JOURNAL OF PHILIPPINE TOURISM
AND HOSPITALITY STUDIES 1 (2019)

JPTHS

Job Displacement due to Fourth Industrial Revolution in the Hospitality Industry in the Philippines

Pia Rhoda Pinpin-Lucero
Cavite State University Main Campus - Indang, Cavite

Abstract

The imminent and unprecedented acceleration in technological advancement and its implementation brought the entire hospitality industry to accommodate the innovations in terms of the jobs of the future, which for instance, rendering several human-performed occupations redundant. The consequences shortly, these jobs may be eliminated. At the same time, other jobs are experiencing a rapid increase in demand, and some occupations are revising the skill sets they traditionally require (ILO, 2016). This study used a descriptive research design utilizing the mixed-method of both quantitative and qualitative approaches. Data were collected from four-hundred and thirty respondents from the key experts in the field – industry professionals, faculty members, and representatives from the government regulating agencies in the Philippines for hospitality and tourism. The questionnaire and in-depth interview guide was the primary research gathering instrument. Responses from the participants were coded, analyzed, and interpreted. Statistical treatment such as frequency count, percentage distribution, weighted mean, standard deviation, and ANOVA was used to answer the research problems. The result of the study showed that workers in lower-wage occupations are more likely to be impacted and will face more significant automation threats. There will be jobs that will be displaced or replaced in the future, but, there will be new opportunities coming. Digitally enabled growth will also generate new employment opportunities that could outpace the automation of existing roles, especially a healthy growth is forecast in the hospitality sector. The significant changes are being felt by the industries, which includes the hotel industry as well. The hospitality industry is only one of the many sectors that will undergo new changes and processes due to a paradigm shift. Given some dynamic changes experienced right now in the business environment, the researcher decided to examine the jobs that are at high risk of displacement due to the fourth industrial revolution in the hospitality industry in the Philippines..

Keywords

Job Displacement, Fourth Industrial Revolution, Hospitality Industry, Automation, Robotics

1 Introduction

The hotel and hospitality industry is now one of the largest and fastest industries around the world. It encompasses a wide range of professions including those related to food service and lodging. The hospitality industry is going through irreversible change and will look different in the coming 30 years (Lipstok, 2014). Right now, with the use of digital technology, consumers have the edge in choosing their own pace. Hospitality establishments are now cautious in relating to changing consumer demands. Consumers, especially the 'millennials' who are digital natives, are desiring local, and 'authentic' experiences, great convenience, and hassle-free service environment. The changes brought by globalization are fast; the influential trends that are shaping the world includes the jobs of the future. The workforce is changing, both among young tech-savvy individuals and the aging population. Therefore, the hospitality industry worldwide should adapt to the Fourth Industrial Revolution, which will happen between 2020 to 2050. Based from the article of Marr (2018), the Fourth Industrial Revolution affected the way we live right now. It is now a breakthrough in human development, enabled by remarkable technology advances comparable with the previous phases. These advances are merging the physical, digital, and biological worlds in ways that create both considerable promise and potential peril. Today, we are now in the early stage of the Fourth Industrial Revolution. It is an extension of computerization of the Third Industrial Revolution. The study of Heng (2014), pointed out that the Fourth Industrial Revolution originates from a German government project to promote digitalization and automation. The hospitality industry is one of the many sectors that will undergo new changes and processes due to the emergence of the Fourth Industrial Revolution.

One of the prominent sectors with the highest susceptibility to job displacement is the hotel and restaurant sector. The rising of artificial intelligence and other latest innovations in the hospitality industry will threaten future jobs in this sector.

