A Mixed-Method Study of ICT Labour Market in Ho Chi Minh City

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Abstract

The purpose of this study is to provide insights into Information and Communication Technology (ICT) labour market in Ho Chi Minh City – the most important centre of VietnameseICT industry. The study was conducted using an innovative mix of semi-structured interview, online survey, desk research, and content analysis methods. Qualitative and quantitative data on enterprise profiles, business directions, employment situation, employment prospect, and job profiles in the industry were collected and analysed to provide a view of the ICT labour market and the ICT employers in Ho Chi Minh City. As it is probably the most comprehensive survey of the ICT labour market for Ho Chi Minh City, the data has been used for the development of a labour market information system.

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Keywords

ICT industry, job profile, labour market information system, labour market survey

1 Introduction

During the past 10 years, higher education in Viet Nam has made significant progress in a number of areas. The number of research output, student enrolment and international cooperations has significantly increased from two to three times, as compared to the last decade. Vietnamese universities has now appeared in global university rankings [1]. Nevertheless, critics are still aimed at Vietnamese universities for not meeting the demand of the society. Recent studies have revealed that the gaps between what the industry wants and what the universities can deliver still exist [2-4]. Therefore, in order to close these gaps, it is evidently necessary to understand the demand and supply of the labour market.

In Viet Nam, due to the shift of the country to market economy, studying the labour market has been the major concern of various labour market stakeholders. Numerous studies in labour markets have been conducted. However, most of these studies are at a national level, mainly using questionaires for gathering data and focusing on macrolevel information for national economic policies [5, 6]. Rarely seen are studies of a labour market for a specific industry sector in a specific region with the objective of serving students and universities, which are two important stakeholders of a labour market.

In contrast, in developed countries, especially European countries, labour market information of national and regional scales are available to stakeholders through various instruments [7]. Moreover, it is a practice among European universities to routinely survey local labour markets and make the information such as job profiles and employment trends available to educators and students through online information systems [8]. Such information has been shown to be beneficial to higher education institutions [9].

The purpose of this study is to provide insights into the ICT (information and communication technology) labour market of Ho Chi Minh city, one of the key centres of Vietnamese ICT industry. The intended users of the survey result are current and future labour market participants, such as job seeker and students who need

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information on employment situation and prospect; and educational and training institutions, whose training should answer the demands from the labour market. The objectives of the present study are to provide labour market information in terms of (1) business profiles of potential employers; (2) employment situation in the industry; (3) employment prospect in the industry; (4) job titles and related requirements in the industry.

2 Literature review

Many studies have pointed out the gaps between demand and supply in labour markets worldwide [10]. Probably, the first step in closing the gap is measuring it by using a labour market survey (LMS). The first LMS was probably conducted in the United States [11]. Since then, LMS has been widely used around the world as an instrument to gather and analyse data on demand and supply at various scales and levels.

In Europe, LMS has been integrated into Labour Market Observatories (LMO) platforms. These platforms, operating as independent bodies, or embedded in existing structures such as public bodies, academic institutions, and research centres, collect and analyse data, and provide to labour market stakeholders information on market situation and development [12]. These LMO platforms vary in terms of organisational setting, territorial coverage, focal themes, and main target users. An example at multi-national level is ESSC LMO [13], which operates as part of European Economic and Social Committee, to identify and analyze European labour market trends and challenges with focus on youth employment, the integration of refugees and asylum seekers into the labour market, the inclusion of the long-term unemployed in the labour market. For information gathering, it uses interviews, desk research, survey. An example at national level is the Excelsior Project - Information System for Employment and Training (https://excelsior.unioncamere.net/), operated by an Italian trade association Unioncamere. It provides forecast on labour demand and the professional, training and skills needs. The data collected through surveys and administrative sources are divided into territorial regions and industrial sectors.

