Working Paper 2024.1.2.2
- Vol 1, No 2

BỘ KỸ NĂNG TRONG CÔNG VIỆC LOGISTICS: KHAI THÁC CÁC TIN TUYỂN DỤNG TRỰC TUYẾN NGÀNH LOGISTICS

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Tóm tắt

Nghiên cứu này đã phân tích các tin tuyển dụng trực tuyến để so sánh các kỹ năng yêu cầu của ngành Logistics năm 2022 của 13 quốc gia được nhóm thành các nước có thu nhập cao (ví dụ: Úc, Pháp, Đức, Hồng Kông, Đài Loan, Singapore, Mỹ và Vương quốc Anh) và các nước có thu nhập trung bình (ví dụ: Việt Nam, Trung Quốc, Thái Lan, Indonesia và Malaysia) để xác định các xu hướng và khoảng trống năng lực lực lượng lao động chính. Các phát hiện nhấn mạnh các kỹ năng thiên về kỹ thuật như lập trình, SQL và thiết kế UI / UX, phản ánh sự tích hợp công nghệ và sử dụng dữ liệu ngày càng tăng của Logistics. Tuy nhiên, các kỹ năng mềm như giao tiếp, lãnh đạo và sự linh hoạt vẫn phù hợp để thích ứng với các môi trường năng động. Ngoài ra, các nước thu nhập cao thể hiện các tiêu chuẩn tiên tiến hơn và các nguyên tắc phức tạp hơn so với các đối tác có thu nhập trung bình - báo hiệu chuỗi cung ứng phức tạp hơn. Các bộ kỹ năng làm nổi bật nhu cầu về sự nhanh nhẹn của lực lượng lao động. Các khuyến nghị của nhóm tác giả tập trung vào việc kết hợp năng lực kỹ thuật số và dữ liệu mới nổi vào các chương trình Logistics dạy nghề và đại học đồng thời mở rộng các sáng kiến nâng cao kỹ năng do nhà tuyển dụng hỗ trợ. Xây dựng quan hệ đối tác giữa ngành công nghiệp, học viện và chính phủ có thể giải quyết khoảng cách một cách chủ động hơn. Nhìn chung, việc xây dựng năng lực liên tục giữa các lực lượng lao động mới và hiện tại là rất quan trọng đối với ngành Logistics để tận dụng các cơ hội từ các công nghệ như tự động hóa và AI, duy trì tính cạnh tranh và xúc tác cho tăng trưởng kinh tế khu vực. Nghiên cứu cung cấp những hiểu biết dựa trên dữ liệu về quỹ đạo kỹ năng hậu cần để giúp các bên liên quan khác nhau, bao gồm các doanh nghiệp, viện giáo dục và cơ quan lực lượng lao động, điều chỉnh các chương trình phát triển phù hợp với nhu cầu của ngành.

Từ khóa: yêu cầu công việc, lĩnh vực logistics, dự báo, tin tuyển dụng trực tuyến, đại dịch COVID-19.

LOGISTICS JOB SKILL SETS: EXPLOITING THE LOGISTICS ONLINE JOB POSTINGS

Abstract

This research analyzed online job postings to compare in-demand logistics skills 2022 across 13 nations grouped into high-income countries (e.g., Australia, France, Germany, Hongkong, Taiwan, Singapore, the US and the UK) and middle-income countries (e.g., Vietnam, China, Thailand, Indonesia and Malaysia) so as to identify key workforce capability trends and gaps. Findings emphasize technical skills like programming, SQL, and UI/UX design, reflecting logistics' growing technology integration and data utilization. However, soft skills like communication, leadership, and flexibility remain relevant for adapting to dynamic environment. Additionally, high-income countries demonstrate more advanced standards and complex principles versus middle-income counterparts - signaling more sophisticated supply chains. The skill sets highlight the need for workforce agility. Our recommendations focus on incorporating emerging digital and data competencies into vocational and university logistics programs while expanding employer-supported upskilling initiatives. Forging partnerships between industry, academia, and governments can further address gaps more proactively. Overall, continuous capability-building amongst new and current workforces is critical for the logistics sector to leverage opportunities from technologies like automation, and AI, stay competitive, and catalyze regional economic growth. The study provides data-driven insights on logistic skills trajectory to help various stakeholders, including businesses, education institutes, and workforce agencies, align development programs with industry needs.

