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KNOWLEDGE WORK PRODUCTIVITY IN THE PUBLIC SECTOR: The case of Nha Be District, Ho Chi Minh City, Vietnam

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ABSTRACT

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The performance of knowledge workers influences strongly on the results of knowledge-intensive organizations. Therefore, to increase organizational performance, the role of knowledge work is necessary to be considered carefully. However, the traditional methods are not relevant to gain effectiveness as well as efficiency in current context. The idea New Ways of Working deals with the practice of non-traditional and adaptable work practices and locations for completing knowledge work. Especially, public organizations such as Vietnamese organizations need to consider the relation between new ways of working and knowledge work productivity in order to their performance. Throughout the People's Committee of Nha Be district, Ho Chi Minh City, the study has been attempted to get three main goals. The study will support to not only understand the mean of knowledge work productivity, but also recognize which factors impact on knowledge work productivity as well as the status of knowledge work productivity in Nha Be district. To obtain these main goals, the study applied the quantitative research method. The study collected data from 162 civil servants working in Nha Be district before testing for reliability and validity by Cronbach's Alpha and EFA. The research results reveal that the productivity of the civil servants in Nha Be district is affected positively by four factors, comprising physical environment, virtual environment, social environment, and personal work practices. Furthermore, the level of impact of each factor is sorted in ascending: physical environment, social environment, virtual environment, and personal work practices. This is can be a reference for managers in setting up the conditions and the way of working. Moreover, the study also discusses some limitation and suggests a few recommendations for future researches.

Keywords: New Ways of Working, work environment, physical environment, virtual environment, social environment, personal work practices, civil servant

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1 Introduction

1.1 Background of the research

There is evidence that success of knowledge-intensive organizations results strongly from the performance of knowledge workers (Alvesson, 1993; Blackler, 1995; Miles, 2005; Groen et al., 2012). Thus, it is critical to understand the attributes of knowledge work in order to enhance organizational performance. According to Palvalin et al. (2015), knowledge worker is an individual who not only works with data and utilizes knowledge but also is often independent on location or time. Drucker (1999) emphasized the advancement of performance of knowledge work as a fundamental issue which modern economy has been facing. However, the problem is still an important challenge in research area (Jääskeläinen & Laihonen, 2013).

The industrial time has generated many ways of working which are productive and effective. However, these customary methods for working are never again relevant in our contemporary knowledge economy, where knowledge laborers make the dominant part out of the work labor (Davenport, 2008). There is evidence that although these conventional methods of working have interpreted to be gainful in industrial settings, they have not revealed the similar impacts on knowledge work (Drucker, 1999). As a result, this leads to a challenge on which economists have to focus on keeping up the development of economy. In other words, the best way to not only maintain the economic development but also guaranteeing the welfare of the work labor is hence to plan and modify better approaches for arranging work in order to get simultaneously improvement of productivity and the well-being of the work labor.

In addition to the traditional ways of working derived from industrial era, the dramatic increase of the number of knowledge workers is a reason which knowledge organization needs to find out a new way of working so as to replace the conventional methods. Indeed, knowledge workers have augmented considerably because of the movement of organizations from manual production to a more knowledge – intensive business (Ramírez & Nembhard, 2004). Furthermore, a significant change should be considered is that Drucker (1999) considered the knowledge workers as an asset instead of cost, therefore they should be built up, not controlled and reduced. Thus, in the contemporary business environment, knowledge workers are the main assets in the organizations. This results in the dependence of the success of contemporary organizations on knowledge workers, as mentioned

above. In other words, economic growth results mainly from the improvement of the productivity and performance of the knowledge workers.

One obtainable way of advancing the productivity of knowledge laborers is to plan the work practices, strategies, and setting in an absolutely new manner. New Ways of Working gives a novel way to deal with scrutinizing the contemporary and more conventional ways of working (Palvalin et al., 2015). The idea New Ways of Working copes with the practice of non-conventional and adaptable work practices and areas for fulfilling knowledge work (Van der Voordt, 2004; Gorgievski et al., 2010). The usages of information and communications technology (ICT) star a vital role for New Ways of Working applications (Palvalin et al., 2015). In other words, New Ways of Working practices are influenced by the utilization of ICT. For instance, in the view of Gorgievski et al. (2010), New Ways of Working is portrayed as a probability to work without dependence of location and time due to utilize quick and locomotive information and communications facilities. In addition, workplaces are described getting to be systems of action-related non-assigned "hot" desks and individuals utilizing supplemental outside work puts at home, at the customer, in a coffee shop, and so on. The concept New Ways of Working originates from the needs to support competitiveness and productivity of employee whereas the job satisfaction of workers keeps constant (Van der Voordt, 2004; Beauregard & Henry, 2009; Kattenbach et al., 2010). These outcomes result from flexible work arrangements, the cost efficiency and creation of working environments. As a consequence, New Ways of Working seems to be an approach which workers do their jobs in a new and innovative method rather than they are done as before. In the New Ways of Working, the autonomy and flexibility of knowledge worker are increased, as can be seen in Van der Voordt (2004). Furthermore, the author illustrated that people concentrate on the outcomes of work, not on the way of doing the work. These advantages are supported in many ways which are revealed as mobile work, telework, desk sharing, paperless offices, videoconferencing, and flexible or alternative workplaces and practices (Van der Voordt, 2004; Juriaan, 2011). All of these factors leads to a whole idea is to "work smarter, not harder", as stated in Bontis (2011).

Research by Greene and Myerson (2011) stated that the needs of an individual knowledge worker should be bolstered by the work settings. It emphasizes for the fact that the requirements of the tasks at hand should be considered as key criterion for designing work practices in modern knowledge-intensive organizations (Gibson, 2003). Conventionally, laborers are put into a certain space to do their jobs during the period of working time. According to Juriaan (2011), the manufacturing-based mindset is the basis of "old ways of working". In such setting, it is significant to note that all members

of team have to be available in the meantime at the assembly line so as to be possible to achieve the tasks undertaken. In contrast, there is no need that simultaneous physical presence of entire group members may not be required in knowledge work context. In fact, in some circumstances, the productivity of knowledge work can be reduced because of issues of focusing on the tasks given which are resulted from noise or interruptions (Heerwagen et al., 2004). As a consequence, work environment should be considered as a fundamental aspect when New Ways of Working is applied in knowledge work context. The researches by Vartiainen (2007) and Bosch-Sijtsema et al. (2009) portrayed that there are three vital aspects of work environment, comprising: the physical environment, the virtual environment, and the social environment. As can be seen from the view of Vartiainen et al. (2006) the physical environment refers to the physical work settings and location where work is achieved. In terms of virtual environment, it refers to a complex and various set of many types of services and devices that require to meet the needs of different entities, such as the task, the employee, and the physical location. The last term of working environment – social environment – refers to all of the intangible factors of work environment, including cognitive constructs, thoughts, beliefs, ideas, and mental states which employees share (Vartiainen, 2007).

In addition to these aspects of work environment, the dependence on the ability of employees determines the success of New Ways of Working to exploit advantages which it provides (Roustela & Lönnqvist, 2013). In fact, although New Ways of Working is supported by facilities, it does not mean that the work practices of the work labor can be changed without considering the ability of individual workers. For instance, once the knowledge workers can make use of the quiet spaces and virtual negotiation to support their work, these factors can be called the benefit of the work, as can be stated in Palvalin (2017). In other words, the knowledge workers need to utilize the advanced facilities and virtual tools in a right way so as to produce value for them and then the organizations. Therefore, harnessing the full potential is ultimately dependent on the employees' capability to utilize this potential.

Furthermore, another factor can be seen as a driver for productivity in New Ways of Working is well-being at work (Wright & Cropanzano, 2000; Schaufeli et al., 2006). The well-being of knowledge worker includes some many crucial perspectives, such as job satisfaction, work engagement, appreciation, work-life balance and atmosphere (Bakker & Demerouti, 2008). As a result of previous research, well-being at work can be improved throughout the work environment drivers (Halpern, 2005; Kelly et al., 2011).

There are few previous studies which discovered the relationship between the level of impact of work environment, individual work practices, and the productivity, or at least which factors have influence on productivity (Van der Voordt, 2004; Palvalin, 2019). Furthermore, it is no clear whether New Ways of Working and productivity have the link. It means that the literature requires a comprehensive view of positive impacts in the case of New Ways of Working.

1.2 The context of Vietnam

In Vietnam, the public organizations invest in necessary facilities and equipment to guarantee the basic condition of their operations. It means that physical work setting is much more taken care than ever before. In fact, Vietnamese government has been promulgated a law to control the usage the public asset (National Assembly of the Socialist Republic of Vietnam, 2017). Accordingly, the public organizations of Vietnam want to create many workplaces supporting the operation of their civil servants. In detail, the civil servants can use a variety of workplace to do their jobs. Moreover, many facilities are invested to create "non-noise workplace". In other words, they have space to either organize important meeting or avoid the interference from others. This results in the concentration for the civil servants, then increase their productivity.

Another critical change of Vietnam workplace is that the civil servants can practice their jobs in locations which they suppose to be the best way for them. As can be seen from National Assembly of the Socialist Republic of Vietnam (2012), the specific working time in Vietnam is 40 hours per week. It means that the civil servants have to present in their office at least eight hours per day from Monday to Friday. However, in the current trend, the Vietnamese supervisors seem to change their minds. In other words, the supervisors allow their staff working in a various types of location. They pay attention the result than the progress of job. This leads to a change in location where the job is done.

It is crucial to note that the changes of working location in Vietnam resulted partially from the utility of technology. In fact, Government of the Socialist Republic of Viet Nam (2011) promulgated the rule about the provision online information and public services on the websites and web portals of public organizations. Furthermore, Prime Minister of the Socialist Republic of Viet Nam (2018) published a decision about the list of online public services which completing the level 3 and 4 in specific sectors and locations from 2018 to 2019. Accordingly, the Vietnamese civil servants have to receive document and return result throughout the online systems, such as websites or web portals.

This seems to be able to reduce the negative problems such as bribery. Besides that, technology can support Vietnamese civil servants making use of positive conditions which physical workplace creates. To do this, many local authorities, such as Ho Chi Minh city, planned to build the Smart City. Consequently, a requirement of using technological applications is necessary. Accordingly, technological applications, including online Ho Chi Minh, GIS (Geographic Information System), have been using in order to support the civil servants do their jobs. Therefore, technology information has increasingly significant role in Vietnamese state agencies.

Due to technology, the Vietnamese public employees can do their job in different locations. It means that they can perform their job in the most convenient way for them. On the other hand, it is so critical to note that these advantages are just taken once the flow information conveyed efficiently and effectively. In other words, the intangible factors, such as thoughts, beliefs, ideas, evaluation procedure, must be understood consistently. In fact, the thoughts about efficiency and effectiveness of job has been changing in Vietnamese public organizations. The supervisors seem to evaluate their employees basing on the final result rather than the progress of creating the result. They allow their workers approaching the job in the most convenient way. Moreover, many organizations use applications, such as Zalo, Viber, to convey the internal information. And of course, online system is also used as the main channel to inform the policies or ideas. Hence, transparency is increased in each state agency. As a result, relationship between civil servants is stronger than before.

According to National Assembly of the Socialist Republic of Vietnam (2017), Ho Chi Minh City is the first pilot location which is permitted to pay for the civil servants an additional income basing on the results of work. The point is that the supervisors focus on the effectiveness and efficiency of the result to evaluate their employers. This means that the workers have been allowing to perform with the most convenient approach. This leads to flexibility and mobility of the civil servants. Furthermore, they can plan their job as well as set the goal to achieve. Therefore, the level of autonomy of the civil servants are increased. After two years, the result seems to be that the policy has been increased the force of the civil servants. This implies that the Vietnamese civil servants can perform in the personal approach to practice their jobs.

In Vietnam, one of indicators of the National Statistical Indicator System is productivity of social labour (National Assembly of the Socialist Republic of Vietnam, 2015). It is measured by the average gross domestic product (GDP) which an employee creates in the period of one year. According to General Statistics Office of Viet Nam (2019), Vietnam is a nation has a high development rate of

labour productivity, compared to ASEAN region. There are some studies as well as policies researching factors impact to the productivity of Vietnamese civil servants. As mentioned above, National Assembly of the Socialist Republic of Vietnam (2017) promulgated a policy which supports the civil servant increasing their productivity. Moreover, Nguyen et al. (2015) pointed out that some factor influences on the productivity. However, there is no any studies discover whether factors in the model of Palvalin et al. (2015) affect to the productivity although there is evidence about the impact of features of new ways of working on the productivity. Therefore, this study seems to provide a general view about the impact of new ways of working on the productivity.

1.3 Objectives of the research

This study aims to find out the impact of New Ways of Working, in terms of work environment and individual work practices on knowledge worker productivity. To get these aims, there are three objectives the study has. Firstly, the study aims to elaborate the phenomenon of knowledge work productivity. To attain this objective this study reviews the literature of knowledge work and knowledge work productivity. Secondly, from the literature the study also recognizes the main factors influencing knowledge productivity. Third, the study uses a measurement tool suggested by Palvalin et al. (2015) to evaluate the status on knowledge work productivity in the specific case of Nha Be District. Thus, the study aims to answer the following research question:

What is the situation and affecting factors of knowledge work productivity in Nha Be District?

1.4 Structure of the research

This study is structured in the following way: The first chapter introduces the background of the research, the context of Vietnam with respect to new ways of working, the objective of the research, and the research structure. The second chapter is to reveal literature review of knowledge work and knowledge worker. Next, the concept about knowledge work productivity is presented. After that, general introduction of new ways of working is described. Then, factors of the model of Palvalin et al. (2015), such as physical environment, virtual environment, social environment, and work practices, are illustrated. Moreover, the research model is elaborated basing hypotheses the study pose.

The third chapter is to present the explanation of methodology of the research. In this chapter, the study describes the research method as well as research procedure. Furthermore, the sample design and way of gaining data are shown. After that, some ethical issues are pointed out at the end of this

chapter. The fourth chapter will analyze the data and point out the result of checking hypotheses. This chapter begins with the description of the data. After that, Cronbach's Alpha and Explore factor Analysis are used to exam the reliability and validity of data. Then, some findings will be also revealed. The last chapter presents the conclusions as well as limitations and recommendations after some discussions will be illustrated basing on the findings of the research.

2 Literature review

2.1 Knowledge work and knowledge worker

With the purpose is to separate knowledge work from manual work, Drucker (1959) introduced the context of knowledge work (as cited in Palvalin et al., 2015). According him, knowledge worker is an individual who work basically with data or improves and utilizes knowledge at working environment. After that, there are some ways to define the meaning of knowledge work, yet, no standardized definition can be established (Dahooie et al., 2011; Kelloway & Barling, 2000).

In relation to knowledge worker, the main resource is the knowledge, so the knowledge intensiveness can be seen as the key aspect to define the most basic knowledge work. According to Davenport and Prusak (1997), knowledge workers as individuals who produce wisdom, or as individuals whose utilization of knowledge is an overwhelming part of their work. Then, Thompson et al. (2001) expand the idea more and discover that knowledge work creates works that the knowledge worker is allowed to use, spread out and innovative apply of that knowledge. Similarly, Davenport et al. (1996) define that the primary activity of knowledge work is "the acquisition, creation, packaging, or application of knowledge". Furthermore, Davenport defines knowledge work can be seen as individuals whose own experience, high levels of professional, or education, and the basic role of their jobs includes the innovation, distribution, or practice of knowledge. In addition, Palvalin et al. (2015) developed an idea based on the concept of Drucker (as cited in Palvalin et al., 2015). It means that knowledge worker is an individual who not only either works basically with data or improves and utilizes knowledge at working environment but also is often independent on location or time. This concept entails the laborers who "is high knowledge intensive work, but has a special nature" (Palvalin et al., 2015, p. 482). In short, knowledge workers can be considered as individuals who are described by the concept of Palvalin et al. (2015) in terms of New Ways of Working.

Drucker (1999) presented that manual work and knowledge are usually compared together. In addition to the knowledge intensiveness, knowledge work can be defined throughout a diversity of characteristics. For instance, there are eight dimensions which knowledge work can be differentiated from manual work (Ramirez & Steudel, 2008). They are: autonomy, structure, tangibility, knowledge, creativity and innovation, complexity, routine and repetitiveness, and physical effort (Ramirez & Steudel, 2008.). According to them, structure alludes to the quantity of standards and polices which are set up about the execution of an assignment. In that sense, manual work is far more structured

than knowledge work. Moreover, it is so exceedingly variable and difficult to characterize the processes of knowledge workers. In other words, Davenport (2008) revealed that detail stages of task cannot be determined to establish the work of knowledge workers, partially because the nature of their work cannot be forecast. As a result, a requirement of autonomy is clear to support to accomplish the jobs of knowledge workers. Autonomy refers to the level which the workers are controlled during fulfilling their tasks, given by Ramirez and Steudel (2008). Therefore, in comparison, knowledge workers require a lot higher degree of self-sufficiency than individuals working in a mechanical production system. In addition, Davenport (2008) took a note that autonomy needs commitment which is especially significant to the job. In other works, commitment is really vital with respect to knowledge work productivity.