The Philippines, along with other ASEAN countries, are poised to face the challenges brought about by the Fourth Industrial Revolution. One of those challenges will be job losses and disruptions. Due to automation, some jobs will be displaced. Technological and digital disruptions in the hotel industry will also bring significant opportunities. The rising of artificial intelligence (AI) and robotics are rapidly increasing and machines can perform many jobs better and faster than people. While this may reduce cost, help to raise productivity and it will create job placements, technological advancements could also face some challenges. And the major challenge is the immediate threats for those jobs with low-skilled and repetitive jobs such as assembly-line work and some service jobs are also at risk. In the short term, at least, unemployment will likely increase due to services that require more human interventions. According to Bernard Marr (2018), there might be increased social tensions as a result of the socio-economic changes that will be brought about by the Fourth Industrial Revolution. It could create a job market that's segregated into "low-skill-low-pay" and "high-skill-high-pay" segments, with some jobs even becoming obsolete. Indeed, every industrial revolution creates fears over job losses. In the past, however, more jobs were created through the growth of new industries and with the advancement of new technologies.

For these reasons, the hospitality industry should prepare for future requirements for its potential workforce. It is critical for employers, government workers, and other key hospitality stakeholders to actively develop and respond to the changes taking place in workplaces. Also, constructive engagement between social partners, and education and training institutions is critical to ensure that the workers of today continue to find meaningful employment tomorrow.

2 Literature Review

The presentation of related literature and studies provided relevant information on the problem under investigation.

The study of Stormer, Patscha, Prendergast, and Daheim (2014), analyzed trends that were shaping jobs and skills in the United Kingdom, and forecast the most likely disruptions to those trends. Pompa (2015) outlined the skills needed to developed for the jobs of tomorrow in the different key sectors, such as health and social assistance, construction, technology, big data, manufacturing, creative industries, and the hospitality and tourism sector.

Chang, Rynhart, and Huynh (2016) conducted surveys and extensive secondary research across ASEAN to understand better how disruptive technologies may reshape the landscape of labor in the region. The study revealed that manufacturing production processes have been undergoing a transformative change. The technological impact on jobs and enterprises has been pervasive. Furthermore, specific sectors and groups will be vulnerable to more enormous disruptions, requiring significant effort to make skills, training, and education systems fit for purpose. Lastly, in the technological age, there is a need for comprehensive, multifaceted growth and investment strategies. The technical paper of Chang and Huynh (2016) assessed what types of occupation in Cambodia, Indonesia, the Philippines, Thailand, and Vietnam would have a high probability of being automated in those ASEAN countries. The researcher utilized the variables of the study of Chang and Huynh (2016) in the conduct of this research in the Philippine context.

The study of Shamim, Cang, Yu, and Li (2017), found that the hospitality sector is focusing on digitalization to generate long-term capabilities for more effective and efficient business intelligence. The study is somewhat similar to the present study because both consider the impact of Industry 4.0 on the hospitality sector.

The study of Jasonos, and McCormick (2017), found that the majority of restaurant consumers today are self-sufficient, tech-savvy travelers who are comfortable using apps or mobile websites. The study predicted the future and determined the impact of technology integration on the hospitality industry.

The study of Gul and Gul (2018), pointed out that, historically the industrial revolution processes have affected the tourism industry in a multi-faceted way. The tourism industry has also played an active role in accelerating the industrial revolution processes.

The previous literature has prompted out that hospitality industry workers must meet specific professional standards to be effective in their positions. Education and training providers and industry professionals need to be aware of the potential future requirements of the labor market

and deliver the kind of training workers need to be competitive in the future. The hospitality industry is only one of the many sectors that will undergo new changes and processes due to a paradigm shift. Tomorrow's jobs will look dramatically different and will require new skill sets.

3 Methodology

This study employed the mixed-method of both quantitative and qualitative approaches. Creswell (2009), described the appropriateness of the research design. According to Creswell, mixed methods research is a strategy enables a researcher to broaden understanding by incorporating both qualitative and quantitative analysis, or build on the results from the other approach, thereby assisting the researcher is not only discovering what happened but how it happened as well.

A total of 430 respondents in the Philippines participated in this study. The respondents were composed of 163 tourism industry professionals, 147 faculty members in higher educational institutions teaching hospitality subjects; and 120 participants from government regulatory agencies for hospitality and tourism. Key-informant interviews were carried out with 18 experts, six from each of the three groups of participants.

The instrument used in the study was the researcher's own-formulated survey questionnaire developed based on literature, articles, working papers, and few reviews on competencies. On the other hand, all interview questions were structurally written to discourage short 'yes' or 'no' responses. The meeting was designed in a semi-structured format to allow the researcher to ask pre-planned questions. Each group of participants has a separate interview guide.

