Now (excl. trainees) 預計十二個月後僱員人數（受訓者除外）	(E) Number of Vacancies at Date of Survey (excl. trainees) 現有空缺額(受訓者除外)	(F) Number of Trainees at Date of Survey 現有受訓者人數
	For Official Use Only → 此欄毋須填寫	1	8-10	11	12-15	16-19	20-22	23-25
	TECHNOLOGIST LEVEL 技師級							
1	Electronics Engineer 電子工程師	2	1 0 1	8	5	6	1	1
2	Electrical Engineer 電機工程師	2	1 0 2	7	2	2	0	1
3	Mechanical Engineer 機械工程師	2	1 0 3	7	2	2	0	0
4	Manufacturing/Quality Assurance Engineer 製造／品質保證工程師	2	1 0 4	7	1	1	0	0
5	Chemical Engineer 化學工程師	2	1 0 5					
6	Product/Graphic Designer 產品／平面設計員	2	1 0 6					
7	System Analyst 系統分析員	2	1 0 7					
	TECHNICIAN LEVEL 技術員級							
8	Electronics Technician 電子技術員	2	2 0 1	6	3	4	1	1
9	Mechanical Technician 機械技術員	2	2 0 2	5	1	1	0	0
10	Draughtsman 繪圖員	2	2 0 3	4	2	2	0	0
11	Manufacturing/Quality Assurance Technician 製造／品質保證技術員	2	2 0 4					
12	Supervisor/Foreman/Leader 監督／管工／組長	2	2 0 5					
13	Programmer 程式編製員	2	2 0 6					
14	Web Developer/Designer 網站開發員／設計員	2	2 0 7					
15	Sales Technician 推銷技術員	2	2 0 8					
	CRAFTSMAN LEVEL 技工級							
16	Cable Jointer/Wireman 電纜接駁技工／駁線技工	2	3 0 1					
17	Electronics Craftsman 電子技工	2	3 0 2	3	3	4	1	1
18	Electrician 電氣技工	2	3 0 3	3	1	1	0	0
19	Mechanic 技工	2	3 0 4					
	OPERATIVE LEVEL 操作工級							
20	Operator 生產線操作工	2	4 0 1	2	5 0	5 5	5	0
21		2						
22		2						
23		2						
24		2						
25		2						

Average Monthly Income
每月平均收入

Enter in column B employee's average monthly income range according to the following codes :

請將僱員的每月平均收入幅度按照下列類別編號填入B欄內：

Code 編號	Average Monthly Income Range 每月平均收入幅度
1	Under $6,001 以下
2	$6,001 - $8,000
3	$8,001 - $10,000
4	$10,001 - $15,000
5	$15,001 - $20,000
6	$20,001 - $25,000
7	$25,001 - $30,000
8	Over $30,000 以上

Remark
備 註

Note 1 If additional lines are necessary, please tick here ☐ and enter on supplementary sheet(s).
附註一 如此頁填滿，請先將（✓）號填入此 ☐ 內，然後在附頁繼續填寫 。

Note 2 The term 'trainees' includes all trainees receiving any form of training and apprentices under a contract of apprenticeship.
附註二 「受訓者」包括正在接受各種訓練的人士，以及簽有學徒合約的登記學徒。

Annex E
附 件 戊

JOB DESCRIPTIONS OF PRINCIPAL JOBS IN THE ELECTRONICS INDUSTRY
電子業主要職務工作說明

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
TECHNOLOGIST LEVEL		技師級
101	Electronics Engineer [Electronics Sales / Support Engineer, Telecommunications Engineer]	Carries out one or more of the following activities: research into electronic engineering / telecommunication engineering problems, design of, technical sales / support, and advice on electronic equipment and systems, components and products, and planning and supervision of their development, production, construction, installation, operation and maintenance. Usually specialises in one or more of the following: (i) computer systems; (ii) consumer electronic products; (iii) electronic instruments and equipment; (iv) semiconductor and electronic components; (v) telecommunication systems; (vi) multimedia electronics, audio-visual and entertainment systems; (vii) other electronic engineering fields.
	電子工程師 [電子推銷／支援工程師，電訊工程師]	擔任下列一項或多項工作：研究電子工程／研究電訊工程方面的問題；負責電子設備及系統、零件及產品的設計、技術推銷／支援及顧問工作；策劃及督導電子設備及系統、零件及產品的發展、生產、構造、安裝、操作及保養工作。通常與下列專門範疇有關： (i) 電腦系統； (ii) 電子消費產品； (iii) 電子儀器及設備； (iv) 半導體及電子零件； (v) 電訊系統； (vi) 多媒體電子、影音及娛樂系統； (vii) 電子工程其他方面的工作。

