

Systematic Literature Review Work from Home: Technological Readiness Among Staff in Government Sector

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Abstract

The concept of work from home emerged as early as the 1980s but did not receive significant attention until the emergence of the Covid-19 pandemic. Initial attempts to adopt it were unsuccessful. However, Covid-19 necessitate the need for establishing work from home arrangements for private and public sectors employees. Public sectors, especially in Malaysia have particularly expressed the interest in progressing with work arrangement post the Covid-19. As they do so, it important to note that previous experiences have highlighted that technological readiness can significantly increase the success of WFH. This study therefore aimed to review existing literature to establish insights and gaps related WFH and technological readiness in the public sector. It involved conducting a systematic literature review from three databases, namely Scopus, business source, and Mendeley. 40 studies (n = 40) were retrieved and included in the study. They were analysed using both quantitative and qualitative method. The descriptive analysis underscored the increasing research interest in this area, while also pointing out the need for more studies specifically focused on Malaysia. On the other hand, thematic analysis indicated that technological readiness could increase the success of WFH.

Keywords: Work from Home, Teleworking, Technological Readiness

1. Introduction

1.1 Working from Home

Working from home, otherwise referred to as virtual working, remote working, and telecommuting, is the practice performing job-related tasks and responsibilities from a location outside of the traditional office, mostly one's residence (Tambou, Rahim & Sabar, 2021). However, this practice is not limited to solely working from ones residence. It involves the freedom to choose a location to work from, without being directly under the employer's control (Yahya & Dzainuddin, 2021). This can include non-traditional work settings like co-working spaces, coffee shops, or other remote environments. In this flexible arrangement, employees have the autonomy to select where they work. On the other hand, employers prioritize the employee's performance and achievement of established goals and objectives rather than controlling the surroundings (Faulds & Raju, 2021).

Working from home, while was notably popularized by measures undertaken to prevent the spread of Covid-19, has been around for a while. As indicated by Streitfeld (2020), telecommuting, or working from home has been an idea discussed since the 1980s. Its proponents have promoted it as technology-driven innovation with benefits for employees and companies. According to Fauld and Raju (2021), the concept did indeed emerge in the 1980s when technology made it possible. Initially, it was viewed as a benefit for special employees. However, many CFOs and CEOs were sceptical about its productivity. However, the perception has changed over the years (Faulds & Raju, 2021; Masood, Zakaria, & Kamarudin, 2024).

True to that, initial experiments of working from home were not successful. Many companies, including IBM, Aetna, Best Buy, Bank of America, Yahoo, AT&T, and Reddit, experimented with remote work (Streitfeld, 2020). However, they had to downsize or abandoned their programs. Apart from failing to achieve result, remote employees often felt marginalized, resulting in decreased loyalty, creativity, innovation, and serendipity. For instance, The International Business Machines Corporation (IBM) experience a revenue slump after implementing its 2009 WFH program that allow 40% (360,000) of its employees to work remotely (Streitfeld, 2020). Likewise, the WFH experiment adopted by RLM Public Relations was also unsuccessful. After allowing employees to work from home on Fridays, the company experience significantly project failure as employees became unavailable during the day. It was thus forced to drop the program. Similarly, Best Buy implemented a program in 2004 that aimed to judge employees based on accomplishments rather than hours or location. However, the program was discontinued in 2013, with the CEO stating it gave employees excessive freedom (Streitfeld, 2020; Faulds & Raju, 2021).

The low number of employees WFH prior to covid-19 pandemic act as testament to the unsuccessful nature of this program. As noted by Faulds abd Raju, (2021) in 2019 only approximately 10% and 20% of employees worked full-time and part time at home respectively. This number however significantly increased due to Covid-19. According to the author, almost 100% of employees who could work from home did so temporarily. The pandemic forced many companies to embrace remote work successfully. It acted as the largest test market for remote work and proved that the working arrange can be adopted successfully. Companies like Facebook, Shopify, Zillow, Twitter, and Walmart's tech division are now planning for a future where a significant portion of their workforce operates remotely (Streitfeld, 2020). Furthermore, employees who tried the method developed a liking for it. A report by Quora indicated that 60% of its workers expressed a preference for remote work. Likewise, Prudential established that 54% of its workers want remotely (Streitfeld, 2020; Faulds & Raju, 2021). The statistics indicate that the trend towards work from home is expected to continue post the pandemic.

1.1.1 Working from Home in the Government Sector

The Government sector has been traditional considered to be resistant to remote work than the private sectors. That means, prior to covid-19, Governments around the world had made little to no efforts towards adopting WFH arrangements. However, like in the private sector, the pandemic resulted in a dramatic shift in attitude (Inside Government, 2024). In Malaysia, for instance, The Malaysian government, particularly the Public Service, issued Circular 5/2020 to regulate WFH arrangements. This circular provided guidelines and reasons for permitting civil servants to work from home. Even though the circular was issues as part of the Malaysian government's efforts to contain the spread of the virus by reducing physical interactions in the workplace, it set a precedence for enabling civil servant in the country WFH. After it issue, a notable number of public sector employee continue WFH. Asasa indicated that upto 80% of the employees were still WFH by February 2014 (Tambou, Rahim & Sabar, 2021).

Malaysia Government have without been exhibit notable efforts towards the adoption of WFH arrangement for its civil servant. For instance, in 2015 it launched a pilot project for Flexible Work Arrangement (FWA) involving various ministries and departments. The arrangement involves allow its employees to work at office as well as from home. Unfortunately, it encountered challenges such as integrity issues and inconsistent performance. However, like in the private sector, the Government, through its ministry and organization hopes to implement lessons learned during the pandemic forced WFH arrangement to develop an effective long-term WFH arrangement (Yahya & Dzainuddin, 2021; Kamarudin et al., 2023).