Descriptive statistics including percentage and frequency were computed to obtain a general view of the profile of the respondents. Weighted mean, standard deviation was used in determining the hospitality jobs that were at risk of becoming obsolete in the future. One-way analysis of variance (ANOVA) was used to determine if there was a significant difference between and among the ratings of the participants on the perceived level of risk of becoming obsolete of the hospitality jobs in by 2030.

4 Results and Discussions

Profile of the Participants

Out of four hundred thirty participants (430), one hundred sixty-three (163) participants came from industry professionals; one hundred forty-seven (147) participants from academe professionals; and one hundred twenty (120) participants from the members of government regulating agencies for hospitality and tourism in the Philippine.

The participants surveyed were relatively young, the majority from the Industry participants were 25 years old and below. The highest percentage of academe and government agency participants belonged to 41 years and above. The workforce of the hospitality industry nowadays were younger generations of employees. The Millennials grew up in a world that was exposed to technology, and they tend to prefer personalized experiences.

Based on sex, there were more female workers surveyed for all the three groups of participants. This implies that the Philippines remains committed to promoting gender equality. On the other hand, majority of the respondents from the three groups were single (56%). With regards to the years of service, the highest number of participants had a working experience of fewer than five years (45%), followed by six to ten years (27%).

In terms of educational attainment, the majority from the industry and government agencies participants were college graduate while the most considerable population from the academe have units in doctorate. It only shows that faculty members are giving importance to the professional growth as well as in updating and upgrading their knowledge and skills, and this will result in improved teaching skills.

On the other hand, the key-informant interview was carried to at least 18 key experts representing six for each group of participants of the study in the field of the hospitality industry. These experts are holding the top and senior management positions. They have been working for over ten years. There were six (6) Industry professionals who have been interviewed and considered as experts, and they are the General Manager, Executive Assistant, Front Office Manager, Assistant Restaurant Manager, Assistant Housekeeping Manager and Sous Chef from various hospitality establishments in the Philippines. Another six (6) Academe professionals who participated in the key-informant interview and they were the deans, executive director, founder of professional organization and retired dean, department head, director, and senior faculty under the college of hospitality and tourism from reputable Colleges and Universities in the Philippines. Members from government regulating agencies for hospitality and tourism in the Philippines was carried out to six (6) experts which include the Assistant Secretary, Director, and Regional Director of Department of Tourism, Chief Supervising Specialist and Provincial Director of Technical Education Skills and Development Authority. Table 2 shows the Profile of Key Informant Interview.

Hospitality Jobs that are at Risk of Displacement due to 4IR

The participants from three sectors involved in the hospitality industry which are the industry, the academe, and the government were asked to indicate the risk level of becoming obsolete of hospitality jobs in 2030 using a five-point scale.

Front office. Table 3 shows mean score ratings of the three groups of participants in terms of front office jobs. The risk level of hospitality jobs in the front office of the hospitality industry as perceived by all participants (n = 430) from the three sectors. The study indicates the high-risk jobs perceived by all the participants are telephone operator ($\bar{X}$ = 3.87, s = 0.96), and receptionist/front office clerk ($\bar{X}$ = 3.55, s = 1.05).

As pointed out by the Front Office Manager of one of the five-star hotels in Manila in an in-depth interview, there are jobs which will face risk due to automation in the hospitality industry. Some of the front office staff will be lessened in number, but definitely, human workforce is needed.

According to DOT Assistant Secretary in an in-depth interview, different innovative technological platforms are being used in the tourism and hospitality industry which makes travel seamless and easy for tourist and consumer of hospitality and tourism services. Tourism and hospitality industry in the Philippines is such a very person to person kind of sector. Human touch is still essential in this industry. For her, AI will be useful in countries where there is less workforce like Japan. In our country, we had a significant number of workforce. All we need to do is to train, upskill, and provide necessary training to our workforce.

