INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 15, Issue 5, (2025) E-ISSN: 2222-6990

Work From Home and Perceived Productivity among Public Service Engineers

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To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v15-i5/25434 DOI:10.6007/IJARBSS/v15-i5/25434

Published Date: 21 May 2025

Abstract

The work from home (WFH) arrangement, once a relatively uncommon practice, has attracted significant scholarly attention following its widespread implementation during the recent global health crisis. Organizations, including Malaysia's public service sector, were compelled to adopt WFH, making it a new norm for many employees. This study aims to investigate the factors that contribute to perceived productivity among public service engineers while WFH and to identify the impacts of WFH on public service engineers' perceived productivity. To achieve these objectives, semi-structured interviews were conducted with ten public service engineers who had experience working both in-office prior to the COVID-19 pandemic and remotely during the pandemic. The findings reveal that individual factors, along with organizational support, home and family dynamics, and job-related demands, significantly influence perceived productivity during WFH. However, the overall impact of WFH on productivity was perceived to be negative, with participants reporting reduced efficiency and longer task completion times compared to traditional office settings. The study concludes with practical suggestions and recommendations for enhancing productivity in future remote work arrangements.

Keywords: Work From Home, Perceived Productivity, Contributing Factors, Impacts, Public Service Engineers

Introduction

The nature of work has significantly evolved, particularly with the rise of information and communication technology (ICT), which has become an integral part of our daily lives in the 21st century. This technological advancement has enabled many tasks to be carried out remotely, eliminating the need for employees to be physically present in the office. One prominent form of remote work is working from home (WFH), where employees perform their duties from the comfort of their homes. The COVID-19 pandemic, which swept across the globe, further accelerated the widespread adoption of WFH, transforming it from a rare option to a mainstream work arrangement.

Previous studies indicates that the suitability of adopting WFH varies across different industries and occupation. Dingel and Neiman (2020) discovered that 37 percent of employment in the United States may be done totally from home, with considerable differences between cities and industries. The type of jobs that can be performed at home are mainly managers, educators, and those working in computers, finance, and law. A study by Morikawa (2020) indicated that the suitability of adopting WFH among different jobs in Japan vary across different industries and occupations with engineering sector scores 43.2 percent of WFH adoption rate contrasted to a job in the sales industry scoring only 11.4 percent. Meanwhile in Malaysia, Tumin (2020) pointed that high-skill jobs had a higher prevalence of WFH than did mid-skill and low-skill jobs. Among the high-skill jobs are managers, professionals, and technicians.

While WFH has proven effective in various industries, its impact on productivity remains a subject of ongoing debate, especially within the public service sector. The nature of their work, the availability of necessary tools and technologies, and the organizational support they receive can all influence their productivity in remote settings. Public service engineers, whose work often involves both technical expertise and collaboration, may face unique challenges and opportunities in WFH environment. To explore this situation, this study aims to gain insights into how WFH can be optimized to improve the effectiveness and efficiency of public service engineers. The objectives of this study are: (1) to investigate the factors that contribute to perceived productivity among public service engineers while WFH and (2) to identify the impacts of WFH on public service engineers' perceived productivity.

Literature Review

Work from Home (WFH)

Reviews on the literatures for this study has shown that the term WFH is often being used interchangeably with telework across research. The WFH term has grown popular in the COVID-19 era to describe the condition and necessity of working from home and away from the traditional workplace. Sayers and Monin (2005) defined working from home as working day spent in the home environment. While the International Labour Organization (ILO) (2020) defined WFH as working arrangement in which an employee uses information and communications technology to carry out the primary duties of his or her job while still at home. Meanwhile, WFH is also considered as a home-based telework (ILO, 2020) where it allows flexibility for employee to work in a home setting with the use of ICT in completing a task.

Although the WFH concept has been around for decades worldwide, without a doubt it has been more prominent in the private sectors due to the nature of service that government delivers according to Durbarry (2021). Yahya and Nur Dzainuddin (2021) mentioned some of the challenges in implementing flexible working arrangements in the public service sector are worker integrity, a lack of ICT to track staff's locations, uneven performance, and other productivity concerns.