1.2 Technology Readiness

As indicated, WFH emerged in the 1980s due to the advancement of technology (Streitfeld, 2020; Faulds & Raju, 2021). The success of WFH arrangement is generally highly dependent on availability of technology. However, previous failed experiment indicate that availability is not the only determinant factors; technological readiness also plays a significant role. Technology readiness generally refers to the willingness of individuals and entities to adopt and use technologies to accomplish established goals and objective (Blut & Wang, 2020; Masood, Zakaria, & Kamarudin, 2024; Sidek et al., 2024). That means in addition to the availability of technology, people and organizations should be willing and capable of utilizing the technology essential for support WFH.

In fact, the government of Malaysia have indicated that technology readiness is critical for ensuring it succeeds in its plan to succeed in WFH. According to Yahya and Dzainuddin (2021), implementation of remote work during the pandemic highlighted the dependency on technology. It emphasizes the importance of digital infrastructure readiness, such as internet access and necessary equipment, for enabling remote work. Therefore, it is critical to investigate the technological readiness among government employees working or looking to work from home. The first stage towards this investigation is conducting a systematic review that establish what past literature have studied and establish in relation to these two variables.

2. Method and Analysis

A systematic literature was thus conducted to explore the existing knowledge and research on the technological readiness of government sector staff for remote work. The researcher was particularly interested to establish evidence associated with employees working in Malaysia Government sector. However, the limitation of study covering this area made it necessary to include studies from other regions in the world. Furthermore, analyzing other region could provide additional evidence that could be of benefit to Malaysia.

2.1 Search

The literature included in the study was searched from three databases, namely Scopus, Business Source, and Mendeley. Relevant search terms and search strings were derived from the two concepts, namely 'technological readiness' and 'staff in Government sector', relevant to the study. A list of key terms that could help retrieve articles with these two concepts were generated (see table 1). Boolean operators "OR" and "AND" to refine the search process by narrowing or expanding the search result. Specifically, OR was used to broaden search by retrieving results that include different types of keywords. For instance, "Work from Home" OR "Telecommuting" was used to retrieve results that contain either "Work from Home" or "Telecommuting" or both. Operator "AND" was used to narrow research by directing the result to contain all specified keywords. For instance, "Technological Readiness" AND "Government Sector" was used to retrieve results that contain both "Technological Readiness" and "Government Sector". Since the researcher was keen to collect information of Government sector staff in Malaysia, "Malaysia" was one key search term used. However, the search term was not limited to Malaysia as this would reduce the number of available articles, and in addition, the researcher also wanted to present further evidence and insights from other parts of the world.

Table 1: Search Strings.

SCOPUS	"Work from Home" AND "Technological Readiness" AND "Staff" AND "Government Sector" "Work from Home" OR "Telecommuting" AND "Technological Readiness" AND "Staff" AND "Government Sector", "Remote Work" AND "Technological Readiness" AND "Staff" AND "Government Sector" "Telework" AND "Technological Readiness" AND "Staff" AND "Government Sector"
Mendeley	Work from Home" AND ("Technological Readiness" OR "Digital Readiness") AND "Staff" AND "Government Sector" "Work from Home" AND "Technological Preparedness" AND "Staff" AND "Government Sector", "Remote Work" AND "Technological Readiness" AND "Staff" AND "Government Sector" "Telework" AND "Technological Readiness" AND "Staff" AND "Government Sector"
Business Source Complete	"Remote Work" AND "Technological Readiness" AND "Staff" AND "Government Sector" "Telework" AND "Technological Readiness" AND "Staff" AND "Government Sector"

2.2 Study Selection

2.2.1 Screening

Following, the approach adopted by Hackney, Yung, Somasundram, Nowrouzi-Kia, Oakman, and Yazdani, (2022), this study adopted a two-step screening approach was adopted. The first step involved screening the title and abstract and the second one involved conducting a full text review and extracting data. The title and abstract screening process first involve removing all the duplicate articles. This was done manually. The second step involved using a screening tool of inclusion and exclusion developed during the preparation of the study to determine the articles to be included, and those to be excluded (Table 2).

Table 2: Inclusion and Exclusion Eligibility Criteria

Criterion	Inclusion	Exclusion
Language	English	Non – English
Timeline	1990 - 2023	Before 1990
Literature type	Peer reviewed Journals, research papers.	Review papers, Books, dissertations, opinion pieces, news, blog posts, conference proceeding, and other opinion pieces.
Publication stage	Published	Preprints, unpublished works.
Subject area	Government sector, Work from Home, Technological Readiness	Private sectors (studies that cover work from home, and technological readiness but in the private sector were excluded from the study).

2.2.2 Data Collection: Full Text Review

After the preliminary screening, the selected articles underwent a thorough full-text review. To systematize the data extraction process, a standardized Microsoft Excel sheet was employed. This Excel sheet served as a structured tool, guiding the extraction of various categories of data from the full texts. The categories included:

1. General information of the articles (Title, Authors, Publication Year, Journal/Conference)
2. Methodology (Research Design, Sample and Population, Geographical Focus)
3. Findings and location

Table 3: Information Extracted

Category	Subcategories
General Information	Title, Authors, Publication Year, Journal/Conference
Key Variables	Independent Variables, Dependent Variables
Methodology	Research Design, Sample and Population, Geographical Focus
Findings and conclusion	Summary of Key Findings and Conclusion

3. Results

259 articles were identified from the three databases: Scopus (n = 113), Mendley (n = 58), and Business Source Complete (n = 88). 62 duplicate articles and an additional 10 were removed prior to the start of formal screening. During the abstract screening 39 articles were removed for failing to meet the inclusion and exclusion criteria, leaving 148 records for retrieval. 10 records (n = 10) were not successfully retrieved, leaving 138 records assessed for eligibility. Of the 138 records assessed, 98 records (n = 98) were excluded from the systematic review. These exclusions were due to reasons such as being non-English (n = 3), not fitting the literature type criteria (n = 30), being preprints (n = 15), or focusing on the private sector (n = 50). After the rigorous screening and eligibility assessment, 40 studies (n = 40) were deemed suitable for inclusion in the systematic review (See figure 1). These studies met the predefined criteria and were considered relevant to the research questions under investigation.

