A quantitative study on how covid-19 has impacted the relationship between employees and the hybrid employment model in the information technology field

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Abstract

The purpose of this case study was to provide a better understanding on how COVID-19 has impacted the relationship between employees and the hybrid employment model in the Information Technology (IT) field. A review of the literature regarding the general background of a hybrid employment model and the relationship it has with employees in the IT field and related technologies is provided. Hypotheses were tested using a research model. Data was collected through a survey that was conducted on individuals that worked in the IT field. A total of 102 participants completed the survey. The findings indicated that before COVID-19, individuals of an older age who worked in the Information Technology industry perceived that working remotely is not a better place for them to be productive while in a post COVID-19 society, individuals of an older age who worked from home did not perceive a negative impact on their career due to a lack of face-to-face interaction with colleagues and managers.

Keywords: Hybrid Employment Model, Hybrid Employee Relationships, Information Technology, Onsite vs. Remote, Productive Working Environments, Working Remotely, Work Environment

Introduction

The world was changed when the Corona Virus Disease (COVID-19) surfaced in the year 2019. Organizations found themselves pivoting and changing the way they operated. Organizations found themselves trying to find innovative ways to keep their businesses afloat. Many employees were forced to transition to remote work. Working remotely is a concept that was new to much of the workforce. Previously, the general idea of working remotely was frowned upon as being not as productive and efficient compared to someone working onsite. Employees working remotely used to have to deal with the reputation of them being lazy and not having the same lack of motivation compared to someone working in person. This reputation led to many organizations not eager to entertain the idea of having their employees work remotely. When COVID-19 affected the world, the attitude of working remotely has changed along with the daily life of everyone around the world. Organizations have now started to become more flexible with employees' work conditions.

A hybrid employment model is a plan that incorporates a mixture of in-office and remote work in an employee's schedule (Diab-Bahman & Al-Enzi, 2020). Employees will have the ability to choose when they work from home and when they travel to the office to work. Due to COVID-19, hybrid work schedules will become a normal concept in the future work culture (Jaiswal & Arun, 2020). There is much discussion

about a hybrid employment model in the post-pandemic world. The hybrid work model would allow people to work at least some part of the week from home. In a hybrid employment model, employees would have more flexibility to get work done when they're most productive.

The following will present a review of the literature to give a better understanding of the importance of this study. Previous studies focused on how Covid-19 has impacted the relationship between employees and the hybrid employment model in the Information Technology field will be discussed. The methodology of this study will be described, followed by the results. Finally, the limitations, conclusions, and future recommendations on how to extend this study will be offered.

Literature Review

There are companies that believe their organization will be at a disadvantage if their employees continue working remotely while their competitors bring their employees back to the office (Pataki-Bittó & Kapusy, 2021). Another belief by companies is that they worry their remote employees' engagement and loyalty will start to decline if those employees continue to work remotely (Raghuram, 2021). The following literature will explain the hybrid employment model, the advantages, and the disadvantages that this style of hybrid work brings to employees and employers.

Hybrid Employment Model

The hybrid working model is a type of work style that allows employees to blend working from different locations (Jaiswal & Arun, 2020). For example, in a hybrid working model, an employee could work a percentage of the work week offsite and the other percentage onsite at their corporate office. Within the hybrid working model, companies may have teams or departments split between working remotely and working onsite. One example of this could be having the marketing team work remotely while the sales team works on site every day. Certain positions or leadership roles in a company could be changed to working completely remote or to a hybrid work style. A hybrid employment model can increase employee's flexibility, performance, collaboration, work relationships, and work habits (Zhang et al., 2020). This model can help improve company culture by helping their employees work-life balance (Raghuram, 2021). The hybrid employment model allows employees to focus more on their personal lives and families while also bringing in their income. Google was one of the first companies during the COVID-19 pandemic to announce in December of 2020 that when employees return back to the office, that they would use the hybrid employment model in which employees would be expected to work at least three days a week onsite and the rest of the time remotely (Pataki-Bittó & Kapusy, 2021).