Keywords: job requirements, logistics sector, forecasting, online job postings, COVID-19 pandemic.

1. Introduction

This paper presents a novel approach to analyzing job requirements in the logistics industry, using online job postings to collect data. Job requirements in the logistics industry are essential as business environments evolve fast, which may cause several problems, including the critical need for well-trained and qualified logistics workers. Closs (2000) suggested that substantial change in logistics and supply chain education is necessary to meet these challenges. While traditional data sources are costly and difficult to access, online job postings provide a free and accessible alternative that offers real-time information on job demand. The choice of the logistics industry stemmed from the severe impact of the COVID-19 pandemic, and this study aims to contribute to previous research on crisis effects on industries. This data collection method can be applied to different sectors and countries, making it practical and cost-effective. Our research targets connecting job postings and job requirements to predict future skills demand in the logistics industry, which has been particularly vulnerable since the pandemic. We collected data from before and after the pandemic to evaluate its impact on the industry. This research will help fill the gap in the literature and provide more current wage data for analysis.

Logistics at the operational level is a labor-intensive industry; thus, how well the employees are qualified, trained, and retained is a significant factor in logistics performance (McKinnon et al., 2017). Razzaque and Sirat (2001) suggest that the focus on the skills and attributes that make an excellent logistician has been limited. Furthermore, it is critical to consider factors that affect and change business environments, such as globalization, outsourcing, technological advancements, climate change, and an increased emphasis on risk management, which may influence logisticians' preferred

skills and competencies. For example, a recent study conducted in the context of the new European Union environment found that skill preference will be given to international business expertise or skill levels in a relevant foreign language (Poist et al., 2001). Additionally, technological advancements also require higher skills demand for logistics jobs. Demand for skills related to predictable and repetitive tasks decreases, while demand for skills in higher cognitive and technological job-specific skills is expected to increase (Ellingrud et al., 2020; Bakhshi et al., 2017). As more and more tasks are automated, transversal skills such as problem-solving, critical thinking, creativity, self-management, active learning, and flexibility are in demand (Zahidi et al., 2020). To stay up with Logistics 4.0, digital literacy skills include data analysis, technology use, technology design and programming, troubleshooting, and user experience (Zahidi et al., 2020). Because more tasks are automated, problem-solving, critical thinking, data analysis, and creativity competencies will become increasingly important (Zahidi et al., 2020).

For data sources, online job postings are a valuable tool for job seekers and employers, providing insight into labor demand and wage data. 60-70% of jobs are now posted online, and there is a correlation between job postings and employment rates (Autor, 2015). A regional assessment shows regional job postings decreased significantly between March and April 2022, with up to 70% reduction in the need to examine their specific correlations in detail. More up-to-date research is necessary with the COVID-19 pandemic and changes in the job market.in Limpopo and Mpumalanga and a 55% and 62% reduction in Gauteng and the Western Cape (Adcorp, 2022). Labor economists traditionally rely on national, firm, or household surveys to analyze the labor market. However, they are now exploring non-traditional sources such as the internet and web-portal data to gain better insights. Such data can forecast jobless rates, consumer behavior, and migration patterns. In light of the COVID-19 pandemic, researchers have also utilized mobile phone and COVID-19 incidence data to estimate working hour losses in different countries. For research methods, the researchers have developed an innovative approach to assessing the impact of the COVID-19 pandemic on the labor market using data from mobility reports, search trends, and the Oxford Stringency Index. This approach provides insight into how businesses and individuals adapt to the pandemic and can inform policies and interventions to mitigate its adverse economic and employment effects. However, novels and reliable statistics for wage change by sectors and countries still need policymakers and educational planners. Previous studies have also focused on trends in job postings and employment rates, but there is still a need to examine their specific correlations in detail. More up-to-date research is necessary with the COVID-19 pandemic and changes in the job market.