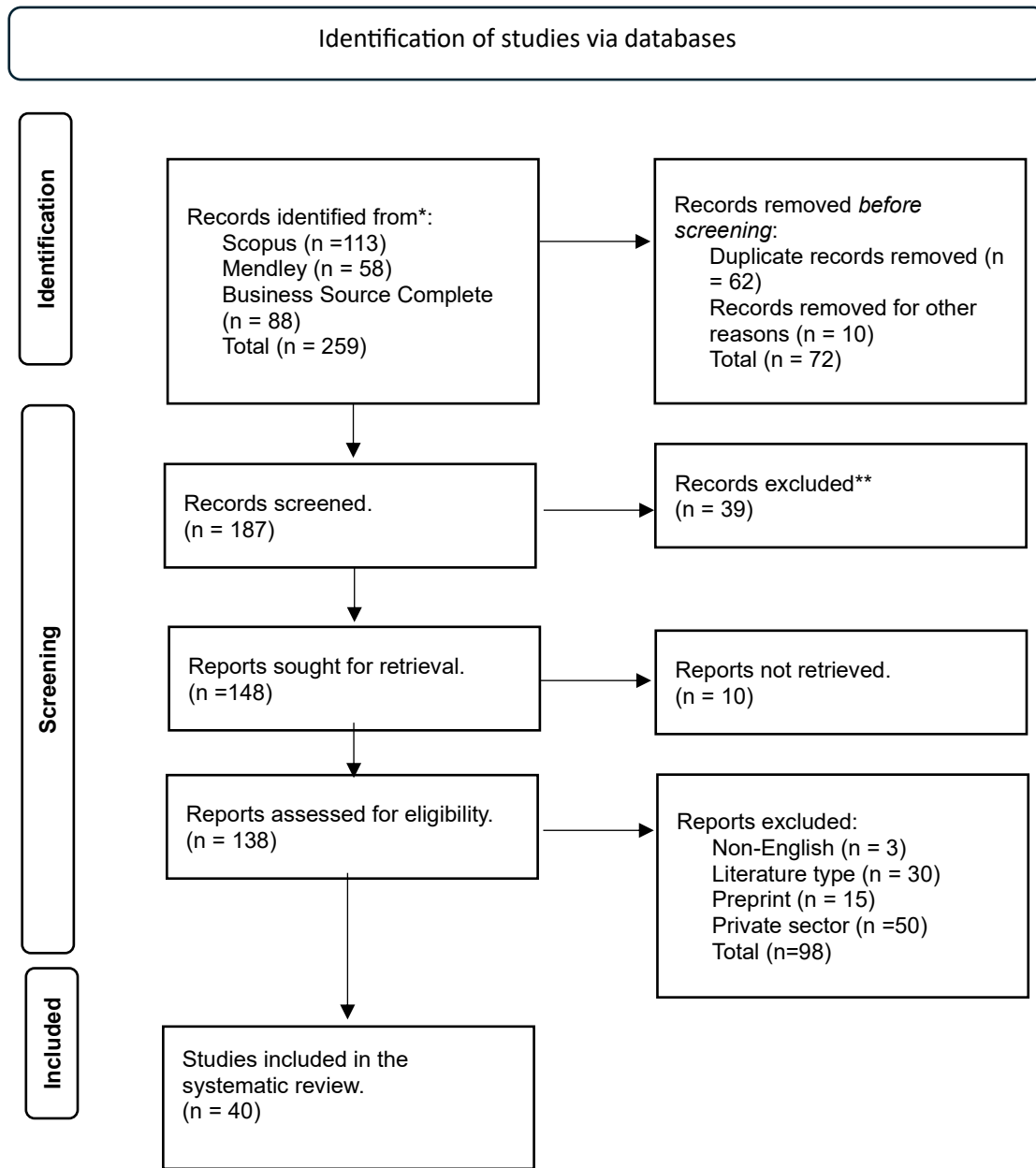


Figure 1. Updated PRISMA Flow diagram of the proposed searching study (Moher D, Liberati A, Tetzlaff J, 2009)

The data were extracted were filled into an excel spreadsheet in preparation for analysis (Table 4)

Table 4: Results of Extracted Data

Author	Year	Research Design	Population	Location	Findings
Akbar, Nurliawati, Muchtar, & Ramdhani	2021	Quantitative	Civil Servants	Indonesia	1) Gender, age, education, and year of service influence how individuals perceive benefits and disadvantages of WFH. 2) Civil servant with lower education and shorter service experience low performance decline during WF, 3) WFH is associated with communication challenges
Bawono & Setyadi	2020	Quantitative	Indonesia local government Civil Servant	Indonesia	Technology mastery positively influences the performance of civil servants working from home during the pandemic, while work motivation significantly contributes to their performance in the context of remote work.
Terdpaopong, and Kraiwanit	2021	Quantitative	543 Thailand civil servants	Thailand	1) Digital technology readiness can be achieved through factors such as learning facilities, staff training, and providing a platform for self-learning.
Dos Santos, Sallaberry, & Mendes (2022).	2022	Quantitative	468 Civil servants	Brazil	1) Telework efficiency positively affects the congruence of objectives between civil servants and their organizations. 2) Management control systems (MCSs) can enhance the relationship between telework efficiency and objective congruence. 3) Personnel controls play a fundamental role in aligning actions with organizational purposes. 4) Lack of training can hinder efficient task performance and objective

Author	Year	Research Design	Population	Location	Findings
					alignment in telework. 5) Action controls may be less effective in influencing teleworking employees due to their desire for freedom and autonomy.
Praptana & Riyanto (2020)	2020	Quantitative	Civil Servants	Indonesia	1) Motivation, work experience, and utilization of information technology partially impact civil servants' productivity. 2) Together, these factors account for 76.6% of the productivity variation during work from home. 3) Other factors not examined in the study also influence productivity.
Filardi, Castro, and Zanini	2020	Mixed methods	Managers and Teleworkers from 98 teleworkers and the Brazilian Federal Data Processing Service (SERPRO) and the Federal Revenue Service	Brazil	1) Teleworkers enjoyed benefits such as reduced costs, increased family interaction, and improved quality of life, but face challenges such as technological issues, professional isolation, and managerial difficulties. 2) Organization can address teleworking challenges by enhancing infrastructure, technology, psychological support, and implementing management tools for effective oversight and recognition.