Perceived Productivity

Employee productivity issue has been one of the challenges for most businesses. The need to boost staff productivity is one of the major difficulties that the majority of firms are currently facing (Hanaysha, 2016). The universal concept ratio of output over input in specific period of

time to describe productivity is not quite simple as it may sound. The lack of efficient measures and the development of measures in a very selective manner can be linked to issues with the use of productivity metrics (Sole and Schiuma, 2010). In addition to that, Nollman (2013) found that it can be difficult to compare the results of research that have concentrated on just one or two methods of productivity measurement. Thus, in general, there is a lack of a reliable, consistent method to measure production. However, Beller et al. (2021) explained that there are two main productivity assessment methods, it's either objectively or subjectively. The former method or also known as the traditional way uses automated measurement of product or process features while the latter uses self-assessed productivity reporting, also known as self-assessed, self-rated, or self-perceived productivity which are considered more complex and subjective method.

Perceived productivity is among the measure that can be used to gauge how productive an employee feel is, according to Smite et al. (2022). Beller et al. (2021) stated that, contrary to many automatic metrics, perceived productivity is susceptible to subjective judgement, which makes inter-individual comparisons challenging. Haynes (2008) found that there isn't a single method that is approved by all researchers for assessing office productivity, in which researchers who have produced the most study evidence tends to take a self-evaluation approach. Haapakangas et al., (2018) pointed out that it is generally impossible to test employee's performance objectively, therefore researchers must rely on own assessments of perceived productivity. However, one benefit of subjective assessments is that they might be able to capture some characteristics of the input that would be challenging to measure objectively.

Public Service Engineer

The engineering sector in the public service is broad and multi-disciplinary which include electrical, civil, mechanical as well as other engineering discipline. According to Public Services Commission of Malaysia (SPA), a general job description of an engineer under the Management and Professional Group is planning and coordinating the development of the irrigation system, water supply, civil engineering services, service quality improvement activities civil engineering, special projects, and general office administration. The nature of work location of these engineers differs across departments/ministries and positions in which some may be primarily stationed in the office while some other postings might require on-site works.

Contributing Factors of WFH Perceived Productivity

Baruch and Nicholson (1997) theorized that under normal conditions, individual factors which refer to personal characteristics such as personality traits, attitudes, and needs; organizational support refer to how WFH-friendly the organization is to staff; home and family factor include elements like solid family relationships, a healthy mind and body, and facilities available; and job factors refers to the nature of the job:

a) Personal Factor

Back to when WFH was an option, not all employees will necessarily choose to WFH. However, the COVID-19 pandemic has revolutionized global work arrangement with not much choice but to adopt WFH. Since WFH employees generally work longer hours than their non-WFH colleagues (Hill et al., 2003), effective time-management skills are seen as a crucial resource

for increasing productivity when working autonomously (Harpaz, 2002). Hasan et al. (2022) and Nakrošienė et al. (2018) suggested a good time management must be instilled in employee for better WFH focus and productivity. One of the top business concerns for organisational executives is employee work engagement. Hanaysha (2016) suggested employers should consider investing in employee engagement due to the favourable effect on performance outcomes like staff productivity. The scholar later concluded work engagement has a significant positive effect on employee productivity.

b) Organizational Support Factor

Saludin et al. (2020) highlighted the importance of top management efforts in the adoption and implementation of WFH since they are the key to organisational, employee, economic, and environmental performance improvement over time. This factor is in line with other research findings by Durbarry (2021) and Dixon (2003). The Malaysia's ICT sector is eager to undertake telecommuting jobs, but the primary obstacles are the organization's nature of work, trust, and monitoring according to Subrahmanyam et al. (2008). In 2017, Malaysia recorded only 16 percent adoption rate, less 34 percent than regional norm (TalentCorp and UNDP Malaysia, 2021). This could be attributed to a lack of trust in staff productivity or a focus on on-site collaboration and communication. Nakrošienė et al. (2018) presented manager's trust contribute to a significant portion of the variation in WFH outcomes in terms of productivity.

Employees who work from home certainly needs access to all of the computer networks that they would have if they were physically present at their place of employment (Dixon, 2003). Durbarry (2021) pointed out that working from home will be ineffective without access to technology. During the MCO in Malaysia, TalentCorp and UNDP Malaysia (2021) reported the largest productivity gains among individuals was identified on employees who got technical support, such as advice on work policies and telecommunications platforms. Furthermore, they suggested that material support such as computers, internet connectivity, and home office equipment may also be necessary for WFH arrangements. In contrary to this statement, Baker et al. (2007) found no correlation between technical support and employee productivity.

c) Home and Family Factor

WFH employees frequently face blurred boundaries as a result of the removal of physical barriers between home and work (Basile and Beauregard, 2016). Johnson et al. (2007) mentioned, the capacity to WFH on a telework basis allows individuals to combine work with the opportunity to deal with family-related difficulties and helps balance work-family time. Johnson et al. (2007) further added, frequent disruptions from home, working longer hours, or working more days per week all have a detrimental impact on an individual's work-life balance. Nakrošienė et al. (2018) identified caregiving role as related to the WFH outcomes in terms of productivity.