Particularly, in Europe, there are LMO that are operated by universities. These LMO provide labour market information related to the professions trained by the operating universities and limited to the regions of the universities. An example is the LMO by University of Padova (https://www.unipd.it/osservatoriolavoro). The data of LMO are limited to Veneto region and collected by various means, including questionnaires, interviews, and focus group.

In Viet Nam, since the shift from a planned to a market economy, LMS has been used by governmental and international bodies as an instrument to provide evidence-based recommendations for national policy-making and action. An example is the labour force surveys that have been annually conducted by Vietnam's General Statistics Office since 2007. The studies rely on household questionnaires to calculate macroeconomic labour and employment indicators [5, 6]. Another example is a recent LMS study for International Organization for Migration that used a combination of questionnaires, interviews, and desk review methods to assess the employment situations in selective provinces [14].

Although it is quite easy to encounter a LMS study at national level, LMS research for a specific region and/or a specific industrial sector is hardly found. Even for the ICT industry, of which the importance in the economy is growing, official data sources on the employment situation are very few and brief [15]. Similarly, the officially-published data for ICT labour market in Ho Chi Minh City are sporadic, while the data available from news agencies seem error-prone. Recently, as Vietnamese universities are more concerned about improving training quality, surveys are routinely conducted with employers and alumni, yet they are often narrowed down to identifying only competences for some specific professions.

Overall, it can be seen that an LMS is a popular and useful approach to study a labour market. Although there is no general prescription for implementing an LMS, several methods such as questionnaire survey, interview, focus group, and desk research are widely used, either alone or in combination. In Viet Nam, LMS are mainly used by governmental and international institutions to obtain macrolevel information about the national labour market. While this macrolevel labour market information is highly useful for the purpose of developing and reviewing policies, there is also a need for microlevel labour information market such as employers' profiles, employment situation and

prospect, job titles and skills requirements for specific industries and local regions. Furthermore, although this source of information is useful for educators to better suit the demands of employers [7] and for students to better make occupational choices [16], it barely exists for many important industries and localities.

3 Methods

This study employed an innovative combination of desk research, questionnaire survey, interview, and content analysis methods. Desk research was carried out to map the status quos of the ICT industry in Viet Nam and Ho Chi Minh City in terms of business performance, key activities, key regions, and employment situation. It was also used to identify available data sources related to the labour market, as well as a potential list of candidates for surveying and interviewing.

The qualitative and quantitative data were collected by semi-structured interviews and an online survey. The target subjects were ICT enterprises operating in Ho Chi Minh City. The potential list of the target enterprises was combined from the enterprise database of the authors' home university and the member listings of the trade associations identified in the desk research. For the semi-structured interviews, large enterprises were preferably selected, along with enterprises of other sizes to maintain the representativeness of ICT enterprises in the sample. The selected candidates were contacted by telephone and asked for an interview. Each interview was conducted by two trained moderators. A total of 37 interviews were carried out.

For the online survey, inviting emails were sent to the potential list of enterprises (excluding those in the list for interviewing). The recipients can choose to participate or not in the survey. The online questionnaire was conducted using Google and Lime platforms. A total of 365 enterprises were invited for the online survey with 24 responses, achieving a response rate of 6.6 %.

The questionnaire on business activities, employment situation and employment prospect were based on the template provided by University of Padova within the framework of the Labmovie project (https://labmovie.eu/). Some modifications to the questions were done to fit Vietnamese context such as classification of business, enterprise ownership, and employability competence. The interview used the same set of questions with the survey, except some minor adjustments to the format of the questions to accompany the nature of interviewing.

The data on job titles were captured by the interviews and the content analysis of the online job listings. In the interviews, in addition to the questions on business and employment profiles, moderators also asked some details regarding job titles in the industry, such as names of job positions, required qualifications and experience, expected knowledge and skills. At the same time, job posts related to ICT were collected from 3 major online job portals. Only job postings that locate in Ho Chi Minh City and require at least a bachelor degree are selected. A total of 15 job titles and 73 job postings were collected.