Author	Year	Research Design	Population	Location	Findings
Gozdziewska-Nowicka, Modrzynska & Modrzynski (2020).	2020	Quantitative	Union of Polish Metropolises's members	Poland	<p>1) Covid-19 pandemic accelerated adoption of Teleworking 2) The pandemic forced offices to introduce remote work, leading to positive changes and improvements. 3) Remote work reduced absenteeism and promoted technological development. 4) Lack of appropriate regulations for remote work in Polish labor law remains a significant concern. 5) Over 80% of respondents expressed a desire to continue working remotely in the future. 6) Implementing remote work permanently requires upgrading infrastructure, providing training, and adapting management styles. 7) Remote work during the crisis showed more benefits than losses, highlighting the need for preparedness in similar situations</p>
Tanesab	2020	Quantitative	Korean public-sector organizations	Korea	work autonomy achieved through organization innovation such as WFH has positive impact on employees' work performance development and public service satisfaction.
Mheiri & Zaid	2022	Mixed methods	102 public sector employees	UAE	<p>1) Effective communication is essential for smooth transition of E-government 2) Lack of clarity about transition affect preparedness</p>

Author	Year	Research Design	Population	Location	Findings
Houghton, Foth, Hearn	2018	Mixed methods	47 trial participants from 10 government department	Australia	Co-working spaces (Flexible Work Centers) led by the Queensland State Government had positive impacts on productivity, staff retention, and work-life balance of employees from different government departments, leading to the continuation and potential expansion of the flexible workspace arrangement.
Amelia, Maarif, & Hubies	2021	Quantitative	Regional Secretariat of the Bogor Regency Government.	Indonesia	Readiness to change and technology acceptance significantly impact performance in government employees working from home, with no difference between men and women.
Durbarry	2021	Quantitative	3029 Public sector workers in Mauritius	Mauritius	Work-from-home adoption in the public sector can be effective with the right conditions and leadership support, especially during lockdown periods.
Chafi, Hultbergm & Yams	2021	Qualitative	Sweden public sector organization	Sweden	1) Remote work increases flexibility, enhanced autonomy, improves work-life balance, enhanced individual performance 2) Its major challenge is loss of social aspect such as camaraderie and increase feeling of isolation. 3) Solution is to provide hybrid work that combine remote working and office working. Employers need to provide support and flexibility Physical and digital workplaces should be redesigned to meet diverse employee needs.
Seinsche, Schubin, Neuman, & Pfaff	2022	Qualitative	12 public sector employees	Germany	Employees identified personal resources, job autonomy, work tasks, collaboration, leadership, agency offers, work environment, and equipment as the various resources that helped them

Author	Year	Research Design	Population	Location	Findings
					cope with physical, social, psychological, and organizational demands while working from home.
Meirana	2022	Quantitative	Employees of BKD in East Java	Indonesia	The use of IT to support WFH has a significant impact on work stress, emotional intelligence, and employee performance. Emotional intelligence acts as a significant mediator between the use of information technology and employee performance, while work stress does not have a mediating role in this relationship
Edelmann and Millard	2021	Qualitative	Public sector in e European Commission	European Commission	1) The implementation of telework has had and will continue to have a significant impact on public sector organizations. 2) The COVID-19 pandemic acted as the main catalyst for the mainstream adoption of teleworking, creating opportunities for organizational change and digital transformation.
Doberstein and Charbonneau	2022	Quantitative	605 Teleworking public service workers	Canada	Teleworking has the potential to enhance job satisfaction, work-life balance, and productivity for employees with greater autonomy. However, it also presents challenges in terms of communication, collaboration, and maintaining team cohesion. Organizations should adapt by promoting autonomy, effective communication, and avoiding micromanagement while carefully assessing the long-term effects of telework.

Author	Year	Research Design	Population	Location	Findings
Ma'arof, Kamaruddin, and Yusop	2023	Quantitative	public officials in Selangor	Malaysia	Factors of attitude, subjective norms, and perceived behavioral control were found to be significantly associated with teleworking adoption.
Svidronova, Merickova, and Nemeč	2016	Mixed methods	Government employees in Slovakia National library	Slovakia	The implementation of telework in the Slovak National Library was influenced by social, economic, technological, individual, and organizational factors, highlighting the importance of factors such as the need for qualified employees, cost savings, ICT development, positive management attitude, individual characteristics, and IT readiness.
Liebermann et al.,	2021	Qualitative	20 supervisors from the State Office for Agriculture, Environment, and Rural Areas of Schleswig-Holstein (LLUR).	Germany	The abrupt implementation of teleworking in the public sector has made it difficult to exercise transformational leadership. Challenges related to communication obstacles and limitations in technological infrastructure. These challenges hinder the development of strong relationships and effective leadership practices.
De Vries, Tummers, and Bekkers	2019	Quantitative	public servants from a medium-sized Dutch municipality.	Netherlands	1) the study found that home-based teleworking among public servants, when measured on a daily basis, was associated with Greater professional isolation, less organizational commitment, and no evidence of enhanced work engagement. 2) High-quality leader-member exchange (LMX) relationship however can mitigate the negative impact of professional isolation in a teleworking environment.

