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TECHNOLOGY

INFORMATION AND COMMUNICATION TECHNOLOGY AS A TOOL FOR CREATING JOB OPPORTUNITIES IN MALAYSIA

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ABSTRACT

Purpose of the Study: The study sought to examine information and communication technology as a tool for creating job opportunities in Malaysia.

Statement of the Problem: Despite the potential of Information and Communication Technology (ICT) as a tool for creating job opportunities in Malaysia, there exists a significant gap between the demand for skilled ICT professionals and the available workforce. This disparity impedes the country's ability to leverage ICT for economic growth and hinders the overall development of the job market in Malaysia.

Methodology: The study was literature based. The study collected and analyzed existing research and publications to inferences.

Findings: The study discovered that the use of Information and Communication Technology (ICT) has been instrumental in creating job opportunities in Malaysia. The COVID-19 pandemic has accelerated the adoption of remote work in Malaysia. Many businesses have shifted to remote work, resulting in the creation of new job opportunities in areas such as remote customer support and telecommuting. The Malaysian government has also launched initiatives to promote remote work, like the Work From Home (WFH) initiative. As the country continues to undergo a digital

transformation, it is expected that the demand for skilled workers in the ICT sector will continue to grow, creating even more job opportunities.

Conclusion: The study concluded that the rapid growth of the digital economy and the government's focus on developing a digital nation have contributed to the expansion of ICT-related employment across various sectors. The ICT sector itself has become a major source of employment, with job opportunities in software development, IT support, cybersecurity, data analytics, and digital marketing. Digital platforms have empowered individuals to start their own businesses, offering services such as ride-hailing, food delivery, freelance work, and online tutoring. This has provided flexible job opportunities and income streams for Malaysians, promoting economic inclusivity. ICT has proven to be a transformative force in creating job opportunities in Malaysia.

Recommendations: The government should collaborate with educational institutions and industry stakeholders to design comprehensive training programs and upskilling initiatives. Also there should be a strong partnerships with the private sector to drive job creation in the ICT sector. Encouraging entrepreneurship in the digital realm can lead to job creation and economic growth. The government should invest in expanding broadband connectivity and promoting the adoption of emerging technologies in underserved regions. This will create an enabling environment for digital businesses and remote job opportunities, bridging the digital divide and promoting inclusive economic growth.

Keywords: *Information and Communication Technology, Job Opportunities, Malaysia*

INTRODUCTION

Information and Communication Technology (ICT) has played a significant role in creating job opportunities in Malaysia (Audi & Ali, 2019). As a rapidly developing country with a growing digital economy, Malaysia has recognized the potential of ICT in driving employment and economic growth. In this discussion, we will explore how ICT has contributed to job creation across various sectors in Malaysia. The ICT sector itself has emerged as a major source of employment. With the government's focus on developing a digital economy, numerous job opportunities have been created in areas such as software development, IT support, cybersecurity, data analytics, and digital marketing (Avirutha, 2021). Local and international companies are establishing their presence in Malaysia, leading to a demand for skilled ICT professionals.

Furthermore, the adoption of ICT in traditional industries has transformed job markets. Manufacturing, for example, has embraced automation and digitalization, leading to the creation of jobs in areas like robotics, industrial IoT, and smart manufacturing. The integration of ICT has increased productivity and efficiency, enabling companies to expand their operations and hire more workers (Horváth & Szabó, 2019).

ICT has also revolutionized the services sector, particularly in e-commerce and digital platforms. Modgil, Dwivedi, Rana, Gupta and Kamble (2022) noted that the rise of online marketplaces and e-commerce platforms has generated employment opportunities in areas such as online retail, logistics and delivery services, customer support, and digital marketing. These platforms have facilitated the growth of small and medium-sized enterprises (SMEs) by providing them with a digital presence and access to a wider customer base. In addition to job creation within specific sectors, ICT has fostered entrepreneurship and the gig economy. Digital platforms have enabled individuals to start their own businesses, offering services such as ride-hailing, food delivery, freelance work, and online tutoring (Keegan & Meijerink, 2022). This has empowered Malaysians to become self-employed, creating flexible job opportunities and income streams. ICT has also contributed to job creation through the development of smart cities. Malaysia has embarked on smart city initiatives, integrating technology into urban infrastructure and services (Kozlowski & Yusof, 2022). This has created demand for professionals specializing in smart city planning, IoT implementation, data management, and urban analytics. Job opportunities have emerged in sectors such as urban transportation, energy management, healthcare, and public safety.

