



Manpower Update Report

Electronics and Telecommunications industries

2020

Electronics and Telecommunications
Training Board

ACKNOWLEDGEMENT

The Electronics and Telecommunications Training Board would like to express its gratitude to the members of the focus group for their valuable time and insights on the manpower situation in the Electronics and Telecommunications industries. Special thanks go to the CTgoodjobs and other major recruitment websites. Their views and database of online job vacancies formed an integral part of this report.

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Introduction

Background

The Electronics and Telecommunications Training Board (ECTB) of the Vocational Training Council (VTC) is appointed by the Government of the HKSAR.

According to its Terms of Reference, the ECTB is responsible for determining manpower demand of the industry, assessing whether the manpower supply matches manpower demand, and recommending to the VTC the development of vocational and professional education and training (VPET) facilities to meet the assessed training needs.

A new approach for collecting manpower information is adopted to enhance the effectiveness and better reflect the dynamics of the manpower situation in the various industries.

Under the new approach, one full manpower survey is conducted every four years, and this is supplemented by two manpower updates. The ECTB completed its latest manpower survey in 2016. Two manpower updates should be conducted in 2019 and 2020.

The 2020 manpower information update comprises:

(a) a focus group meeting getting the views of industry experts on the latest developments in the industry, manpower and training needs, and recruitment difficulties, and measures to tackle the challenges the industry faces; and

(b) desk research analysing job advisements including qualifications, experience and skills required by the principal jobs in the Electronics and Telecommunications (EC) industries

Objectives

The objectives of the manpower update are:

- (i) to examine the latest trends and developments of the industry;
- (ii) to explore the job market situation and training needs;
- (iii) to identify the recruitment challenges; and
- (iv) to recommend measures to meet the training needs and to ease the problem of manpower shortage.

Methodology

Overview

With reference to the 2016 full manpower survey of the EC industry, this update report aims to provide qualitative descriptions of the recent development of the industry through focus group meeting, supplemented by making reference to some quantitative data of recruitment advertisements from desk research.

Focus Group Meeting

The focus group members are representatives from six sectors of the EC industries, including 1. Manufacturing, 2. Trading and Services, 3. Telecommunications Services, 4. Wholesale, 5. Design Houses and Relevant Departments in Universities and Government, and 6. Retail for Electronics Products.

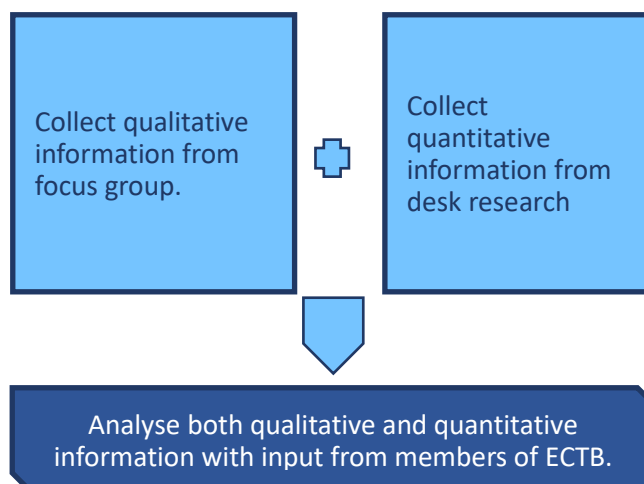
The focus group meeting was conducted on 31 October 2019 with discussion on topics selected by the Working Party on Manpower Survey of the ECTB. The discussions at the meeting were recorded and transcribed to facilitate analysis.

Desk Research

Manpower information covering the period between Quarter 3 of 2018 and Quarter 2 of 2019 was collected through desk research by quarter. An employment information system was developed to capture the relevant recruitment data from major online recruitment portals. Some 9,600 recruitment records were collected during the research period and served as indicative information of the job market trend. The list of related companies under the Hong Kong Standard Industrial Classification was mapped to remove duplicated records.

Data Analysis

The analysis consists of the following three steps:



Limitations

As this is not a full manpower survey, the findings and recommendations of the focus group meeting are more qualitative in nature and the report focuses mainly on the manpower trends. The information of job advertisements was collected from major recruitment websites and the

Labour Department. Other channels, such as head hunting for managerial positions, were not covered. Since the data collected is a snapshot of a particular period without reference to any historical data, this can serve as reference information supplementary to the findings of focus group meeting.