Author	Year	Research Design	Population	Location	Findings
Ortiz-Lozano, Martínez-Morán, and de Nicolás	2022	Quantitative	Civil servants working at levels A1, C2, or equivalents in the public sector in Spain.	Spain	COVID-19 led to a significant increase in telework in the public sector Telework perceived as more beneficial for women Challenges identified for individuals with young children or dependents Negative impact worsens when technological resources are shared Age can negatively influence individuals in later career stages Recommendations include investing in equipment, ICT training, and promoting work-life balance
Lewis	2013	Qualitative	6 teleworkers and 11 non-teleworkers at a French Public administration organization	France	Teleworkers in the organization experience a lack of technical support, including issues with IT updates and access to IT administrators. That means technology readiness for teleworking in the organization is perceived as inadequate, and both teleworkers and non-teleworkers may experience role stress due to these technological challenges
Caillier	2016	Quantitative	U.S. federal government employees. (Permanent employees in 18 departments and 6 independent agencies.)	USA	1) Frequent telecommuters (4 to 5 days a week) reported higher Public Service Motivation levels compared to those teleworking less than 1 day a week or 1 day a week. 2) No significant difference in PSM levels for frequent telecommuters and those teleworking 2 to 3 days a week.
Ortiz-Lozano, Martínez-Morán, and de Nicolás	2021	Quantitative	Civil Servant in the Spanish General State Administration (AGE).(241 public employees who have WFH	Spain	1) Civil servants of the Spanish General State Administration (AGE) continue to face challenges in teleworking, including bad posture, work-life balance issues, and varying

Author	Year	Research Design	Population	Location	Findings
			for atleast 2 weeks)		difficulties based on gender, household structure, and job levels. 2) They expressed mixed feelings about the adequacy of resources and training provided by the organization in support of WFH
Filardi, Castro, and Zanini	2020	Mixed methods	Managers and Teleworkers from 98 teleworkers and the Brazilian Federal Data Processing Service (SERPRO) and the Federal Revenue Service	Brazil	1) Teleworkers enjoyed benefits such as reduced costs, increased family interaction, and improved quality of life, but face challenges such as technological issues, professional isolation, and managerial difficulties. 2) Organization can address teleworking challenges by enhancing infrastructure, technology, psychological support, and implementing management tools for effective oversight and recognition.
Hati, Kahpi, Nuryanto, Prihatin and Ridwan .	2022	Quantitative	civil servant administration working in Banten Province	Indonesia	Working from home significantly improve the performance of civil servants
De Vries, Tummings, and Bekkers	2018	Mixed methods	city managers and Works Council members	Netherlands	1) City managers and Works Council members on agreed teleworking improved services to citizens. 2) They significantly on the effect of teleworking in increasing employee satisfaction, trialability, and ease of use; city managers expressing more positive views. 4) moderating factors such as job position could shape the perceptions of teleworking adoption in Dutch municipalities

Author	Year	Research Design	Population	Location	Findings
Williamson, Colley, and Foley	2022	Mixed methods	Middle level managers and employees in public organization in Australia	Australia	1) WFH during the pandemic brought about a positive attitudinal change, bridging the gap between organizational and individual flexibility needs. 2) Some lingering reluctance exists at higher organizational levels, potentially impacting sustained support for WFH.
Riyanto and Prasetyo	2021	Quantitative	Civil servants from various ministries	Indonesia	WFH can enhance the level of commitment among civil servant in Indonesia
Silva and Rosa	2023	Quantitative	Public servant (N = 236)	Brazil	1) Employees output control is significant for managers overseeing remote public servants during the COVID-19 crisis. 2) Autonomous motivation positively influences task performance. 3) controlled motivation alone did not significantly impact task performance in the remote work context.
Fischer, Siegel, Proeller, and Drathschmidt	2023	Quantitative	Employees working 4 German public institutions	Germany	1) Supervisors faced more challenges than employees during the COVID-19 crisis, emphasizing the need for improved virtual leadership skills. 2) Greater autonomy for employees positively impacted their performance and resilience during telework. 3) While digital competencies contribute to resilience, effective leadership, especially trustful leadership, played a crucial role in the public sector's ability to navigate the challenges of the crisis.

Author	Year	Research Design	Population	Location	Findings
Morteza, Hamidreza, and Mojtaba	2013	Quantitative	Manager and IT experts in Government and Semi government organization	Iran	<p>1) To implement teleworking in governmental and semi-governmental organizations, electronic readiness criteria need to be met first before IT acceptance, as the first is deemed more important</p> <p>2) Electronic readiness criteria include informatic and communicative bases, managerial indices, human resource indices, and IT accessibility.</p> <p>3) Once electronic readiness criteria are fulfilled, IT acceptance criteria such as IT use acceptance, perceived benefit, ease of use, job relation, conformity with personal lifestyle, mental norms, and picture should be addressed.</p>
Lecours, Gilbert, Boucher, and Vincent	2023	Qualitative	Special needs people working in Government facilities	Canada	<p>1) Teleworkers with physical disabilities face increased work demands, challenges in accessing technology, and issues related to work-life balance during the pandemic.</p> <p>2) Autonomy, support from colleagues and managers, a conducive physical environment, and maintaining oral communication are crucial factors contributing to their healthy work experience.</p>
Asgari and Gupta	2023	Mixed methods	South Florida Civil servant	United States	<p>Telework became more prevalent during the pandemic, with a majority of respondents expressing a desire for continued telework in the future. Factors such as pro-telework attitude, pro-technology attitude, and productivity increase during the pandemic influenced the preference</p>