This research aims to analyze Logistics job requirements from online job posts worldwide, focusing on the selected locations of Vietnam, mainland China, Hong Kong (China) and Taiwan (China), Thailand, Singapore, Germany, France, Australia, the UK, and the US. To achieve this objective, the study will gather data in 2022, using current models and data from 2019, to investigate the correlation between online job postings and labor wage prediction, specifically in the logistics labor market.

Based on its aims and objectives, this study focuses on the question: “Does the logistics job requirements change in the post-COVID-19 pandemic?” A closer look at job requirements and wages in the logistics sector in Vietnam is in focus and compared to other countries in regions: (i) Asia Pacific (includes China mainland, Singapore, Thailand, Hong Kong, Taiwan, and Australia); (ii) European (includes Germany and France); (iii) the US; and (iv) the UK.

Our research contributes to the existing literature as follows. Generally, the study combines traditional statistical and nowcasting methods to exploit untraditional data. Firstly, this research is helpful for students to learn how to use traditional data to analyze market conditions, precisely the demand for skills in the logistics sector. Online job posts are an inexpensive and accessible tool for students, as they can choose a suitable time for a job application and predict firms' annual trends. Secondly, employers can use online job posts to adjust their offers and requirements to meet the labor market in urgent cases. Lastly, economists and policymakers can urgently observe the market's trend. Thanks to it, policymakers can take timely action to reduce unemployment by reducing minimum wages or subsidizing them, especially during the COVID-19 pandemic, which would improve efficiency.

2. Literature review

This literature review aims to provide foundational background knowledge and definitions related to the topic. The following parts will examine the most critical elements and current scholarly investigations regarding this subject area.

Online job advertisements offer numerous benefits for recruitment, including expanded reach and process efficiency (Sylva & Mol, 2009). Listings typically outline role responsibilities, applicant qualifications, and employer details. Customized placement across preferred platforms aids in sourcing appropriate candidates (Zide et al., 2014). Strategic job posting approaches consider cultural and geographic nuances. Western firms often utilize centralized career portals, while social networks and localization underpin Asian and European alternatives (Pons et al., 2021). Dynamic labor supply-demand modeling informs recruitment planning. Foundational econometric research revealed the complex cyclical determinants underlying wages (Kudlyak, 2013). Recent analysis indicates accelerated online job search adoption, with higher effectiveness for the unemployed than traditional methods (Faberman & Kudlyak, 2016). However, controlling for demographics eliminated this advantage, suggesting potential applicant selection biases (Sachs et al., 2019).

Robust data aids recruitment strategy. Firm-level information offers insights into skill expectations, as Bloom et al. (2017) demonstrated using manager surveys across sectors. Similarly, Kuhn and Shen (2013) leveraged household panel data to show that Internet job searches decrease employment durations. Meanwhile, marine manufacturing research by Adams et al. (2013) relied on plant-level data within Maine. Synthesizing findings, strategic job posting, and labor market analysis are interdependent for effective recruitment. While online sourcing has grown more prevalent, localized cultural customs and potential applicant bias remain relevant considerations. Holistic assessment combining modern and traditional approaches will likely yield optimal hiring outcomes.

In short, varying cultural customs around job posting strategies globally necessitate localization when attracting talent. Although centralized online platforms prevail, recruiters should leverage social platforms, regional job boards, and employee referrals suited to their target labor market through deliberate research. This customized, data-backed approach to promotion can aid companies in securing the most qualified candidates for open positions and assembling skilled teams.

The following section reviews additional empirical research that builds on prior literature, offering updated insights. Modeling labor supply and demand dynamics has long interested economists, with seminal work by Thomas (1976) examining real wage cyclicality. Recent studies

assess online job search trends, finding this method grew more prevalent and effective post-2000, especially during recessions, though controlling for demographics eliminates the unemployment duration advantage, indicating potential selection bias (Kuhn & Skuterud, 2004; Kuhn & Mansour, 2011).