Findings

Factors Affecting the Development of the Industry

New applications driven by new technologies

Promotion of the use of IoT applications especially in Government projects

The Government is taking the lead to promote the use of IoT in various new infrastructure projects in New Development Areas, especially in the applications for construction and communication, such as the use of sensors for inspection and monitoring the progress of construction processes.

Demand for total solution specialists

The design of IoT included five major areas, namely hardware, connectivity, data collection, machine learning and system action/response. Since it is difficult to recruit technical personnel who are competent in all these areas and there is a high demand for such specialists who

could integrate the technologies with total solutions to meet the specifications required by the clients.

Innovative applications of technologies need talents with broadened skillsets

Other innovative applications of the new technologies such as AI, 5G and Big Data need technical experts with broad knowledge and skills in various technical areas, especially for applications involving the combination of several new technologies such as Smart Robots in manufacturing sector.

Mechatronics

Robotics and automation technology for handling the repeated production process to reduce headcounts and enhance efficiency.

Policy

Compliance with overseas requirements

Hong Kong companies are capable of meeting the technical requirements of relevant authorities in overseas markets. These include the safety requirements of Underwriters Laboratories and Electrical Testing Labs/Intertek listing or equivalent in the United States, as well as the relevant safety directives and CE marking requirements of the European Economic Area.

Regarding the medical equipment, the Government considers to impose the regulation for certification of medical electronics devices (e.g. ISO 13485) and making preparation of the guidelines for the manufacture of medical IoT devices. Hence, there is a demand for the practitioners in the industry to be trained up in the requirements to comply with the required standards as well as to enhance product safety.

Impact of trade war

The export of electronics products to the United States such as toys and smartphones was seriously affected by the trade war and fortunately the Japanese market could still be sustained as they had demand for the electronics products, especially the electronics toys for entertainment and education.

Demand for manufacturing environment for training up engineers and technicians

As most of the manufacturing plants have relocated their production facilities to the Mainland and Eastern Asia, there are little opportunities for the engineering graduates or students to be trained up with the whole manufacturing processes from production to testing of the electronics products.

Manpower Demand

Focus group

With reference to the trends and development of the industry, views of the focus group on the anticipated changes in manpower demand were collected. Principal jobs in high demand related to compliance, new technologies and new areas of applications were identified as follows:

- Digital Signal Processing Engineers
- Cloud Management and Infrastructure Professionals and Developers
- User Interface and Application Designers
- Field Service Engineers
- Solution Based Specialists
- AI/Machine Learning Analysts
- Instrumentation/Devices Engineers
- IoT Specialists/Integrators
- Robotic System Programming/ Mechatronic Engineer.

Desk Research

Out of the relevant recruitment advertisements captured in desk research, the top five principal jobs with the highest number of recruitment advertisements were identified:

1	System Analyst	25.5%
2	Programmer	19.4%
3	Electronics Engineer	17.1%
4	Electronics Technician	13.9%
5	Sales Technician	6.0%

Details of the number of vacancy advertisements of popular recruitment media by job levels and sectors, principal job, and qualification requirements are at Appendices (a), (b) and (c).

Comparison with previous manpower survey / update

Compared with each principal job's manpower figures in the 2016 manpower survey, the number of vacancies were

particularly high for System Analyst/ Software Engineer, and Programmer. This might be attributed to the high turnover rates of these jobs. Besides, the Electronics Engineer and Technician are also in demand as they occupied over 10% of the advertisements probably due to the need to develop innovative applications driven by the new technologies. Most of the vacancies are found in the sector of trading and services within the period from Q3 2018 to Q2 2019.

Working Party members shared the view that there will be a demand across the various skill levels of manpower to meet the requirements of the new products/services arising from the new technologies such as 5G, Artificial Intelligence, Big Data and IoT, etc. The employers have to provide on-the-job training to their employees in order for them to keep abreast of the latest development of the new technologies.