Advantages and Disadvantages of the Hybrid Employment Model

An advantage of the hybrid employment model is the ability to allow employees who need to focus quietly at home compared to those who thrive better in a community office setting (Khare & Yadav, 2021). This model allows the employee to choose their work environment where they can be the most productive. A second advantage of companies using the hybrid employment model is that it could better accommodate employees with disabilities. Working from home could give people with disabilities or medical conditions the chance to work comfortably while staying connected. Another advantage of companies using the hybrid employment model is that it can help decrease health exposure risks (Zhang et al., 2020). With fewer employees onsite, this would mean that the company could be able to lower the chances of employees getting sick which may result in fewer sick days being taken.

A disadvantage of the hybrid employment model could be that employees may feel isolated and disconnected from the team. A second disadvantage of the hybrid employment model is that employees

may not get enough facetime with the people in higher positions to prove that they deserve the chance to climb the corporate ladder (Ramsay, 2020). Another disadvantage of companies using the hybrid employment model is that communication between team members requires extra effort (Jaiswal & Arun, 2020). While working remotely, a software tool would need to be installed to allow communication between the team members.

Research Methodology

Research Question and Hypotheses

The main research question that this study addressed was: How did COVID-19 impact the relationship between employees and the hybrid employment model in the Information Technology field. The specific research question that this study addressed was:

Will a hybrid employment model in a post COVID-19 society be successful for all ages of employees in the Information Technology field?

The following hypotheses were tested:

> H_1. Before COVID-19, individuals of a younger age who worked in the Information Technology industry perceived that working remotely is a better place for them to be productive.
> H_2. Before COVID-19, individuals of an older age who worked in the Information Technology industry perceived that working remotely is not a better place for them to be productive.
> H_3. In a post COVID-19 society, individuals of a younger age who worked from home do not perceive a negative impact on their career due to a lack of face-to-face interaction with colleagues and managers.
> H_4. In a post COVID-19 society, individuals of an older age who worked from home do not perceive a negative impact on their career due to a lack of face-to-face interaction with colleagues and managers.
> H_5. Before COVID-19, individuals who worked in the Information Technology industry will not want to have two workspaces and would rather prefer to be either completely remote or completely in the office.
> H_6. In a post COVID-19 society, individuals who worked in the Information Technology industry will not want to have two workspaces and would rather prefer to be either completely remote or completely in the office.

Questionnaire Development and Testing

The questionnaire contained nine questions. A demographic question was asked to gather the age range of the participants. A pretest was conducted on a group of participants who completed the questionnaire by themselves, without intervention or support from the researcher. The pretest was given to participants from specific targeted audiences. The purpose of the pretest was to validate the questions on the questionnaire. The questionnaire was converted into a survey and created through a website (www.surveymonkey.com). The researchers used SurveyMonkey due to its reputation of stability and for the simple appearance of the interface that it provided. SurveyMonkey uses traditional web widgets such as checkboxes and radio buttons. This interface helped reduce the amount of instructions on how to reply to the questions. SurveyMonkey was chosen by the researchers due to the built-in functions to analyze the results of the data collection. These tools have been tested and validated by previous studies. The tools that were provided by SurveyMonkey were at no cost to the participants or researchers.

Data Collection Methodology

All constructs were measured with previously validated instruments. In this study, one survey was conducted on a variety of participants. The instruments used in the study were a series of survey questions that were measured on a 5-point Likert-type scale in which 1 denoted "Strongly Agree (SA)," 2 denoted "Agree (A)," 3 denoted "Neither Agree Nor Disagree (NAND)," 4 denoted "Disagree (D)," and 5 denoted "Strongly Disagree (SD)." The participants for the survey were given the link through a social media posting on LinkedIn. The participants were able to access the questionnaire between March 1st, 2022, and April 1, 2022. Participants were given an introduction and the purpose of the survey before being asked to take it. Participants were expected to fully understand the purpose of the survey and agree to the terms and conditions before proceeding to complete the survey. The targeted participants were individuals who worked in the Information Technology field. The purpose of the survey was to collect data and analyze the results to add to the body of literature regarding how COVID-19 has impacted the relationship between employees and the hybrid employment model in the Information Technology field. Surveys and questionnaires are widely used in research to target a specific population with questions designed to measure and collect data pertaining to a specific topic (Alvarado et al., 2016). This technique provides precise calculations of the variables that are being used in the study.