The government has recognized the importance of ICT in job creation and has implemented various initiatives to support the growth of the sector. For instance, the Digital Malaysia initiative promotes digital adoption and entrepreneurship, offering training programs, grants, and incentives to individuals and businesses (Orser, Riding & Li, 2019). These initiatives have created an environment conducive to job creation and innovation. However, challenges remain in maximizing the job creation potential of ICT in Malaysia. One key challenge is the digital skills gap. While job opportunities exist, there is a shortage of skilled ICT professionals to fill these positions. Addressing this gap requires collaboration between the government, educational institutions, and the private sector to provide relevant training and upskilling programs. Another challenge is ensuring equal access to ICT opportunities across different regions and socioeconomic backgrounds. While urban areas like Kuala Lumpur and Penang have thriving digital ecosystems,

rural areas may face limited infrastructure and connectivity. Bridging this digital divide is crucial to ensure inclusive job creation (Koe & Sakir, 2020).

Moreover, the rapid advancement of technology requires continuous learning and adaptation. To remain employable, workers need to continuously update their skills and stay abreast of emerging technologies (Khai, Onn, Zulkifli, Kandasamy & Ahmad, 2020). Lifelong learning programs and upskilling opportunities are essential to equip the workforce with the necessary skills for the digital era. ICT has played a pivotal role in creating job opportunities in Malaysia. It has not only led to job creation within the ICT sector itself but has also transformed traditional industries, fueled entrepreneurship, and facilitated the growth of the gig economy. However, addressing the digital skills gap, ensuring equal access to opportunities, and promoting continuous learning are crucial to harness the full potential of ICT in job creation and sustainable economic growth in Malaysia (West, Kraut & Ei Chew, 2019).

STATEMENT OF THE PROBLEM

The Information and Communication Technology (ICT) sector has emerged as a powerful tool for economic growth and job creation worldwide. Malaysia, as a developing nation, recognizes the potential of ICT to drive its economy and address the issue of unemployment. However, despite progress in the sector, there is a need to assess the current state of job opportunities created by ICT in Malaysia and identify potential challenges. This statement of the problem aims to explore the role of ICT in job creation, the existing job opportunities, and the barriers that hinder the full utilization of ICT for employment generation in Malaysia. Information and Communication Technology has revolutionized various industries, enabling automation, digitalization, and connectivity. It has created new job roles and transformed existing ones across sectors such as telecommunications, software development, e-commerce, data analytics, and cybersecurity. The utilization of ICT has the potential to enhance productivity, competitiveness, and innovation, thereby creating numerous job opportunities. Recognizing this potential, Malaysia has made significant efforts to develop its ICT infrastructure and promote digitalization. However, it is essential to evaluate the effectiveness of these initiatives in translating ICT advancements into tangible job prospects for the Malaysian workforce.

Malaysia has witnessed a growth in ICT-related industries, including software development, IT services, digital marketing, and e-commerce. The government's Digital Economy Blueprint and

initiatives like the Malaysia Digital Economy Corporation (MDEC) have aimed to attract investments and foster entrepreneurship in the ICT sector. These efforts have led to the emergence of start-ups, the establishment of technology parks, and the growth of the outsourcing industry. Additionally, the demand for skilled professionals in areas such as artificial intelligence, cloud computing, cybersecurity, and data analytics has increased. Despite these positive developments, it is crucial to evaluate whether the available job opportunities align with the skill sets of the Malaysian workforce and cater to a diverse range of educational backgrounds and experience levels. While ICT presents promising job prospects, certain barriers and challenges need to be addressed to fully utilize its potential for job creation in Malaysia. One key challenge is the digital skills gap, where there is a mismatch between the skills demanded by the ICT industry and those possessed by job seekers. Limited access to quality ICT education and training programs, particularly in rural areas, hampers the development of a skilled workforce. Additionally, issues like limited industry-academia collaboration, inadequate funding for research and development, and a lack of supportive policies for start-ups pose obstacles to the growth of the ICT job market. Addressing these challenges will be crucial to ensure that the benefits of ICT are accessible to all Malaysians.