Creating spatial boundaries at home to divide work and non-work domains has been discovered to be important for telecommuting according to Johnson et al. (2007). An unsuitable working environment has a detrimental impact on employee effectiveness according to Bailey and Kurland (2002), whereas a well-organized working environment can be regarded as a valuable productivity resource (Nakrošienė et al., 2018). Despite those

identified factors, Baker et al. (2007) concluded that household characteristics plays little roles in affecting employee's satisfaction and perceived productivity.

d) Job Factor

The suitability and adaptability of WFH is among the issue that intrigued many parties when lockdowns being imposed. A study by Dingel and Neiman (2020) discovered that 37 percent of employment in the US, including engineering, can be done wholly at home, with substantial variance among towns and sectors. Meanwhile, the share of tasks that can be done from home varies considerably both across as well as within occupations and industries and 55 percent of respondents of Architecture and Engineering report being able to do an intermediate share of tasks from home according to Adams-Prassl et al. (2022). In the same study, they also noted that the share of workers who can do all tasks from home has increased most in those occupations in which the pre-existing share was already high. A study on determinants of WFH before and during COVID-19 by Haider and Anwar (2022) found that determinants of WFH manifested differently for those who engaged in telework prior to the pandemic and those who switched to WFH during 2020.

Impacts of WFH on Perceived Productivity

The physical workplace is typically regarded as an important organisational aspect that contributes significantly to effective performance (Fassoulis and Alexopoulos, 2015). According to Mohammad et al., (2019), workforce productivity is an important component that may help a company's overall performance by improving, strengthening, and sustaining it. Technology, leadership, team spirit, self-management practices, and workers' intrinsic motivation are among the elements that influence productivity, and it's difficult to cover all conceivable effect factors in one research according to Palvalin et al., (2017).

Many businesses and organisations were already implementing WFH, which provides flexibility to their employees (Farooq and Sultana, 2022) due to a number of multifaceted implications and advantages of WFH for individuals, organizations and society (Perez and Perez et al., 2003). The WFH concept has garnered attention of many researchers to study about the topic way before the COVID-19 pandemic. Reviews on existing literatures regarding WFH productivity for this study reveal that WFH somehow does impact employee productivity either positively or negatively based on the contributing factors associated to it.

Kapeter et al. (2021) found that perceived self-productivity is higher than pre-WFH times. Kaufman and Taniguchi (2021) also reported similar result, where employees who WFH have the tendency to report their work hours and work productivity increased during COVID-19. This result is also supported by George et al. (2021) in which they reported employees believe that WFH has a significant and beneficial influence on their level of creativity and productivity at work. On the other hand, Farooq and Sultana (2021), discovered a negative relationship between WFH during COVID-19 pandemic and employee productivity. Morikawa (2022) also reported WFH productivity in Japan was found particularly lower for employees and firms that started WFH after the onset of the COVID-19. Furthermore, another study in Japan by Magnier-Watanabe et al., (2022) also reported a negative impact between WFH during COVID-19 and the three indicators of job performance which is altruism, conscientiousness and task performance. Four key determinants to the success and effectiveness of WFH will be explored to determine its impact on employee's perceived productivity.

Conceptual Framework

Guided by the factors derived from Baruch and Nicholson's Model of WFH as well as factors derived from the review of literatures, all of which have been considered into developing a conceptual framework representing the main contributing factors of WFH perceived productivity. The analysis has led to a finalization of four main contributing factors of public service engineers' WFH perceived productivity as demonstrated in Figure 1.

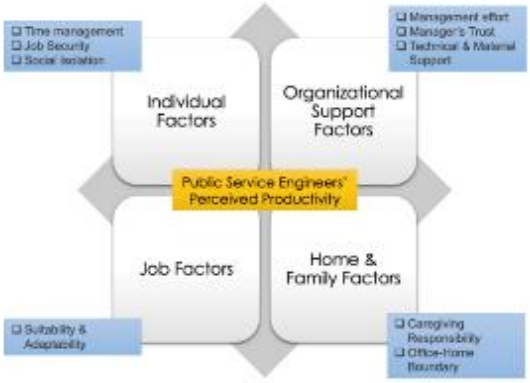

Figure 1: Conceptual Framework of Public Service Engineers' Perceived Productivity

Research Method

Research Design

This study employs a qualitative research approach, utilizing semi-structured interviews to explore the experiences of engineers in WFH settings.