The following statements in the questionnaire were given to the participants of this research study:

RQ_1: Please select your age range.
RQ_2: Please select your gender.
RQ_3: Do you work in the Information Technology field?
RQ_4: Before COVID-19, I believed that working remotely was a better place for me to be productive.
RQ_5: In a post COVID-19 society, I believe that working remotely is a better place for me to be productive.
RQ_6: Before COVID-19, I believed that working remotely would not have a negative impact on my career due to a lack of face-to-face interaction with colleagues and managers.
RQ_7: In a post COVID-19 society, I believe that working remotely will not have a negative impact on my career due to a lack of face-to-face interaction with colleagues and managers.
RQ_8: Before COVID-19, I preferred to work in a hybrid work environment where I had two workspaces.
RQ_9: In a post COVID-19 society I do not prefer to have two workspaces and would rather be either completely remote or completely in the office.

**Questionnaire Distribution**

The approach to invite participants to the survey was done online through multiple social media postings on LinkedIn. This was the only contact with the participants, and it explained the purpose of the research, who the researchers were, and the average time that would be spent to complete the questionnaire. SurveyMonkey.com provided a header for the survey questionnaire to include additional information for the participants. This helped show the participants that the research was focused on a specific topic.

Data Analysis

Civelek's (2018) book on structural equation modeling (SEM) explained that using this technique in a research study could reveal the relationships among the variables that are not directly measured. Civelek demonstrated how the SEM technique can be used to reveal direct and indirect relationships between

variables. The SEM technique was used to analyze the relationships between age in this study. This technique was chosen to measure how the variation of the latent variables (before COVID-19: individuals of a younger age perceived that working remotely is a better place for them to be productive, before COVID-19: individuals of an older age perceived that working remotely is not a better place for them to be productive, post COVID-19: individuals of a younger age who worked from home do not perceive a negative impact on their career, post COVID-19: individuals of an older age who worked from home do not perceive a negative impact on their career, before COVID-19: individuals will not want to have two workspaces, and post COVID-19: individuals will not want to have two workspaces) impacted the measured variable (age). The goal was to understand and indicate a relationship between these latent variables and the measured variable. Replication of this study using this framework and research design is possible. Figure 1 shows the theoretical framework for this study. This theoretical framework displays the latent variables and the measured variable on how Covid-19 has impacted the relationship between employees and the hybrid employment model in the information technology field.