The result of the study was affirmed by Chang, J-H and Huynh, P, (2016), the immediate threats are to low-skilled, repetitive jobs and services jobs are at risk to become obsolete in the future. These findings are in agreement with Bernard Marr (2018); every industrial revolution creates fears over job losses. The "low-skill/low-pay" jobs will become obsolete in the future. According to the Future of Jobs Report 2018 collected by the World Economic Forum (2018) in the Travel and Tourism Sector, the concierges and hotel desk clerks are one of the identified declining jobs today.

Table 3. Mean score ratings of the three groups of participants in terms of front office jobs

FRONT OFFICE JOBS	INDUSTRY		ACADEME		GOVERNMENT		AVERAGE MEAN SCORE	
	WM (SD)	VI	WM (SD)	VI	WM (SD)	VI	WM (SD)	VI
Front Office Manager	2.40 (1.16)	LR	2.33 (1.18)	LR	2.43 (1.07)	LR	2.38 (1.14)	LR
Front Office Supervisor	2.49 (1.00)	LR	2.42 (1.21)	LR	2.50 (1.11)	LR	2.47 (1.10)	LR
Receptionist / Front Office Clerk	3.61 (0.93)	HR	3.55 (1.08)	HR	3.48 (1.17)	HR	3.55 (1.05)	HR
Telephone Operator	3.74 (0.96)	HR	4.05 (0.87)	HR	3.82 (1.05)	HR	3.87 (0.96)	HR
Bell Boy	3.32 (0.93)	MR	3.14 (1.13)	MR	3.16 (1.06)	MR	3.21 (1.04)	MR
OVERALL COMPOSITE MEAN	**3.11 (0.53)**	**MR**	**3.10 (0.66)**	**MR**	**3.08 (0.74)**	**MR**	**3.10 (0.64)**	**MR**

Legend:

Range of Values	Risk Level			
1.00 – 1.79	Extremely low risk	(ELR)	WM	– Weighted Mean
1.80 – 2.59	Low risk	(LR)	SD	– Standard Deviation
2.60 – 3.39	Moderate risk	(MR)	VI	– Verbal Interpretation
3.40 – 4.19	High risk	(HR)		
4.20 – 5.00		Extremely high risk	(EHR)	

Housekeeping. Table 4 shows the risk level of hospitality jobs in the housekeeping of the hospitality industry as perceived by all the participants (n = 430) from the three sectors. The high risk jobs in the housekeeping as perceived by all the participants are laundry attendant ($\bar{X}$ = 3.57,s = 0.98), room attendant ($\bar{X}$ = 3.57, s = 1.11), and public area cleaner ($\bar{X}$ = 3.44, s = 1.06). These results imply that there will be jobs that will be displaced or replaced in the future, but, there will be new opportunities coming. Automation has a great help in their operation, but the human workforce is

still needed. Filipinos are known to be hospitable; that is why human touch will be a great impact in providing personalized service to the customers.

As pointed out by the Assistant Housekeeping Manager of one of the five-star hotels in Manila in an in-depth interview, their hotels are already acquiring and utilizing the modern housekeeping tools and equipment which makes their work easier, faster and very convenient and it served as a great help in their operation. And with these, the workforce they need was already lessened.

Table 4. Mean score ratings of the three groups of participants in terms of housekeeping jobs

HOUSEKEEPING JOBS	INDUSTRY		ACADEME		GOVERNMENT		AVERAGE MEAN SCORE	
	WM (SD)	VI	WM (SD)	VI	WM (SD)	VI	WM (SD)	VI
Executive Housekeeper	2.37 (1.14)	LR	2.40 (1.21)	LR	2.18 (0.94)	LR	2.33 (1.12)	LR
Laundry Manager	2.48 (1.03)	LR	2.59 (1.09)	LR	2.34 (0.98)	LR	2.48 (1.04)	LR
Floor Supervisor	2.55 (0.93)	LR	2.52 (1.08)	LR	2.42 (0.93)	LR	2.51 (0.98)	LR
Laundry Attendant	3.53 (0.89)	HR	3.55 (1.01)	HR	3.65 (1.04)	HR	3.57 (0.98)	HR
Room Attendant	3.69 (0.98)	HR	3.53 (1.16)	HR	3.45 (1.21)	HR	3.57 (1.11)	HR
Public Area Cleaner	3.52 (0.96)	HR	3.46 (1.13)	HR	3.32 (1.12)	MR	3.44 (1.06)	HR
OVERALL COMPOSITE MEAN	**3.02 (0.64)**	**MR**	**3.01 (0.73)**	**MR**	**2.90 (0.58)**	**MR**	**2.98 (0.66)**	**MR**