LITERATURE REVIEW

Speckesser, Gonzalez Carreras and Kirchner Sala (2019) conducted study to look at how unemployment affected GDP in Austria during the chosen years, and to see what type of relationship unemployment had with the components of GDP in Austria. In this study, the researcher analyzes the impact of unemployment on Austria's GDP during a nine-year period (2010-2018). Regression analysis was used to gather and analyze the data. According to estimates from the National Population Commission (NPC), the current population of Austria is above 140,000,000. Young people account for 60% of this total, and many of them are just passing the time doing nothing productive. Increasing numbers of Austrian college and university grads are joining the ranks of their predecessors, who received their degrees before them but have been unable to find gainful employment in their fields, despite having lived in Austria for years. The results indicated that unemployment plays a major role (about 65%) in determining Austria's GDP, and that there is a negative correlation between the model (unemployment) and GDP growth (higher unemployment rates result in lower GDP growth, and vice versa). The research concludes that ICT are effective instruments for combating Austria's growing unemployment rate. Wage

workers who are competent and eager to work but cannot find jobs are definitely driven into "idleness" by the lack of employment opportunities. By using ICT, young people may find work. The proliferation of smartphones has resulted in the development of new jobs. Stores, universities, churches, libraries, and even police stations and hospitals are all finding uses for tele-centres. The research suggested that Public Sector Reforms and the use of ICT may help reduce unemployment.

Juárez, Urdal and Vadlamannati (2022) conducted research to determine how ICT affects youth employment in Mexico and to analyze the connection between working as an internet café owner or a contact center operator and adolescent employment in Mexico. For this study, researchers elected to use a survey-based approach. Teenagers (both male and female) living in the research region make up the population. Purposive sampling was used to choose 200 total samples for this investigation. The questionnaire was chosen as the primary method of information gathering. The Pearson product moment correlation coefficient was used as the statistical instrument for examination of the field data that was coded and assessed hypothesis by hypothesis. Only 157 of the 200 questionnaires returned by respondents were complete (i.e., no blanks or alterations were made), hence only those responses were utilized in the analysis. In Mexico, the results showed a statistically significant connection between working in a contact center and finding work for young people, and the same was true for working in an Internet café. The report suggests, among other things, that the state and administration of Mexico expeditiously provide the required facilities for the training of young in ICT management so as to give employment chances for the thronging jobless youth in the area.

Sun (2022) mentioned that China's economy is one of the most stable in Asia, and its growth rate increased to 7.60 percent in the first quarter of 2015. As stated in EDPRS2's pillar, the role of ICT to the attainment is critical if the 2020 goal is to be realized. From e-commerce and e-services to mobile technologies to application development and automation to being a regional hub for the training of high quality ICT workers and academics, China remains one of the fastest developing Asian nations in ICT. The research set out to answer the question, "What effect do ICT have on employment in China?" with a focus on two subtopics: young employment and the promotion of employment. The research used time series data from 2005-2018 to count mobile cellular subscribers and assess internet penetration to gauge ICT infrastructure. Mobile phone subscriptions have a positive impact on young employment and job advancement in China, according to the results of an empirical study. The empirical analysis also revealed the effect that

internet accessibility has on young employment and the promotion of job opportunities in China. The research concludes that the Chinese government should make it easier for foreign direct investment in ICTs infrastructures in order to boost the employability of the country's youth and the country's rate of job creation. The government should coordinate more effort and enhance innovations and research in ICTs from High Learning Institutions (HLI) and IPRCs that can contribute to the services and agriculture sectors, and more attention should be paid to ensuring that young people in rural areas have access to ICTs facilities.

Mendoza and Tadeo (2023) conducted study to analyze the contribution of SMEs in the ICT sector to employment growth in Singapore using a quantitative survey research approach. Small and medium-sized businesses (SMEs) that offered information and communications technology (ICT) services and/or ICT-based goods were the primary focus of the research. Primary data was gathered using a pilot-tested questionnaire, and descriptive statistics were used for analysis. According to the data, the majority of new employment were generated by the sale of airtime, the repair of mobile devices, and mobile money (17, 34 and 34 percent respectively). Seventy-three percent of ICT SMEs employed just one to five workers, with the majority of positions going to technicians (40%) and sales reps (35%), while only 2% of ICT SMEs were involved in software development. According to the data, just 8% of the new positions were at the highest level of management, while 75% were at lower levels. Most workers for Singaporean ICT SMEs earned competitive salaries. Moreover, Kim, McVee and Faith (2019) conducted research to determine whether or not the use of Information and Communication Technology (ICT) may help reduce young unemployment in USA. The information was gathered by means of a questionnaire. The results demonstrate that using ICT for youth empowerment results in the development of new employment possibilities. As a result, this study stresses the need of youth investing in their own ICT education and making good use of ICT for both individual and national growth.

