

Impact of Work from Home Model on the Productivity of Employees in the IT Industry

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Abstract - Remote workers did not appear out of nowhere, when the internet was first invented in the 1980s. Far before downtown offices and commuting, working from home was commonplace. Since everybody worked from home until the Industrial Revolution, businesses are familiar with the concept of working remotely. The available studies on remote working does not have such a comprehensive description of how working from home impacts IT workers in particular. For this research study, data was collected from 115 IT employees in India, about their experiences when being required to work from home through a structured questionnaire. The study concluded that, among the four independent variables considered, communication and collaboration have the highest impact on productivity of the employees when they work from home. The authors also suggest that employers and managers must find ways by which they can enhance the communication with their employees and between employees, improve collaboration with employees and among employees as a team, by which they can improve employee productivity. Additionally, it is vital to provide workers with job flexibility and to ensure that they have a healthy work-life balance.

Index Terms - Communication & Collaboration, IT employees, Work from Home, Productivity, Work life balance.

1.INTRODUCTION

Work is traditionally done in an office environment. Workers conduct work-related tasks in a physical space where a company's operations take place. This is changing as the digital transformation progresses. As technical capabilities become more advanced and business processes become more dependent on them, companies are finding that many of their employees are no longer limited by a physical workspace in order to operate effectively. Working from home or remotely can be just as efficient. Several businesses transformed their employees from the office to a work-

from-home model during the global Coronavirus pandemic. Coronavirus (COVID-19) forced several people to take time off work. Many employees and business owners in a variety of sectors were unable to make the transition to a work-from-home model. Coronavirus, on the other hand, has driven many service providers to go even further with technology, addressing how they can operate and function more efficiently and effectively by digital means. This study focuses primarily on employees in the IT industry, as it is one major industry that demonstrated flexibility during the lockdown, with up to 97 percent of its workers operating from home or wherever they found convenient to support not only domestic but also international clients. According to estimates, the IT industry will not return to the old model of operating from an office anytime soon, and about 75% of the workforce will continue to work from home in the future.

When the employees are physically separated from the office environment, the major concern is Productivity itself. When it comes to working from home, there are two camps. People will get nothing done, according to one party, while employees will be happier and more efficient, according to the other. It's likely that it depends on a variety of variables, including the job's characteristics, the employee's personality, and how the home environment complements the work-from-home model.

2.LITERATURE REVIEW

A study to analyze the effect of the type of work, preference of schedule (Traditional or Flextime), problems and benefits on the attitude towards telecommuting give an initial insight about the attitudes of systems personnel towards working from home. (Gerardine DeSanctis ,1984). The next report,

which looked at the relationship between productivity and feasibility, as well as cost and benefits, work habits, isolation vs. social contact, and career implications, found that people who already work for a business and use their homes as full- or part-time work sites have leverageable skills. (JOANNE H. PRATT, 1984). A study has also been undertaken on the relationship between motivation for telecommuting with factors including Work and non-work relationship, social relationship, Co-workers' efficiency, Interaction with co-workers' relationships within households. (Ilan Salomon, Meira Salomon, 1984). The next research looked into the relationship between flexibility and a variety of factors such as work conflict, work expectations, autonomy, job satisfaction, task variety, position clarification, family conflict, job involvement, family involvement, marital satisfaction, intervention, family expectations, overload and stress. (LE Duxbury, 1996). Relationship between work family conflict and Performance, turnover, absenteeism, organizational commitment, job involvement, and burnout was the basis of the next study. According to the findings, work-family tension does not always have a negative effect on job-related efficiency and attitude. (Ellen Ernst Kossek & Cynthia Ozek, 1999). A study to understand the attitude of respondents towards teleworking concluded that individuals who are married and people who professed more advantages accruing from teleworking either to themselves or to their organizations, reported a more favorable and positive attitude and relation towards teleworking. (Vivien K.G. Lim, Thompson S.H. Teo, 2000). A study based on remote working and employee relationship was done by keeping the employer or employee led initiative, trust in the employment relationship, the interface between work and home life as the independent variable. (Lynette Harris, 2003). Another study was conducted to analyze the Job aspects and Family aspects by keeping the work venue as the independent variable. (E. Jeffrey Hill, Maria Ferris, Vjollca Martinson, 2003). The results of a study on telecommuting showed that the majority of the employees who participated in this research are in favor of the telecommuting concept and they have a positive attitude towards this concept. (Ahmed Gad Abdel-Wahab, 2007). Work flexibility was the next parameter chosen in the next study for measuring the change in employee productivity and it concluded that work flexibility was an important