Author	Year	Research Design	Population	Location	Findings
					for telework after the pandemic.
Nurhayati and Sari	2023	Quantitative	Civil servant in PU Bina Marga East Java	Indonesia	Organizational culture, work discipline, and work from home arrangements have an impact on employee work productivity in PU Bina Marga East Java Province. These factors collectively influence the level of employee productivity in the organization.
Bilan, Mischchuk and Samoliuk	2023	Quantitative	428 civil servants in Ukraine	Ukraine	1) E-government systems positively impact economic competitiveness 2) A unified framework is crucial for assessing digital skills in professional groups, including civil servants, to address skill gaps. 3) Digital skills related to problem solving, digital content creation, and safety need improvement for effective modernization and information security in public administration.
Arriffin, Abd Aziz	2022	Qualitative	Senior Public Servant leaders	Malaysia	Malaysia has the potential to achieve progress and create value by addressing challenges in the fragmented policy environment, open data management, and fostering awareness and motivation for Open Data and Open Science implementation.
Nadzim and Halim	2022	Qualitative	Public Univesities civil servant	Malaysia	Digital competency positively influences employee agility, which in turn positively impacts employee performance. Furthermore, employee agility acts as a mediator between digital competency and employee performance.

Author	Year	Research Design	Population	Location	Findings
Olatubosun and Madhava Rao	2012	Quantitative	Staff at Ondo State Education Ministry		e-governance implementation has the potential to improve internal efficiency, public service delivery, and accessibility. The responded had positive attitudes towards embracing e-governance and the potential benefits it can bring

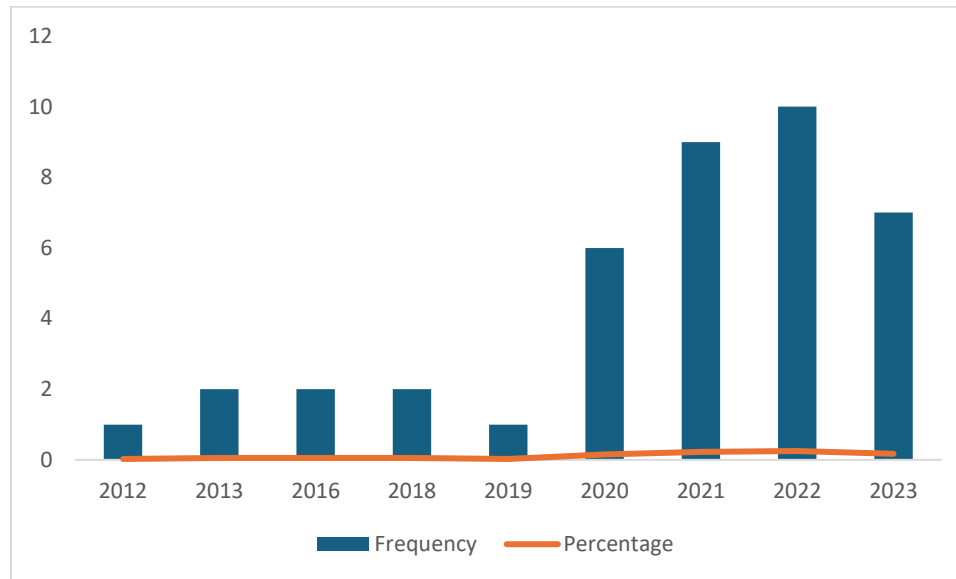
4. Data Analysis

4.1 Quantitative Analysis

Data collected was analyzed using quantitative methods, particularly descriptive analysis and qualitative methods, namely thematic. In terms of descriptive analysis, even though the analysis involves retrieved articles published with the 1990 – 2023 timeline. Most of eligible articles retrieved were recently published. The oldest article retrieved was published in 2012 (n = 1, 2.5%), while 2022 (n = 25.0%) experience the highest number of publications. Based on the data, the number of published article exponential rose in 2020 and progress throughout to 2023 (see table 5 and figure 2)

Table 5: Frequency Distribution of Publication

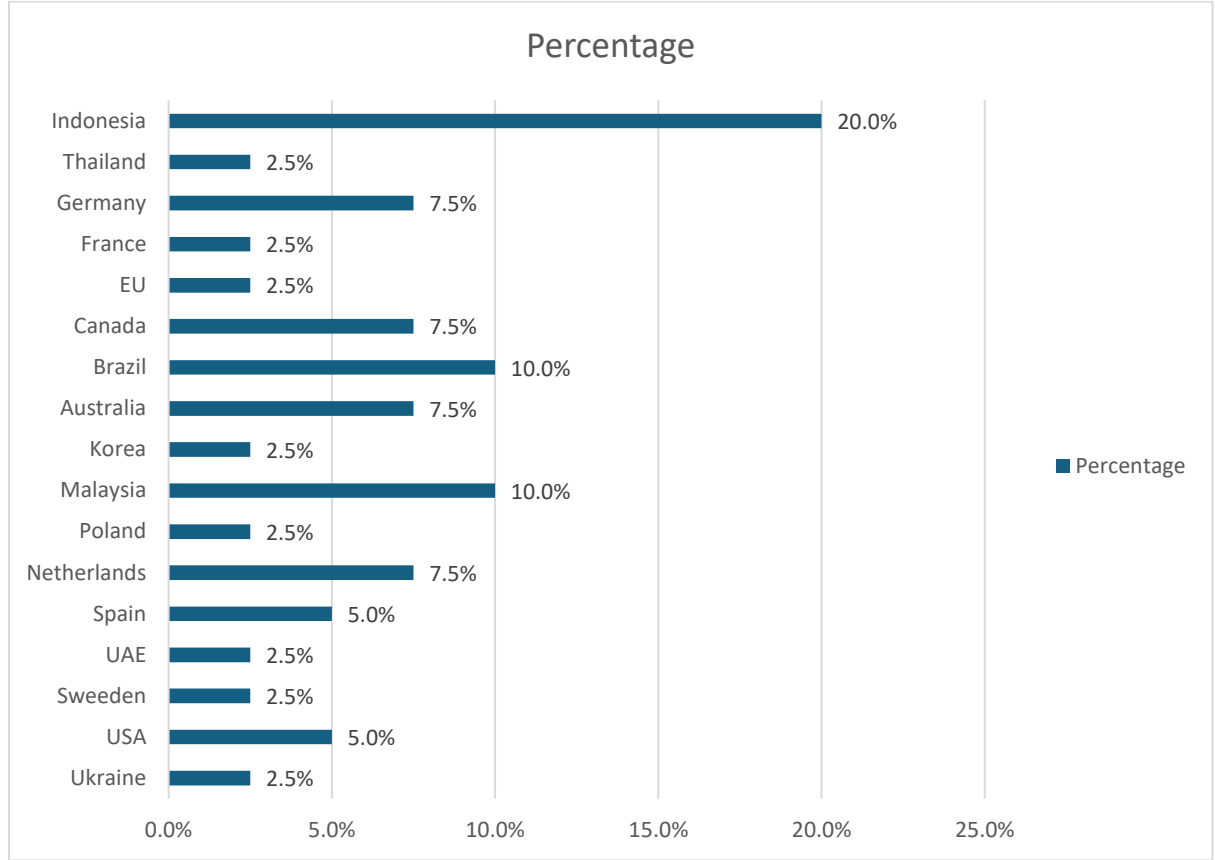
Year	Frequency	Percentage
2012	1	2.5%
2013	2	5.0%
2016	2	5.0%
2018	2	5.0%
2019	1	2.5%
2020	6	15.0%
2021	9	22.5%
2022	10	25.0%
2023	7	17.5%
Total	40	100.0%