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
TECHNOLOGIST LEVEL (Continued) 技師級（續）		
102	Electrical Engineer 電機工程師	Designs and advises on electrical equipment and systems, and plans, and supervises their development, construction, installation, operation, maintenance and repair. 設計電器及電機系統，並就該方面提供意見；策劃及監督電器及電機系統的發展、構造、安裝、操作、保養及維修。
103	Mechanical Engineer 機械工程師	Designs and advises on plant, mechanical parts, moulds and equipment, machinery and tools, and plans and supervises their development, construction, installation, operation, maintenance and repair. 設計廠房、機械配件、工模及設備、機器及工具，並就該方面提供意見；策劃與監督其中的發展、構造、安裝、操作、保養及維修。
104	Manufacturing / Quality Assurance Engineer [Industrial Engineer, Quality Control Engineer] 製造／品質保證工程師 [工業工程師，品質控制工程師]	Carries out one or more of the following activities: (i) Plans, directs and supervises all technical aspects of the manufacturing process to ensure the most efficient and economical means of operation and the maintenance of quality standards; (ii) Plans, directs and supervises the quality assurance / control at all phases of manufacturing, including testing and measurement, of incoming materials and parts, work-in-progress, and finished products to ensure compliance with standards, specifications, safety and environmental regulations. 擔任以下一項或多項工作： (i) 策劃、指導及監督製造程序的各種技術工作，確保採用最快捷經濟的生產方式，並且保持品質標準； (ii) 策劃、指導及監督各製造階段的品質保證／控制工作，包括測試及量度交來物料與配件、半製成品及製成品，確保產品符合標準、規格、安全與環保條例。

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
TECHNOLOGIST LEVEL (Continued) 技師級（續）		
105	Chemical Engineer 化學工程師	Designs and advises on manufacturing processes in which chemical changes occur, and plans and supervises their development, construction, installation, operation and maintenance to ensure compliance with standards, specifications, and safety and environmental regulations. 設計能產生化學變化的製造程序，並就該方面提供意見；策劃及監督其發展、構造、安裝、操作及保養，確保符合標準、規格、安全與環保條例。
106	Product / Graphic Designer 產品／平面設計員	Originates and develops ideas to design, create, modify and arrange the form of manufactured products, layouts and containers for the products based on factors such as design-function relationship, knowledge of design, art concepts, market and pricing characteristics, client specifications, method and cost of production to achieve aesthetically pleasing and functional effect for the products. 能根據設計與功能的關係、設計知識、美術概念、市場與價格特性、顧客規格、生產方法及成本等因素進行創作，並加以發揮，以便設計、創作、修改及安排製成品的形狀、結構及包裝，務求產品既美觀又實用。
107	System Analyst [Software Engineer] 系統分析員 [軟件工程師]	Carries out one or more of the following activities: (i) Works closely with user personnel to identify problems, review methods and specify and evaluate information technology (IT) solutions; (ii) In accordance with product specifications, designs system firmware / software using high level and/or assembler languages for electronics, microprocessors, microcomputers and embedded systems. 擔任以下一項或多項工作： (i) 與用戶部門緊密合作，確定問題、檢討方法、說明和評估資訊科技的解決辦法； (ii) 依據產品規格，使用高階語言及／或匯編語言，爲電子、微處理器、微型電腦及嵌入式系統設計軟件及／或系統軟件。

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN LEVEL 技術員級		
201	Electronics Technician [Electronics / Maintenance / Service Technician, Telecommunications Technician, Computer / Network Technician, Audio-Visual Technician, Electronic Support Technician]	Performs technical tasks, normally under the direction and supervision of an electronics / telecommunications engineer, contributory to design, development, manufacture, technical support, construction, installation, operation, maintenance and repair of: (i) Electronic and electrical products, equipment and systems, such as consumer electronics, home appliances, healthcare electronics, toys, and watch / clock; (ii) Telecommunication systems and equipment, such as telephone, digital broadcasting, high-definition electronic media, wireless / microwave / satellite communication, mobile communication and data communication systems; (iii) Computer and multimedia networks, systems and peripherals; (iv) Audio-visual, entertainment and associated equipment and systems.
	電子技術員 [電子／保養／維修技術員，電訊技術員，電腦／網絡技術員，影音技術員，電子支援技術員]	通常在電子／電訊工程師的督導下擔任技術工作，如參與設計、發展、製造、技術支援、構造、安裝、操作、保養、修理： (i) 電子及電機產品、器材及系統，例如消費電子產品、家居電器、保健電子產品、玩具及鐘錶； (ii) 電訊系統及器材，例如電話、數碼廣播、高清電子媒體、無線電／微波／衛星通訊、流動通訊及數據通訊系統； (iii) 電腦及多媒體網絡、系統及周邊設備； (iv) 影音、娛樂及附屬設備與系統。
202	Mechanical Technician	Performs technical tasks, normally under the direction and supervision of a mechanical engineer, contributory to design, development, construction, installation, operation, maintenance and repair of plant, mechanical parts and equipment, machinery and tools.
	機械技術員	通常在機械工程師的督導下擔任技術工作，如參與設計、發展、構造、安裝、操作、保養、修理廠房、機械配件及設備、機器及工具。