Training Needs

Focus Group

The following are the corresponding training needs identified from the focus group members:

Technical skills

- Digital signal processing / Image processing / Sensor technology
- Radio frequency design
- Cyber / Cloud security
- User experience / user interface design
- IoT integration / applications
- Blockchain / data analytics
- Robotic system programming

Soft skills

- Project management
- Critical thinking
- Problem solving
- Technical report writing
- Presentation and communication skills
- Language skills
(No priority)

Desk Research

In addition, the advanced/ emerging skills and related job titles identified from the advertisements are summarised in the following table.

Advanced Technology	Related Job Titles	Emerging Skills
Cyber Security	Cyber Security Consultant	Intrusion Detection Tools
Cloud Technologies	Cloud Solutions Consultant Full Stack developer	Cloud Technologies
Data Storage	Extract Transform Load (ETL) Developer	Data Storage Tools
Big Data/Data Mining/Data Analytic	Data Scientist Big Data Developer	Data Mining Tools Data Analytic Tools
Wireless Technology	Wireless Engineer RF Engineer	Zigbee WiFi 6 Buletooth Low Energy
IoT	IoT Solution Architect	Sensor Technology
A.I./Machine Learning	AI Engineer	AI Tools
AR/VR/MR	AR/VR/MR Engineer	AR/VR/MR Tools
NLP	Natural Language Programming (NLP) Expert	NLP Tools
Blockchain	Blockchain Specialist	Blockchain Software Tools
Robotics Process Automation	Robotic Process Automation (RPA) Developer	RPA Tools

It is anticipated that those new emerging skills are required by the employers to develop new products/ services to meet the requirement of existing and potential customers. In this connection, the related professionals who possess those skills are in demand in the industry.

Recruitment Challenges

Due to the keen competition of the market, some employers have experienced difficulties in the recruitment process. The difficulties are summarised and related to some of the following factors:

Unwillingness of young generation to stay overnight in Mainland China

Upon the request of the employers, the young generation were usually unwilling to stay overnight in Mainland China because of limited choices of entertainment and opportunities to stay in touch with their peers. The employers indicated that they could hardly retain those young recruits if they needed to frequently stay in Mainland for business activities.

Salary not competitive with working in financial institutions

The young generation preferred to work in financial institutions where the salary offered is more competitive, and the working environment is much comfortable. In this connection, the new graduates would not prefer to select jobs in manufacturing environment and engineering services sectors.

Low professional status

Comparing with those professionals in other engineering sectors, the status of the electronics and telecommunications professional seems relatively low as there are no specific requirements or certification for them to acquire in order to be qualified to work on the electronics and telecommunications related projects.

Shortage of experienced professionals to handle innovative projects

There are limited supply of experienced professionals who could handle the innovative projects arising from the applications of the new technologies. Most employers are providing on-the-job training to the existing employees and urge them to acquire the necessary skills by self-learning.

Shortage of supply of technicians

There are limited supply of sub-degree graduates since majority of them would like to attain higher academic qualifications by pursuing further study. Hence, the employers found it difficult to recruit technicians to handle their projects.

RECOMMENDATIONS

To meet the future development of the industry, it is considered essential for the, government, education institutions and employers to provide suitable training opportunities to the employees and students in the following areas:

Government

Enhancement of Professional Status

The Government should consider to assist in promoting the professional status by recognition of certified professionals in cyber security, IOT as well as reliability and safety.

Providing Subsidies to Employers

Providing subsidies to employers offering internship (including part-time) and attachment training to students would also encourage the employers to provide more training opportunities to the students.

Recruitment of Fresh Graduates

In order to provide more opportunities to the relevant engineering graduates, the Government should consider to set requirements of recruitment of fresh graduates for government projects.

Priority in Testing and Trial of Hong Kong Products

To encourage the local companies to develop new products and services, the Government should consider to set priority in testing and trial of Hong Kong manufactured goods and services.

Shortening Claim Procedures

Shortening the claim process for funding subsidy for recruitment of postdoctoral talents for research and development (R&D) projects under the Postdoctoral Hub programme would be able to encourage the technology companies to recruit more R&D professionals.

Education Institutions

Assistance for Proof of Concept Testing and Clinical Trial

Strengthening the collaboration with government and semi-government organisations to assist the local companies for proof of concept testing and clinical trial of new products and services.

Broadening the Scope of Curriculum

Broadening the curriculum to cover new technologies via electives or integration with fundamental modules.