Research Procedure

Prior to data collection, ethical approval was obtained from the relevant authority, and informed consent was secured from all participants. A detailed consent form was distributed, outlining the study's purpose, the voluntary nature of participation, and the confidentiality of responses. Participants were also informed about the recording of interviews for transcription purposes.

Research Instrument

An interview guide was developed to ensure consistency and coverage of key topics, including participants' experiences with hybrid work, challenges, and adaptations.

Research Participants

Participants were from government organisation that has a dedicated engineering division. Participants were selected through purposive sampling, ensuring they met three key criteria: (1) employment as public service engineers, (2) experience working in both office and work-from-home (WFH) settings, and (3) have experience performing job responsibilities at two locations—on-site and in the office. Ten participants involved in this study. According to Barkhuizen et al., 2022 (2022) ten participants was deemed sufficient to achieve data saturation. [insert relevant citation, e.g., Guest et al., 2006].

Data Collection

The interviews were conducted one-on-one via an online platform, with each session lasting approximately 30 to 45 minutes. To ensure accuracy, interviews were recorded, and

supplementary notes were taken during the sessions. Following data collection, interviews were transcribed manually to capture the details.

Data Analysis

The transcribed data were then analysed using Quirkos software, a qualitative data analysis tool to identify themes and patterns aligned with the study's research objectives. Interview data were coded and organized into themes. To facilitate the coding of the data into the appropriate themes, the primary theme or nodes as well as sub themes were defined in this software. The coded segments were then systematically compared across interviews and within themes to identify recurring patterns, as well as notable differences and similarities. Given the narrative and subjective nature of qualitative data, achieving consistency, reliability, and replicability presents inherent challenges. Thus, this systematic approach ensured rigor and reliability in the analysis process. This method also supported the study's claims of reliability in both form and context.

Validity and Reliability

The concept of validity in qualitative research is a matter of trustworthiness, utility, and reliability that the evaluator and other stakeholders place in it (Zohrabi, 2013). The major concern with validity is if research is credible and truthful, and whether it is evaluating what it is supposed or professes to evaluate. Thus, content validity and internal validity in the form of respondent validation or member checks method was carried out to ensure the validity of the study. Transcripts of the interview were sent through e-mails to the participants for accuracy check of initial data gathered. Subsequently, the participants were asked to comment on the first draft of interpretative accounts to ensure their perspectives are being represented as fully and validly as possible (Torrance, 2012).

Findings

Factors Contribute to Perceived Productivity among Public Service Engineers while WFH

The findings from the interviews highlight four primary factors influencing public service engineers' perceived productivity during work-from-home (WFH) arrangements: individual factors, organizational support, and family/home support:

(a) Individual factors

The sub-themes within individual factor are classified into focus, flexibility and autonomy, goal clarity, cohesive teamwork. One participant mentioned that WFH helped some people to remain focus on their work because they were less distracted from colleagues and bosses, one participant quoted:

> *"I feel more focused at home than at the office. At the office, sometimes the boss calls every now and then asking for advice and so on. In the office we are more exposed to things that are outside the scope of our work. If I'm at home, I can just focus on my work."*
>
> *(Participant P10)*

WFH also allows greater flexibility and autonomy to public service engineers to effectively manage their time. It is recognized that having a fixed working hour is preferred by public service engineers who do not normally work beyond office hour. In addition, a flexible

working hour is favoured by those who are used to work outside office hour since they get the freedom to manage their own time and stretch their working time past normal working hour as indicated by a participant:

> *"Personally, we technical people are not tied to work from 8.00 a.m. - 5.00 a.m. I like MCO time because we get to manage our own time, like in the morning we can go for a jog first, or have breakfast. Then at 9:00 a.m. continue to work until 12:00 p.m. I think our efficient time is only 3-4 hours."*
>
> *(Participant P9)*

Goal clarity also emerged as a motivating factor, helping engineers stay focused and achieve daily objectives. One of the participants shared:

> *"I made sure that there will be at least one output every day, and I achieve the output. There is always a target every day."*
>
> *(Participant P1)*

Having a cohesive teamwork is crucial, given the collaborative nature of public service engineering across multiple disciplines. As one participant emphasized:

> *"The design process involves several engineering disciplines. We have an architect team, a mechanical team among others. So, we have to sit down together and discuss, to avoid missing out important information or data from each discipline."*
>
> *(Participant P9)*