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN LEVEL (Continued) 技術員級（續）		
203	Draughtsman 繪圖員	Prepares detail and assembly drawings and circuit diagrams according to design specifications. 按照設計規格繪製明細圖、裝配圖及線路圖。
204	Manufacturing / Quality Assurance Technician [Quality Control Technician] 製造／品質保證技術員 [品質控制技術員]	Performs technical tasks, normally under the direction and supervision of a manufacturing / industrial or a quality assurance / control engineer, contributory to: (i) The efficient and economical operation of the manufacturing process and the maintenance of quality standards; (ii) Quality assurance / control at all phases of manufacturing including testing and measurement of in-coming materials and parts, work-in-progress, and finished products to ensure compliance with standards and specifications, and safety and environmental regulations. 通常在製造／工業或品質保證／控制工程師的監督下擔任： (i) 製造程序中的技術工作，協助以最快捷經濟的方式運作，並且維持產品質素； (ii) 技術工作，協助各製造階段的品質保證／控制事項，包括測試及量度來料與配件、半製成品及製成品，確保產品符合標準、規格、安全與環保條例。
205	Supervisor / Foreman / Leader [Junior Supervisor] 監督／管工／組長 [初級監督]	Performs supervisory duties contributory to the planning and allocation of tasks to workers and trainees, and to the production, inspection, installation, operation, maintenance and repair of components, products, equipment and systems; OR Organises and takes charge of a group or groups of operatives in a section, normally under the direction of a supervisor / foreman. 擔任監督工作，如參與策劃、向工人及受訓者分配工作，以及參與生產、檢查、安裝、操作、保養、修理零件、產品、器材與系統； 或 通常在監督／管工指導下，安排及主管部門內一組或多組操作工的工作。

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN LEVEL (Continued) 技術員級（續）		
206	Programmer [Software Technician] 程式編製員 [軟件技術員]	Develops computer programmes and systems to implement embedded systems / software design, normally under the direction and supervision of a software engineer / system analyst. 通常在軟件工程師／系統分析員的督導下研究嵌入式系統／電腦程式，以便推行電腦系統及軟件設計。
207	Web Developer / Designer 網站開發員／設計員	In the mixed technical and creative works, uses tool set to design and create web pages / sites, 2D / 3D graphics and animation and/or other multimedia contents for integration to IT applications according to business requirement, strategy and direction. 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／網站、二維／三維圖像動畫或其他多媒體內容，以便配合電腦應用軟件使用。
208	Sales Technician [Electronic Sales Technician, Electronic Merchandising Technician] 推銷技術員 [電子推銷技術員／電子採購技術員]	Updates / studies / analyses electronic, technical and functional knowledge as well as contemporary trend and development of products, systems, equipment and components from the demands of electronics market, proposes and demonstrates suggestions / follows up orders according to the needs of clients and customers, and liaises with departments and suppliers to provide suitable alternatives in view of the market. Usually involves in one or more of the following: (i) consumer electronics, home appliance and healthcare electronics; (ii) telecommunication systems and equipment; (iii) computer and multimedia networks, systems and peripherals; (iv) audio-visual, entertainment and associated equipment and systems. 更新／學習／分析電子、技術及功能知識，以及市面上的潮流時興新穎的產品、系統、設備及零件；因應顧客需要而提供意見、示範產品及跟進訂單；與其他部門及供應商聯繫以提供適當意見。通常會與下列範疇有關： (i) 消費電子產品、家居電器及保健電子產品； (ii) 電訊系統及器材； (iii) 電腦及多媒體網絡、系統及周邊設備； (iv) 影音、娛樂及附屬設備與系統。

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
CRAFTSMAN LEVEL 技工級		
301	Cable Jointer / Wireman 電纜接駁技工／ 駁線技工	Lays, joints, connects, terminates and maintains underground, submarine, surface and aerial telecommunication cables and wires. 敷設、接駁、端接及保養地底、海底、地面及架空電訊電纜。
302	Electronics Craftsman [Audio Visual, Electronic Servicing, Electronic System Installation, Telecommunications and Surveillance Technical Assistant] 電子技工 [影音、電子維修、電子系統安裝、電訊及監控技術助理]	Carries out one or more of the following activities: (i) Installs, services and maintains consumer electronics, audio-visual products, multimedia and entertainment electronic equipment and systems, In-building Coaxial Cable Distribution System, telecommunications and surveillance systems; (ii) Diagnoses, locates and repairs faults in the maintenance of electronic devices and products, systematically records these faults and recommends changes to minimize such occurrence; (iii) Installs, inspects, tests, repairs, calibrates and maintains electronic, electrical and mechanical instruments, meters, equipment and systems. 擔任以下一項或多項工作： (i) 安裝、保養及及維修消費電子產品、影音產品、多媒體和娛樂電子設備與系統、大廈內同軸電纜分配系統、電訊及監控系統； (ii) 在維修電子裝置及產品的過程中，查出及修理所出現的毛病，有系統地記錄下來，並且建議如何盡量減少毛病出現； (iii) 安裝、查驗、測試、修理、校準及保養電子、電機及機械儀器、儀錶、設備及系統。
303	Electrician 電氣技工	Installs, maintains, tests and repairs electrical wiring, devices and equipment, and building services in buildings and other structures in accordance with regulations and specifications. 按照條例及規格安裝、保養、測試及修理屋宇電線、電器及其他設備。