Tangibility relates to a how obvious an undertaking is (Ramirez & Steudel, 2008). In the literature, Ray and Sahu (1989), and Drucker (1999) presented that manual work is often illustrated more tangible than knowledge work. It means that status of task which is charged by knowledge worker is not a criterion to determine if knowledge workers are working or not. In other words, Davenport (2008) noted that a work task only can be evaluated when the tangible outcomes are obtained. However, this results in challenges which evaluators encounter to assess the level of achieved tasks because the outcomes are often tangible, as can be seen in Laihonen et al. (2012).

There is a linkage between tangibility and knowledge dimension, because the fundamental intangible resource of knowledge work is knowledge. Ramirez and Steudel (2008) presented that "knowledge dimension refers to how much prior knowledge and executing cognitive actions are part of the task". As mentioned above, the differentiation between knowledge workers and manual workers is mainly supported by knowledge. Moreover, a variety of kinds of knowledge processes is entailed by knowledge work, such as acquisition and finding, application, creation, organizing, packaging and storing, and storing (Kelloway & Barling, 2000; Davenport 2008). These processes play a vital point regarding to productivity and performance of knowledge work, as stated in (Mill & Smith, 2011). For instance, Davenport (2008) showed that knowledge workers should be considered as the main assets in their companies because these organizations can take advantage of the innovative nature of knowledge work to increase their ability of competition. Furthermore, in the view of Ramirez and Steudel (2008), creative and innovative outcomes result from processes which refers to creativity and innovation. Therefore, the role of creativity and innovation in knowledge work is broader than in manual work.

"Complexity relates to how difficult or complex the task is" (Ramirez & Steudel, 2008). Although manual work is remarkable more simply than knowledge work, the diversity of types of knowledge workers is the key element to determine the complexity of jobs (Okkonen, 2004). There is no doubt that while some of knowledge workers' tasks may be so complicated, others refer to regular tasks basing on formal procedures which can be highly routine and repetitive, e.g the task of surgeons (Ramirez & Steudel, 2008; Bosch-Sijtsema et al., 2009). "Physical effort is about how much a task requires physical strength and power to perform a task" (Ramirez & Steudel, 2008). It is obvious that the need of physical effort is often minimal in knowledge work. However, in recent time, there are some jobs requiring not only knowledge but also physical effort. These individuals are named techonologist (Drucker, 1999).

2.2 Knowledge work productivity

In conventional way, Hannula and Lönnqvist (2002) defined productivity as the ratio of use between the outputs and the input to create output. It means that either the more output or the less input will lead to increase in productivity. However, there is a requirement to consider the issue regarding to productivity in knowledge work because knowledge workers are differentiated from manual workers thank to some major differences. In knowledge work, the concept of inputs as well as outputs is so difficult to define (Davenport, 2008). This is because both the nature of inputs and outputs are often intangible in knowledge work (Laihonen et al., 2012). As a consequence, the idea of conventional definition of productivity still remains the same in knowledge work context, yet with respect to operationalization of the concept, the level of difficulty in knowledge work is higher than in traditional work. It is more interesting to note that the relationship between input and output seems to be unnecessary, since the intervention of variables is so complex in knowledge work (Bosch-Sijtsema et al., 2009). Hence, the issue of recognizing which inputs resulted in which outputs is a challenge.

Drucker (1999, P 83-84) presented that knowledge-worker productivity is determined by six fundamental facts, including:

1. Knowledge worker productivity demands that we ask the question: "What is the task?"
2. The responsibility for productivity rests with knowledge workers themselves
3. Continuing innovation has to be part of the work, and the responsibility of knowledge workers

4. Knowledge work requires continuous learning and teaching
5. Quality of output also needs to be taken into account in productivity in addition to quantity
6. A knowledge worker has to be seen and treated as an asset rather than a cost to the company."

Perhaps excepting the last fact, these requirements are the opposite conditions to raise the productivity in manual worker (Drucker, 1999). In context of knowledge work, the quality is an essential factor to evaluate the output. Thus, the first target of knowledge work productivity has to be the obtain of quality. In this case, quality is not minimum, but maximum or at least optimum. However, it does not mean that the way of increasing productivity of knowledge worker has to start from quality rather than quantity (Drucker, 1999). Therefore, quality and quantity should be considered in line in terms of productivity of knowledge worker.

As can be seen in the listed requirements above, the first requirement leads to answer the question "what is task" in order to insight knowledge work productivity. This question can be seen as a guidance to support knowledge workers focusing on the task and rejecting all of other things. In other words, the idea is to highlight that the results and outcomes should be concentrated more than the way of working in knowledge work. The implication is that autonomy is a fundamental aspect to support knowledge workers doing their jobs. As a consequence, they have to be in charge of the results comprising their works. Davis (2002) revealed that the ability of knowledge workers about self-management is a necessity so as to determine their productivity. It means that the ability of managing the use of time, attention, and motivation is often showed by the most productive knowledge workers.

According to Ramírez and Nembhard (2004), a significant part of productive work is the generation of innovations in knowledge work. The reason is that one the most basic features of knowledge work is creation of innovations, as can be stated in the research of Davenport (2008). Therefore, innovations which are one of the most significant aspects in the light of productivity determine the knowledge work productivity. Davenport (2008) pointed out that knowledge workers who are high-performing are learning, particular learning new things, all of time to be more innovative. It is argued that knowledge workers can become productive once they are treated as assets of their organization, rather than the costs. In an organization, it is obvious that the manager not only tries to save their cost but

also find out the best way to utilize their assets to grow their organization. In other words, in terms of assets and cost, the most importance difference is that assets require to be encouraged to develop while reducing the cost is a basic target of the managers. This results in a requirement for a new idea is that knowledge workers should be managed in a different way, compare to the way of management in the industrial time (Davenport, 2008).

2.3 New ways of working

New Ways of Working gives a novel way to deal with scrutinizing the contemporary and more conventional ways of working (Palvalin et al., 2015). The idea New Ways of Working copes with the practice of non-conventional and adaptable work practices and areas for fulfilling knowledge work (Van der Voordt, 2004; Gorgievski et al., 2010). The usages of information and communications technology (ICT) star a vital role for New Ways of Working applications (Palvalin et al., 2015). In other words, New Ways of Working practices are influenced by the utilization of ICT. For instance, in the view of Gorgievski et al. (2010), New Ways of Working is portrayed as a probability to work without dependence of location and time due to utilize quick and locomotive information and communications facilities. In addition, workplaces are described getting to be systems of action-related non-assigned "hot" desks and individuals utilizing supplemental outside work puts at home, at the customer, in a coffee shop, and so on. The concept New Ways of Working originates from the needs to support competitiveness and productivity of employee whereas the job satisfaction of workers keeps constant (Van der Voordt, 2004; Beauregard & Henry, 2009; Kattenbach et al., 2010). These outcomes result from flexible work arrangements, the cost efficiency and creation of working environments. As a consequence, New Ways of Working seems to be an approach which workers do their jobs in a new and innovative method rather than they are done as before. In the New Ways of Working, the autonomy and flexibility of knowledge worker are increased, as can be seen in Van der Voordt (2004). Furthermore, the author illustrated that people concentrate on the outcomes of work, not on the way of doing the work. These advantages are supported in many ways which are revealed as mobile work, telework, desk sharing, paperless offices, videoconferencing, and flexible or alternative workplaces and practices (Van der Voordt, 2004; Juriaan, 2011). All of these factors leads to a whole idea is to "work smarter, not harder", as stated in Bontis (2011). There are also a few concepts are described in Hardy et al. (2008) relating to New Ways of Working, such as hot desking, hotelling, mobile working, teleworking, homeworking, non-territorial working, virtual team-working, and flexible working.

The main idea which these concepts entails is that there is a need to reorganize the work practice in terms of physical place and location. Indeed, Van der Voordt (2004) and Gorgievski et al. (2010) showed that New Ways of Working contains the idea about dealing with the practice of non-conventional and adaptable work practices and places for accomplishing knowledge work. On the other hand, New Ways of Working cannot obtain potential results without support from ICT (Springer, 2011). In other words, different physical locations are really flexible for knowledge workers, but these workplaces would not be productive without sufficient ICT tools. Gorgievski et al. (2010) revealed that physical locations enable to work with support of fast and mobile IT facilities without dependence on time and space. Therefore, ICT is a key point among aspects of New Ways of Working.

In contrast, it is more important to note that a shift in mindset plays a significant role in applying New Ways of working, although new office designs as well as multiple locations are facilitated by efficient ICT tools. It is stated in Juriaan, (2011) that the work in the contemporary organization environment is increasingly flexible and mobile, so that the conventional way of designing work from industrial time is not applicable. As a consequence, a requirement to change the way which organizations and managers think about work and work practices is more obvious than ever before. Thus, managerial practices and mindsets of managers as well as employees should be change in New Ways of Working and then a need towards “smart work” should be considered carefully.

In short, physical environment as well as virtual tools star an important role in applying New Ways of working. Moreover, the social dimension of work environment needs to be carefully considered as it leads to the preconditions for the adoption of New Ways of Working. In addition to these dimensions, it is remarkable to note that the success of application of New Ways of Working strongly depends on the fashion of practice of knowledge workers. Hence, there is a need to discover in order to more thorough understand these perspectives.

2.4 Work environment

The studies by Vartiainen (2007) and Bosch-Sijtsema et al. (2009) portrayed that there are three vital aspects of work environment, comprising: the physical environment, the virtual environment, and the social environment.

2.4.1 Physical environment

As can be seen from the view of Vartiainen et al. (2006) the physical environment refers to the physical work settings and location where work is achieved. According to Vartiainen et al. (2006) there are five kinds of physical space, including home, the main workplace, moving places (for example cars, trains), other workplaces (for instance customer's premises), and the "third workplaces" (for example hotels, cafe's). Maier et al. (2008), Breu et al. (2005) stated that in current time, the knowledge workers do their job more mobile than ever before. In other words, they spend time in their office less than they used to. As a result, there is a change about the physical environment where the knowledge workers practice their jobs. The traditional workplace seems to change in function which it played (Harrison, 2002; Juriaan, 2011). It means that the role about social aspect of physical environment has been increasing while its traditional aspect has been decreasing.

Because of the way of working of knowledge workers, there are new needs for building and or at least designing the office guarantee the mobility of the employees. Maier et al (2008) pointed that the traditional office would be waste when the mobility of the knowledge workers increased. Thus, it is supposed that the level of office space usage can be enhanced once the workplaces are reorganized in the new way. Elsbach (2003) stated that the use of the office space can create the efficiency and the effectiveness of cost which result from the shared workspaces. Especially, this kind of using the office space is more popular in current time (Elsbach, 2003) because of the increasing need of knowledge worker about the flexibility and mobility. As argued above, I pose a hypothesis that:

H1: The physical environment has a positive impact on knowledge work productivity.

2.4.2 Virtual environment

In terms of virtual environment, it refers to a complex and various set of many types of services and devices that require to meet the needs of different entities, such as the task, the employee, and the physical location.

According to Harrison (2002), the virtual space is one of the fundamental factors which support to the use of physical environment. Vartiainen et al. (2006) shown that an electronic working environment or virtual working space is the image of virtual space. The simple or complex communication tools, such as email, are used as platform of which the knowledge workers can make use to practice their jobs.

It is evidence that there is an interrelation between physical and virtual spaces (Hyrkkänen et al., 2012). The point is that the needs for virtual space are various because of the diversity of physical spaces. For example, if two co-workers need a tools to do the task, they can use email to communicate together. On the other hand, when a team or an international organization need to exchange the information (each member stays alone), they need to use a variety of tools, such as email, videoconferencing, document management, as revealed in Vartiainen (2007).

It is important to note that in the context of increasing knowledge worker's mobility and flexibility, technology stars a significant role which allow knowledge workers communicate with their customers as well as co-workers while far away (O'Neill, 2010). Such information communication technology (ICT) can save time for the knowledge workers. Therefore, they use time efficient even commuting, as stated in (Davis, 2002; Breu et al., 2005). As a consequence, provision the mobile technologies for the knowledge workers is one of the means to improve the productivity of knowledge workers (Davis, 2002). Therefore, I suppose the second hypothesis:

H2: the virtual environment has a positive impact on knowledge work productivity.

2.4.3 Social environment

The last term of working environment – social environment – refers to all of the intangible factors of work environment, including cognitive constructs, thoughts, beliefs, ideas, and mental states which employees share (Vartiainen, 2007).

One of the key factors of the new ways of working is that the flow of the information is conveyed effectively in the organization. Davenport (2008) shown that the quantity and quality of information is supported due to the sufficiency of information technology in the organization's social networks. Moreover, the knowledge is shared in the organization is influenced by the social networks and social environment (Nenonen, 2004). It is more interesting to note that the social space represents the intangible factor of work environment while tangible factors are played by physical and physical spaces. Social environment supports the flow of knowledge and information in the organization. So, it can be supposed that the subconscious values and beliefs which shared by persons of an organization are the organizational culture, as shown in Martins and Terblanche (2003). As a result, Roper and Kim (2007) said that the organizational culture plays a critical role and support to arrange new work regarding to new ways of working. Moreover, Peponis et al. (2007) argued that productivity is affected by the communication way and knowledge sharing which are a part of organizational

culture. Therefore, when applying new ways of working, the supervisors should consider how to preserve the culture of organization, as described in Harrison (2002).

Another crucial perspective of social environment is the managerial culture. According to Barney (1986), the business is managed in the way defined by organizational culture. Therefore, when new ways of working is applied, the organization should be considered managerial culture carefully (Halford, 2005). In short, Juriaan (2011) emphasized that the social environment plays a significant role even though there are many changes in terms of working patterns as well as the mobility of work. Hence, I suppose the third hypothesis:

H3: Social environment has a positive impact on knowledge work productivity.

2.5 Work practices

In addition to these aspects of work environment, the dependence on the ability of employees determines the success of New Ways of Working to exploit advantages which it provides (Roustela & Lönnqvist, 2013). In fact, although New Ways of Working is supported by facilities, it does not mean that the work practices of the work labor can be changed without considering the ability of individual workers. For instance, once the knowledge workers can make use of the quiet spaces and virtual negotiation to support their work, these factors can be called the benefit of the work, as can be stated in Palvalin (2017). In order words, the knowledge workers need to utilize the advanced facilities and virtual tools in a right way so as to produce value for them and then the organizations. Therefore, the responsibility of employees is to not only make use of the potential which new work settings create but also recognize a smarter approach to work.

Warren et al. (2007) stated that flexibility plays a crucial role in new ways of working. According to Gibson (2003), there are some kinds of expectation about flexibility. For instance, the customers seem to change their requirement, so they need the adaption of the companies speedily. Consequently, the companies need to find out the new ways to satisfy their customers. Similarly, the businesses need to be flexible from their employees in order to solve the problems regarding to work-life balance. On the other hand, the flexibility of the employees has a vital role to complete a variety of their activities. Thus, I suppose the fourth hypothesis:

H4: Work practices have a positive impact on knowledge work productivity.

As mentioned above, this study elaborated four hypotheses. As a result, this study proposed the research model which is illustrated in the Figure 1.

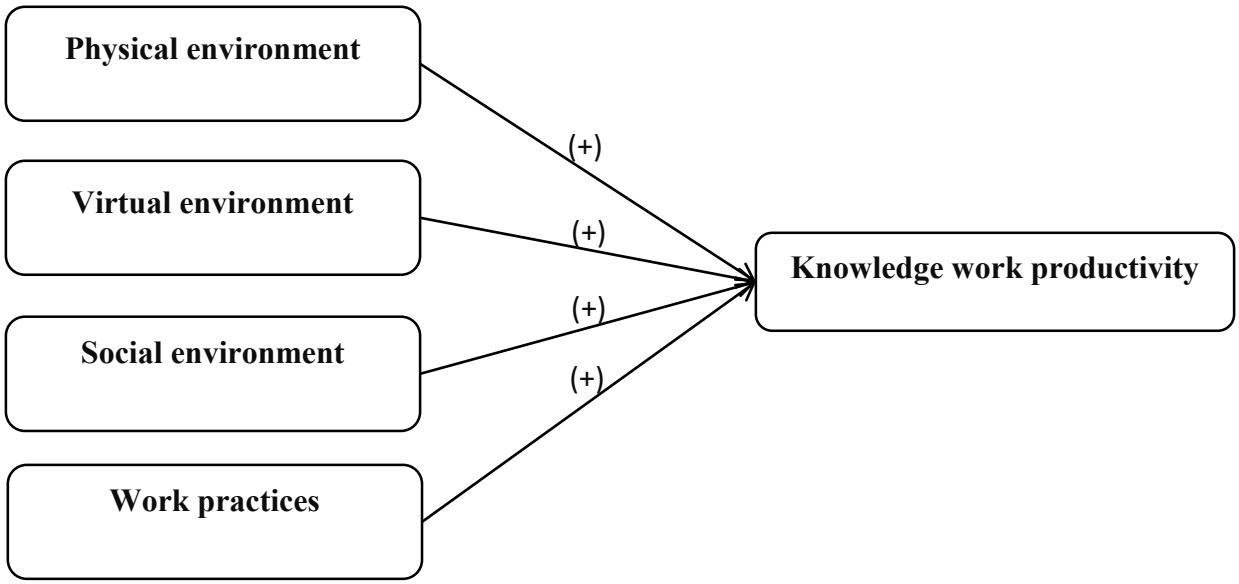


Figure 1. The research model

3. Research design

The purpose of the study is to recognize which factors influence the productivity of knowledge work in the public sector in Nha Be district. Moreover, by using data collected in public organizations in Nha Be district, the research can point out what are the key drivers of knowledge work productivity in public organizations. This chapter elaborates the research design used. In addition, it will show how data was collected and analyzed. Additionally, some ethical issues are introduced.