Food production. Table 5 also shows the risk level of hospitality jobs in the food production of the hospitality industry as perceived by the all the participants (n = 430) from all the three sectors indicating an overall low-risk level ($\bar{X}$ = 2.58, s = 1.02) for all the food production jobs as a whole. These results imply that humans are still relevant to food and beverage production. There are many innovations in food and beverage production, and this makes the hospitality business competitive. Developed technology could make the work easier and faster.

These results also imply that adapting to digital technology creates a positive impact. Thus it increases the speed and efficiency of operation. The successful application of advanced technology in the hospitality industry will play an important role to enhance competitiveness and business development. However, the quantity and quality of human resources are equally important to be able to provide personalized services to the guests effectively. One of the best thing that keeps guest from coming back is the warm and hospitality of the Filipino people.

As pointed out by the Sous Chef in one of the five-star hotels in Manila in an in-depth interview, there are advantages and disadvantages of using technology in the hospitality industry. For the benefits, technology could make the work easier and faster. Adopting the technological

trends makes their company competitive. Another outcome of technological advances, there will have a significant effect on the workforce and this contributes to the disadvantages.

According to DOT Director, in an in-depth interview, the government has the initiatives to prepare the workforce in the future. Just like what DOT is doing. They are planning to conduct the future of tourism work. And the objectives of this project is to initiate discussion on the tourism trends in the next five to ten years, create human capital development roadmap that will become a guide to the industry to prepare the workforce for the future of tourism. With this project, it will be of great help for those people who are involved in the tourism and hospitality industry.

Table 5. Mean score ratings of the three groups of participants in terms of food production jobs

FOOD PRODUCTION JOBS	INDUSTRY		ACADEME		GOVERNMENT		AVERAGE MEAN SCORE	
	WM (SD)	VI	WM (SD)	VI	WM (SD)	VI	WM (SD)	VI
Executive Chef	2.29 (1.17)	LR	2.34 (1.33)	LR	2.36 (1.21)	LR	2.33 (1.24)	LR
Demi Chef	2.38 (1.06)	LR	2.44 (1.23)	LR	2.48 (1.41)	LR	2.43 (1.22)	LR
Commis Chef	2.47 (1.08)	LR	2.55 (1.25)	LR	2.41 (1.11)	LR	2.48 (1.15)	LR
Chef de Partie	2.43 (1.02)	LR	2.56 (1.23)	LR	2.43 (1.13)	LR	2.48 (1.12)	LR
Commis Pastry	2.71 (0.99	MR	2.61 (1.23)	MR	2.44 (1.11)	LR	2.60 (1.11)	MR
Baker	3.10 (1.17)	MR	2.73 (1.20	MR	2.65 (1.14)	MR	2.85 (1.19)	MR
Butcher	3.08 (1.13)	MR	2.87 (1.17)	MR	2.79 (1.21)	MR	2.93 (1.17)	MR
OVERALL COMPOSITE MEAN	**2.64 (0.89)**	**MR**	**2.59 (1.10)**	**LR**	**2.51 (1.07)**	**LR**	**2.58 (1.02)**	**LR**

Food and beverage services. Table 6 also shows the risk level of hospitality jobs in the food and beverage services of the hospitality industry as perceived by all the participants (n = 430) from the three sectors. The high-risk job as perceived by all the participants in the three sectors is a waiter ($\bar{X}$ = 3.52, s = 1.21).