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
CRAFTSMAN LEVEL (Continued) 技工級（續）		
304	Mechanic [Maintenance Mechanic / Fitter / Machinist, Tool and Die Maker, Mould and Die Maker and Repairer]	Carries out one or more of the following activities: (i) Fits, assembles, installs, repairs and maintains plant and machinery and makes replacement parts when required; (ii) Sets up and operates machine tools to produce components according to specifications; (iii) Makes, maintains and repairs press tools, dies, cutting tools, gauges, jigs and fixtures according to drawings and other specifications; (iv) Makes, maintains and repairs moulds and dies for plastics processing machines according to drawings and other specifications.
	技工 [保養技工／裝配打磨技工，機床工，工具及工模製造技工，工模製造及修理技工]	擔任以下一項或多項工作： (i) 打磨、裝配、安裝、修理、保養廠房及機器，並於需要時製作更換配件； (ii) 按照規格裝設及操作機床，以生產零件； (iii) 按照圖則及其他規格，製造及維修啤孔工具、工模、切削工具、量規及夾具； (iv) 按照圖則及其他規格，製造及修理塑膠機的工模。

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
OPERATIVE LEVEL 操作工級		
401	Operator [Assembler, Soldering Worker, Aligner / Tester, Quality, Assurance / Control Operator, Machine Operator / Attendant, Packer, Stock Handler, Electronic Data Processing Operator, General Worker]	Carries out any one of the operative jobs in assembly line in the areas of: (i) Assembles parts in the manufacture of electronics components (semiconductor, computer memory plane etc.) or assembles parts and components into printed circuit boards, modules and finished products, prepares materials by cutting, coats and paints protective or decorative materials onto parts or components; (ii) Performs proper soldering at all solder joints by hand or machine; (iii) Aligns, tests and inspects electronics products on production lines; (iv) Assists the quality assurance / control technician in the inspection of incoming parts and finished products before packaging according to a predetermined quality standard; (v) Operates various previously set-up processing machines, fixtures, continuous plating and etching baths, polishing machine and coil winding machines etc; (vi) Packs finished products into boxes, crates or other containers; (vii) Handles components, parts issued to and returned from assembly line. (viii) Sets, operates and controls data processing and/or data-switching systems, including all peripheral units according to operating instructions; operates data entry machines, which translate manually prepared data into computer readable format and store them into media, verifies / corrects entry data according to standard procedure; (ix) Handles odd jobs and undertake other manual work.

Job Code 職位編號	Job Title 職稱	Job Description 工作說明
OPERATIVE LEVEL (Continued) 操作工級（續）		
	生產線操作工 [裝配工，焊錫工，校整／測試工，品質保證／控制工，機器操作工／看值工，包裝工，物料搬運工，電腦操作員／雜工]	擔任以下一項或多項工作： (i) 裝配各種零件以製造電子元件（半導體、記憶板等等）或將零件及元件裝配在印刷線路板、模組及製成品上；切割材料；塗膠及髹保護或裝飾塗料於零件或元件上； (ii) 用手或機器焊接所有焊點； (iii) 校整、測試及檢查生產線上的電子產品； (iv) 協助品質保證／控制技術員，依照預定的品質標準檢查交來配件，並在包裝前檢查製成品； (v) 操作各類已調校妥當的加工機械、夾具、連續運作電鍍及蝕刻設備、磨光機及繞線機等等； (vi) 以木箱、紙盒或其他容器包裝製成品； (vii) 負責搬運裝配工場的元件及零件； (viii) 根據工作指示，調校、操作及控制數據處理及／或數據交換系統，包括周邊設備；操作數據輸入機（可將人手編製的數據翻譯爲可供電腦閱讀的資料，並將數據貯存在電腦卡、磁帶、紙帶或磁盤內）；根據標準程序核對／更正輸入的數據； (ix) 擔任雜務及其他勞力工作。

Remark: [ ] Equivalent

註： [ ] 其他名稱