3.1 Research Design

According to Perry (1998), research method plays a significant role in the study. In this study, the questionnaire which was built by Palvalin et al. (2015) is used to gather the data. However, there are some changes to adjust the questionnaire with the context of Vietnam. For instance, applications such as Zalo, Viber replaced Skype - the application used by Palvalin et al. (2015). Moreover, this study did not study the factor "Well-being at work" which is one of the four factors of the model developed by Palvalin et al. (2015). In addition, some open-ended questions were eliminated because the aim of this study was to study which factors affect knowledge work productivity. Therefore, there are 37 statements and one open-ended question to measure four hypotheses. After that, the questionnaire was translated into Vietnamese.

The quantitative research method was chosen. The aim was to exam study whether the proposed hypotheses were satisfied. After collecting the data, the study used Statistical Package for the Social Sciences - IBM SPSS Statistics 20 - to check the Cronbach's Alpha and Explore factor analysis (EFA). Then, the four proposed hypotheses were assessed. After amending, the questionnaire consists of 32 statements. There are some reasons for choosing this research method. The most important reason originated from the purpose of the study is to test factors affecting to knowledge work productivity and their levels of impact. Indeed, a variety of studies regarding knowledge work productivity have already been carried out. Palvalin et al. (2015) constructed a SmartWoW questionnaire comprising four areas: work environment, personal work practices, well-being at work, and productivity. This tool was demonstrated to be useful. However, Palvalin (2017) suggested that there is a need to verify the impacts of the first two factors on the last factor. Therefore, this study has elaborated four hypotheses basing on previous researches. In addition, Kamil (2004) showed that the quantitative method is an appropriate method supporting to examine assumptions. It means that,

quantitative method helps to test whether suggested factors have influence on knowledge work productivity or not. Another reason is that quantitative research method can find out not only the factors impacting knowledge work productivity but also which factors are the main drivers of productivity of knowledge work. In other words, either qualitative research method or quantitative research method can recognize which elements affecting to knowledge work productivity. However, it is difficult to point out which factor is the most influencing one on knowledge work productivity without statistics. Furthermore, time can be seen as a constraint, which researchers may confront when applying the mix method between quantitative and qualitative research method. In addition, as can be suggested by Palvalin et al. (2015), the author used the open-ended questions in questionnaire to discover deeper from the view of respondents. Therefore, quantitative research method can be supported by open-ended questions to solve the research question. As a consequence, quantitative research method can be considered to be more appropriate than qualitative research method in this study.

3.2 Empirical Data

3.2.1 Type of data

The study used primary data to find out the answer of the research question. In the context of Vietnam, there is no any studies which have been researched concerning new ways of working. Therefore, that is the reason why primary data was used. In addition, the primary data can supply a comprehensive and accurate view about the issues in the case of Nha Be district. It results from the diversity of characteristics which different employees bring.

Both online survey and paper questionnaire were used to gather data, albeit there are other methods can be used, such as experimentation, secondary data, as shown in Polonsky and Waller (2018). The questionnaire was designed on paper and conveyed directly to respondents. Besides that, it was also designed on the Google driver software to support to gain the data. On the one hand, the online survey can be more convenient to collect data in recent time due to development of technology. This way saved a lot of time for researcher. On the other hand, paper questionnaire seems to be more interactive than online survey since the researcher was face to face with the colleagues as well as partners. In addition, the researcher can explain and support participants to understand the context and key concepts of the study. Therefore, with the aim is to collect the data, the two methods can be used.

To get the support from the civil servants in People's committee of Nha Be district, the researcher suggests the introduction of the supervisor. After that, the researcher called or met face to face each civil servant to send the questionnaire. The questionnaire was conveyed directly to respondents who wanted to do it on paper. In other cases, the research transferred the online survey throughout the personal email. In addition, social networks were also used to support the researcher. Then completing the questionnaires, the respondents sent them to the researcher. Finally, the researcher summarized and used SPSS 20 to analyze the data.

3.2.2 Measurement scales

Likert 5-point scale is practiced to measure the level of agreement of respondents in terms of all items, ranging from 1 (strongly disagree) to 5 (strongly agree). The previous researches and literature are the background for this research scale. In addition, the research scale was also amended to be appropriate with the condition of Vietnam.

To measure the knowledge work productivity in the public sector, four independent variables (physical environment, virtual environment, social environment, and work practices) as well as a dependent variable (knowledge work productivity) will be tested. The thesis applies the questionnaire used by Palvalin et al. (2015) with a few adjustments to be more appropriate in the case of Vietnam. This results from the difference between the social application used in the context of Palvalin et al. (2015) and in the context of Vietnam. For example, Vietnamese people like to use Zalo or Viber rather than Skype. Besides that, one of the four factors in the model of Palvalin et al. (2015) "Well-being at work" was not test in this research. Also, the study just used one open-ended question concerning to knowledge work productivity. The reason is that the other open-ended questions in the model of Palvalin et al. (2015) seems to mean about modifying the model. After all, there are 37 statement and one open-ended questions to check four hypotheses posed in the Chapter 2.

Factors		**Items**	**Source**
Physical environment/Physical workplace (PW)			Palvalin et al. (2015)
1	PW1	There is a space available for tasks that require concentration and peace at our workplace when needed.	
2	PW2	There are enough rooms for official and unofficial meetings at our workplace.	
3	PW3	There is a space for informal interaction at our workplace when needed.	

4	PW4	Issues related to ergonomics are properly taken care of at our workplace.	
5	PW5	The restlessness of the work environment does not significantly interfere with my working.	
Virtual environment/Virtual workplace (VW)			Palvalin et al. (2015)
1	VW1	The most important information systems are easy to use.	
2	VW2	Workers have an access to information regardless of my location.	
3	VW3	Workers have opportunity to see each other's calendar.	
4	VW4	Workers have possibility to communicate with each other using instant messaging (e.g. Zalo, Viber).	
5	VW5	Our workplace has equipment that enables having video conferences.	
6	VW6	Group work software is used in our workplace.	
Social environment/Social workplace (SW)			Palvalin et al. (2015)
1	SW1	Workers have the possibility to work in the most suitable ways and when it is the most convenient.	
2	SW2	Telework is a generally accepted practice at our workplace.	
3	SW3	Operations in our workplace are transparent.	
4	SW4	Knowledge flows adequately between the key persons at our workplace	
5	SW5	Meeting practices are efficient	
6	SW6	Our workplace has clear policy how to use IT and communication tools	
7	SW7	I have clear personal goals for my work	
8	SW8	I am being evaluated according to the results I achieve, not, for example, according to the working hours.	
9	SW9	New ways of working are actively explored and experimented at our workplace.	
Personal work practices (PWP)			Palvalin et al. (2015)
1	PWP1	I exploit video conferences to minimize the need for unnecessary travelling.	
2	PWP2	I use mobile services for working in situations where I have idle time (e.g. working in coffee shops by using smart phones or laptops).	
3	PWP3	I am able to prioritize my tasks in order to manage my workload.	

4	PWP4	I often telework for carrying out tasks that require uninterrupted concentration.	
5	PWP5	I prepare for meetings.	
6	PWP6	I stretch my muscles during the brakes.	
7	PWP7	I follow the organization communication channels	
8	PWP8	I shut down email and other communication tool to concentrate important work task.	
9	PWP9	I plan my day beforehand.	
10	PWP10	I actively seek for the most suitable work practices and tools.	
Productivity (PR)			Palvalin et al. (2015)
1	PR1	I achieve satisfactory results in relation to my goals.	
2	PR2	I am usually able to carry out my work tasks efficiently (smoothly, without problems).	
3	PR3	I am able to use the majority of my working time for conducting relevant tasks related to my goals.	
4	PR4	My job mainly includes tasks in which I am able to exploit my knowledge and skills efficiently.	
5	PR5	I am able to meet customers' expectations.	
6	PR6	The quality of my work outputs is high.	
7	PR7	The work group I work in works efficiently as a whole.	
Open-ended question		How could your productivity be improved?	

Table 1. Research variables

3.2.3 Questionnaire design

The questionnaire was designed on paper and conveyed directly to respondents. Besides that, it was also implemented on the Google drive to support the data gathering. There are two fundamental parts in the questionnaire. The first part consist four questions designed to gather the background information of the respondents. The second part has 37 statements as well as one open-ended question. The original version of the questionnaire was in English. However, the questionnaire was translated into Vietnam in order to be easier for the respondents. To ensure accuracy of the language, both translator and professional colleague consulted during the process of translation.

The data was collected from civil servants who work in People's committee of Nha Be district. More particularly, the respondents work in the division requiring high professionalism. They included all kind of staff, comprising supportive personnel, managers, and experts. There are many reasons why this location was selected to do the questionnaire. Firstly, the researcher has been working for eight years in Nha Be district, which locates in Ho Chi Minh City. As a result, it is more convenient for researcher collect data due to relationship with colleagues as well as partners. Furthermore, Nha Be district is one of the local government of Ho Chi Minh City, which is the most developing city in Vietnam. In addition, application "Nha Be online" has been practiced to evaluate the satisfactory level of civil and the progress of civil servants' job. By that way, Nha Be district is a leading district in terms of building smart city in Ho Chi Minh City. Therefore, the thesis chose respondents who have been member staff of Nha Be government to guarantee the representative of civil servants in Vietnam. It is critical to note that the researcher did not choose the street level civil servants. The explanation is that the workers at street level organizations in Ho Chi Minh City do their jobs mainly based on experience and they are not considered as knowledge workers as those are regarded in this study. Therefore, it is considered difficult for them to answer the questionnaire relating to New Ways of Working

As mentioned in section 3.2.4, the civil servant who have been working at People' committee of Nha Be district are samples of the research. The non-probability convenience method was practiced in other to choose the samples. The data collection was done in July 2019. There are five variables with 37 items in the questionnaire (excepting one open-ended question). Hair et al. (2009) stated that the sample size must be at least 100 samples. In addition, the number of respondents need to correspond with four to five times of the number of items to ensure the statistical significance for the thesis. As a result, the number of samples was defined with 180. During the process of collecting data, 18 samples were eliminated because of dissatisfaction. As a consequence, there are 162 samples (n=162) which were used in order to analyze.

3.3 Data analysis

According to Polonsky and Waller (2018), quantitative data can be analyzed by a diversity of software. In this thesis, SPSS 20 was used to analyze the data. The data was typed into SPSS 20 after gaining from the respondents. The assessment and refinement of the measurement scale are accomplished due to Cronbach's alpha as well as Exploratory factor analysis (EFA). Moreover, to

test hypotheses, the Pearson correlation and multiple-linear regression analysis were used. During this process, some inappropriate items were deleted. After that, the hypotheses were exam basing on the regression analysis. Finally, some assumptions were also checked to guarantee confidence.

3.4 Ethical issues

It is important thing that the respondents can understand what they are answering. It means that if there is no any explanation about the key concepts as well as statement of questionnaire, the respondents' answers may be inaccurate in relation to the nature of data. As a result, the research can lead to inexact outcomes about the real circumstances. Therefore, researcher needs to explain some key concepts to ensure the accuracy of data, because exact data is crucial to answer the research question. As a consequence, findings are useful to apply in the real life.

Language is a difficulty which any researchers confront when they collect data in Vietnam. Therefore, once doing the research in Vietnam, the researcher has to translate questionnaire into Vietnamese. Hence, it is significant to guarantee that questions should be understandable but accurate with the nature of problems. To solve this issue, the research required translators and professional in administrative area helping to translate the questionnaire into Vietnamese.

In addition to language, the context between Vietnam and other countries is different. Therefore, when researcher utilizes the questionnaire which Palvalin et al. (2015) used, there are some things which cannot be applied completely. Although researcher tried to change some things to be more appropriate with the context of Vietnam, some words (e.g. telework) cannot be translated correctly. Therefore, the factors which are examined in this study may be not same with model of Palvalin et al. (2015) constructed.

Open-ended question can be considered as a solution to find out new factors to improve knowledge work productivity. However, the respondents used a variety of words to say about the same things. Therefore, the data was so chaos before it was grouped. This led to an important challenge that researcher needs to have ability to group the same idea together.

Because of quantitative research approach, it is necessary to determine that data must be stored safely. Moreover, the issue about translation from paper questionnaire into computer should be implemented carefully. Any mistakes can result in inaccurate outcomes of nature of circumstance. Therefore, the usefulness of findings depends on the accuracy of data in terms of quantitative research method.

4 Data analysis

This section reveals the analysis of data collected to find out the results relating to productivity of civil servant who working in people committee of Nha Be district. There are three part in this section, including respondents' descriptive, assessment and refinement of measurement scale, revised research model, hypothesis testing, and results of open-ended question.

4.1 Respondents' descriptive

4.1.1 Respondents' characteristics

The study sample is civil servants who are working in the people committee of Nha Be district. The data is collected basing on their willingness to answer the questionnaire. It took three weeks to complete the data collection. 180 questionnaires were done by interviewees thank to paper surveys or online surveys. However, there are 18 replies facing error problem. Therefore, the data remained 162 replies guarantee the validity to analyze. The general description of sample as follows:

		Frequency	Percent
Gender	Male	68	41.98%
	Female	94	58.02%
	Total	162	100%
Age group	Under 30	54	33.33%
	From 30 to 40	46	28.40%
	From 40 to 50	29	17.90%
	Above 50	33	20.37%
	Total	162	100%
Seniority	Less than 01 year	45	27.78%
	From 01 year to 05 years	55	33.95%
	Above 05 years	62	38.27%
	Total	162	100%
Profession	Supportive	127	78.40%
	Manager	18	11.11%
	Expert	17	10.49%
	Total	162	100%

Table 2. The general description of research's respondents

As can be seen from the Figure 2, there are 162 civil servants who participate in survey, including 68 males (41.98%) and 94 females (58.02%).

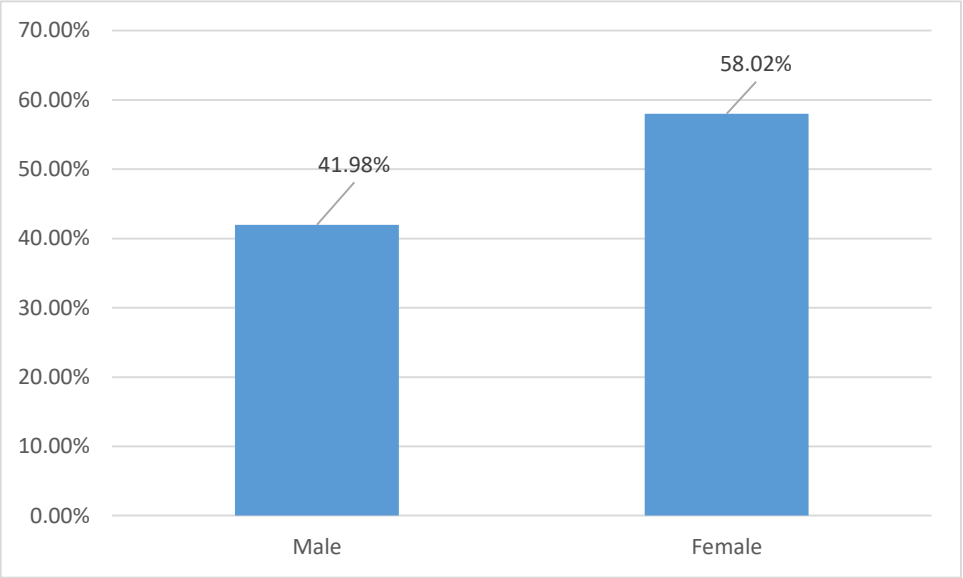


Figure 2. Gender of the samples

Regarding to age group, civil servants of Nha Be district were divided into four group (Figure 3), comprising under 30, from 30 to 40, from 40 to 50, and over 50 years old. The highest age group was under 30 years old, accounted for one-third the total of sample. Age group from 40 to 50 and above 50 years old were the smallest age groups, with one-fifth. Remaining groups is from 30 to 40 years old standing 28.4% of sample.