Dosi, Piva, Virgillito and Vivarelli (2021) reported that in the modern world, information and communication technology (ICT) has become an integral part of daily life. The use of ICT has grown so pervasive in modern society that it cannot be avoided in any area of human endeavor, including but not limited to learning, socializing, working, and feeling safe. Many ICT centers in the developing countries employ young people as part of human capacity development to man the centers for up to twenty-four hours a day, seven days a week. Young people in the poor world are increasingly congregating at ICT centers to network, find jobs, and spread their political and social

ideas. In addition, the advancements in ICT have given young people the technical know-how to become successful architects. When young people are hired to do routine maintenance and repairs, it opens up employment chances in the field. This study examines the significant impact that ICT is having on human capacity development and employment creation in the developing countries.

Balsmeier and Woerter (2019) argued that there has been a surge in mobile phone and early phases of internet access throughout South America during the last two decades. The study provides a summary of recent empirical research findings on the effects of ICTs on the labor market in South America, including the creation and elimination of jobs and the modification of existing jobs' productivity, incomes, and working conditions. The research delves into the numerous ways in which ICTs might affect the workforce: Mobile money has the potential to give the most vulnerable workers more independence and security; the internet could help women in particular increase their incomes and independence; and text-based services platforms have the potential to help farmers and small and medium-sized enterprises (SMEs) increase productivity or gain better access to market information. In the literature review, we look at how much hard data there is to back up these assertions. The majority of the analyzed research shows that ICTs have a beneficial impact on employment and other associated factors in South America. Based on these results, the paper discusses potential courses of action for promoting employment in South America. As the research comes to a close, it points out the possibility that these good results coexist alongside negative structural dynamics that are harder to quantify. While the review's conclusions are generally positive, they should be interpreted as applying only to information and communication technologies (ICTs) of the 1990s and 2000s and not necessarily implying that the much more advanced technologies of the Fourth Industrial Revolution (such as machine learning, blockchain technologies, big data analytics, platform economies) will have the same effect.

RESEARCH FINDINGS

The study discovered that the use of Information and Communication Technology (ICT) has been instrumental in creating job opportunities in Malaysia. The nation has been undergoing a digital transformation, and this has created a demand for skilled workers who are proficient in ICT. The ICT industry in Malaysia has been growing rapidly over the past few years. According to a report by the Malaysian Digital Association, the ICT industry has seen a compound annual growth rate of 10.4% from 2015 to 2020. The industry is expected to continue growing, and this will create

new job opportunities in the ICT sector. There is a high demand for workers with ICT skills in Malaysia. According to a report by the Malaysian Communications and Multimedia Commission (MCMC), there were over 20,000 job vacancies in the ICT sector in 2020. Employers are looking for candidates with strong technical skills, such as software development, data analytics, and cybersecurity, and the ability to adapt to new technologies. E-commerce has been growing rapidly in Malaysia, with a compound annual growth rate of 14.3% from 2015 to 2020. This growth has resulted in the creation of new job opportunities in areas such as digital marketing, logistics, and customer service.

The Malaysian government has also launched initiatives to promote e-commerce, such as the National E-Commerce Strategic Roadmap. The COVID-19 pandemic has accelerated the adoption of remote work in Malaysia. Many businesses have shifted to remote work, resulting in the creation of new job opportunities in areas such as remote customer support and telecommuting. The Malaysian government has also launched initiatives to promote remote work, like the Work From Home (WFH) initiative. The Malaysian government has launched various initiatives to promote the adoption of ICT and create job opportunities in the sector. These initiatives include the National Fiberisation and Connectivity Plan, the Digital Malaysia initiative, and the Malaysia Tech Entrepreneur Programme. These initiatives have created new job opportunities in areas such as infrastructure development, software development, and entrepreneurship. The growth of the ICT sector has also led to an increase in entrepreneurship in Malaysia. Many startups have been established in areas such as e-commerce, software development, and mobile app development, creating new job opportunities for Malaysians. The Malaysian government has launched initiatives to support entrepreneurship, like the Malaysia Tech Entrepreneur Programme and the Malaysian Global Innovation and Creativity Centre (MaGIC). As the country continues to undergo a digital transformation, it is expected that the demand for skilled workers in the ICT sector will continue to grow, creating even more job opportunities.