Figure 1. Theoretical Framework.
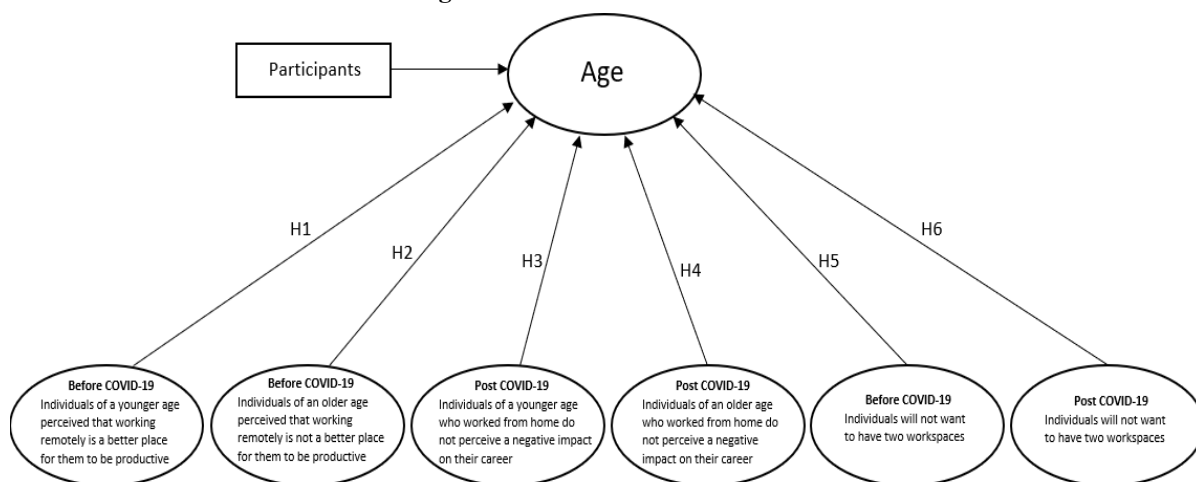
Results

The questionnaire was taken by 102 participants. The data was collected from March 1st, 2022, until April 1st, 2022. The participants were over the age of 18 years and all participants worked in the Information Technology field. From the 102 participants, 78 were male and 24 were female. Question 1 asked the participants to select their age range. The possible age range choices were 18-24, 25-34, 35-44, 45-54, and over 55. Of the participants, 5.8% (6 participants) were in the 18-24 range, 5.8% (6 participants) were in the 25-34 range, 17.6% (18 participants) were in the 35-44 range, 23.5% (24 participants) were in the 45-54 range, 29.4% (30 participants) were between the age of 55 and 64, and 5.8% (6 participants) were over the age of 64. The results from the survey showed 70.5% of the individuals fell in the age range of 35-64. The demographic factor of the participants who completed this survey can be found in Figure 2.

Demographics

■ Under 18 ■ 18-24 ■ 25-34 ■ 35-44 ■ 45-54 ■ 55-64 ■ 64+

Figure 2. Demographics of the participants
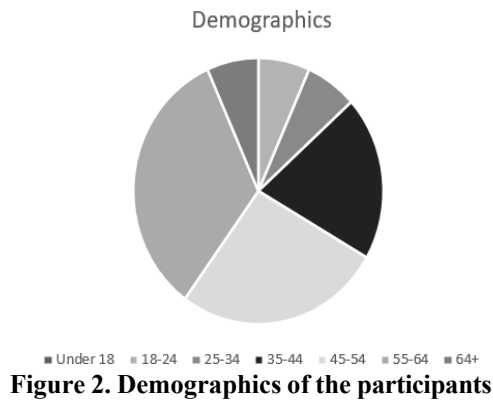
Findings

In research question 4 (RQ4), 53% of the participants selected "Strongly Agree" or "Agree" regarding how before COVID-19, they believed that working remotely was a better place for them to be productive. In research question 5 (RQ5), 94% of the participants selected "Strongly Agree" or "Agree" regarding a post COVID-19 society, they believed that working remotely is a better place for them to be productive. In research question 6 (RQ6), 65% of the participants selected "Strongly Agree" or "Agree" regarding in a post COVID-19 society, they believed that working remotely will not have a negative impact on their career due to a lack of face-to-face interaction with colleagues and managers. In research question 7 (RQ7), 82% of the participants selected "Strongly Agree" or "Agree" regarding in a post COVID-19 society, they believed that working remotely will not have a negative impact on their career due to a lack of face-to-face interaction with colleagues and managers. In research question 8 (RQ8), 65% of the participants selected "Strongly Agree" or "Agree" regarding how before COVID-19, they preferred to work in a hybrid work environment where they had two workspaces. In research question 9 (RQ9), 59% of the participants selected "Strongly Agree" or "Agree" regarding in a post COVID-19 society, they do not prefer to have two workspaces and would rather be either completely remote or completely in the office. It is important to observe that over 80% of the participants selected "Strongly Agree" or "Agree" for research questions 5 (RQ5) and 7 (RQ7). Table 1 shows the breakdown of the survey results.