factor in deciding employee productivity and therefore, it can be considered as a significant factor when it comes to employee productivity. (Ellen MacEachen, Jessica Polzer, Judy Clarke, 2007). A previous study was conducted to determine the effect of job characteristics and working conditions on job efficiency. (Emin Kahya, 2007). A study was done to analyze employee productivity as keeping the stress and satisfaction of the employees as the independent factor. The results were that higher stress leads to decline in employee productivity and as the satisfaction of the employees increases the productivity also increases. (George Halkos, Dimitrios Bousinakis, 2010).

The next study was conducted keeping the flexible work program as the changing variable and it was done to understand how much impact does the work flexibility has on employee productivity. The results of the research showed that employees who have a flexible work schedule are observed to be associated with a high level of productivity. (Song Yang, Lu Zheng, 2011). There is a study which was based on the studies that had already been done and this study analysed the employee performance and employee productivity with respect to the physical environmental factors. (N. Kamarulzaman, A. A. Saleh, S. Z. Hashim, H. Hashim, A. A. Abdul-Ghani, 2011). Another research which was conducted to measure the change in the employee performance and productivity keeping the reward management system as the basis of study. (Pınar Güngör, 2011). In the literature on remote working, the workplace has been explored as a measure of job satisfaction and productivity. Most aspects of the UOA administrative staff's working climate were unsatisfactory, including a failure to promote and endorse new ways of office work. This situation was also found to be inefficient in terms of efficiency. (Konstantinos Fassoulis, Nikolaos Alexopoulos, 2015). Another study has been done on employee satisfaction, self-assessed employee productivity and health. (Jungsoo Kim, Christhina Candido, Leena Thomas, Richard de Dear, 2016). A research has been conducted on efficient telework strategies. Teleworkers use spatial, temporal, behavioral, and communicative strategies to establish boundaries similar to those used in office environments. Employees with more job control and strength, as compared to teleworkers, are better able to create integration or segmentation strategies that suit

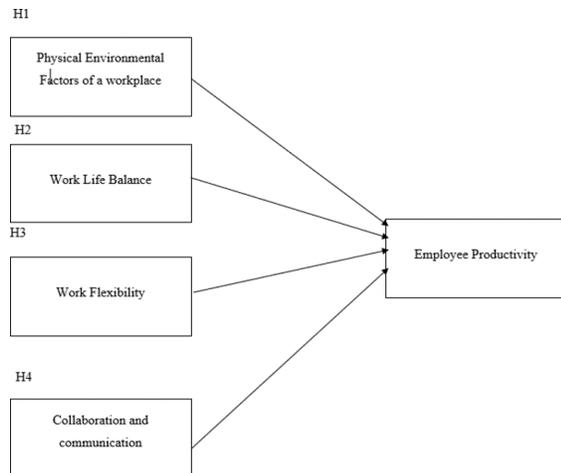
their needs. (Kelly A. Basile T. Alexandra Beauregard, 2016). In an activity-based workplace, a research was conducted on self-rated employee efficiency and employee welfare. Employee efficiency and health are boosted by satisfaction with the physical environment, privacy, connectivity, and increased workplace switching. Morale of employees suffers as a result of increasing time spent looking for a workspace. (Annu Haapakangas, David M. Hallman, Svend Erik Mathiassen, Helena Jahncke, 2018). There is a study on the impact of privacy, collaboration, friendship and generation of employees on employee productivity. Privacy and collaboration have a positive impact on work success, whereas friendship has a negative impact. For Generation Y, the connection between privacy and work efficiency is greater than for senior workers, such as Baby Boomers and Generation X. (Erlinda N. Yunus, Erni Ernawati, 2018). Research has been done on the effect of commuting on employee productivity. Active commuting has a positive relationship with job performance in middle-aged workers. The distance travelled to work is linked to absenteeism. Commuters who drive short distances and use active transportation are more likely to be satisfied. (Liang Ma, Runing Ye 2019). There is also a study on the impact of Telework hours, Effect of telework on stress, happiness and life satisfaction and Commuting Time on Employee Productivity. Appropriate telework hours increases employee productivity. Telework enhances life satisfaction which leads to employee productivity. (Sachiko Kazekami, 2019). Characteristics and outcomes of telework have also been studied. The most significant telework factors affecting various telework results were found to be reduced communication with peers, supervisor confidence and help, and suitability of a working place in the house. (Audronė Nakrošienė, Ilona Bučiūnienė, Bernadeta Goštautaitė, 2019). According to a report on forced working at home in response to the Covid- 19 pandemic and how it differs from working from home by choice, employers and employees are correlated with feelings of greater autonomy and respect for being able to exercise independence over their working arrangements. These results may not be seen when working from home is expected of employees. (Deirdre Anderson and Clare Kelliher, 2020). Research has been conducted on the cost-effectiveness of team coordination and mandated working from home. (Lena Waizenegger, Brad