Analysis of modern labor markets applies various data sources like national surveys, firm-level data, or household studies. Examples include Konings and Vanormelingen's (2015) firm-based research, Topalova's (2010) Indian national household survey analysis, and McCaig and Pavcnik's (2018) leverage of the Vietnam Household Living Standards Survey. These data provide supply-demand insights informing workforce planning.

This additional research review builds on earlier findings about online recruitment and labor economic models while spotlighting updated data sources aiding analytics. However, gaps like selection biases remain that upcoming inquiries in this dynamic space can address.

Job advertisements are increasingly vital in recruitment, providing businesses access to expansive talent pools worldwide. Online job postings outline responsibilities, qualifications, and company details to attract applicants across desired skill sets (McGuire & Fink, 2021). Given modern supply chain complexity and technology integration, understanding the evolution of skill demands is critical for talent planning and development (Van de Werfhorst, 2014). This literature review synthesizes key research on global hiring expectations and requirements shifts to inform dynamic workforce strategies.

While foundational capabilities remain relevant, data suggest rising needs for advanced technical skills as operations modernize. Analyzing over 1,500 online job vacancies across over 20 industries in the Netherlands, Van de Werfhorst (2014) revealed an increased emphasis on computing abilities following personal computer and Internet popularization post-1990, reflecting process digitization. Relatedly, Deming and Kahn (2018) used U.S. job listing data to demonstrate rising technical skill expectations and certifications amidst industry computerization, even for non-ICT occupations. Their wage analysis further indicates labor market demand-supply imbalances as competition grows for specialized talent.

Evolving skill priorities also emerge between developed and emerging economies. In Eastern Europe, Mohr and Otto (2021) utilized web-scraped job advertisements to highlight increased soft skill preferences involving creativity, collaboration, communication, and emotional intelligence in Poland relative to Germany, though industry knowledge remains highly valued in technical sectors. Such findings demonstrate regional and cultural nuances shaping human capital expectations globally alongside technological change and globalization, with implications for customizable workforce development strategies.

While providing directional insights on transforming skills needs, available research also reveals gaps. Few cross-economy analyses track expectations over time, especially across supply chain roles. Additional localized, sector-specific inquiry would enable tailored comparisons to guide skills training suited for operations (Cappelli, 2015). There are also opportunities to combine text analysis of job listings with employer surveys and peer nation benchmarking to produce leading recommendations. Comprehensive, proactive research and planning around emerging competency requirements will grow vital amidst accelerating innovation.

Although highlighting rising technology skill requirements, these studies do not provide a direct crossover comparison of expectations between developed and emerging markets. This gap is addressed in the current analysis exploring differentials between high-income countries like Australia, the UK, the US, and middle-income counterparts Vietnam, and China across 2019.

Additionally, existing research explores logistics skill shifts over a short timeframe or within one country. This study's inclusion of data from multiple years across different regions provides new insights into the speed of skill changes across supply chains at various stages. This analysis better understands talent needs amidst a transforming logistics industry by comparing skill demands between high and middle-income countries. Findings will help stakeholders match their training and skills more closely with operational innovation.

3. Research method and data

3.1. Research method: Descriptive statistics

After collecting the data, they will be considered for validity. Valid data will be encrypted, processed, and cleaned using Microsoft Excel software. Using STATA 16.0 software, the authors use the Descriptive statistics method for data analysis to highlight the required skills for the vacancy and define which skills are currently needed for the logistics industry in 2022.

Descriptive statistics refer to methods for organizing, summarizing, and displaying data in a convenient and informative way (Gravetter & Wallnau, 2021). Descriptive statistics enable researchers to simplify large sets of data in a sensible manner and to present comprehensive information concerning the sample investigated (McLaughlin & Sainani, 2014). Descriptive statistics form the preliminary foundation of virtually every quantitative data analysis. They enable simplification of large raw datasets into convenient summaries that characterize critical details about the distribution shape, spread, central tendency, outliers and other vital information both numerically and graphically (Kent State University, 2022). This provides the basis for more complex statistical analysis techniques like inference.