The data from the desk research, interview, survey, and content analysis were analyzed and combined to ensure proper triangulation of the data. First, the major descriptive statistics for the data collected from the interviews and online survey was calculated to identify the trend and patterns in the data. Second, the content analysis of the job title descriptions and the job postings was conducted to identify the common job titles of the industry and the requirements for the job titles. Then, all findings were to mapped to the research objectives. Finally, the results were cross-examined across the data sources.

4 Result and discussion

The study lasted from March 2021 to September 2021. A significant percentage of the sampled enterprises (41 %) is large business (with more than 100 employees) with some enterprises possessing more than 1,000 staff. On the other hand, smaller business with less than 50 employees also accounts for a sizeable portion (41 %). This composition of the sample is the result of our intended sampling for the interviews. Here, we biased towards large enterprises for interviewing, as we believe they would provide a more comprehensive view of the industry. At the same time, we also maintained the representativeness of the sample by including enterprises of various sizes so that the survey would express a balanced view from various types of enterprises.

4.1. Business profiles and growth prospect

In the survey, we asked the respondents to give information about their enterprises' business profiles (ownership, business location, business activities) and their view on the growth of the industry in the future.

The survey confirmed that Ho Chi Minh City plays the major role in the ICT industry of the country, as 95 % of the surveyed enterprises place their headquarters and carry out extensive business activities in the city. In fact, 75 % of them operate at several premises in the city and 43 % of them have more than one primary business activities. Figure 1 provides information about the primary business activities of the enterprises. It could be seen that most of the businesses (85 %) identify computer programming, consultancy and related activities as their primary business. A significant portion of them (39 %) also have the primary businesses in data processing and information, while telecommunication accounts only a small part for business for the surveyed enterprises. This suggests the dominance of information technology (IT) over telecommunication in the ICT industry; which corresponds to the country statistics [12].

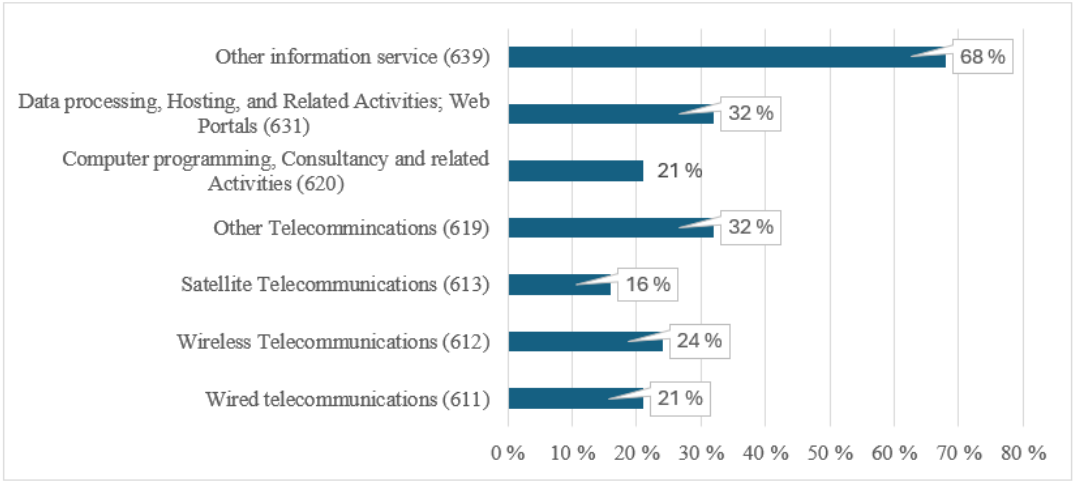

Figure 1 Primary business activities of the surveyed enterprises. (Business activities are classified according to Vietnam's Standard Industrial Classification. Some enterprises identified more than one primary business activities).