Figure 2: Publication Years Frequency

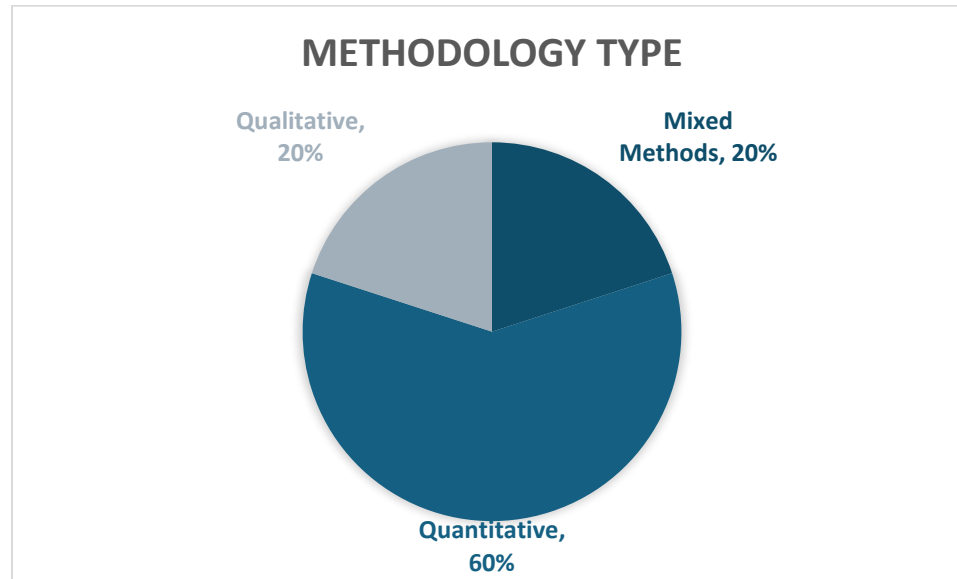
When it comes to geographical location, the analysis of the topic of working from home and technological readiness in the public sector has attracted interest across different countries. Important to note, the researcher was keen to establish article published in Malaysia. However, limiting the search to Malaysia minimize the chances of the researcher retrieving a relatively large number of articles. In fact, the four articles ($n = 4$), 10%, retrieved from Malaysia, mainly covered only one of the concepts, that technological readiness in the public. Most articles retrieved from the country were disqualified as they focused on the private as opposed to public sector. A notable lack of article focusing on both working and technology readiness in Malaysia public sector was notable.

Indonesia attracted the highest interest when it comes to these research areas. The country had the highest number of published articles, with 8 articles accounting for 20.00% of the total. Other notable contributors include Brazil, with 4 articles, representing 10.00% of the total for each country. Germany had 3 articles, accounting for 7.50% of the dataset. Australia, Canada, the Netherlands, Spain, and the USA each had 2 articles, making up 5.00% of the total for each location. Other countries and regions such as EU, France, Iran, Korea, Mauritius, Poland, Slovakia, Thailand, UAE, Sweden, and Ukraine a single article representing, thus each country 2.50% of the dataset (See figure 3).

Figure 3: Geographical Distribution of Retrieved Articles



The articles were also analyzed in terms of the research method they employed. The researcher generally reviewed articles to determine whether they applied quantitative, qualitative, or a mixed method. The distribution of research methods among the 40 studies included in the systematic review is summarized in the figure. Quantitative methods were employed in most of the studies, accounting for 60% (24 out of 40) of the total. These studies utilized numerical data and statistical analyses to investigate research questions and hypotheses. Qualitative methods were used in 20% (8 out of 40) of the studies. These studies employed non-numerical data collection techniques such as interviews, observations, or textual analysis to explore complex phenomena and generate in-depth understanding. Similarly, mixed methods, which integrate both quantitative and qualitative approaches, were also utilized in 20% (8 out of 40) of the studies. These studies combined the strengths of both methodologies to provide a comprehensive understanding of the research topics.