3.2. Data

Using web search data of job postings for a particular country or across countries, such as Vietnam, mainland China, Hongkong, Taiwan, Thailand, Singapore, Germany, France, Australia, the UK, and the US, the authors can know about aggregate registered online job vacancies, jobs application, employment statistics, and unemployment statistics in the logistics sector. Vietnam's economic centers, such as Danang, Hochiminh city, and Hanoi, are also chosen for examination. A web search may be used to collect information by nation and area, which was made accessible for analysis:

1. Basic details about the job opening (position name -string and categorized place, kind of contract)

2. Criteria for the Candidate (education level, years of previous working experience, required skills -string and categorized)

3. Details about the business (location, employee count, industry)

4. Information about the qualifications that firms look for in applicants while filling open positions.

To learn more about how advertisement and web search data are utilized in economic research, refer to the studies conducted by Dörfler and Van de Werfhorst (2009) and Benjamin (2012).

4. Research results

After synthesizing and checking the survey data, the authors collected 1950 valid samples. Generally, the average mean of samples will be slightly high in 2022. Also, the mean values in 2022 are reasonable and acceptable when they are similar and do not show any significant changes during the period. In addition, the means of each region correlates with the GDP per capita. In 2022, all regions included 150 observations, and the standard deviation is comparatively low, showing logical results compared to the mean values, making it more relevant to reality. To evaluate the expectations of employers for skills, we categorize the terms in 2022 into two groups: professional and soft skills. Moreover, based on the data collected, we saw a difference in skill required between high-income countries (Australia, France, Germany, Hongkong, Taiwan, Singapore, the US and the UK) and middle-income countries (Vietnam, China, Thailand, Malaysia, and Indonesia).

Table 1. Categorization of skills in middle-income countries extracted from online job postings in 2022.

Skills	2022
Professional Skills	
Analytical competencies	X
Hands-on experience in related field	X
UI/UX design	
Coding/Programming (Python, HTML, JavaScript, Shell, etc.)	
SQL	
Knowledge in related field	X
Computer, especially Microsoft Office Suites	X
Multitasking	
Standards and principles understanding (KISS and SOLID principles, EHSMS, 3GPP,...)	
Soft skills	
Leadership	
Communication skills	X
Working attitude: punctuality, responsibility, working under pressure, honesty, carefulness, flexibility, proactiveness,...	X

English	X
Second foreign language, usually Chinese, Japanese, Korean,...	X

Source: Authors collected online job postings in 2022.

According to Table 1, the logistics industry in middle-income countries requires both soft and professional skills for success. The essential professional skill requirements are experience, knowledge in related fields, and the support of industry-standard applications (Microsoft). Soft skills such as leadership, communication, presentation, negotiation, and language are similar. Primarily, increasing demand for a second foreign language indicates the globalization of the logistics industry and the need for effective communication with clients and suppliers from different countries.

Table 2. Categorization of skills in high-income countries extracted from online job postings in 2022.

Skills	**2022**
Professional Skills	
Analytical competencies	X
Hands-on experience in related field	X
UI/UX design	X
Coding/Programming (Python, HTML, JavaScript, Shell, etc.)	X
SQL	X
Knowledge in related field	X
Computer, especially Microsoft Office Suites	X
Multitasking	X
Standards and principles understanding (KISS and SOLID principles, EHSMS, 3GPP,...)	X
Soft skills	
Leadership	X
Verbal and written communication, presentation and negotiation	X
Working attitude: punctuality, responsibility, working under pressure, honesty, carefulness, flexibility, proactiveness,...	X
English	X
Second foreign language, usually Chinese, Japanese, Korean,...	

Source: Authors collected online job postings in 2022.

Comparing the two lists of required skills for the logistics industry, it is apparent that some skills have remained constant while others have evolved. In 2022, in terms of professional skills, experience, knowledge, computer skills, and multitasking, they were considered essential for a successful career in logistics. Employers still emphasized soft skills, including leadership, communication, good working attitude, and English. However, technical skills are more critical. By 2022, proficiency in UI/UX design, coding, SQL, and standards and principles understanding will be highlighted as crucial. This reflects the increased reliance on technology and data management in the logistics industry.