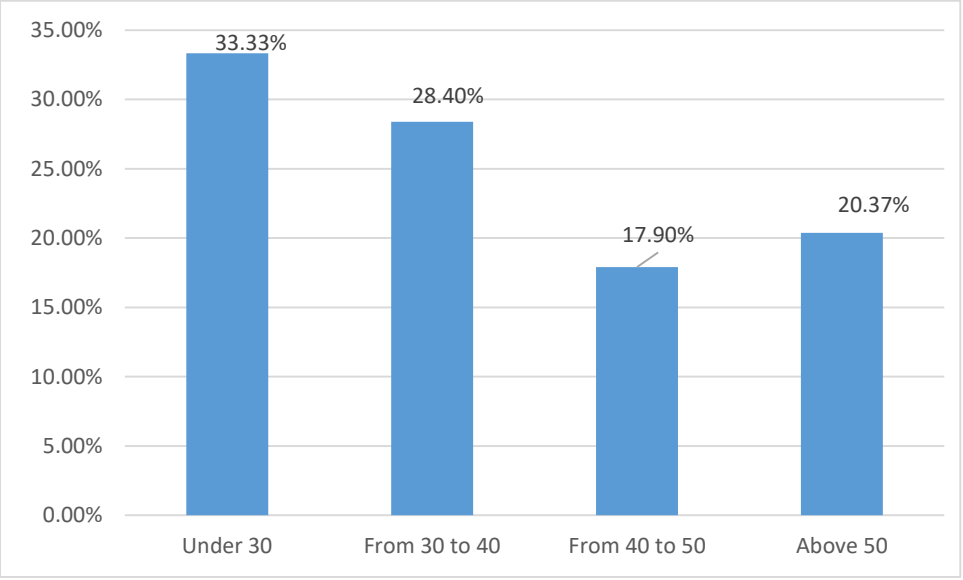


Figure 3. Age group of the sample

The figure 4 described that seniority of civil servants had three groups, in which the smallest group was people whom had less than 1 year working, with 27.78%; the highest group included workers whom had above 05 years working (38.27%), the remaining group was civil servant whom did their job from 01 year to 05 years (33.95%).

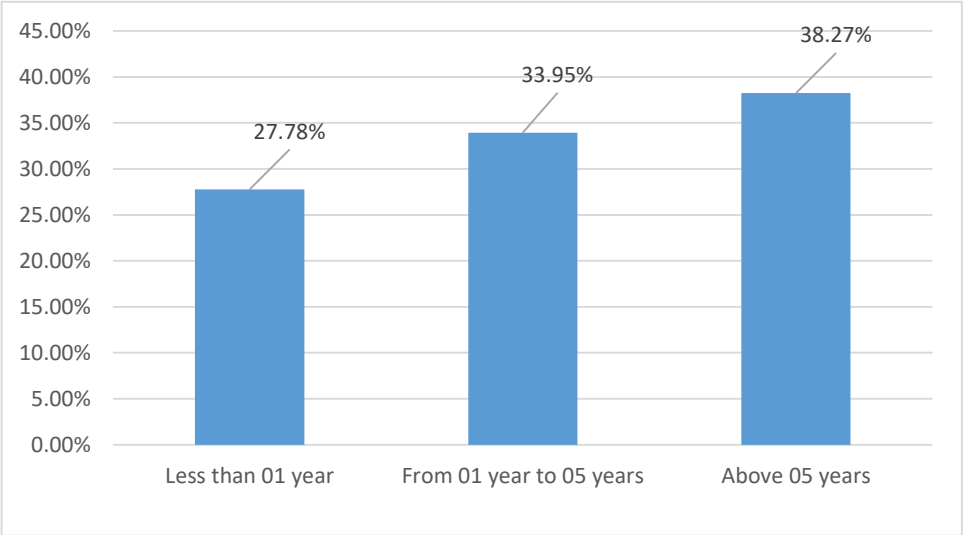


Figure 4. Seniority of the sample

In terms of profession, Civil servant in Nha Be district was arranged into three groups. The highest group was supportive, with nearly 80% of the sample. In contrast, manager and expert had the smallest groups which accounted for somewhere in the vicinity of 10% per group (Figure 5).

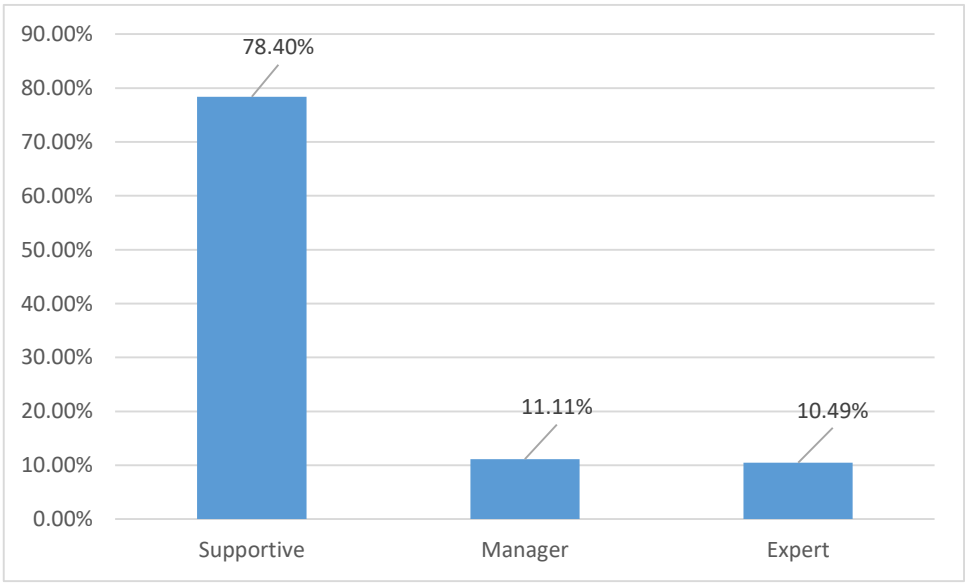


Figure 5. Seniority of the sample

4.1.2 Observed variables statistic description

It is significant that each observed variables of independent factors and productivity need to be described statistically to evaluate the productivity of civil servants. The descriptive statistics illustrate the preliminary results which the employees evaluate about their current work.

	N	Minimum	Maximum	Mean	Standard Deviation
Physical workplace					
PW1	162	1	5	3.57	1.130
PW2	162	1	5	3.59	1.129
PW3	162	1	5	3.70	1.115
PW4	162	1	5	3.82	1.136
PW5	162	1	5	3.62	1.142
Virtual workplace					
VW1	162	1	5	3.28	1.252
VW2	162	1	5	3.64	1.239
VW3	162	1	5	3.62	1.158
VW4	162	1	5	3.21	1.335
VW5	162	1	5	3.35	1.248
VW6	162	1	5	3.49	1.237
Social workplace					
SW1	162	1	5	3.00	.772
SW2	162	1	5	3.04	.877
SW3	162	1	5	3.11	.878
SW4	162	1	5	3.03	1.514
SW5	162	1	5	3.12	.866
SW6	162	1	5	3.16	.898
SW7	162	1	5	3.11	.834
SW8	162	1	5	3.06	1.535

SW9	162	1	5	3.08	.841
Personal work practices					
PWP1	162	1	5	2.86	1.250
PWP2	162	1	5	2.94	1.277
PWP3	162	1	5	2.94	1.359
PWP4	162	1	5	2.84	1.261
PWP5	162	1	5	3.02	1.476
PWP6	162	1	5	2.85	1.310
PWP7	162	1	5	2.85	1.303
PWP8	162	1	5	3.22	1.413
PWP9	162	1	5	2.88	1.311
PWP10	162	1	5	2.83	1.303
Productivity					
PR1	162	1	5	3.43	.932
PR2	162	1	5	3.14	.951
PR3	162	1	5	3.23	.829
PR4	162	1	5	3.25	.887
PR5	162	1	5	3.26	.936
PR6	162	1	5	3.25	.908
PR7	162	1	5	3.23	.907

Table 3. Statistic description of observed variables

As can be seen from the figure 6, the highest mean 3.82 was PW4-“Issues related to ergonomics are properly taken care of at our workplace” and PW1-“There is a space available for tasks that require concentration and peace at our workplace when needed” had the lowest mean of physical environment 3.57

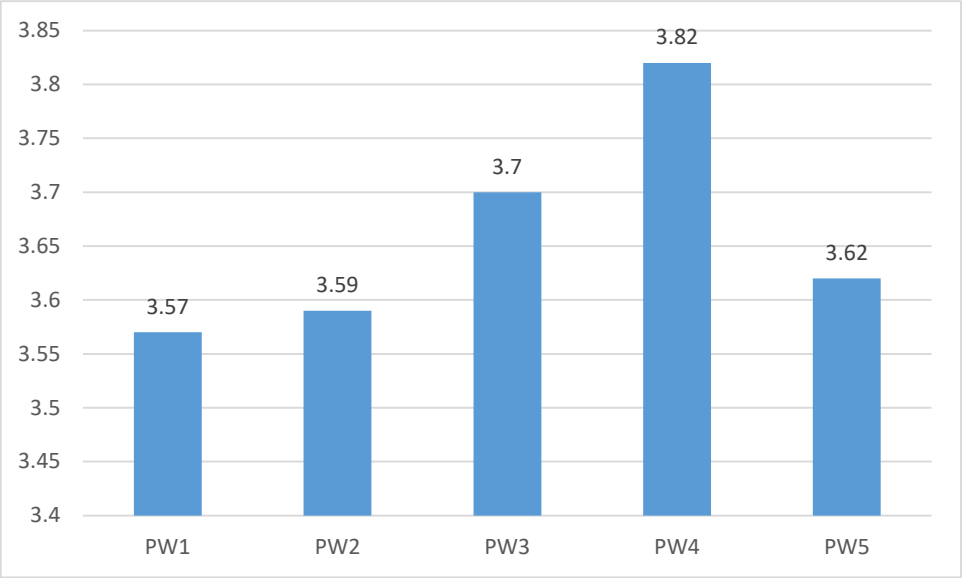


Figure 6. Statistic description of physical workplace's observed variable

According to statistic description of virtual workplace's observed variable, VW2-"Workers have an access to information regardless of my location" and VW3-"Workers have opportunity to see each other's calendar" had the two highest mean, which are 3.64 and 3.62 respectively. On the other hand, the lowest mean of virtual environment 3.21 was VW4-"Workers have possibility to communicate with each other using instant messaging (e.g. Zalo, Viber) (Figure 7).

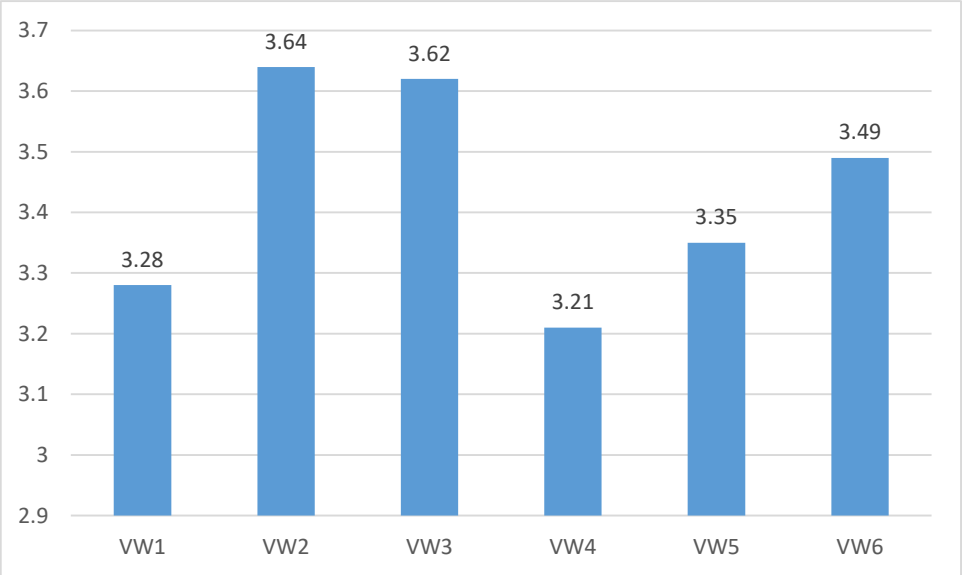


Figure 7. Statistic description of virtual workplace's observed variable

The figure 8 shows that the highest mean of social workplace's 3.16 was SW6-"Our workplace has clear policy how to use IT and communication tools". In contrast, SW1-"Workers have the possibility to work in the most suitable ways and when it is the most convenient" had the lowest mean 3.00.

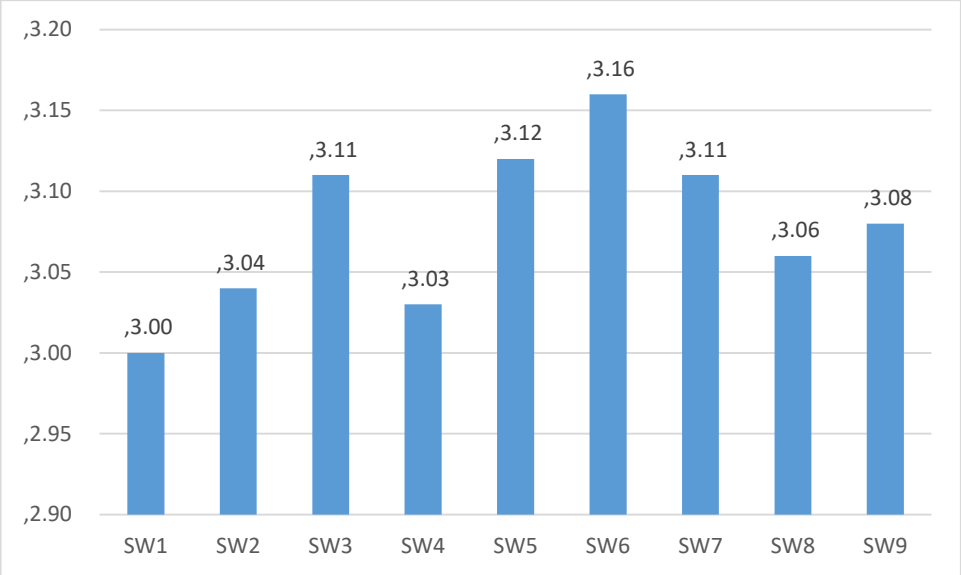


Figure 8. Statistic description of social workplace's observed variable

As can be seen from the figure 9, PWP8-"I shut down email and other communication tool to concentrate important work task" had the highest mean 3.22. On the contrary, the lowest mean of personal work practices was PWP10-"I actively seek for the most suitable work practices and tools.

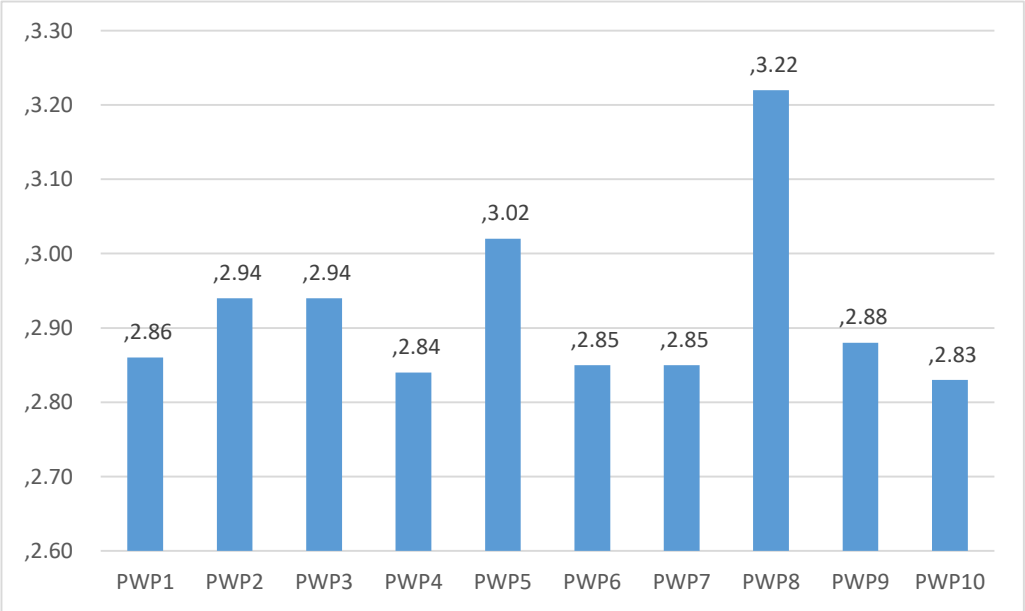


Figure 9. Statistic description of personal work practices' observed variable

According to statistic description of productivity's observed variable, PR1-"I achieve satisfactory results in relation to my goals" had the highest mean 3.43 and PR2-"I am usually able to carry out my work tasks efficiently (smoothly, without problems)" had the lowest mean of productivity 3.14 (Figure 10).