Table 1. Survey Results.

RQ	SA	A	NAND	D	SD
RQ4	30	24	18	18	12
RQ5	54	42	0	6	0
RQ6	12	54	12	12	12
RQ7	12	72	0	18	0
RQ8	30	36	18	18	0
RQ9	36	24	0	42	0

Data Synthesis for Research Question

The SEM technique was conducted to see if any relationships existed among the variables. Figure 3 displays the model and the path coefficients that were created in the PLS-SEM tool. The model represents the measured variable and the latent variables. The path coefficients were calculated through an algorithm in a sequence of regressions in terms of weight vectors. The weighting scheme consisted of 300 maximum iterations with a stop criterion (10^-X) of 7.
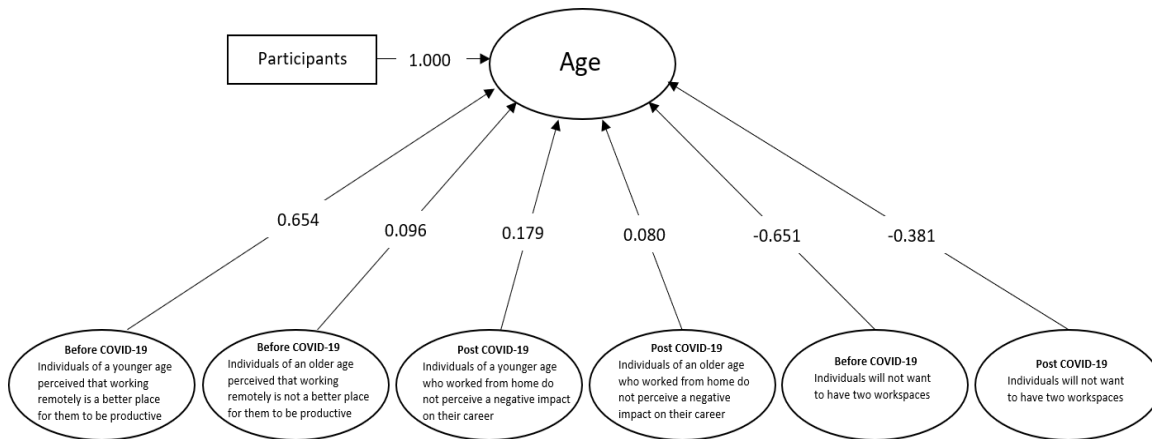
Figure 3. Coefficients of the SmartPLS Model.

Summary

An algorithm known as bootstrapping was used to test the statistical significance of the path coefficients of the SmartPLS model. A significance level of 1% was applied with a subsample of 500 and parallel processing to the tacit and explicit model. The breakdown of the *p*-values for H1 through H6 were: H1 resulted in generating a *p*-value of 0.345, H2 resulted in generating a *p*-value of 0.010, H3 resulted in generating a *p*-value of 0.266, H4 resulted in generating a *p*-value of 0.018, H5 resulted in generating a *p*-value of 0.269, and H6 resulted in generating a *p*-value of 0.374. Figure 4 displays the *p*-value results for the model. Based on the *p*-values derived from bootstrapping, H2 and H4 were supported, while H1, H3, H5, and H6 were not supported and must be rejected. Only H2 and H4 were supported and the rest of the hypotheses were not supported due to the significance level of 1% (p-value > 0.1).

Path Coefficients

	Mean, STDEV, T-Values, P-Values	Confidence Intervals	Confidence Intervals Bias Corrected	Samples

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
H1 -> Age	0.654	-0.147	0.692	0.945	0.345
H2 -> Age	0.096	0.254	0.206	0.466	0.010
H3 -> Age	0.179	0.135	0.161	1.112	0.266
H4 -> Age	0.080	0.239	0.321	0.248	0.018
H5 -> Age	-0.651	-0.191	0.588	1.108	0.269
H6 -> Age	-0.381	-0.088	0.429	0.889	0.374

Figure 4. Bootstrap results of the SmartPLS model.