The surveyed enterprises were asked to provide details on the sources of their clients. This is to judge the export orientation of the enterprises as well as to provide hints on the importance of language competence in employment. On average, 46 % of the clients of the enterprises are from Ho Chi Minh City, 23 % of the clients are from other provinces and cities in Viet Nam, and 31 % of the clients are from overseas. This points toward the importance of export in the city's ICT industry. However, there is a contrast among individual enterprises. An enterprise has a tendency to serve mainly either domestic clients or overseas clients. Sixty four percentage of the sampled enterprises have less than 20 % clients from overseas while there are a noticeable number of the IT enterprises (19 %) serving dominantly overseas clients. Particularly, 15 % of them serves only overseas clients.

The growth prospect of the industry was examined through the questions regarding the enterprises' business results and future directions. Despite the Covid-19 outbreak, most of the surveyed enterprises reported positively on business results. 87 % of them reported their business goals achieved or achieved better than expected. This view is confirmed the employment situation of the enterprises. These enterprises were also positive about the future. 82 % of them expected the business would be growing in the future. The respondents' answers on the future investment and direction of the enterprises also reflect the positive outlook of business (Table 1). More than 70 % of the surveyed enterprises indicate that they will invest in expanding service, staff training/upskilling, research and development.

Table 1 Future investment and direction

Questions	Percentage of Respondents (%)				
	Currently investing	**Intends to invest in the near future**	**Already invested sufficiently**	**I do not intend to invest / I do not consider it important**	**No opinion**
Renovation/change of business location	15	21	16	28	20
Replacement/modernisation of equipment	30	20	26	8	16
Acquisition of new software	23	21	20	20	16
Quality management system certification of company processes	21	31	18	13	17
Entry/increase in overseas markets	41	28	7	13	11
Search for new customers	72	10	8	0	10
Expansion of the services offered	54	16	11	2	17
Introduction of new job titles currently not present in the enterprise	28	25	18	13	16
Increase of job tittles already present in the enterprise	31	31	11	10	17
Staff training/upskilling	74	8	7	2	9
Research and development	64	13	11	0	12

4.2 Employment situation

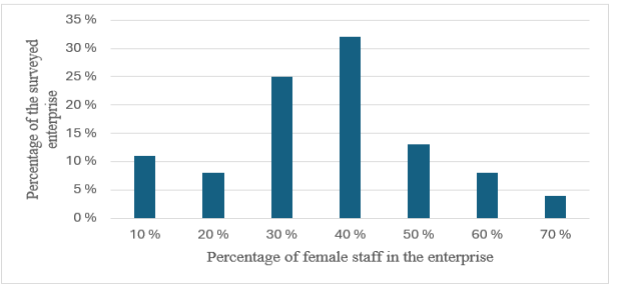

Figure 2 Distribution of enterprises according to the percentage of female staff.

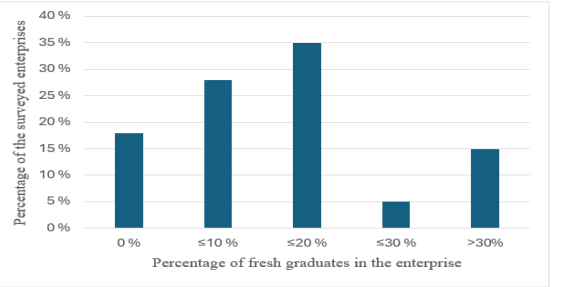

Figure 3 Distribution of enterprises according to the percentage of fresh graduates.

Here, we assess the employment situation of the industry in terms of gender balance, job opportunities for fresh graduates, and job stability.

In contrast to the general belief of male-only employment in ICT, it is found that female staff accounts for a sizable part at the enterprises (Figure 2). The averaged percentage of female staff at these enterprises is 32 % with the largest percentage of the female staff at 63 % and the smallest percentage at 3 %. Figure 2 also shows that more than 50 % of the sampled enterprises have the percentages of

female staff falling between 20 % to 50 % of the total staff.