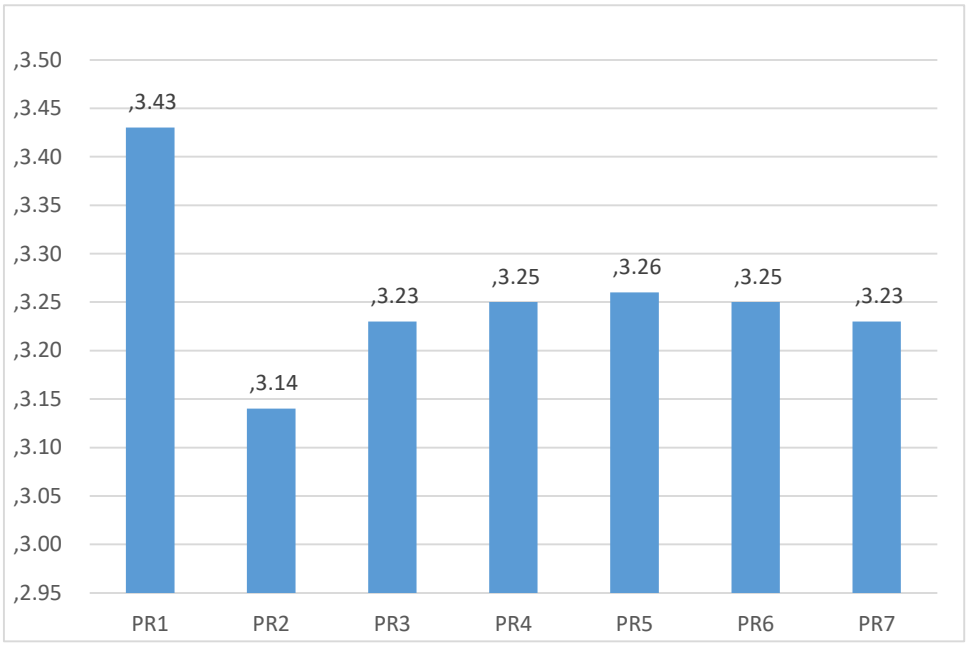


Figure 10. Statistic description of productivity's observed variable

4.2 Assessment and Refinement of measurement scale

There are two methods which are used to assess and refine the measurement scale. The first method is Cronbach's alpha which is used in order to verify the reliability of measurement scale. The second method is used to assess the validity of measurement scale, named exploratory factor analysis (EFA).

4.2.1 Reliability of measurement scale

The purpose of the Cronbach's alpha test is to check the reliability of the measurement scale. The value of Cronbach's alpha is acceptable if it is in the range between 0.7 and 0.9, as shown in Tavakol and Dennick (2011), and Muijs (2010). Moreover, according to Hair et al. (1998) any variables would be excluded to modify the reliability of measurement scale if their value of Corrected Item-Total Correlation below 0.4 or Alpha if Item Deleted over the Cronbach's alpha.

Variables	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Physical Workplace (PW)		
Cronbach's Alpha 0.891_Number of Items: 5		
PW1	0.736	0.867
PW2	0.768	0.860
PW3	0.748	0.864
PW4	0.672	0.881
PW5	0.747	0.865
Virtual Workplace (VW)		
Cronbach's Alpha 0.895_Number of Items: 6		
VW1	0.661	0.885
VW2	0.746	0.872
VW3	0.730	0.875
VW4	0.669	0.885
VW5	0.719	0.876
VW6	0.789	0.865
Social Workplace (SW)		
Cronbach's Alpha 0.776_Number of Items: 9 (the first time)		
SW1	0.729	0.727
SW2	0.529	0.746
SW3	0.575	0.741
SW4	**0.213**	**0.813**
SW5	0.527	0.747
SW6	0.638	0.732
SW7	0.611	0.738
SW8	**0.242**	**0.809**
SW9	0.621	0.736
Cronbach's Alpha 0.874_Number of Items: 7 (the second time)		
SW1	0.690	0.852
SW2	0.612	0.862
SW3	0.631	0.859
SW5	0.570	0.867
SW6	0.703	0.849
SW7	0.700	0.850
SW9	0.677	0.853
Personal Work Practices (PWP)		
Cronbach's Alpha 0.799_Number of Items: 10 (the first time)		
PWP1	0.726	0.753
PWP2	0.626	0.764
PWP3	**0.070**	**0.826**
PWP4	0.563	0.772
PWP5	**0.152**	**0.821**
PWP6	0.692	0.756
PWP7	0.691	0.756
PWP8	**0.127**	**0.822**
PWP9	0.653	0.760
PWP10	0.626	0.764
Cronbach's Alpha 0.896_Number of Items: 7 (the second time)		

PWP1	0.726	0.878
PWP2	0.721	0.879
PWP4	0.617	0.890
PWP6	0.706	0.880
PWP7	0.736	0.877
PWP9	0.712	0.880
PWP10	0.670	0.885
Productivity (PR)		
Cronbach's Alpha 0.898_Number of Items: 7		
PR1	0.687	0.885
PR2	0.729	0.880
PR3	0.701	0.884
PR4	0.724	0.881
PR5	0.695	0.884
PR6	0.721	0.881
PR7	0.662	0.888

Table 4. Reliability Testing Results

As can be seen from the Table 4, the Cronbach's Alpha value of each factor in the measurement scale is higher than 0.7. However, there are some factors containing observed variables which need to be removed to guarantee the reliability because their corrected item-total correlation is less than 0.4 as well as Cronbach's Alpha if Item Deleted is more than Cronbach's Alpha. As a result, the author eliminated five observed variables, including SW4 "Knowledge flows adequately between the key persons at our workplace", SW8 "I am being evaluated according to the results i achieve, not, for example, according to the working hours", PWP3 "I am able to prioritize my tasks in order to manage my workload", PWP5 "I prepare for meetings", and PWP8 "I shut down email and other communication tool to concentrate important work task".

In detail, the observed variable SW4 needs to be eliminated due to its corrected item-total correlation (0.213) is less than 0.4. Moreover, when it is deleted, the Cronbach's Alpha value of Social Workplace factor will increase from 0.776 to 0.813. Similarly, the Cronbach's Alpha value of Social Workplace factor will rise from 0.776 to 0.809 if SW8 is deleted. Furthermore, its corrected item-total correlation equal 0.242 (less than 0.4), so it requires to be eliminated to guarantee the reliability.

In comparison, observed variables PWP3, PWP5, and PWP8 have the same reasons with SW4 as well as SW8 when they are deleted. In other words, their corrected item-total correlation is less than

0.4. Besides that, the Cronbach's Alpha value of Personal Work Practices factor will increase when the author removes them from measurement scale.

After deleting five observed variables mentioned above, there are 32 observed variables remained in the measurement scale. In terms of reliability of measurement scale, all conditions were satisfied because of Cronbach's Alpha. It means that the Cronbach's alpha value of each factor is more than 0.7, the corrected item-total correlations of all observed variables are greater than 0.4 and their Cronbach's Alpha if Item Deleted are less than Cronbach's Alpha.

4.2.2 Validity of measurement scale.

The validity of measurement scale is tested by the Exploratory Factor Analysis (EFA) method after the reliability of measurement scale was refined as practiced in the previous part.

4.2.2.1 The independent factors

According to Williams et al. (2012), the suitability of the data should be assessed before the factors are extracted. This assessment is conducted due to the Kaiser-Meyer-Olkin (KMO) index as well as significance of Barlett's Test of Sphericity.

As can be seen from the Table 5, the KMO index is 0.859 (more than 0.5) and Sig. Of Bartlett's Test is 0.000 (less than 0.05), the factor analysis is appropriate (Hoang & Chu, 2008).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.859
Bartlett's Test of Sphericity	Approx. Chi-Square	2271.038
	Df	300
	Sig.	.000

Table 5. Independent factors' KMO and Barlett's Test result

In addition, Ledesma and Valero-Mora (2007) detemined that in the research model the factors are only retained when their eigenvalues are more than one. As can be seen from the Table 6, the result

of independent factors' total variance explained shows that there are four components which have initial Eigenvalues over 1 (7.369, 3.582, 2.923, and 2.056). It means that these components represent factors which are assumed to test the hypotheses in this construction. Moreover, Rotation Sums of Squared Loadings (Cumulatve %) is 63.719% (more than 50%). This showed that the 63,719% of variances of factors are explained by observed variables.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.369	29.475	29.475	7.369	29.475	29.475	4.363	17.450	17.450
2	3.582	14.329	43.804	3.582	14.329	43.804	4.069	16.276	33.726
3	2.923	11.692	55.496	2.923	11.692	55.496	4.002	16.007	49.733
4	2.056	8.222	63.719	2.056	8.222	63.719	3.496	13.986	63.719

Table 6. Independent factors' total variance explained

According to Hair et al. (1998), if the sample size is from 100 to 350, the load factor should be greater than 0.55. In this study, the sample size is 162, so only observed variables which have the load factor over 0.55 are chosen. The table 7 showed that at the Eigenvalues 2.056, there are four factors have been extracted by rotated component matrix from 25 observed variables. In addition, there is no new factor formed. The range of the load factor of these variables is from 0.661 to 0.842.

	Component			
	1	2	3	4
PWP7	.793			
PWP2	.786			
PWP9	.760			
PWP10	.758			
PWP1	.757			
PWP6	.745			
PWP4	.661			
SW6		.792		
SW7		.792		
SW1		.777		
SW9		.773		
SW3		.724		
SW2		.719		
SW5		.661		
VW6			.830	
VW5			.817	
VW2			.815	
VW3			.780	
VW4			.760	
VW1			.743	
PW2				.842

PW5				.819
PW1				.806
PW3				.787
PW4				.732

Table 7. Independent factor's rotated component matrix

4.2.2.2 The dependent factor: Productivity

The Table 8 described that the dependent factor had KMO index over 0.5 (0.906) with the Sig. Of Bartlett's Test is 0.000 (less than 0.05). As a result, the factor analysis is suitable (Hoang & Chu, 2008).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.906
Bartlett's Test of Sphericity	Approx. Chi-Square	570.853
	Df	21
	Sig.	.000

Table 8. Dependent factors' KMO and Bartlett's Test result

As can be seen from the Table 9, the result of dependent factors' total variance explained illustrates that only one factor has Initial Eigenvalues above 1 (4.356). Additionally, observed variables explain of 62.228% of the variances. These results answer that this component represents factor which is assumed to check the hypotheses in this construction, as stated in Ledesma and Valero-Mora (2007).

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.356	62.228	62.228	4.356	62.228	62.228
2	.590	8.433	70.661			
3	.536	7.654	78.315			
4	.461	6.589	84.904			
5	.418	5.969	90.873			
6	.349	4.980	95.853			
7	.290	4.147	100.000			

Table 9. Dependent factors' total variance explained

4.3 Revised research model

As the result of assessment and refinement of measurement scale, independent and dependent factors were regrouped from the remained observed variables as the following (Table 10):

Factors	Observed variasbles
Independent factors	
PW – Physical Workplace	PW1, PW2, PW3, PW4, PW5
VW – Virtual Workplace	VW1, VW2, VW3, VW4, VW5, VW6
SW – Social Workplace	SW1, SW2, SW3, SW5, SW6, SW7, SW9
PWP – Personal Work Practices	PWP1, PWP2, PWP4, PWP6, PWP7, PWP9, PWP10
Dependent factors	
Productivity	PR1, PR2, PR3, PR4, PR5, PR6, PR7

Table 10. Remained observed variables of measurement scale

The research model is revised and finalized as the following figure (Figure 11):

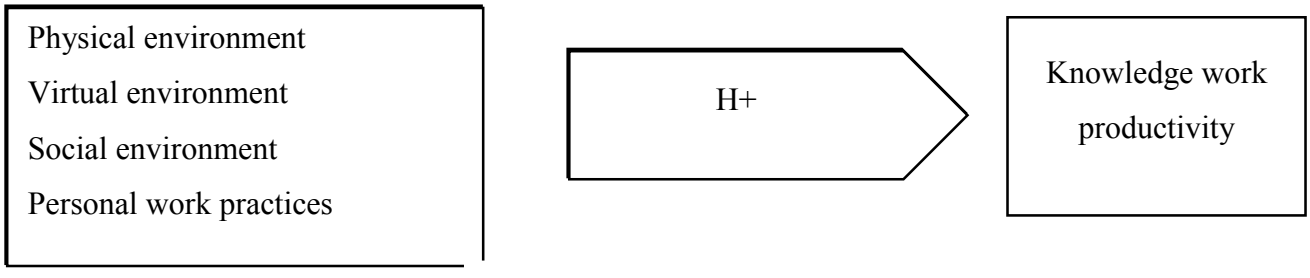


Figure 11. Revised research

H1: The physical environment has a positive impact on knowledge work productivity.

H2: The virtual environment has a positive impact on knowledge work productivity.

H3: The social environment has a positive impact on knowledge work productivity.

H4: The personal work practices have a positive impact on knowledge work productivity.

4.4 Hypotheses testing

The next step is to test hypotheses thanks to the Pearson correlation and multi-linear regression analysis. The aim is to discover the relationship between independent factors and dependent factor. Also, the study recognizes factors have significant impact on the productivity of knowledge workers in people's committee at Nha Be district.

4.4.1 Pearson correlation

It is important that the correlations should be analyzed to consider that linear relationships exist or not between the factors. The regression analysis uses the result of correlation analysis as fundamental. In terms of Pearson correlation, the value is ranged from -1 to 1. It means that if the value is more than 0, a positive linear relationship exists between the dependent factors and the independent factors. On the other hand, if the value is less than 0, there is a negative linear relationship between them. Another case is that the value is 0 or approximate 0, there is no existence of linear relationship. It is crucial to note that multicollinearity should be considered carefully to avoid the high correlation between an independent factor and others.

Correlations

		PW	VW	SW	PWP	PR
PW	Pearson Correlation	1	.282**	.140	.474**	.482**
	Sig. (2-tailed)		.000	.077	.000	.000
	N	162	162	162	162	162
VW	Pearson Correlation	.282**	1	.199*	.334**	.493**
	Sig. (2-tailed)	.000		.011	.000	.000
	N	162	162	162	162	162
SW	Pearson Correlation	.140	.199*	1	.217**	.414**
	Sig. (2-tailed)	.077	.011		.006	.000
	N	162	162	162	162	162
PWP	Pearson Correlation	.474**	.334**	.217**	1	.679**
	Sig. (2-tailed)	.000	.000	.006		.000
	N	162	162	162	162	162
PR	Pearson Correlation	**.482****	**.493****	**.414****	**.679****	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	162	162	162	162	162

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 11. Pearson's correlation analysis result

As can be seen from the Pearson's correlation analysis result (Table 11), there were positive linear relationships between independent factors and dependent factor because all their Pearson Correlation were more than 0.3 and the Sig. were less than 0.01 (Muijs, 2010). In detail, physical workplace, virtual workplace, and social workplace have the moderate relationship with productivity due to their Pearson Correlation are over 0.3 and less than 0.5 (Muijs, 2010). At the same time, there was a strong

relationship between personal work practice and productivity because their Pearson Correlation (0.679) is above 0.5 and less than 0.8 (Muijs, 2010).

In terms of independent factors, there are some modest relationships as well as moderate relationship (the Pearson Correlation values ranged from 0.199 to 0.474 with the Sig. were less than 0.05). As a result, the multicollinearity of the independent factors should be paid attention. This is conducted at regression analysis.

It is significant to note that the Pearson Correlation between physical workplace and social workplace were 0.170, but its Sig. was 0.077 (greater than 0.05). This showed that there is no relationship between these two factors.

4.4.2 Regression analysis

Regression analysis was used to assess how much the independent factor impact on the dependent factor. The study used multi-linear regression analysis with Enter method to be able to avoid serious issues existing when using other methods in the analyzing process (Muijs, 2010). In terms of Enter method, the point is that R square is contributed by all of the independent factors which are entered in the regression equation.

Muijs (2010) stated that the fundamental regression equation is $Y = a + bX$. *Y* represents the dependent factor; *X* represents the independent factor; *a* is the value of Y once X equals zero; *b* symbolizes the value which Y will change when X changes per unit.

In this study, the following regression equation illustrates the relationship between the dependent factor (PR "productivity") and the independent factors, including physical workplace (PW), virtual workplace (VW), social workplace (SW), and personal work practices (PWP) (Muijs, 2010). Moreover, the regression coefficient of the independent factors is symbolized by *b* in the regression equation.

$$PR = a + b_1*PW + b_2*VW + b_3*SW + b_4*PWP$$

As can be seen from the Table 12, there are three values in the model summary, comprising R, R Square, and Adjusted R Square. Muijs (2010) revealed that how well the dependent factor is predicted by the independent factors due to R value. R Square describes the observed variables of four independent factors explain the amount of variance in productivity. At the same time, Adjusted R Square reveals the level which research model seems to fit in the population.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.784[a]	.615	.605	.4494751	1.776

a. Predictors: (Constant), PWP, SW, VW, PW

b. Dependent Variable: PR

Table 12. The model summary

In the model summary table, R value is 0.784 and the R Square is 0.615. This result showed that a strong correlation exists between the variables of productivity factor and the variables of four independent factors. Furthermore, the Adjusted R Square is 0.605 (above 0.5) proving that the model is strong fit (Muijs, 2010). In other words, the research model is used positively in order to explain factors influence on civil servants' productivity.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.448	.217		2.066	.040		
	PW	.118	.043	.156	2.740	.007	.758	1.319
	VW	.173	.038	.244	4.546	.000	.854	1.171
	SW	.268	.057	.241	4.711	.000	.935	1.070
	PWP	.334	.041	.472	8.071	.000	.718	1.393

a. Dependent Variable: PR

Table 13. Regression coefficients result

As can be seen from the Table 13, the Beta column was standardized coefficients. These values showed the number of productivity of civil servants in Nha Be district will change when independent factors change per unit (Muijs, 2010). It means that if physical workplace rose in 1, general productivity of civil servants in Nha Be district increased in 0.156. Similarly, if virtual workplace, social workplace, and personal work practices increased in 1, general productivity of civil servants in Nha Be district rose in 0.244, 0.241, and 0.472 respectively. Furthermore, the personal work practices had the strongest impact on the productivity of civil servants in Nha Be district with β is 0.472. On the contrary, the weakest impact was physical workplace with β is 0.156.