Reliability and Validity

Reliability was established by using three different subject matter experts (SMEs) to generate the survey questions. A SME is an individual who is a specialist in their field, with degrees and years of experience in a particular topic (Mattoon, 2005). The SMEs made the determination of which questions should be on the questionnaire based on their knowledge and experience. The candidates to be SMEs in this research were recruited through a list of individuals in the IT field. The candidates were determined based on their experience working within their chosen field, collaboration techniques, and soft skills.

Discriminant validity was applied by using a statistical technique to determine the relationship between the variables. The Fornell-Larcker criterion was used to measure the discriminant validity. This approach

compared the average variance extracted (shared variance within) of the constructs to the squared correlation between the constructs (shared variance between). Figure 5 displays the results of the Fornell-Larcker criterion. As all the coefficients in the diagonal are larger than the values in the table, discriminant validity is guaranteed.

Discriminant Validity

	Fornell-Larcker Criterion	Cross Loadings	Heterotrait-Monotrait Ratio (HTMT)	Heterotrait-Monotrait Ratio (HTMT)		
	Age	H1	H2	H3	H4	H5	H6
Age	1.000						
H1	0.167	1.000					
H2	0.261	0.665	1.000				
H3	0.263	0.449	0.493	1.000			
H4	0.222	-0.079	0.245	0.557	1.000		
H5	0.166	0.788	0.652	0.719	0.255	1.000	
H6	-0.174	0.294	-0.124	-0.438	-0.623	-0.237	1.000

Figure 5. Results of the Fornell-Larcker Criterion.

Discussion

The hybrid employment model was a transitory work environment but now is a part of the "new normal" for many businesses. Previous studies have indicated that the result of companies using the hybrid employment model has renewed employee's passion, happiness, and fulfillment from their work (Khare & Yadav, 2021). Throughout the pandemic, the remote and hybrid work models have become the new normal. Post pandemic, many businesses are starting to transition back to an in-office work environment but also implementing to some extent the hybrid employment model. These models will likely continue to play a role in the evolution of the work environment for years to come. For many individuals in the IT field, the hybrid employment model has introduced an appreciation for a better work-life balance. Employees can still report for meetings but do not need to endure the daily travel to the office. Due to the pandemic, the hybrid employment model has introduced to many a new level of freedom and control of their time.

Two hypothesis (H1 and H3) were not supported and this could be related to the participants belief that before COVID-19, individuals of a younger age who worked in the Information Technology industry perceived that working remotely is a better place for them to be productive, and in a post COVID-19 society, individuals of a younger age who worked from home do not perceive a negative impact on their career due to a lack of face-to-face interaction with colleagues and managers. H5 and H6 were not supported and this could be related to that the participants belief that before COVID-19, individuals who worked in the Information Technology industry would not want to have two workspaces and would rather prefer to be either completely remote or completely in the office and in a post COVID-19 society, individuals who worked in the Information Technology industry would not want to have two workspaces and would rather prefer to be either completely remote or completely in the office. Possible reasons why H1, H3, H5, and H6 were not supported, could be the cause of several factors including the predominant age group, gender, and IT experience of the participants.

Limitations

The implementation of this study was not without certain limitations. The study is limited by the fact that it only focused on the measurement of specific variables. A limitation exists regarding the personal views of the participants in the IT field. It is unknown whether certain answers to the questions were biased, based upon the participants previous experience in the IT field, therefore altering the acceptance of one or more hypotheses. Another limitation is the lack of knowledge regarding the participants experience in the IT field

and the size of the data sample. Further investigation is needed to establish if the same results could be duplicated through a larger data sample and applied across a broader context.