(b) Organizational Support

Access to essential tools and documents is vital for productivity. Insufficient access to physical documents, specialized software, and proper equipment hinder WFH efficiency. One participant shared the inconvenience of lacking a printer:

> *"Not having a printer is the only constraint for me to reprint documents. This thing really interferes with my work, it makes my work get stuck if I can't print anything."*
>
> *(Participant P3)*

To add up, limited workspace and inadequate office supplies at home may disrupt productivity, as noted by another participant:

> *"In my case, I live in an apartment and it's not very conducive in terms of space. I feel like working in the office is more comfortable. Big desk, complete stationeries and equipment. Everything is there. It's not conducive to work at home especially when you want to find all those equipment/stationeries. Because my house is small.".*
>
> *(Participant P7)*

Document access is particularly challenging due to the volume and physical format of the materials. Engineers often rely on large-scale drawings and classified documents, which cannot be easily transported or accessed remotely. One participant explained:

> *"In terms of my work, I refer a lot to documentation such as contract documents. But when working from home, certain documents are quite limited for me to bring back home. Sometimes the documents I want to bring are just too many. So, it becomes an obstacle when I want to refer the documents."*
>
> *(Participant P10)*

Furthermore, some classified documents cannot be removed from secure locations, limiting access at home. Reliable internet infrastructure is also critical for online meetings and data sharing, but high-speed subscriptions can be burdensome. These challenges underscore the importance of organizational support in providing the necessary resources and infrastructure to mitigate these barriers and facilitate effective remote work.

(c) Family and Home Support

Family responsibilities, particularly childcare, present challenges to maintaining productivity. One participant described the difficulty of balancing work and family duties:

> *"For me, in terms of productivity when it comes to these children, it affects the delivery of work. Sometimes, when I need to join an online meeting, the schedule clashes with my children's online class or my baby having a tantrum.".*
>
> *(Participant P7)*

On contrary, participants with older children reported fewer disruptions:

> *"As for me, my children are all grown up, so it doesn't affect me that much when I'm working at home."*
>
> *(Participant P1)*

Several public service engineers were reported to have a conducive workspace at home which they can carry out their work without any obstacle. However, participant P7 complained about not having enough space to do his work because he lives in a small apartment with no dedicated workspace. Another factor affecting the perceived productivity of public service engineers working from home is family understanding and acceptance. Some engineers may struggle if their family perceives them as not working, leading to expectations of handling household chores or frequent interruptions during work hours.

(d) Job related Factor

Finally, job-related factors also contribute to the perceived productivity of public service engineers. Certain engineering tasks require physical presence and cannot be performed remotely. Fieldwork remains a crucial aspect of public service engineering, as engineers must inspect construction sites across Malaysia, which cannot be done virtually. Additionally, the urgency of specific tasks often demands regular supervision and communication to ensure timely completion. One participant highlighted the necessity of in-person meetings for material inspections:

> *"However, there are meetings that cannot be held by video call. For example, there is a meeting that are attended by our clients, contractors and suppliers, which they will bring the materials for us to see, touch and inspect physically.".*

(Participant 4)

Thus, these job-related factors cannot be replaced by working from home, which may affect overall productivity.

Table 1 shows the list of factors contribute to perceived productivity among public service engineers while WFH.

Table 1
Factors contribute to perceived productivity of Public Service Engineers while WFH

Theme (Quirk Title)	**Sub-theme**
Individual	• Communication • Focus • Time Management • Goal Clarity • Social Isolation • Teamwork
Organizational Support	• Document Access • Work Tools/Equipment • Internet Access
Home and Family	• Caregiving Role • Workspace • Family understanding / acceptance
Job-related Factor	• Material inspection

Impact of WFH on Public Service Engineers' Perceived Productivity
Some respondents mentioned that WFH impacted their perceived productivity negatively. For example:

> *"At home I think my productivity seems to decrease a little."*
>
> *(Participant P2)*

The claim was supported by another participant:

> *"In terms of productivity, there may be a slight decrease. From 100% it may drop by 15%."*
>
> *(Participant P6)*

A few of the respondents reported they took longer time to complete their job when they work at home.

> *"Sometimes I missed my target to complete my work for the day. Let's say the work is still not done after 5:00 in the afternoon, so I still have to continue to finish it later in the evening since I've already set the target."*

(Participant P8)

The statement above shows that, even though some of the participants set daily goals to complete, the output produced were sometimes delayed because they get slow response from colleagues and not enough work resources at home. Some even continue their work at night if they can't complete it during office hour.