Another column should be concentrate is the Sig. column. All of the Sig. values are less than 0.05, so there is the statistics significance in relation to the positive relationship between each independent factor and the dependent factor.

As a consequence of regression analysis result, the productivity of civil servants in Nha Be district are influenced positively by four factors. They are arranged in ascending of impact level: physical workplace, social workplace, virtual workplace, personal work practices.

4.4.3 Examination multi-linear regression assumptions

When using regression analysis, many conditions require to be met to guarantee confidence, as shown in Muijs (2010), and Osborne and Waters (2002). In detail, Muijs (2010) stated two vital conditions. The first one is the linearity of the relationship of independent factors and dependent factor. The second one is the multicollinearity. It means that the correlation between a dependent variable and others should not be strong. Also, the study should check some assumptions of multi-linear regression, comprising linearity, multicollinearity, homoscedasticity, and normality.

4.4.3.1 Assumption of linearity

The linearity of residuals is one of requirements needs to be met in order to ensure confidence (Muijs, 2010; Osborne & Waters, 2002). This assumption is tested by using Scatterplot. As can be seen from the figure 12, the Scatter plot did not follow a curvilinear pattern. Therefore, assumption of linearity was met.

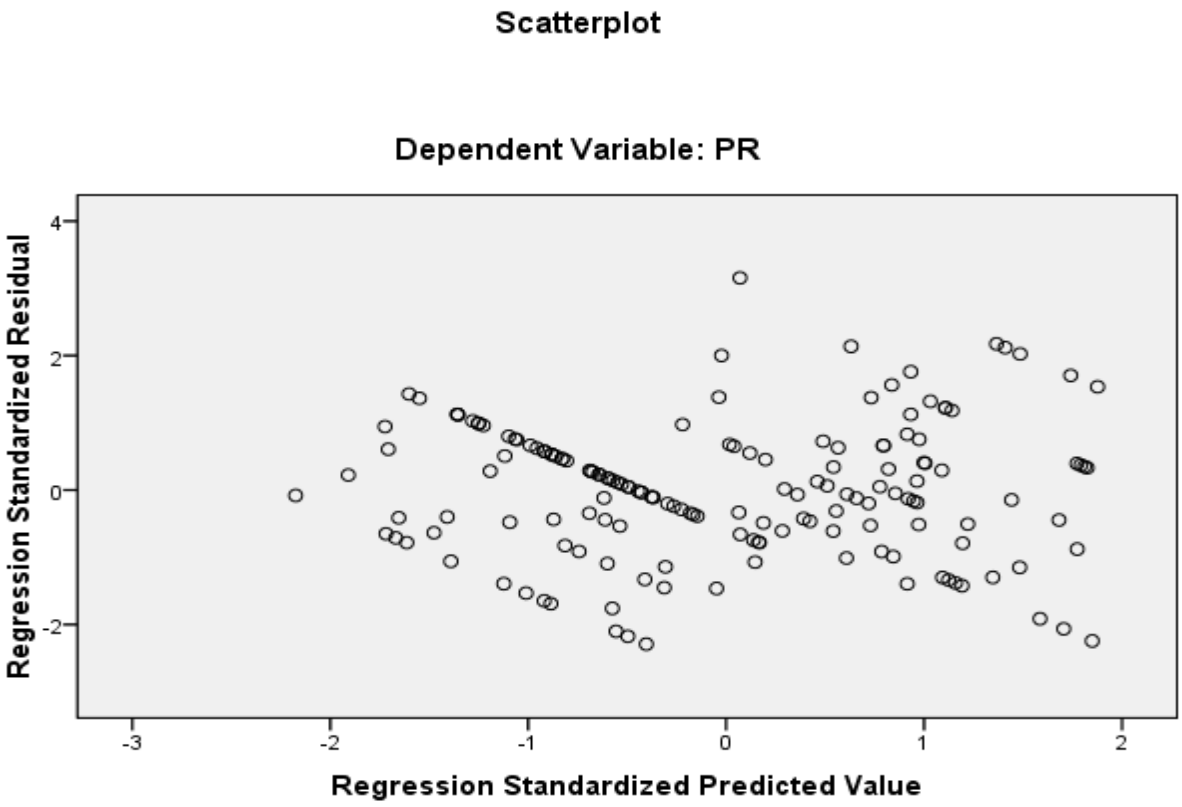
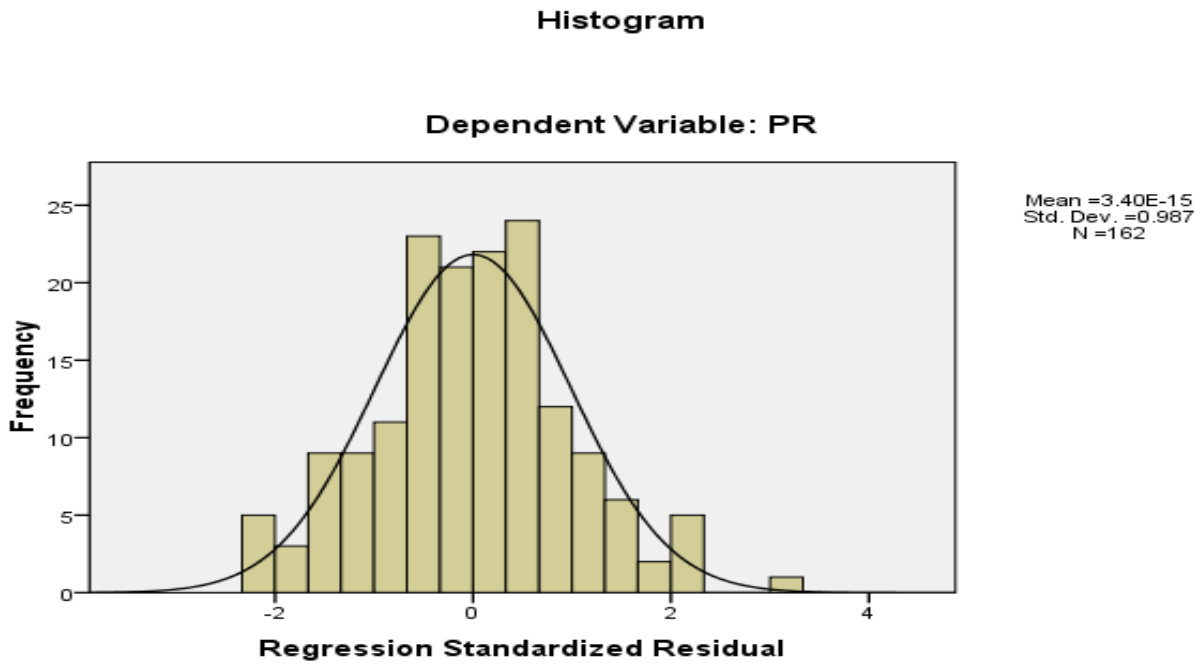


Figure 12. Scatterplot

4.4.3.2 Assumption of normality

One of assumptions when using regression is the normality of distribution of variables (Muijs, 2010). In purpose to test this assumption, two common methods were used, including a histogram, and Normal P-P Plot. As can be seen from the Figure 13, a normal curve of distribution was superimposed the frequency chart. This curve had the sharp of a bell, so it seems to be like normal distribution. In addition, the Mean is somewhere in the vicinity of 0, and its standard deviation is approximate 1 (0.987). Therefore, distribution of residual is nearly normal.



Firgure 13. Histogram

In addition to Histogram graphic, P-P Plot graphic is also used to test assumption of normality. The Figure 14 revealed that observed cum prob of distribution of residual seems to establish a diagonal. Therefore, it can be concluded that the residuals had the normal contribution.

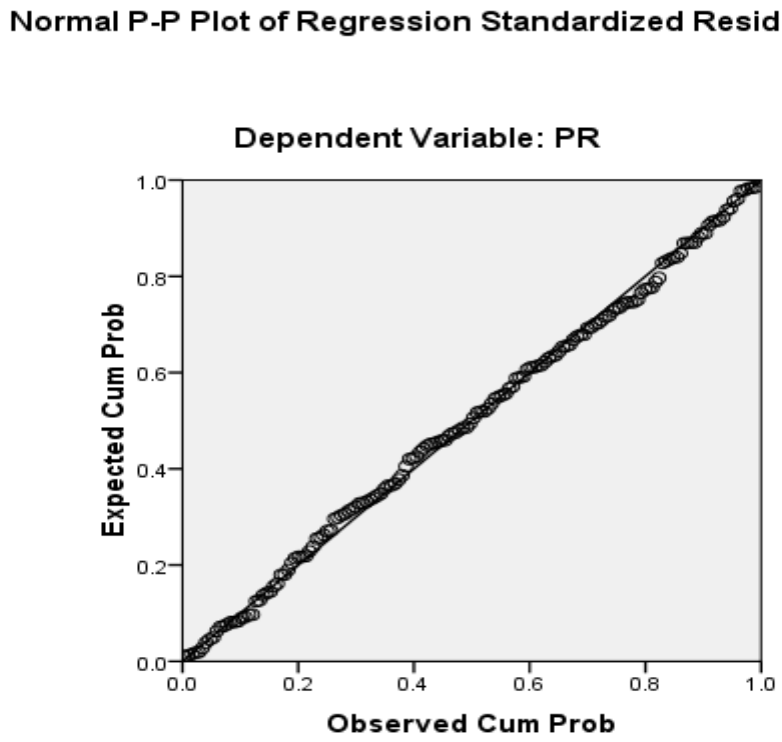


Figure 14. Normal P-P Plot of regression standardized residual

4.4.3.3 Assumption of homoscedasticity

Osborne and Waters (2002) presented that, the Scatterplot graphic between standardized predicted value and standardized residual can support to check if the current data is homoscedasticity or heteroscedasticity. In the figure 15, the Scatterplot showed that the distribution of residuals concentrated on 0, so the data is homoscedasticity in the regression model.

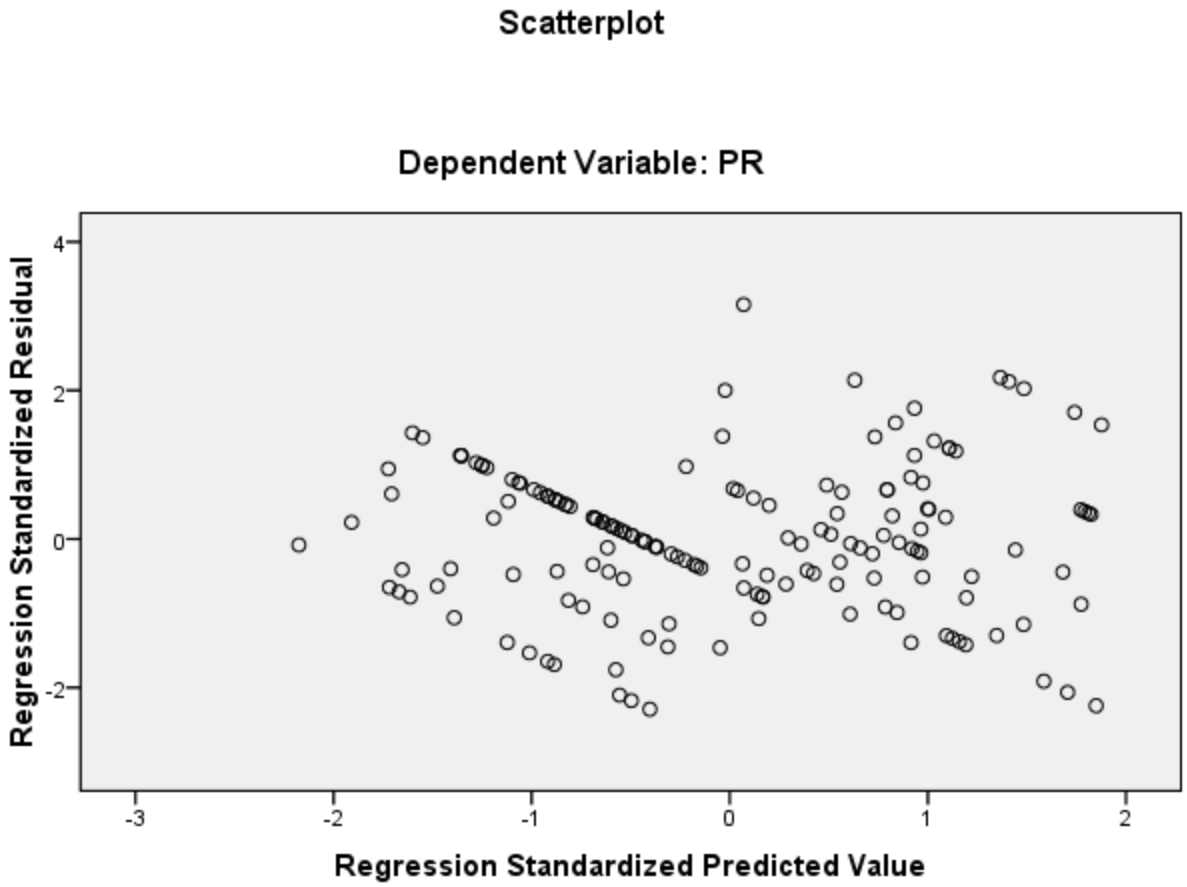


Figure 15. Scatterplot

4.4.3.4 Assumption of multicollinearity

As can be mentioned above, multicollinearity is one of two significant conditions in the multi-linear regression (Muijs, 2010). It means that the correlation between the two independent factors should not be strong. In aim to check multicollinearity, Muijs (2010) presented that there are two measures, such as: tolerance and variance inflation factor (VIF). The research can use one measures to test the multicollinearity because tolerance is inverse of VIF.

In the table 13, the result showed that all independent factors have the tolerances greater than 0.5 (from 0.718 to 0.935). In other words, all VIFs of independent factors are less than 2 (from 1.070 to 1.393). As a result, in research model, the correlation between independent factors is not strong, or not appear multicollinearity.

4.5 Results of hypotheses testing

The result of regression coefficient will answer the hypotheses imposed in the research model.

H1: The physical environment has a positive impact on knowledge work productivity.

The factor PW "physical workplace" has the influence on the productivity of civil servants because of the standardized coefficient β is 0.156 and Sig. is 0.007 (less than 0.05). The β value 0.156 means that physical workplace and civil servants' productivity have the positive relationship. Moreover, this value reveals that general productivity of civil servants would increase in 0.156 if physical workplace rose in 1. Consequently, the H1 is supported. In other words, the physical environment impacts positively on knowledge work productivity. One important thing to note that physical environment is the weakest factor affecting to productivity of civil servants in Nha Be district, compared its β value to others.

H2: The virtual environment has a positive impact on knowledge work productivity.

The factor VW "virtual workplace" has the second standardized coefficient β with 0.244, compared to the three remaining factors. In addition to β value greater than 0, the Sig. is 0.000 (less than 0.05), so the productivity of civil servant in Nha Be district is affected positively by virtual workplace. The β value 0.244 shows that if virtual workplace increased in 1, 0.156 would be the increase of general productivity of civil servants. As a result, the H2 is proven. It means that virtual workplace influences on knowledge work productivity positively.

H3: The social environment has a positive impact on knowledge work productivity.

The factor SW "social workplace" has the impact on the civil servants' productivity in Nha Be district thank to the third standardized coefficient β is 0.241, and the Sig. is 0.000 (under 0.05). The standardized coefficient value 0.241 indicates that there is a positive relationship between social workplace and productivity of civil servants. Furthermore, this value states that if social workplace decreased in 1, general productivity of civil servants in Nha Be district would go down 0.241. This leads to demonstration of H3.

H4: The personal work practices have a positive impact on knowledge work productivity.

The factor has the most level of influence on the productivity of civil servants is PWP "personal work practices", compared to physical workplace, virtual workplace, and social workplace. This results from the standardized coefficient β is 0.472 (the highest value), and the Sig. is 0.000 (less than 0.05). The β value 0.472 means that personal work practices influence positively on productivity of civil servants in Nha Be district. In addition to positive relationship, civil servants' productivity would

increase in 0.472 if personal work practices increased in 1. As a result, H4 is verified. It means that personal work practices affect positively to productivity of civil servants. It is crucial to note that, personal work practices is the strongest factor impacting on civil servants' productivity in Nha Be district, compared its β value to others.

From the result of testing the hypotheses, the research model of this study is appropriate (Figure 16).

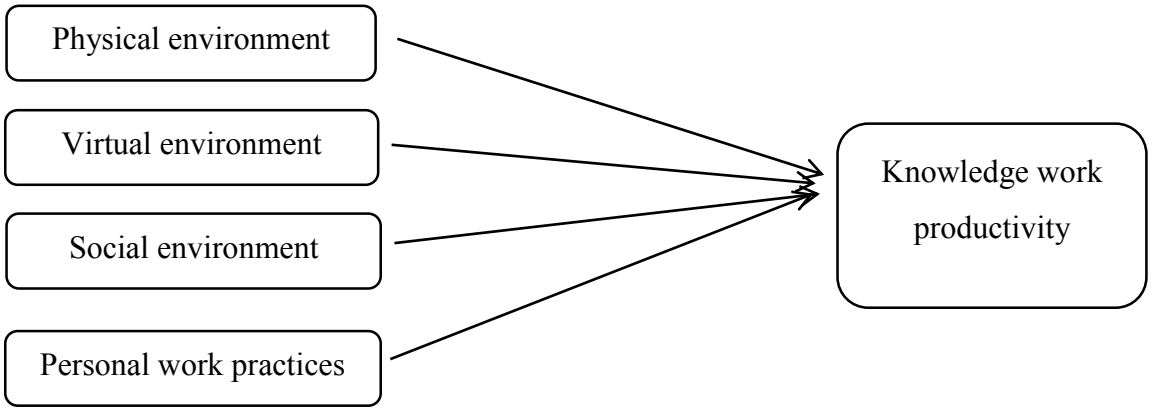


Figure 16. The main effects on knowledge work productivity.