McKenna, Wenjie Cai & Taino Bendz, 2020). During the covid-19 pandemic, there were also discussions about working from home for business continuity, with the conclusion that business intelligence and analytics tools provide managers with a significant route toward efficiency optimization. (Anuj Tripathi, Teena Bagga, 2020). The impact of gender differences in perceived work performance and job satisfaction on dual-career parents who work from home has also been discussed. Prior to the Covid-19 pandemic, there were no gender differences in self-rated work performance and job satisfaction, according to the report. (Zhiyu Feng, Krishna Savani, 2020). It also conducts research into the relationship between managerial capacity and employee performance. It comes to the conclusion that managerial capacity and employee productivity have a significant positive relationship. (Dipankar Ghosh, Xuerong (Sharon) Huang and Li Sun, 2020). It also assesses the COVID crises' job consequences by categorizing economic sectors as per three European countries' confinement decrees. (Germany, Spain and Italy). (Marta Fana, Sergio Torrejón Pérez, Enrique Fernández- Macías, 2020). It also addresses whether the pandemic has the ability to increase job prospects for people with disabilities. It concludes that staff with disorders are more likely to work from home at the moment. (Lisa A. Schur, Mason Ameri, Douglas Kruse, 2020).

3.OBJECTIVES

1. To identify the different factors that affect the employee productivity working from home in the IT industry.
2. To identify whether the physical environmental factors of the workplace affect the employee productivity in work from home model.
3. To identify whether work flexibility affects the productivity of an IT employee working from home.
4. To identify whether collaboration and communication affect the productivity of an IT employee working from home.
5. To identify whether work-life balance affects the productivity of an IT employee working from home.

4.HYPOTHESIS FORMULATION



4.1. Hypothesis

H1 – Physical environmental factors of a workplace affect employee productivity.

H0 – Physical environmental factors of a workplace do not affect employee productivity.

H2 – Work-life balance affects employee productivity.
 H0 – Work-life balance does not affect employee productivity.

H3 - Work-flexibility affects employee productivity.
 H0 – Work flexibility does not affect employee productivity.

H4 – Collaboration and communication affect employee productivity.
 H0 – Collaboration and communication do not affect employee productivity.

5.RESEARCH METHODOLOGY

5.1. Data collection

The primary method of data collection was through a survey which was conducted among the employees working in various IT companies. The study was undertaken mainly to understand how the WFH model had impacted the productivity of employees. The secondary data was collected from the news reports and articles that are published on various websites. The sample consists of 115 IT Employees within the age limit 21-50, working in various IT companies in India. A questionnaire was prepared and distributed to the employees in the form of google forms, the responses of which were studied for drawing conclusions.

5.1.1.Data Analysis and Interpretation

5.1.2. Descriptive Analysis

Age	Frequency	Percent	Income	Frequency	Percent
21-26	85	73.91%	Less than 2 Lakhs	15	13
27-32	18	15.65%	Between 2 Lakhs to 3 Lakhs	18	15.7
33-38	8	6.96%	Between 3 Lakhs to 4 Lakhs	41	35.7
39-44	1	0.87%	Between 4 Lakhs to 5 Lakhs	19	16.5
45-50	3	2.61%	More than 5 Lakhs	22	19.1
Total	115	100%	Total	115	100

Gender	Frequency	Percent	Marital Status	Frequency	Percent
Male	55	47.83%	Single	88	76.5
Female	60	52.17%	Married	27	23.5
Total	115	100.00%	Total	115	100