Prolonged Internship and Attachment Training

Longer duration of internship and attachment training with credit bearing to enrich the students' exposure.

Providing Diversified Training

Providing diversified in-service training related to new technologies to enrich the in-service practitioners.

Providing Honorary Recognitions

Providing honorary recognition to distinguished professionals who have demonstrated their contributions to the launch of new products and services as nominated by their companies.

Offer of Flexible Programmes

The education institutions should consider to provide part-time day release programmes to students for early engagement in the industry.

Employers

Providing In-service Training

The employers should encourage their staff to keep abreast of latest development of new technologies by providing specialised in-service training to employees.

Providing Part-time Job

In order to arouse the interest of potential students, employers should consider to provide part-time jobs to students for the early engagement in the industry.

Providing Mentorship

To enrich the new recruits with the development and culture of their companies, the employers should provide mentorship to train up newly recruited engineers.

Offer More Training Places

Employers should consider to offer more opportunities of training places leading to recognition of professional associations such as the Hong Kong Institution of Engineers.

Clarity of Career Paths

It is important to provide clear career paths for various levels of technical professionals. To arouse young people's interest in joining the industry, information such as structured progression pathways and career prospects could be made available to help them have a better understanding of the future opportunities of the industry.

Employees

Ownership of Responsible Projects

The employees should develop the right attitude to be committed to their work by developing a sense of ownership and being pride of their responsible projects.

Proactive to Learn

Employees should be more proactive to keep abreast of the latest development of new technologies.

Number of Advertisements from Popular Recruitment Media (Q3 2018 to Q2 2019) by Job Levels and Sectors

Sector	Technologist		Technician		Craftsman		Operative		Total	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Manufacturing	41	0.43%	73	0.76%	4	0.04%	21	0.22%	139	1.45%
Trading and Services	3,759	39.18%	3,938	41.04%	134	1.40%	125	1.30%	7,956	82.92%
Telecommunications Services	320	3.34%	359	3.74%	15	0.16%	13	0.14%	707	7.37%
Wholesale	201	2.09%	127	1.32%	6	0.06%	13	0.14%	347	3.62%
Design Houses and Relevant Departments in Universities and Government	111	1.16%	32	0.33%	25	0.26%	--	0.00%	168	1.75%
Retail Shops for Electronics Products	89	0.93%	176	1.83%	10	0.10%	3	0.03%	278	2.90%
Total	4,521	47.12%	4,705	49.04%	194	2.02%	175	1.82%	9,595	100.00%

Number of Advertisements from Popular Recruitment Media
(Q3 2018 to Q2 2019) by Principal Jobs

Job Level	Principal Job	Total	%
Technologist	Electronics Engineer	1.639	17.08%
	Electrical Engineer	37	0.39%
	Mechanical Engineer	50	0.52%
	Manufacturing/Quality Assurance Engineer	161	1.68%
	Chemical Engineer	--	0.00%
	Product/Graphic Designer	187	1.95%
	System Analyst	2.447	25.50%
Technician	Electronics Technician	1.333	13.89%
	Mechanical Technician	40	0.42%
	Draughtsman	30	0.31%
	Manufacturing/Quality Assurance Technician	185	1.93%
	Supervisor/Foreman/Leader	127	1.32%
	Programmer	1.860	19.39%
	Web Developer/Designer	555	5.78%
	Sales Technician	575	5.99%
Craftsman	High Speed Data Network & Wireless Data System Integrator	--	0.00%
	Electronics Craftsman	15	0.16%
	Electrician	93	0.97%
	Mechanic	86	0.90%
Operative	Operator	175	1.82%
Total		9.595	100.00%

Number of Advertisements from Popular Recruitment Media (Q3 2018 to Q2 2019) by Qualification Requirements

Job Level	First Degree or above	Sub-Degree, Prof. Diploma or Certificate	Upper Secondary	Lower Secondary	Unspecified
Technologist	47.53%	35.72%	1.88%	0.04%	14.82%
Technician	24.48%	47.12%	9.56%	2.08%	16.75%
Craftsman	4.12%	29.38%	18.56%	15.98%	31.96%
Operative	0.00%	35.43%	22.29%	9.71%	32.57%