For employment, fresh graduates get a good opportunity. The average percentage of fresh graduates at the surveyed enterprises is 14 % (the median value is 12 %) with one enterprise reporting a very high percentage at 75 % (Figure 3). A majority of them (63 %) do employ fresh graduate at less than 20 %. Nevertheless, 18 % of the surveyed enterprises reported no fresh graduates among their staff.

The stability of employment is evaluated through the types of labour contracts employed at the enterprises. Figure 4 displays the distribution of the types of labour contracts used for employment at the surveyed enterprises. It can be seen that most of the enterprises use indefinite and definite-term labour contracts when employing. 50 % of the surveyed enterprises have more than 40 % of their staff employed with indefinite-term labour contract and similarly 56 % of these enterprises reported more than 40 % of their staff having a definite-term labour contract. In fact, the medians of the percentage on the total employed staff for the indefinite-term and definite-term contracts are correspondingly 38 % and 48 %, respectively. The high percentage of the long-term contracts suggests the stable employment in the ICT industry. At the same time, the higher percentage of definite-term contracts indicates the high percentage of the staff newly joining these enterprises, considering the current practice of signing definite-term contracts with the staff that newly join in Viet Nam.

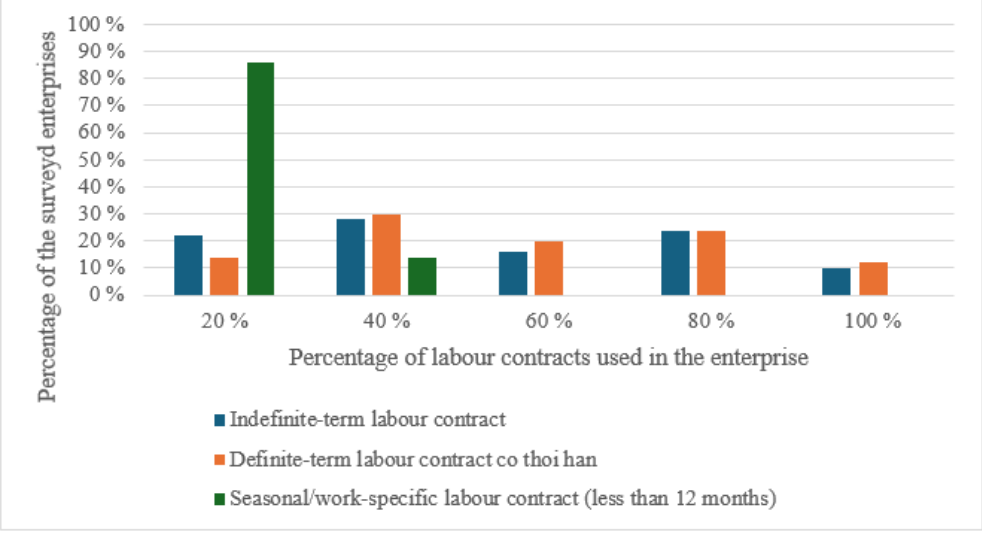

Figure 4 Distribution of the enterprises according to the types of used labour contracts.

We also asked the respondents on their employment of ICT freelance professionals. 38 % of the surveyed enterprises reported the employment of ICT freelance professionals. The most frequently work tasks demanding freelance professionals include product/software development (35 %), UX/UI design (23 %), technology consultant and technical support (10 %), and systems/software deployment (6 %). The use of freelance could be the result of either the shortage of qualified candidates or the unstable nature of the work tasks. The information on employment prospect suggests that the tasks related to software development belong to the former category and the task related to UX/UI design is a latter case. 82 % of the enterprises also reported the presence of interns in their operation.

4.3 Employment prospect

The survey reveals the good prospect of employment in the ICT labour market. Responding to the question whether the enterprise hired new staff in the last 12 months, 80 % of the surveyed enterprises said “yes” for hiring; 10 % reported no change in staff number, and only 5 % of them had reduced the number of staff instead of hiring more. In terms of job positions, a majority of new recruitment falls in the positions relating to software development: 50 % of the new hires are programmers, trailed by the numbers of new solution consultants (20 %), software engineers (16 %), and quality control staff (9 %). However, only a small number of new hires are at senior or management levels (23 positions at senior level compared with 1,530 positions at staff level).