These findings are similar to that of Future of Jobs Report 2018 collected by the World Economic Forum (2018) in the Travel and Tourism Sector, one of the expected impacts on the workforce is reduce workforce due to automation. Based on the result of the study, low-risk jobs were the F&B Director and F&B outlet Manager. On the other hand, high-risk jobs were the bartender and Waiter. These findings are supported by the study of Chang and Huynh (2016), entitled "ASEAN in transformation: the future of jobs at risk of automation, wherein the findings show that managers in hotels and restaurants are included in the ten identified low-risk occupations in the Philippines, while waiters, waitresses, and bartenders ranked 6th in the top ten identified high-risk occupations in the Philippines.

There are many technological innovations in the food service business. As pointed out by the Assistant Restaurant Manager in one of the five-star hotels in Manila in an in-depth interview, technology in the F&B Industry becomes very helpful. It makes them do their duties fast. But we should not only confine or restrict these technologies because sometimes, but there is also an inconvenience when the system is down. When it happen, it will be a big problem, and they need to go back to manual duties. That is the reason why the human factor is still necessary for the workplace.

According to academe participants during the key-informant interview, we already have the technology, but we still need to use our human resources equally capable and competitive with this technology.

Table 6. Mean score ratings of the three groups of participants in terms of Food And beverage services jobs

FOOD AND BEVERAGE SERVICES JOBS	INDUSTRY		ACADEME		GOVERNMENT		AVERAGE MEAN SCORE	
	WM (SD)	VI	WM (SD)	VI	WM (SD)	VI	WM (SD)	VI
F&B Director	2.34 (1.18)	LR	2.40 (1.25)	LR	2.47 (1.17)	LR	2.40 (1.20)	LR
F&B Outlet Manager	2.49 (1.14)	LR	2.45 (1.24)	LR	2.49 (1.11)	LR	2.48 (1.16)	LR
Head Waiter	3.34 (1.06)	MR	2.84 (1.10)	MR	2.82 (1.15)	MR	3.02 (1.12)	MR
Bartender	3.42 (0.99)	HR	2.86 (1.18)	MR	3.51 (1.14)	HR	3.25 (1.14)	MR
Waiter	3.74 (1.01)	HR	3.20 (1.36)	MR	3.62 (1.19)	HR	3.52 (1.21)	HR
OVERALL COMPOSITE MEAN	**3.06 (0.74)**	**MR**	**2.75 (0.98)**	**MR**	2.98 (0.82)	**MR**	**2.93 (0.86)**	**MR**

Table 7 shows the results of hypotheses testing by department jobs. It reveals the comparison of the overall risk level of all the listed hospitality jobs as a whole as perceived by the three groups of participants and the results of ANOVA indicating that their mean risk levels for these three groups of participants are not significantly different with F = 1.068 and p = 0.345. The overall risk levels of all the listed hospitality jobs as a whole as perceived by all the three groups of participants are just about the same.

5 Conclusion and Recommendation

Based on the result of the study, the following conclusions were drawn: The emergence of the Fourth Industrial Revolution will bring many joint opportunities and challenges. One of those challenges is job losses and disruption. As travelers are becoming digitally savvy, the hospitality industry must be responsive and uniquely competitive to the market. With service being the foundation of the hospitality sector, hotels are now embracing automation, which makes our job

easier and faster. Occupations in which the bulk of tasks are more routine tend to be more adaptable to automation. Workers in lower-wage occupations are more likely to be impacted and will face more significant automation threats.

Table 7. Results of hypotheses testing by department jobs

HOSPITALITY INDUSTRY JOBS	GROUP	MEAN	STANDARD ERROR	F COMPUTED	p-VALUE	REMARKS
Front office jobs	Industry	3.11[a]	0.04	0.096	0.908	Accept Ho
	Academe	3.10[a]	0.05			
	Government	3.08[a]	0.07			
Housekeeping jobs	Industry	3.02[a]	0.05	1.458	0.234	Accept Ho
	Academe	3.01[a]	0.06			
	Government	2.90[a]	0.05			
Food production jobs	Industry	2.64[a]	0.07	0.555	0.575	Accept Ho
	Academe	2.59[a]	0.09			
	Government	2.51[a]	0.10			
Food and beverage services jobs	Industry	3.06[b]	0.06	5.475	0.004	Reject Ho
	Academe	2.75[a]	0.08			
	Government	2.98[b]	0.07			
OVERALL	Industry	2.93[a]	0.04	1.068	0.345	Accept Ho
	Academe	2.84[a]	0.06			
	Government	2.84[a]	0.06			

A p-value of less than 0.05 indicates significantly different means.
A p-value of less than 0.01 indicates highly significantly different means.