Experience	Frequency	Percent
Less than 1 year	23	20
Between 1 year and 2 years	57	49.6
Between 2 years and 3 years	4	3.5
Between 3 years and 4 years	6	5.2
Greater than 4 years	25	21.7
Total	115	100

(Source - Primary)

Interpretation

i. Age

Among the 115 respondents, the majority lies in the age group of 21-26 which constitute 73.91 percent and the next was the age group of 27-32 which constituted 15.65 percent of the total. The percentage of respondents for other age groups is very negligible and age category 39-44 was the lowest with just one respondent.

ii. Gender

Among the 115 respondents, there were 55 male employees, which constitutes 47.83% of the total number of respondents and 60 female employees

which constitutes 52.17% which is slightly higher. The difference between the number of female and male employees is very negligible. There is almost an equal proportion of male and female employees who were the respondents in the data collection process.

iii. Marital Status

The difference in the number of employees who are single and those who are married is significant. Among the 115 respondents, 88 employees are single/unmarried and this constitutes the majority of 76.5%. Employees who are married were only 27, that constitutes only 23.5% of the total number of employees.

iv. Income

Under this parameter, 5 different income levels were included. Majority of the employees obtain an income that comes under the ‘Between 3 lakhs to 4 lakhs’ level. 41 employees that constitute 35.7% of the total number of respondents come under this income level. The difference in the percentage/number of employees who are under the rest of the income levels is negligible. Among this, the least number of employees are under the income level ‘Less than 2 lakhs. This is only 15 employees, who constitutes only 13% of the total number of employees.

v. Work experience in years

Under this parameter, 5 different categories were included. Majority of the employees are the ones who have work experience between 1 year and 2 years. 57 employees that constitute 49.6% of the total number of respondents come under this category. From the data, it is clear that almost half of the employees who responded, were having work experience between 1 year and 2 years. Only 4 employees come under the category of ‘Between 2 years and 3 years’ which constitutes only 3.5% of the total number of employees and only 6 employees come under the category of ‘Between 3 years and 4 years’ that constitutes only 5.2% of the total number of employees. The difference between these two categories that comprise the least number of respondents is negligible. 41.7% (20% + 21.7%) of the employees therefore, are the ones who have the work experience of less than 1 year and greater than 4 years, collectively.

5.1.3. Factorial Analysis

Between-Subjects Factors			
		Value Label	N
Gender	1	Male	55
	2	Female	59
Income	1	Less than 2 Lakhs	15
	2	Between 2 Lakhs to 3 Lakhs	18
	3	Between 3 Lakhs to 4 Lakhs	41
	4	Between 4 Lakhs to 5 Lakhs	19
	5	More than 5 Lakhs	21

(Source - Primary)

From the findings of factorial analysis, for understanding which demographic factors have the most significant impact on Employee Productivity, we selected Gender and Income as the independent variables. From the findings of the analysis, we can infer that both gender and income do not have a significant impact in Employee Productivity because the significance value of Gender and Income are 0.389 and 0.824 respectively which is greater than 0.05. Also, the aggregate significance value of Gender and Income is 0.924 which is greater than 0.05. Hence, according to the results of our study gender and income have no significant impact on employee productivity.

5.1.4. Multiple Regression Analysis

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error				Lower Bound	B
(Constant)	0.733	0.383		1.915	0.058	-0.026	1.492
WLB	0.118	0.099	0.11	2.048	0.045	-0.105	0.34
CAC	0.403	0.081	0.452	5.003	0	0.243	0.563
PE	0.078	0.113	0.059	0.691	0.491	-0.146	0.302
WF	0.186	0.092	0.173	2.295	0.03	-0.078	0.27

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.538 ^a	0.48	0.464	0.52381

a. Predictors: (Constant), WF, PE, WLB, CAC

(Source - Primary)

On the basis of multiple regression analysis, following are the interpretation:

Among the four independent variables, Communication and collaboration has the highest impact on Employee productivity with a significance value of 0.000 which is less than 0.05. Also, for one unit change of communication and collaboration, there is 0.403- unit change Employee Productivity which is also the highest among the four independent variables. The next two independent variables that have significant impact on Employee Productivity are Work Flexibility and Work life balance with a significance value of 0.030 and 0.045 respectively, both of which are less than 0.05. Therefore, the null hypothesis of Communication and Collaboration, Work Flexibility and Work Life Balance are rejected. The independent variable which does not have an impact on Employee Productivity is Physical Environment Factors with a significance value, 0.490 which is greater than 0.05. With an increase in One unit of Physical Environmental Factors, the increase in Employee Productivity is only 0.078 which is very negligible. Therefore, the null hypothesis of Physical Environmental Factors is accepted.