The job market is also positive to fresh graduates. 79 % of the respondents answered "yes" to the question whether they recruited fresh graduate. Regarding the trained majors of 482 fresh graduates recruited, 59 % graduated from information technology programmes, 18 % from computer science, 10 % from software engineering, 9 % from electrical and electronic engineering. The remaining graduates were from information systems, computer networks, and telecommunication.

For the future, the outlook of employment in the ICT industry is quite optimistic, judging by the answers to the question whether the enterprises continue to hire in the next 2 years. 90 % of them replied "yes" on hiring in the next 2 years while only 3 % had no plan for new staff. The bright prospect of employment is highlighted by the projected increase of new recruits; 4,473 positions are projected in comparison with 1,530 recruited the last 12 months. Especially, 94 % of the projected new hires are IT engineers.

On the other hand, 75 % of the enterprises reported having difficulties in recruiting. Figure 5 gives the cited reasons for the difficulties. In general, 70 % of the respondents cited the reasons related to the availability of qualified candidates. For those that cited other reasons for the difficulties, the mismatch between the offered and the asking salaries was the most common reason for hiring problems. The cited reasons for recruiting difficulties highlight the unbalance between the demand and supply sides in the ICT labour market. It indicates there is a shortage of ICT human resources in overall and a shortage of high-qualified ICT human resources specifically.

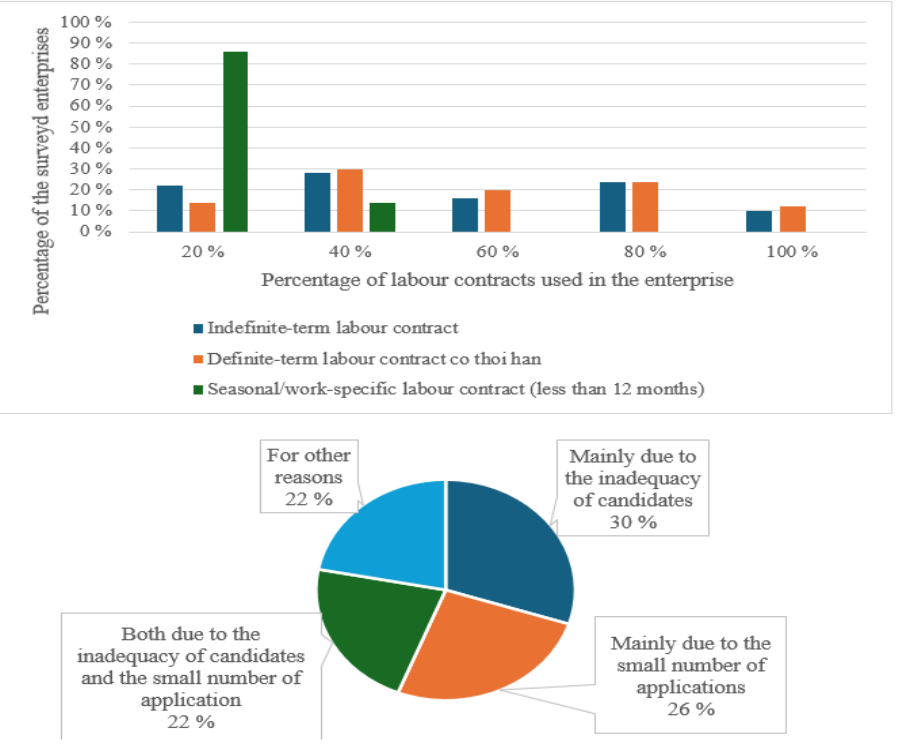

Figure 5 Reasons for recruiting difficulties.