Figure 4: Geographical Distribution of Retrieved Articles

4.2 Qualitative Analysis

The data, particularly the findings reported by the article extracted, was also analyzed thematically to retrieve key themes related to Technological readiness and working from home among Government employees. The themes arrived after the extensive thematic analysis are discussed below:

4.2.1 Positive impact Technology Mastery on Performance

Several articles highlight the positive impact of technological mastery on work performance during remote work. For example, Bawono and Setyadi (2020) found that technology mastery positively influences the performance of civil servants working from home. Praptana and Riyanto (2020) also stated that the utilization of information technology partially influences civil servants' productivity. Likewise, Morteza et al. (2013), echoed the theme by emphasizing the importance of electronic readiness criteria, including informatic and communicative bases, managerial indices, human resource indices, and IT accessibility, for successful teleworking implementation. (Nadzim & Halim, 2022) also suggested that digital competency positively influences employee agility and performance. In general, majority of the articles, argue that technology mastery could positively influence the work performance of Government employees working from home.

4.2.2 Training

Training was established as a crucial theme for supporting technological readiness and efficient working from home. This is particularly true considering the articles emphasize the need for employees to be digitally competent. Training can enhance technology mastery, which Bawono and Setyadi (2020) identified as crucial for effective WFH. It can also address challenges such as observed among most civil servants working from home. In fact, the studies suggest employees felt lack of sufficient training was majorly responsible for their lack of readiness to work efficiently from home. For instance, Ortiz-Lozano, Martínez-Morán, and de Nicolás (2021) found that civil servants in the Spanish General State Administration expressed mixed feelings about the adequacy of resources and training provided by the organization to support work from home. This indicates that there is room for improvement in providing the necessary resources and training to enhance. In addition, Dos Santos, Sallaberry, and Mendes (2022) mentioned that lack of training could hinder efficient task performance in telework.

4.2.3 Technology Readiness and its Determinants

Several articles discussed the importance of technological readiness among staff for successful work from home arrangements. Terdpaopong and Kraiwanit (2021) emphasized the achievement of digital technology readiness through factors such as learning facilities, staff training, and self-learning platforms. Similarly, Svidronova, Merickova, & Nemecek (2016) discuss the various social, economic, technological, individual, and organizational factors influencing the implementation of telework in the Slovak National According to the researcher; these factors are important determinant of technological readiness is one key barrier of successful and efficient WFH practices among public sector employees.

4.2.4 Technology Infrastructure

Several articles highlight the challenges faced by public sector employees in terms of technological infrastructure and support when working from home. Lewis (2013) states that teleworkers experience a lack of technical support, including issues with IT updates and access to IT administrators. This indicates that the technological readiness for teleworking in organizations is perceived as inadequate. Similarly, Ortiz-Lozano, Martínez-Morán, and de Nicolás (2022) suggest that challenges worsen when technological resources are shared, and they recommend investing in equipment and ICT training to address these issues. These challenges, according to Gozdziwska-Nowicka, Modrzynska & Modrzynski (2020) can be addressed by upgrading infrastructure, providing training, and adapting management styles for successful implementation of remote work. Additionally, Lewis (2013) mentions issues with IT updates and access to IT administrators, indicating inadequate technology readiness in organizations. Filardi, Castro, and Zanini (2020) recommend that organizations address teleworking challenges by enhancing infrastructure and technology. This includes improving technological resources, providing psychological support, and implementing management tools for effective oversight and recognition. These recommendations highlight the importance of having the necessary infrastructure and technology to support work from home arrangements.

4.2.5 Other Factors

In addition to technological readiness, the articles pointed to other factors such as organizational support and leadership, socio-psychological factors, and individual characteristics that can affect WFH by government employees. Articles such as Durbarry (2021), Doberstein and Charbonneau (2022), Liebermann et al., (2021) indicated that the level of support from the organization and leadership in terms of communication, autonomy, flexibility, supervision affects performance while working from home. Likewise, authors such as Chafi, et al., (2021), Meirana (2022) and, Praptana & Riyanto (2020) identified key Socio-psychological factors like work-life balance, job satisfaction, motivation, emotional intelligence to be having significantly influence on the productive and experience of remote workers. When it comes to individual characteristics, most of the articles indicated that age, education, and family responsibilities significantly influence employee's ability to adapt to work from home (Akbar, et al., 2021, Svidronova, et al., 2016).

5. Discussion and Conclusion

The findings of this study emphasize the significance of working from home and technological readiness in the government sector. As will be highlighted in the introduction section, WFH has a relatively long history, but Covid-19 pandemic accelerated its popularity. This explains why the descriptive analysis established the number of published works associated with WFH increased after 2019. The significant increase was in tandem with the changing operating environment, particularly in terms of the increasing acceptance of WFH working arrangement in public and private sectors.

In addition, the result confirms that technological readiness is critical for the success of WFH. The key finding of thematic analysis highlights the importance of technological readiness. To elaborate, the need to achieve technology mastery, to have adequate technological infrastructure, and to offer important training programs all point to the fact success requires a high level of technological readiness. However, the review also goes further to highlight the importance of other factors such as organizational support, socio-psychological, and individual characteristics. Even though these factors do not directly relate to technological readiness, they review established they work in collaboration with readiness to guarantee success of WFH.

However, the analysis also identified a gap in the literature specific to Malaysia. From scholar point of view, the topic of working from home and technological readiness in the public sector attracted interest from various countries but the number of articles specifically focused on Malaysia were limited. This is concerning considering Malaysia Government is aggressively striving to promote WFH for its civil servants. Therefore, there is a need for more research and exploration of the challenges and opportunities related to remote work in the Malaysian government context.

In conclusion, the systematic review confirms the growing acceptance of remote work in the government sector and emphasizes the importance of technology mastery and training for successful remote work. The descriptive analysis underscores the increasing research interest in this area, while also pointing out the need for more studies specifically focused on Malaysia. By addressing the identified gaps and challenges, governments can further enhance their technological readiness and support efficient remote work practices among government employees.

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