4.6 Results of open-ended question

As mentioned in the Chapter 3, the open-ended question "How could your productivity be improved?" is a fundamental part of the questionnaire. There are 33 respondents answered this question. The answers mainly focus on personal work practices, teamwork, specific goal, and the knowledge of their colleagues. The following shows some general answers for this question:

- Increasing the autonomy of the employees. It means that the employees would like to do their jobs in the location and time they want. Moreover, of course, they guarantee to complete jobs effectively and efficiently.
- Increasing the level of teamwork. The employees require more time to work together.
- The employees need to be more self-management. They can plan their job and complete it. The supervisors should focus on the result rather than the process of working.
- Each worker should set his or her own goal. In addition, this goal should be open to others.
- They want to work with co-workers who are the masters in their area.

As can be seen from the general idea about how the productivity could be improved. The opinions focus on the way they want to do the job. In addition, teamwork is an important idea should be researched. In purpose to increase the level of teamwork, the role of technology, such as application

about job management, email, social network, cannot be denied. Moreover, the specific goal is also a critical opinion. It means that they need a motivation to do the job.

Another interesting thing is that few answer is about the salary, and promotion. It means that the productivity could be got higher once the workers either got higher salary or had promotion opportunity. Although there are few answers regarding salary and promotion, this result should be concentrated on by managers. It implies that Ways of Working can increase the productivity of knowledge workers in terms of working condition, way of working, atmosphere, and so on, yet the manager should also focus on the traditional factors such as salary, promotion opportunity. In other words, the productivity can just be improved really when both New Ways of Working and traditional conditions are focused on simultaneously.

The last thing is that some answers relate to knowledge of their co-workers. The respondents believe that they feel more motivated and confident when they work with colleagues who have higher knowledge than. This leads to enthusiasm of knowledge workers and then increase their productivity. In that sense, knowledge of co-workers seems to be a factor belong the social environment. However, in this study, it should be considered as “a new factor” which can affect to knowledge work productivity. In the model of Palvalin et al (2015), the model just concentrates on the personal work practices. It means that this model focus on how a knowledge worker can increase his or her productivity by himself or herself. The model has not yet paid attention to the ability of co-workers. Hence, the opinions of civil servants in Nha Be district seems to pose a new factor which should be researched in terms of new ways of working. It means that whether the model suggested by Palvalin et al (2015) should be modified with a new input factor: knowledge of co-workers.

5 Conclusions and Recommendations

5.1 Overview on knowledge work productivity

This study aims to find out the impact of New Ways of Working on knowledge work productivity. First of all, the phenomenon of knowledge work productivity is elaborated due to the literature review of knowledge work and knowledge work productivity. Secondly, the literature also supports the study to recognizes the main factors impacting knowledge work productivity. Finally, the study attempts to measure the status of knowledge work productivity in Nha Be district by using measurement tool suggested by Palvalin et al. (2015).

The section 2.2 supplied a general overview about knowledge work productivity. The productivity of knowledge worker as well as manual worker is defined basing on outputs and inputs. However, in knowledge work, output and input are often intangible, so it is so difficult to define them. In addition, it challenges to determine which input resulting in which output. Therefore, there is no need to find out the relationship between output and input in knowledge work.

Both knowledge work productivity and manual work productivity are evaluated basing on quality as quantity. However, in knowledge work productivity, the results and outcomes of work are concentrated rather than the process of work. It means that quality is an essential aspect of knowledge work. This also implies that the knowledge workers need to be autonomy, self-management, innovation, learning from new things… to increase their productivity. Because of this, the manager should treat their knowledge workers as an asset rather cost. In other words, knowledge worker should be encouraged to develop, not to be considered as a cost to reduce.

In the context of Vietnam, although the government has been promulgating policies to evaluate basing on the result and outcomes of job, the mindset of assessment seems to change a little bit. The managers still want their employees appear in the offices. It means that they want to control the progress of working. Therefore, the appearance of civil servants is still one of the standards to evaluate the employees. As a result, the productivity of civil servants is also affected by traditional ways of working. Another thing is that one of significant factors of evaluation is the quantity of outputs. In fact, the civil servants try to meet their deadline in any jobs. Moreover, at the ending of year, their productivity is also evaluated basing on how much they do. It implies that in a certain circumstance, the productivity can be evaluated differently, compare to others. It other words, the

level of applying new ways of working will define what is the important factor of productivity in terms of quality and quantity.

Furthermore, the previous studies stated that many factors of New Ways of Working relating to work environment as well as work practice have impacts on productivity. Because of a variety of workplace, knowledge workers can do their job more mobile than before. It means that they can work in difference location, and then leads to reduce of workspace cost of for their organization. In addition, the flexible workplace can be supported due to virtual space, especially ICT. ICT makes communication among knowledge workers and the customers to become easier. This supports knowledge work using time efficiently, then leads to improve the productivity of knowledge work. Furthermore, it is critical to note that information and knowledge sharing play an important role in New Ways of Working. In addition, they are supported by social environment. In fact, social environment includes intangible factors of work environment, such as culture, beliefs, ideas, and others. As a result, the work environment, comprising physical environment, virtual environment, and social environment, has an influence in knowledge work productivity.

In New Ways of Working, knowledge workers just can make use of work environment once they have ability of taking it. It means that the knowledge workers can improve their productivity and then their organizations when they are able to use the advanced facilities and virtual tools. Work practices can be listed as autonomy, flexibility, self-management, and so on. These factors have a crucial role to do their task in various approach. Consequently, knowledge workers can solve the problems relating to work-life balance, and then increase their productivity.

Another interesting factor should be considered carefully is the co-workers. In the context of Nha Be district, the knowledge workers want to work with colleagues who have higher knowledge than. These colleagues encourage knowledge workers in terms of confidence as well as motivation. The civil servants of Nha Be district feel enthusiastic when their colleagues support them by owned knowledge. Once the civil servants feel confident, they believe that their productivity can be increased.

In order to answer to the set research question, the data showed that physical workplace, virtual workplace, social workplace, and personal work practices have the positive impact on the general productivity of employees in Nha Be district. However, the level of influence is difference among these factors. The personal work practices have the strongest impact on the productivity of civil

servants in Nha Be district. In contrast, the physical environment has the weakest influence in civil servants' productivity in Nha Be district. The level of impact of two remaining factors on productivity is nearly equivalent.

5.2 Discussion

In this study, there are four factors which are recognized influencing the knowledge work productivity, including physical workplace, virtual workplace, social workplace, and personal work practices. In addition, the research hypotheses are admitted. In other words, all these observed factors have the positive impact on the general productivity of employees. It means that the more satisfied about these factors, the more satisfied about the productivity. Although all factors affect positively to the general productivity, each factor has the different level of influence on the productivity. This is similar with the current understanding in the previous research (Bosch-Sijtsema et al., 2009). Therefore, the study again affirms the role of work environment and individual work practices regarding to knowledge work productivity. However, there are some differences about the positive role of physical environment and virtual environment, compare to Palvalin (2019). In comparison, Palvalin (2019) also stated the positive impact of social environment as well as personal work practices on knowledge work productivity. However, there is no evidence to confirm the positive relationship between physical and virtual environment and productivity (Palvalin, 2019). The reason can be resulted from the differences concerning with population, context, characteristics of respondents, and so on. It means that in a developing country (for example Vietnam), the facility and technology are the basic factors, which the civil servant can feel as soon as approaching. Therefore, the role of these factors will be more important once they fall below the sufficient level, as can be seen in Palvalin (2019).

The study also points out which are the main drivers of knowledge work productivity in the public sector in Nha Be district. In detail, the observed factors are sorted by descending level of significance: personal work practices, virtual environment, social environment, and physical environment. The result of this study can be described that personal work practices is the most powerful factor impact on civil servants' productivity of Nha Be district. In the meanwhile, the weakest affect factor is the physical workplace. In other words, if the personal work practices are encouraged to increase in one unit, the productivity of employees in Nha Be district will rise in an amount more than the others. It is critical to note that this study seems to be one the first research to assess the level of significance

of various factors. This study designed a model with four dimensions to investigate impact level of each factor on productivity. On the other hand, although the previous research supplied a variety of important information about drivers of productivity, those studies just concentrated on one dimension in each empirical study (Kearns & Gardiner, 2007; Palvalin et al., 2013). Therefore, previous literature cannot compare the level of significance of factors. As a consequence, the result of this study offered an answer concerning with the level of significance of each driver. This opens a new approach for the managers who want to increase the knowledge work productivity in terms of new ways of working. It means that practitioners can consider to invest on a particular sector to enhance the productivity of their employees, then the productivity of their organizations. For example, in this study, the administrators should invest in elements which can improve the personal work practices of their employee because personal work practices have the most influence, compare to the factors of work environment. More particularly, the results will be illustrated as the below.

5.2.1 Physical environment

The physical environment has a positive impact on knowledge work productivity. This is supported by Nguyen et al. (2015). Nguyen et al. (2015) stated that the productivity of employees is affected by the physical layout of workplace. This layout can be listed: furniture, noise, lighting, informal and formal meeting, and other elements. These elements supply the basic conditions to do jobs.

In the context of Nha Be district, the civil servants need an appropriate space for the task at hand. Gibson (2003) described that the employees can choose a space for accomplishing different tasks in terms of flexible working arrangement. This can be explained that they need a diversity of location which suit the task. For example, if the task requires concentration, the employees seem to like do their job at home or somewhere does not have noise. These places support for them to focus on the job without interruptions, as stated in Harrison (2002). In addition, once the civil servants can choose the space for working, they also can solve the problem about work-life balance (Harrison, 2002). For example, the civil servants can save time for commute when they do their job at home. As a result, the benefit of different spaces was supported by findings.

In addition, the civil servants in Nha Be district require a space for meeting. The meeting is an approach to pronounce the information, ideas to other persons. Moreover, the activity of team also needs a place to do together. Sharing information, knowledge is one of the ways to improve the

productivity of knowledge worker (Peponis et al., 2007). Therefore, physical environment really plays an important role to increase the knowledge work productivity.

Although there are many previous research supporting, some studies also argue with this finding. Palvalin (2019) did not confirm the positive impact of physical environment. Furthermore, Haynes (2007), Roper and Juneja (2008), and Roelofsen (2008) also stated that the feature of physical environment can lead to distractions. It is supposed that the employees focus on their job at office more than at home. Thus, distractions happen in office is less than at home.

Leblebici (2012) stated that talented people are attracted strongly by physical environment. However, in the real circumstance, the role of physical environment seems to have not been yet evaluation in the right way. Its role is often less than the others such as self-management - a feature of personal work practices (Palvalin et al. 2017). This leads to an explanation that in this study physical environment is the weakest factor (standardized coefficient β is 0.156) among elements affect to knowledge work productivity. As mentioned above, the role of physical environment is just important when it falls below the sufficient level (Palvalin, 2019). Therefore, it is not surprising when its impact level is less than others.

5.2.2 Virtual environment

In addition to physical environment and social environment, virtual environment is a factor relate to work environment. This study pointed out that virtual environment has a positive influence on the knowledge work productivity, as supported in Kaplan and Aronoff (1996), Davis (2002), Hassanain (2006), Peponis et al. (2007). In previous literature, the impact of virtual environment on productivity is undeniable (Kaplan & Aronoff, 1996; Davis et al., 2011). They only focus how well the technology increases the productivity. In fact, the utility of technology can bridge the gap among other factors.

Using the application “Nha Be online” is compulsory task which each civil servant in Nha Be district does. This application supplies the information about the document, the deadline of document, the result of working of each civil servant. Therefore, every employee can access the information system to evaluate the result together. In addition, social network also supports to work as a team. In Nha Be district, Zalo and Viber are the social networks which are used the most. Social network, application

have been using to share the knowledge, information. In addition, they are used to support to do the job at any location. Moreover, the solution for saving travel cost, facility cost can be accomplished due to technology. Therefore, virtual environment has a relationship with knowledge work productivity as well.

On the contrary, this finding is opposite with the literature in last time. Similar with physical environment, Palvalin (2019) did not confirm the positive influence of virtual environment on knowledge work productivity. In other words, there is no evidence about the relationship between virtual environment and productivity. This seems to be not accurate. For example, in the international economy, the trade between two countries is common. The difference about the time is a difficulty for them to do the contact. Each business need to take a rest to get the health. Therefore, a person cannot do the job during 24 hours to make conversation. As a result, in this case, email becomes the most appropriate way to do the contact. Hence, the virtual must have an influence on knowledge work productivity.

Another reason is that the hardware and software get issue. In this view, it is proposed that there are some negative impacts in the relationship between virtual environment and knowledge work productivity, as shown in Karr-Wisniewski and Lu (2010). These impacts are the reason of productivity losses. According to Karr-Wisniewski and Lu (2010), this circumstance is the situations which the knowledge work productivity is declined by information technology. However, this problem seems to be not common. If the hardware or software face the problems, they can be fixed as soon as possible. Therefore, the negative impact is unremarkable, compare to the positive influence created by technology.

One more important thing is that virtual environment has the second positive impact on the knowledge work productivity (the standardized coefficient β is 0.244). The level of significance of virtual environment seems to be appropriate with previous researches. First of all, its impact is less than the influence level of personal work practice, in line with Palvalin (2019), Palvalin et al. (2017). In terms of work environment, the literature pays attention to physical and virtual environment rather than social environment, as revealed in Kaplan and Aronoff (1996), Davis (2002), Hassanain (2006), Peponis et al. (2007). In addition, the previous studies also focus on the way technology can increase

productivity (Kaplan & Aronoff, 1996; Haner et al., 2009). Therefore, it is evidence that this finding is supported in the literature.

5.2.3 Social environment

The last term of work environment – social environment – refers to all of the intangible factors of work environment, including cognitive constructs, thoughts, beliefs, ideas, and mental states which employees share (Vartiainen, 2007). This study found that social environment has a positive relationship with knowledge work productivity (the standardized coefficient β is 0.241). This finding is supported by many previous researches (Chandrasekar, 2011; Awan & Tahir, 2015).

It is important to note that conditions for new ways of working have been experimenting in Nha Be district. In terms of communication, Peponis et al (2007) emphasized that productivity can be improved thanks to informal communication. In fact, the civil servants in Nha Be district have space for informal as well as formal meeting, communication. This issue is also supported by the development of information technology, especially social network. It means that physical and virtual workplace supply the necessary background to support the communication. In the context of Vietnam, such casual communication would make an improvement of employee productivity because social environment can be beneficial. This finding is in line with Maier et al. (2008).

According to Davis (2002), there are some positive effects in the relationship between mobile work and productivity. In fact, the knowledge workers can use the dead time, for example commute time, to do their jobs, as illustrated in Perry et al. (2001). It means that the workers can use the commute time to check email or read document. As a result, there is a relation between mobile work and productivity. Hence, this finding was supported by earlier studies.

Another crucial point is that, telework is accepted in the context of Nha Be district. New ways of working creates convenient conditions for employees to do their job at home. Thus, the work-life balance can be enhanced because of teleworking. In turn, the work-life balance can support to improve the job satisfaction of the employees, for example saving time for unnecessary travelling, as shown in Harrison (2002). According to Origo and Pagani (2008), there is an indirect connection between job satisfaction and productivity. It means that job satisfaction has a positive impact on

knowledge work productivity due to other relations. Consequently, the previous studies support this finding of the study.

In the previous research, social environment is rarely focused, compare to physical and virtual environment (Kaplan & Aronoff, 1996; Davis, 2002; Hassanain, 2006; Peponis et al., 2007; Davis et al., 2011). It means that improvement of knowledge work productivity is mainly researched in terms of physical and virtual environment. However, this finding seems to be different with the earlier studies in terms of level of significance. In this study, the level of impact of social environment is more than the impact of physical environment. Moreover, the influence of social environment and virtual environment is equivalent. Therefore, the role of social environment is more increasing greater than physical and virtual environment in recent time. This is similar with the findings which Palvalin (2019) stated.

5.2.4 Personal work practices

The finding of this study showed that personal work practices have a positive (the standardized coefficient β is 0.472) and significant impact on productivity. This factor focuses on the ability of knowledge worker to make advantage of new ways of working, according to Palvalin (2017). Personal work practices are the approaches which the knowledge workers use to apply in the real circumstance. Therefore, an appropriate individual work practice can lead to a positive impact on the knowledge work productivity. As a result, this finding was confirmed by few earlier researches (Palvalin, 2019; Palvalin et al., 2017).