The respondents were requested to name the job positions that they experienced hiring difficulties and nominate the job positions that they expected to demand more in the future. The job positions related to software development such as IT engineers, software engineers, programmers are identified as the most difficult in hiring, accounting for with 76 % of the naming; and these job positions are expected to continue in high demand in the future as suggested by 56 % the nomination. Especially, the respondents proposed some job positions that are not present in the list of the most difficult hiring as being in the future demand. These are the job positions of data engineer, cloud engineer, IoT engineer, IT security engineer, and IT infrastructure engineer.

4.4 Job titles and required employability competences

Based on the interviews and the analysis of online job postings, 17 most common job titles relating to the ICT

industry are identified: Programmer, QC Staff/Tester, Software Engineer, IT Engineer, Data Engineer, Business Analyst, UI/UX Designer, Deployment Staff, Software Architect, Network Engineer/Systems Engineer/Network Administrator, Cloud Engineer, AI Engineer, Telecommunications Engineer, IoT Engineer/ IoT Developer, Solution Consultant, Team Leader/ Department Manager, and Project Leader/ Project Manager. For each job tittle, the analysis of the data also provides a complete job profile, including a short description for the position, required qualifications and expected experience, duties performed by the position, and required professional knowledge.

Furthermore, the analysis of the data identifies a list of required employability competences across the positions: these are teamwork and cooperation, communication, goal management, problem solving, and foreign language. The employers highly appreciate the personalities of initiative, dependability, integrity, stress tolerance, persistence, and attentive to details.

4.5 Limitations

As this study was limited to Ho Chi Minh City, , the results would be applicable only to Ho Chi Minh City's ICT situation. Furthermore, as the sample size of the study is rather small compared to the number of ICT enterprises in the city, the findings would not completely reflect all the key situations and prospects of the ICT labour market. The purposive sampling by including large enterprises that are key drivers in the market could improve the coverage of key issues on one hand, but would result in the neglect of diversified views of small enterprises on the other hand.

5 Conclusion

This study can be considered as one of the first most comprehensive surveys of the ICT labour market for Ho Chi Minh City. By combining various methods of data collection, the study provides insights on Ho Chi Minh City's ICT labour market in terms of business profiles, industry growth prospect, employment situation, employment prospect, and job profiles. The insights from the study could help students and job seekers in search and orientation for better employment as well as help educators in improving their training. The data has been used for the development of a labour market information system that is accessible to the public.

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Nghiên cứu sử dụng phương pháp tổng hợp cho thị trường lao động ngành Công nghệ thông tin và Truyền thông tại Thành phố Hồ Chí Minh

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Tóm tắt Mục tiêu của nghiên cứu là tìm hiểu về thị trường lao động ngành Công nghệ thông tin và Truyền thông (ICT) tại Thành phố Hồ Chí Minh – trung tâm quan trọng của ngành ICT Việt Nam. Nghiên cứu này được thực hiện bằng cách kết hợp một cách sáng tạo các công cụ khảo sát bao gồm phỏng vấn bán cấu trúc (semi-structured), khảo sát trực tuyến, nghiên cứu tài liệu và phân tích nội dung (content analysis). Các dữ liệu định tính và định lượng về doanh nghiệp, định hướng phát triển, tình hình sử dụng lao động, triển vọng tuyển dụng, mô tả công việc trong ngành được thu thập và phân tích để cung cấp một cái nhìn hoàn chỉnh về thị trường lao động và người sử dụng lao động trong ngành ICT tại Thành phố Hồ Chí Minh. Với góc độ là một trong những khảo sát hoàn chỉnh nhất về thị trường lao động ICT cho Thành phố Hồ Chí Minh, thông tin thu thập được sử dụng để xây dựng hệ thống thông thị trường lao động địa phương.

Từ khóa Ngành ICT, mô tả công việc, hệ thống thông tin thi trường lao động information system, khảo sát thị trường lao động.