On the other hand, there are some respondents felt that WFH did not have an impact on their perceived productivity as it does not cause any change on their perceived productivity as commented by a participant:

"It's the same for me. I mean, it's not increasing."

(Participant P8)

Participant P10 shared an interesting insight: he believes his perceived productivity at home is similar to that in the office because he can focus more on his tasks, despite having limited work resources such as a printer or documents. In contrast, while the office provides abundant resources, he finds it harder to concentrate due to distractions like work discussions and casual conversations with colleagues.

Table 2 shows the summary of findings for the impact of WFH on public service engineers' perceived productivity.

Table 2
Impacts of WFH on public service engineers' perceived productivity

Theme (Quirk Title)	**Description**
Decreased Output Quantity	Decrease in perceived productivity
Longer Completion Time	Time taken to complete work duties
No Difference	No change on perceived productivity

Conclusion

WFH has been a topic of discussion for academics and writers for many years. The COVID-19 pandemic has boosted the implementation of WFH for many organizations, including government bodies in short notice. The results of this study, in the context of working from home during the COVID-19 pandemic, identify the factors that contributed as well as its impacts to the public service engineers' perceived productivity. In summary, all contributing factors in the conceptual framework which was developed based on the WFH factors by Baruch and Nicholson (1997) were proven to be the key elements to make WFH effective and feasible for public service engineers. The individual factors, organizational support factors alongside with home and family factors, and job factors were found to be the four factors which supports prior research by Mihalca et al., (2021).

Additionally, a common view amongst the public service engineers was that WFH impacted their perceived productivity negatively, in which they view that their perceived productivity was reduced, and longer time needed to complete their job. The findings supported the study of Farooq and Sultana (2021) and Morikawa (2022), who conclude that WFH has a negative

relationship with employee productivity. However, the findings of this study are not in line with past studies by Kapeter et al. (2021) as well as Kaufman and Taniguchi (2021) which reported a positive outcome of WFH on perceived productivity. The lack of sufficient and proper job resources such as document access as well as office supplies and technology equipment became an obstacle for the public service engineers to work efficiently at home. Interestingly, this is the complete opposite from the findings of Nakrošienė et al. (2019), which reported document access possibility doesn't have significant impact on WFH outcomes. Furthermore, the public service engineers also struggled to balance between their work and home duties especially those who have smaller children that needs extra care and attention. This finding is somewhat related to the findings by Nakrošienė et al. (2019), where the increasing number of children might pose a challenge for working parents to manage work-family issues at home which presents an opportunity to be studied further in the future. Meanwhile, those who have older children, or no caregiving responsibility does not face similar challenges.

Contribution

The present study offers meaningful contributions by addressing several existing research gaps. From a theoretical perspective, it extends the body of knowledge by identifying key factors that influence the perceived productivity of public service engineers when working from home (WFH), and by examining the impact of these factors on overall productivity. Furthermore, this study highlights WFH as a critical determinant of perceived productivity within the public service sector. In terms of contextual contribution, the findings provide valuable insights into the elements necessary for effective WFH implementation. This understanding can inform the development of a comprehensive WFH framework—encompassing policies, guidelines, and financial support—aimed at enhancing productivity outcomes in the public sector.

Recommendation

In the context of public service engineers, this study implies that WFH is feasible in the long run. As we are living in a rapid technological advancement era, it is beneficial for government organizations to leverage on the use of technology by embracing emerging technologies such as Artificial Intelligence (AI) and Internet of Things (IOT) to improve public service delivery and the lives of citizens. An online system with vast data and information as well as digital files is essential for the public service engineers so that they no longer need to bring home large and heavy documents. It is also suggested that the use of desktops being switched to laptops equipped with related engineering software to so that the work can be done at home without hassles. A financial aid package might be needed especially for support staff group to prepare them with basic work necessities such as internet access.

The findings suggest that the public service engineers were not fully prepared for WFH implementation during COVID-19 pandemic as it was done in a haste with rooms for improvement. Moving forward, the human resource department of a government organization might consider conducting trainings related to WFH effectiveness, efficiency, and work-life balance. Additionally, since several of the public service engineers expressed concern over communication and social isolation issues when working from home, there might be a need for teambuilding activities and interpersonal communication training to strengthen teamwork and promote effective communication within the organization.

Acknowledgement
The first author gratefully acknowledges the financial support provided by the Public Service Department (PSD), Malaysia, which was instrumental in enabling the completion of this study.

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