The study also pointed out that personal work practices are the strongest factor affecting to knowledge work productivity in Nha Be district. In fact, the civil servants in Nha Be district have ability of autonomy, self-management, as well as making use of new ways of working. In terms of self-management, Palvalin et al. (2017) showed that an improvement of self-management skill should be considered as a fundamental potential to increase the quality of output. In addition, Palvalin et al. (2017) illustrated that the impact of personal work practice is more than the impact of work environment. This seems to support the finding of this study.

It is significant to state that the ability of civil servants determines the success of new ways of working (Palvalin, 2017). It means that new ways of working just can create necessary conditions for the knowledge workers doing their job. In the context of Nha Be district, the civil servants can make use of technology to avoid unnecessary travelling. In addition, they also have flexibility to do their job in where and when are appropriate. Therefore, personal work practices can support the work-life balance, thus improve knowledge work productivity (Harrison, 2002). The finding of this study is also supported by Palvalin (2019).

5.3 Implication of the findings

In human resource management, people's committee in Nha Be district try to find out conditions as well as methods to increase the productivity. This is also the key objective of the study to verify how the factors in the research model affect to productivity of knowledge workers. As a consequent, the leaders of people's committee in Nha Be district try to concentrate on conditions of working in order to promulgate policies increasing productivity. However, in the modern world, this is a challenge issue to comprehend that the new factors such as workplace and personal work practice are efficient to boost the productivity of civil servants.

Due to the regression analysis, the result described that the four observed factors impact on productivity on the ascending: physical workplace, social workplace, virtual workplace, and personal work practices. This is valuable information which the government should prioritize when they make an investment to get the biggest increase in productivity. It means that the administrators should concentrate on conditions which satisfy their knowledge workers. In addition, the knowledge workers need to have ability to manage themselves.

In terms of work environment, the conditions about virtual environment as well as social environment should be invested in more than physical environment. It means that knowledge workers need to be supported by technology. It addition, the flexibility should be accepted as a way of working. As a consequence, the managers should invest in information communication technology to improve the productivity of knowledge workers. The infrastructure about technology can be also considered as a necessary condition to apply the flexibility of knowledge workers. In other words, flexibility can support the employees perform their job in an appropriate location and time for them. This can lead to improvement of work-life balance, then increase job satisfaction, and thus productivity. Therefore, the government should focus on the policies which support improve the virtual and social workplace

rather than physical workplace. On the contrary, it is evidence that if the physical workplace felt below the sufficient level, the productivity could not be improved even other factors invested. For example, the lack of electricity in the office will lead to inactivity of information technology. Hence, although virtual and social environment should be invested more than physical environment, the government should ensure the sufficient level of physical environment to improve knowledge work productivity.

In terms of personal work practices, the government should focus on how to improve the ability of knowledge worker to take advantage of new ways of working. Accordingly, self-management skill should be considered as a key factor of personal work practices. It means that, although new ways of working offer a variety of advantages, the role of human is still the most important factor for the success of new ways of working. As a result of the study, the government should invest in personal work practices than other factors.

5.4 Limitations and recommendations

The first limitation concerns the limited sample of the study. This sample was collected from the People's committee of Nha Be district. It means that data just represents the opinions of local government in this particular district. Therefore, the study does not exam the situation in the context of street and regional government. Therefore, it is difficult to say that this sample can represent for the whole public sector. As a result, when applying this result in other districts as well as other regions, the managers should consider appropriation of each factors. To solve this problem, a future research should be done in a broader region.

In addition, the size of sample seems to be small. Although it satisfies the conditions of previous researches, a larger sample is obvious to be better than. Hence, researcher should collect more data to increase the significance of the result. Moreover, the researcher could do a research which collect more data in difference locations.

This research was done by quantitative approach. Therefore, the result of this research can provide the different influences among observed factors. However, the result cannot describe the way each factors affect to knowledge work productivity. It means that the study just states the influence of work practices in productivity, for example, yet it does not point out why work practices can affect to knowledge work productivity. Thus, a future research needs to be done in a different approach. For

instance, the quality approach can support to solve this limitation. It is so important for the managers because they can take advantages of research to increase their effectiveness and efficiency.

In the model suggested by Palvalin et al. (2015), there are four factors to measure the performance. On the one hand, the first two factors, which are work environment and work practices are drivers of performance. On the other hand, the last factors which are well-being at work and productivity are the output of the model. This study just focuses on researching about the relationship between the first two factor and productivity. As a result, there is a need to exam that whether the two first factors affect to well-being at work. In the future, another study should research the relationship between work environment, work practices, and well-being at work.

Another important thing is that well-being at work can be considered as the input factor (Palvalin, 2017). The previous research rarely concentrates on checking the influence of work environment, work practices, and well-being at work on knowledge work productivity. Hence, in the future, the study should be practiced to exam the impact of three factors above on knowledge work productivity (Palvalin, 2017).

This study just focuses on the public sector. Therefore, the study cannot explain the differences between public sector and private sector when applying New Ways of Working. It is so significant for politicians who promulgate policies. It means that the practioners cannot use this result to apply in the private organizations. Hence, a requirement of researching in private sector is necessary.

Regarding open-ended question, the result pointed out a new factor should be considered in new ways of working is the knowledge of co-workers. In the future research, the researchers should try to build a model with this factor. Furthermore, they also can do a research to check whether there is a relationship between productivity (of a cilvil servant) and knowledge of (other) colleagues.

5.5 Summary

The concept of NewWoW is more interesting in the recent time. There are some changes about work environment. In addition, the studies also focus on the impact of input factors on knowledge work productivity more than ever before. This is supported by previous researches to answer the question which factors are the key drivers of the knowledge work productivity. Surprisingly, this paper is one of the first studies to exam the level of influence of a variety factors on the productivity in a study.

This studies pointed out that personal work practices have the strongest impact on the knowledge work productivity. The level of impact of social environment as well as virtual environment on productivity is equivalent. At the same time, physical environment is the factor has the weakest influence on the knowledge work productivity.

Due to the result of this study, the impact levels of each factor on knowledge work productivity are pointed out. It means that people can compare the significance of each factor which affects to knowledge work productivity. It supplies a potential that the managers can focus on drivers which create the biggest productivity of knowledge worker. In other words, they can use their limited resource to get the best effectiveness as well as efficiency.

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APPENDIX

APPENDIX A. QUESTIONNAIRE (IN VIETNAMESE)

PHIẾU KHẢO SÁT

Về mô hình, cách thức làm việc mới trong các tổ chức công lập tại Thành phố Hồ Chí Minh

Kính chào Anh/Chị!

Thực hiện Quyết định của Ủy ban nhân dân Thành phố về việc cử cán bộ đi học theo Chương trình đào tạo thạc sĩ, tiến sĩ, Học viên trường Đại học Kinh tế thành phố Hồ Chí Minh tiến hành thu thập thông tin phục vụ đề tài khoa học về Mô hình, cách thức làm việc mới trong các tổ chức công lập tại Thành phố Hồ Chí Minh.

Tôi rất mong nhận được sự giúp đỡ của Anh/Chị bằng cách trả lời chân thực các câu hỏi dưới đây. Mọi thông tin mà Anh/Chị cung cấp trong cuộc khảo sát sẽ được bảo đảm bí mật và được sử dụng duy nhất cho công tác thống kê và nghiên cứu. Tôi cam kết không công khai thông tin mà Anh/Chị cung cấp dưới bất kỳ hình thức nào.

Hướng dẫn điền phiếu:

- *Với những câu hỏi ý kiến về mệnh đề được cho sẵn:* xin vui lòng khoanh tròn vào thang điểm mà bạn đồng ý với mệnh đệ đó. Trong đó:

+ "1" là hoàn toàn không đồng ý.

+ "2" là không đồng ý.

+ "3" là không có ý kiến.

+ "4" là đồng ý.

+ "5" là hoàn toàn đồng ý.

- *Với những câu hỏi mở:* xin vui lòng ghi những suy nghĩ của Anh/Chị để người khảo sát có thể hiểu rõ thêm cách nhìn của anh chị về vấn đề được nghiên cứu.

Xin trân trọng cảm ơn Anh/Chị!

I. THÔNG TIN CHUNG

1. Giới tính: ☐ Nam ☐ Nữ

2. Tuổi: Dưới 30 ☐ Từ 31 - 40 ☐ Từ 41 – 50 ☐ Trên 50 ☐

3. Kinh nghiệm công tác:

Dưới 1 năm ☐ Từ 1 – 5 năm ☐ Trên 5 năm ☐

4. Vị trí công tác:

Chuyên viên ☐ Lãnh đạo, quản lý ☐

Chuyên gia ☐

II. NHẬN ĐỊNH VỀ CÁC MỆNH ĐỀ LIÊN QUAN ĐẾN CÁC YẾU TỐ TRONG CÁCH THỨC LÀM VIỆC MỚI TẠI CÁC TỔ CHỨC CÔNG LẬP

Đánh giá của Anh/Chị về các mệnh đề sau : (**khoanh tròn** vào **01** thang điểm **duy nhất**)

Lưu ý:

+ "1" là hoàn toàn **không** đồng ý.

+ "2" là **không** đồng ý.

+ "3" là không có ý kiến.

+ "4" là đồng ý.

+ "5" là hoàn toàn đồng ý.

Yếu tố	Mệnh đề	Thang điểm
Môi trường làm việc thuộc về vật chất (những yếu tố liên quan đến phòng ốc, không gian)		
1	Có sẵn không gian cho những nhiệm vụ đòi hỏi sự tập trung và an toàn tại nơi làm việc của tôi	1 2 3 4 5
2	Có đủ phòng, không gian cho những cuộc họp chính thức và không chính thức tại nơi làm việc của tôi	1 2 3 4 5
3	Có không gian để tương tác, giao tiếp với nhau mà không đòi hỏi sự trang trọng lễ nghi tại nơi làm việc của tôi	1 2 3 4 5
4	Những vấn đề liên quan đến việc nghiên cứu cách thức để tối đa hóa hiệu quả công việc được quan tâm đúng mức tại nơi làm việc của tôi.	1 2 3 4 5
5	Những hoạt động tại nơi làm việc không ảnh hưởng đáng kể đến công việc của tôi.	1 2 3 4 5
Môi trường ảo (những yếu tố liên quan đến công nghệ thông tin)		

1	Những hệ thống thông tin quan trọng nhất tại cơ quan thì dễ dàng để sử dụng.	1 2 3 4 5
2	Tôi có thể truy cập dữ liệu thông tin bất kể đang ở đâu.	1 2 3 4 5
3	Tôi có thể biết được lịch làm việc của những người khác	1 2 3 4 5
4	Tôi có thể liên lạc với những người khác (đối tác, đồng nghiệp) thông qua các ứng dụng nhắn tin như Zalo, Viber, Messenger…	1 2 3 4 5
5	Nơi làm việc của tôi có trang thiết bị để tổ chức các hội nghị Video	1 2 3 4 5
6	Phần mềm, ứng dụng làm việc nhóm được sử dụng tại cơ quan của tôi	1 2 3 4 5
Môi trường làm việc xã hội (những yếu tố liên quan đến giao tiếp, không khí làm việc)		
1	Tôi có thể làm việc theo cách phù hợp và thời gian tiện lợi nhất cho tôi.	1 2 3 4 5
2	Nhìn chung, làm việc từ xa được chấp nhận tại nơi tôi làm việc.	1 2 3 4 5
3	Những hoạt động tại nơi tôi làm việc thì minh bạch, rõ ràng.	1 2 3 4 5
4	Thông tin, kiến thức được truyền đạt đầy đủ giữa những cán bộ chủ chốt tại nơi tôi làm việc.	1 2 3 4 5
5	Việc triển khai, thực hiện nội dung tại các cuộc họp thì hiệu quả.	1 2 3 4 5
6	Nơi tôi làm việc có chính sách rõ ràng về cách sử dụng công nghệ thông tin và những công cụ thông tin, giao tiếp.	1 2 3 4 5
7	Tôi có mục tiêu làm việc cá nhân rõ ràng.	1 2 3 4 5
8	Tôi đang được đánh giá dựa trên kết quả làm việc.	1 2 3 4 5
9	Những cách thức làm việc mới (như là không phụ thuộc thời gian làm việc, có thể làm việc từ xa thông qua việc sử dụng công nghệ thông tin) được trải nghiệm một cách tích cực tại nơi tôi làm việc	1 2 3 4 5
Phương pháp làm việc cá nhân được áp dụng		
1	Tôi sử dụng những cuộc hội thảo qua video để tối thiểu hóa cho việc đi lại không cần thiết	1 2 3 4 5
2	Tôi sử dụng những dịch vụ, thiết bị di động để làm việc ở những nơi mà tôi có thời gian rãnh rỗi (ví dụ làm việc tại cửa hàng cà phê bằng cách sử dụng smart phone hoặc laptop)	1 2 3 4 5
3	Tôi có đủ khả năng để sắp sếp công việc theo thứ tự ưu tiên (theo thời gian, theo mức độ quan trọng) để quản lý công việc của tôi.	1 2 3 4 5
4	Tôi thường làm việc từ xa để thực hiện những nhiệm vụ đòi hỏi sự tập trung liên tục.	1 2 3 4 5
5	Tôi có khả năng chuẩn bị cho các cuộc họp	1 2 3 4 5
6	Tôi thả lỏng bản thân suốt thời gian nghỉ ngơi	1 2 3 4 5
7	Tôi theo dõi những kênh trao đổi thông tin của tổ chức (như tin nhắn trong viber, zalo, messenger)	1 2 3 4 5
8	Tôi tắt email và công cụ giao tiếp khác để tập trung vào những nhiệm vụ quan trọng	1 2 3 4 5
9	Tôi lên kế hoạch làm việc cho ngày hôm sau.	1 2 3 4 5

10	Tôi tìm ra được cách thức và công cụ làm việc phù hợp nhất cho bản thân	1 2 3 4 5
	Hiệu quả, năng suất làm việc	
1	Tôi đạt được những kết quả thỏa mãn với nhiệm vụ của tôi.	1 2 3 4 5
2	Thông thường, tôi có thể thực hiện nhiệm vụ một cách hiệu quả.	1 2 3 4 5
3	Tôi có thể sử dụng phần lớn thời gian làm việc để thực hiện các công việc liên quan đến mục tiêu, nhiệm vụ của mình.	1 2 3 4 5
4	Công việc của tôi chủ yếu là những nhiệm vụ mà tôi có thể khai thác kiến thức và kỹ năng của bản thân một cách có hiệu quả.	1 2 3 4 5
5	Tôi có thể đáp ứng được mong đợi của đối tác, của người dân.	1 2 3 4 5
6	Chất lượng đầu ra công việc của tôi thì cao	1 2 3 4 5
7	Nhóm làm việc mà tôi tham gia thì hoạt động hiệu quả	1 2 3 4 5
Câu hỏi mở	Theo bạn, làm cách nào để hiệu quả, năng suất làm việc được cải thiện? …… …… …… …… …… …… ……	

Xin chân thành cám ơn các Anh/Chị đã hợp tác, giúp đỡ!

APPENDIX B.

Background

Gender (male/female)

Age (<30, 31-40, 41-50, >50)

Experience in current (<1 year, 1-5 years, >5 years)

Profession (manager, expert, supportive)

Physical workplace

1. There is a space available for tasks that require concentration and peach at our workplace when needed.
2. There are enough rooms for official and unofficial meetings at our workplace
3. There is a space for informal interaction at our workplace when needed
4. Issues related to ergonomics are properly taken care of at our workplace
5. The restlessness of the work environment does not significantly interfere with my working

Virtual workplace

1. The most important information systems are easy to use
2. Workers have an access to information regardless of my location
3. Workers have opportunity to see each other's calendar
4. Workers have possibility to communicate with each other using instant messaging (e.g. Zalo, Viber)
5. Our workplace has equipment that enables having video conferences
6. Group work software is used in our workplace

Social workplace

1. Workers have the possibility to work in the most suitable ways and when it is the most convenient.
2. Telework is a generally accepted practice at our workplace
3. Operations in our workplace are transparent
4. Knowledge flows adequately between the key persons at our workplace
5. Meeting practices are efficient
6. Our workplace has clear policy how to use IT and communication tools
7. I have clear personal goals for my work
8. I am being evaluated according to the results I achieve, not, for example, according to the working hours.
9. New ways of working are actively explored and experimented at our workplace.

Personal work practices.

1. I exploit video conferences to minimize the need for unnecessary travelling
2. I use mobile services for working in situations where I have idle time (e.g. working in trains by using smart phones or laptops)
3. I am able to prioritize my tasks in order to manage my workload
4. I often telework for carrying out tasks that require uninterrupted concentration
5. I prepare for meetings
6. I stretch my muscles during the brakes
7. I follow the organization communication channels
8. I shut down email and other communication tool to concentrate important work task
9. I plan my day beforehand
10. I actively seek for the most suitable work practices and tools.

Productivity

1. I achieve satisfactory results in relation to my goals
2. I am usually able to carry out my work tasks efficiently (smoothly, without problems)
3. I am able to use the majority of my working time for conducting relevant tasks related to my goals
4. My job mainly includes tasks in which I am able to exploit my knowledge and skills efficiently
5. I am able to meet customers' expectations
6. The quality of my work outputs is high
7. The work group I work in works efficiently as a whole

Open-ended question: How to increase the productivity?