Jobs resistant to automation involve extensive non-routine, tasks that require judgment, problem-solving, intuition, persuasion, and creativity. Automation has a great help in the operation of the hospitality industry in the Philippines. However, human workforce is still needed. Filipinos are known to be hospitable; that is why human touch will be a significant impact in providing personalized service to the customers.

The hospitality industry, the educational and training providers, as well as the government sector, need to anticipate for automation impacts actively. The hospitality industry should prepare the future, including the requirements for its potential workforce. The academe is suggested to work in coordination with the industry and government regulating agencies in producing globally competitive, multi-skilled, tech-savvy, environment conscious, and values-oriented future workforce. The government is suggested to create human capital development roadmap and provide essential infrastructures for digital transformation (such as reliable and high-speed internet connectivity, safe and secure system, etc.) Hospitality employers, government workers, and other key hospitality stakeholders must actively prepare and respond to the changes taking place in workplaces. It is suggested to have a constructive engagement between social partners and education and training institutions to ensure that the workers of today continue to find meaningful employment tomorrow.

References

Chang, Jae-Hee; Huynh, Phu. (2016). "ASEAN in transformation: the future of jobs at risk of automation"; International Labour Office, Bureau for Employers' Activities; ILO Regional Office for Asia and the Pacific. - Geneva: ILO, 2016 (Bureau for Employers' Activities (ACT/EMP) working paper; No. 9).

Chang, Jae-Hee; Rynhart, Gary; Huynh, Phu (2016). "ASEAN in transformation: How technology is changing jobs and enterprises." International Labour Office, Bureau for Employers' Activities (ACT/EMP). - Geneva: ILO, 2016 (Bureau for Employers' Activities (ACT/EMP) working paper; No. 10).

Creswell, John W. (2009). "Research design." Thousand Oaks, CA: SAGE Publications

Heng, S. (2014). "Industry 4.0: Huge Potential for Value Creation Waiting to be Tapped"; Deutsche Bank Research: London, UK, 2014.

Gül, Melike & Gül, Kudret. (2018). "The Effect of Fourth Industrial Revolution on Tourism." Retrieved from https://www.researchgate.net/publication/330909577_THE_EFFECT_OF_FOURTH_INDUSTRIAL_REVOLUTION_ON_TOURISM/download

ILO 2016 International Labour Conference

Jasonos, Michael, and McCormick, Richard. (2017). "Technology Integration for Restaurants & Hospitality Industry in the Year 2025". Master's Thesis. Degree Programme in Tourism

Lipstok, Kairi (2014). "The hotel industry is going through hugs changes." Hotel Industry Blog. Retrieved from http://www.edreamhotels.com/the-hotel-industry-is-going-through-huge-changes/

Marr, Bernard (2018). "The 4th Industrial Revolution Is Here - Are You Ready?" Retrieved on October 10, 2018 from https://www.forbes.com/sites/bernardmarr/2018/08/13/the-4th-industrial-revolution-is-here-are-youready/#2a5505de628b

Pompa, Caudia, (2015). "Jobs for the Future." Overseas Development Institute. London International Labour Organization.

Stormer, Eckhard; Patscha, Cornelius; Prendergast, Jessica; Daheim, Cornelia. (2014) "The Future of Work. Jobs and Skills in 2030". London: UKCES

Shamim, Saqib; Cang, Shuang; Yu, Hongnian; and Li, Yun. (2017). "Examining the Feasibilities of Industry 4.0 for the Hospitality Sector with the Lens of Management Practice". Retrieved on October 4, 2018 from https://www.researchgate.net/publication/315569812_Examining_feasibilities_of_Industry_40_for_the_hospitality_sector_with_a_lens_of_management_practice

World Economic Forum, (2018). "The Future of Jobs Report." Retrieved on October 11, 2018 from https://www.weforum.org/reports/the-future-of-jobs-report-2018