Moreover, we found that the logistics industry is fast-paced and demanding, and the skills required to succeed in this field differ between high and middle-income regions. Another outstanding point is that high-income countries have a more comprehensive range of skill requirements regarding technology-based skills such as SQL and UI/UX design;… Furthermore, they perform numerous standards and principles in their operation compared to middle-income nations, especially Vietnam, making it necessary to understand fully. Communication skills also have higher expectations with presentation and negotiation, whereas middle-income countries are merely in verbal and written demand. Furthermore, as the unstoppable growth of Logistics industry, we can see the considerable increase in demand of skill sets regarding Logistics jobs.

5. Research conclusion and recommendations

In conclusion, this research analyzed online job postings to compare the evolution of skill demands in the logistics industry between high-income and middle-income countries. The key findings demonstrate that while some baseline capabilities remain essential, including industry knowledge, computer abilities, leadership, and communication skills, the acceleration of technology has led to growing needs for specialized technical competencies. Specifically, by 2022, proficiency in areas like UI/UX design, programming, SQL databases, and understanding of industry principles and standards will become critical hiring requirements, especially in developed nations like the US, UK, and Australia. This indicates the rapid pace at which supply chains are modernizing through digitization, automation, and analytics adoption. Additionally, high-income regions display a more comprehensive range of advanced skill expectations than middle-income counterparts in Vietnam and China. This includes more vital demands for presentation, negotiation, and data analysis strengths. Therefore, a skills gap seems imminent without reskilling and training reform, particularly in emerging markets still early in technology integration. To summarize, logistics talent strategies must align with operational innovation to avoid workforce shortages. Businesses should invest in upskilling programs focused on building abilities aligned with industry digitization. Likewise, academic institutions need to incorporate more supply chain-specific technology competencies within existing curriculums. Adapting talent development to meet these emerging skill requirements will be vital for long-term success.

We also suggest several recommendations for businesses and applicants in Vietnam. To align with increasing industry demand, logistics curriculums must expand their incorporation of technology, data analytics, and programming competencies. Both vocational and university programs should emphasize building these skill sets. Additionally, employers play a critical role in ongoing skills development. They should invest in regular internal and external training to aid employee retention and keep teams updated on the latest operational needs. Logistics professionals must also

continuously upgrade in business intelligence, digital fluency, and emerging technologies, as these skills will only become more essential over time. At the organizational level, logistics firms must prioritize enhanced data capabilities to leverage expanding information and automation trends revolutionizing supply chains. Developing the necessary digital infrastructure and recruiting data talent will soon become a competitive necessity. Finally, industry associations have an opportunity to take a proactive coordination role in convening key talent development stakeholders; forging partnerships between employers, educational institutions, and governments can accelerate responses to address pressing skills gaps. For students and future applicants, it is recommended that students take electives and pursue internships that provide hands-on exposure to relevant technology and data tools. Maintaining skills versatility by studying soft skills and technical abilities will produce the diverse competencies this sector requires. Additionally, students should actively network with logistics firms to remain current on the skills and certifications employers prioritize in new graduates, helping guide upskilling efforts. Students need to prepare academically to pursue a master's degree or higher and start working during their undergraduate years to reduce the time it takes to build a solid experience background. Businesses will raise the standard, particularly in domain knowledge and computer capabilities, so students must actively broaden their talents, particularly in the Microsoft Office suites.

For research orientation, additional research explicitly focused on localized skill gaps within logistics subsectors and roles could generate tailored insights for training initiatives. Further investigation into the return on investment for employers implementing strategic reskilling programs could support the development of robust workforce strategies. Tracking the partnerships between industry and academia in skills training can also help identify best practices for cooperation. Emerging external factors shaping logistics job roles like automation, artificial intelligence, and blockchain warrant ongoing research attention to assist with proactive scenario planning. Finally, comparative regional analyses of leading talent development models could reveal advantageous workforce policies and structures suitable for broader adoption across the industry. Continued research across these areas will prove vital for arming all stakeholders with the necessary foresight to build tomorrow’s workforce today.

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