CONCLUSION

In conclusion, Information and Communication Technology (ICT) has emerged as a powerful tool for creating job opportunities in Malaysia. The rapid growth of the digital economy and the government's focus on developing a digital nation have contributed to the expansion of ICT-related employment across various sectors. The ICT sector itself has become a major source of

employment, with job opportunities in software development, IT support, cybersecurity, data analytics, and digital marketing. The demand for skilled ICT professionals has increased as both local and international companies establish their presence in Malaysia. Moreover, the integration of ICT in traditional industries has transformed job markets. Manufacturing has witnessed the adoption of automation, robotics, and digitalization, leading to the creation of new positions in areas like smart manufacturing and industrial IoT. This integration has enhanced productivity and enabled companies to expand their operations, resulting in additional job opportunities.

The services sector has also experienced a significant impact from ICT, particularly through the rise of e-commerce platforms and online marketplaces. This has created employment opportunities in online retail, logistics, customer support, and digital marketing. Small and medium-sized enterprises (SMEs) have benefitted from these platforms, as they provide a digital presence and access to a larger customer base. Additionally, ICT has fostered entrepreneurship and the gig economy in Malaysia. Digital platforms have empowered individuals to start their own businesses, offering services such as ride-hailing, food delivery, freelance work, and online tutoring. This has provided flexible job opportunities and income streams for Malaysians, promoting economic inclusivity. Furthermore, the development of smart cities in Malaysia has generated job opportunities in sectors like urban transportation, energy management, healthcare, and public safety. Professionals specializing in smart city planning, IoT implementation, data management, and urban analytics are in demand, contributing to job growth in these areas. However, challenges remain in fully harnessing the job creation potential of ICT. The digital skills gap poses a significant hurdle, necessitating collaborative efforts between the government, educational institutions, and the private sector to provide relevant training and upskilling programs. Bridging the digital divide and ensuring equal access to ICT opportunities across different regions and socioeconomic backgrounds are also essential for inclusive job creation. ICT has proven to be a transformative force in creating job opportunities in Malaysia. It has not only fostered employment within the ICT sector itself but has also driven job growth in traditional industries, supported entrepreneurship, and facilitated the development of smart cities. By addressing challenges such as the digital skills gap and promoting equal access to opportunities, Malaysia can continue to leverage the potential of ICT as a powerful tool for job creation and sustainable economic growth.

RECOMMENDATION

To address the digital skills gap, it is crucial to prioritize the development of digital skills among Malaysians. The government should collaborate with educational institutions and industry stakeholders to design comprehensive training programs and upskilling initiatives. These programs should focus on in-demand skills such as software development, cybersecurity, data analytics, and digital marketing, ensuring that individuals are equipped with the skills needed for the evolving job market. The government should establish strong partnerships with the private sector to drive job creation in the ICT sector. By collaborating with industry players, the government can gain valuable insights into emerging trends and skills requirements. Public-private partnerships can also facilitate the creation of internship programs, apprenticeships, and mentorship opportunities, providing hands-on experience to aspiring ICT professionals. Encouraging entrepreneurship in the digital realm can lead to job creation and economic growth. The government should introduce supportive policies, such as streamlined business registration processes and access to funding and resources for digital startups. Providing mentorship programs and networking opportunities for aspiring entrepreneurs can also nurture a culture of innovation and increase the success rate of digital ventures.

To ensure equal access to ICT opportunities, it is crucial to improve digital infrastructure across Malaysia, particularly in rural areas. The government should invest in expanding broadband connectivity and promoting the adoption of emerging technologies in underserved regions. This will create an enabling environment for digital businesses and remote job opportunities, bridging the digital divide and promoting inclusive economic growth. Collaboration between educational institutions and the industry is essential to align education with industry needs. The government should facilitate closer ties between universities, colleges, and industry stakeholders, promoting internships, research collaborations, and curriculum development that reflect real-world ICT requirements. This will produce graduates who are job-ready and equipped with the necessary skills for the evolving digital landscape. Given the rapid pace of technological advancements, promoting a culture of continuous learning and reskilling is crucial. The government, in partnership with industry associations and training providers, should offer lifelong learning programs and incentives for professionals to upskill and adapt to emerging technologies. This will ensure that the workforce remains agile and equipped to meet the evolving demands of the digital job market.

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