A future study could include the use of additional questions to determine the participants' years of working in the IT field and attempt to ensure an equal representation of the amount of experience between the participants. Additionally, an expansion of the sample size would be warranted to eliminate as much bias in the responses as possible. The need to balance the study by age group may also be warranted to remove any significant influence upon the survey. Lastly, a second survey could be conducted asking the same questions to determine if opinions had changed since the participants' initial responses.

Conclusion

This study aims to highlight the impact that the COVID-19 pandemic has on the relationship between employees and the hybrid employment model in the Information Technology field. The hybrid employment model allows employees to focus more on their personal lives and families while also bringing in their income from their place of work. A hybrid employment model is a plan that incorporates a mixture of in-office and remote work in an employee's schedule (Diab-Bahman & Al-Enzi, 2020). In this study, findings are presented through a survey that was aimed to understand the relationship between the employee and the hybrid model employment. To understand this impact, a survey was conducted via www.SurveyMonkey.com to collect data on 102 participants, 78 males and 24 females who worked in the Information Technology, IT field. The results from the study showed that 70.5% of individuals who participated in the survey were in the age range between 35 and 64 years old. While 29.5% of survey participants were in the age range between 18 and 34 years old. Due to the COVID-19 pandemic, many organizations sent their employees home and adopted several models of socially distancing safe work environments (Zhang et al., 2020).

The overall results from our study showed a relationship between employees' age and the preference for hybrid employment models in the Information Technology field. Employees' age determined if hybrid work employment models impacted individuals. An important observation from the survey results indicated that 80% of the participants with an age range between 18-34 years old did not perceive working remotely before COVID-19 and post COVID-19 to impact their productivity. On the other hand, the participants of age 64 years and older perceived hybrid employment models as impacting their social interaction when working in an onsite work environment as opposed to remote work. This age range perceived remote work as impacting their social interactions with colleagues and thus decreased productivity. In addition, the results were consistent with the research questions 8 (RQ8) and 9 (RQ9) showing that before COVID-19, participants in the study were more inclined to work either remotely or in-person. However, post COVID-19, the survey results showed that participants preferred to work remotely than in-person. Another important observation was that 59% of the participants selected "Strongly Agree" or "Agree" regarding in a post COVID-19 society, they do not prefer to have two workspaces and would rather be either completely remote or completely in the office. The research model used in this study supported the research agenda and suggested that the hybrid employment model has a significant impact on employees in a post COVID-19 work environment in the Information Technology field.

In addition, it is important to note that while there appears to be a correlation between the employee and the hybrid employment model in the Information Technology field, the impact was less significant in this domain. The survey results indicated that most of the participants either worked remotely or in a hybrid employment environment before the COVID-19 pandemic. However, the survey results also indicated that the participants who worked onsite before the COVID-19 pandemic were also impacted by changing their work environment to working remotely.

References

Diab-Bahman, R., & Al-Enzi, A. (2020). The impact of COVID-19 pandemic on conventional work settings. *International Journal of Sociology and Social Policy*.

Jaiswal, A., & Arun, C. J. (2020). Unlocking the COVID-19 lockdown: Work from home and its impact on employees.

Khare, M., & Yadav, S. C. (2021). Effects of work from home on the health of information technology employees during pandemic COVID 19.

Pataki-Bittó, F., & Kapusy, K. (2021). Work environment transformation in the post COVID-19 based on work values of the future workforce. *Journal of Corporate Real Estate, 23*(3), 151-169.

Raghuram, S. (2021). Remote work implications for organizational culture. *Work from Home: Multi-level Perspectives on the New Normal*.

Ramsay, S. (2020). Let's not return to business as usual: Integrating environmental and social wellbeing through hybrid business models post COVID-19. *International Social Work*, *63*(6), 798-802.

Zhang, H., Cai, Y., Zhang, H., & Leung, C. (2020). A hybrid framework for smart and safe working environments in the era of COVID-19. *Int. J. Inf. Technol*, *26*(1).