A study “Working from home: characteristics and outcomes of telework” (Audronė Nakrošienė, Ilona Bučiūnienė and Bernadeta Goštautaitė, 2019) supports the conclusion of this study, that communication and collaboration is an important factor that affects employee productivity while telecommuting. Likewise, a study “Mechanisms to improve labor productivity by performing telework” (achiko Kazekami, 2019), concludes that Stress does not decrease labor productivity directly. Although telework improves happiness and job satisfaction, these variables have no direct impact on labor productivity. But after the analysis of results, we can understand that work-life balance impacts employee productivity. Therefore, the results from this study deviates from the previous one.

Studies like “Self-rated productivity and employee well-being in activity-based offices: The role of environmental perceptions and workspace use” (Annu Haapakangas, David M. Hallman, Svend Erik Mathiassen, Helena Jahncke, 2018) and “An Overview of the Influence of Physical Office Environments towards Employees” (N. Kamarulzaman, A. A. Saleh, S. Z. Hashim, H. Hashim, A. A. Abdul-Ghani, 2011), concludes that

satisfaction with the physical environment affects the employee productivity which deviates from this study, that concludes that physical environment factors have the least significant impact on employee productivity. A study “The paradox of de-coupling: A study of flexible work programs and workers’ productivity” (Song Yang, Lu Zheng, 2010) concludes that the highest level of productivity is associated with employees who enjoy a flexible work schedule. This is also in line with the results from this study as from the analysis, we can understand that work flexibility is a significant factor affecting employee productivity. Therefore, we can conclude that the findings from this study complement with the previous study.

6.FINDINGS

- The majority of respondents in this study are from the age group of 21-26 and the income category between 3 lakhs to 4 lakhs.
- Females constitute the majority of the respondents by a small margin when compared to the male category. Majority of the respondents are singles and have work experience ranging between 1 year and 2 years.
- Among the two demographics factors taken for analysis, both gender and income are found to have a very negligible impact on employee productivity during work-from-home.
- Among the four independent factors taken into consideration, Collaboration and Communication is found to have the most significant impact on the employee productivity whereas, Physical Environmental Factors is found to have no significant impact towards the employee productivity.

7. CONCLUSION

Work from home can be compared to two sides of a coin, or to the adage that everything has a grey side. While operating from home, there are advantages and disadvantages for both workers and employers. Employee motivation during telecommuting is solely determined by the employee's personality and personal goals. Furthermore, the productivity rate of a company's workers is determined by the type of industry and nature of the business. The Information

Technology Industry is one of the industries that can easily adapt or manage their businesses while working from home, mainly because of the existing WFH platforms and infrastructure and digital solutions in place for virtual collaboration. The COVID-19 pandemic gave it a whole new meaning and outlook. Because of the numerous benefits of WFH during COVID-19, IT companies such as Tata Consultancy Services have announced that by 2025, only one-fourth of their employees will need work from their facilities at any given time, while the rest will be able to work remotely. The businesses must simply ensure that everyone works together to build a society that is less disruptive and advantageous to all parties, allowing WFH to function effectively. It's also important to note that, while the WFH model has drawbacks, it also offers opportunities to explore uncharted territories and learn a lot.

8. LIMITATIONS OF THE STUDY

The fact that most of the respondents were new to working from home or had very minimal experience prior to the government shutdown forcing them to work from home is a study limitation. Future research may involve participants from a wider population and with prior experience working from home to better understand how affordances have changed. Furthermore, our participants were subjected to various levels of lockout, resulting in a lack of consistency in the study's necessary working from home conditions.

9. FUTURE RESEARCH

The emphasis of this study was solely on the Information Technology industry and the effect of the work-from-home model on it. A more in-depth investigation into other sectors is also possible. Furthermore, this study's sample consists solely of Indian IT workers. There is room for research into the effect of telecommuting on the IT industries of other countries, which will aid in understanding how this work culture has affected those countries' citizens and economies.

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