

# Virtual Meeting Technology Adoption for Business Management in Small and Medium-Sized Enterprises

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**Abstract Purpose** – The objective of this paper is to study the impact of virtual meeting technology adoption towards the productivity of employees in Jakarta during COVID-19 pandemic. **Design/methodology/approach** – The authors conducted a descriptive research using questionnaires distributed to employees in Jakarta. **Findings** – The study has found that the adoption of virtual meeting technology has had significant and positive impact to the productivity of employees in Jakarta during COVID-19 pandemic. The impact on productivity is partially mediated or influenced by employees' satisfaction while using the technology. **Research limitations/implications** – The technology impact to non-employees such as entrepreneurs and freelance workers are not within the scope of this study, as well as employees working outside Jakarta. **Practical implications** – The findings of this study help provide insight for companies in Jakarta to emphasize more on the adoption of virtual meeting technology as well as providing the necessary support for employees to use the technology in the best ways. **Originality/value** – Little research has been done to study the impact of virtual meeting technology towards employees' productivity. And it is even less done in Jakarta especially during COVID-19 pandemic.

**Keywords:** : *Virtual Meeting Technology Adoption, Satisfaction, Productivity, Employee, COVID-19*

## 1. Introduction

A necessity to provide various tools of communications and collaborations in doing business, such as phone call, video conferences, chatting (instant messaging) apps, email, file and applications sharing, emerges due to the needs to facilitate streamlined interactions or communications between colleagues, customers, suppliers and partners [1].

Many studies have proven the impact of technology to society, especially towards employees' productivity. With the technological advancements, employees can work and collaborate with their co-workers by staying connected with their team virtually [2]. This is even more relevant during COVID-19 pandemic which requires more support from technology in order to help employees do their jobs and stay in touch with their co-workers or other parties related to their works.

COVID-19 pandemic, also known as coronavirus pandemic, was declared by the World Health Organization (WHO) as a pandemic on 11 March 2020. For businesses, COVID-19 has forced them to turn more into technology, relying on many kinds of communications technology to keep up the work and collaboration with the employees as well as with the suppliers, customers, and other parties.

One of the technologies gaining high popularity and being widely used during COVID-19 pandemic is virtual meeting technology. By using virtual meeting tools, meetings can be done virtually while coordination and collaboration are still achieved. While previous researches have been done to study the impact of technology towards employees' productivity during normal or no-pandemic time, there are still very few studies of the impact of technology, especially virtual meeting technology, towards employees' productivity during COVID-19 pandemic. Virtual meetings amongst the employees or teams were a cost-efficient business practice, because they help increase organization' competitiveness.

COVID-19 pandemic is said to give birth to the Zoom Generation [3], which refers to Zoom Meetings, one of the top video conference platforms being used by many people for various purposes during COVID-19 pandemic. This statement has made it even more interesting to examine the impacts of those virtual meeting technology towards the employees' productivity during COVID-19 pandemic.

This research will aim to answer whether the adoption of virtual meeting technology has significant and positive impact towards the employees' productivity in Jakarta. It will prove if the significant impact resulted from broad use of the technology at work during normal time still applies during the COVID-19 pandemic. Or if the result is the opposite, which implies that the adoption of virtual meeting technology has insignificant impact towards employees' productivity and even cause more negative impacts such as stress and burnout to the employees who use it [4-7].

## 2. Literature Review

### *Theoretical Framework*

#### *Technology and Technological Advancements*

Technological advancements have created new transformation in many aspects of life, including the employment. The impact of technology has become parts of employee's productivity. Employees deal with the increasingly innovative technologies to perform efficient operations in response to offering service that contributes to customers' satisfaction [8]. The technology has helped employees to have better communication with their co-workers and kept them connected in teams although the technology reduced their personal interactions [9] A study by [10] has suggested the same thing, i.e. the information technology has given significant impacts towards employees' performance. While [11] found that people will be encouraged of the technology implementation in conjunction with the enhanced performance.

### *Virtual Meeting Technology*

One of the most popular applications of IT gaining significantly increasing use during COVID-19 pandemic is the Virtual Meeting Technology.

According to [12], Virtual Meeting Technology is a technology that allows users who are separated in different locations to hold face-to-face meetings without having to move to one single location together. While according to Andreev et al. (2010), Virtual Meeting is a meeting with two or more participants communicating in real time through the use of tele-mediated live pictures and sound. In most cases, Virtual Meeting systems also allow for documents and illustrations to be shared and co-edited. Examples of the popular virtual meeting platforms are Zoom Meetings, Cisco Webex, Microsoft Teams, Google Hangouts Meet, Skype, etc. According to [13], virtual conference or virtual meeting has the power to overcome constraints of time and place, to retrieve and search for associated materials, to reprocess and merge different contents, and to support many-to-many communication flows – in order to be fully utilized to enhance virtual team interaction effectiveness.

### *Adoption of Technology*

The adoption of technology will depend to technology readiness term and some main factors behind that influenced the behaviour adoption. According to [14], the technology readiness will be defined as people's susceptibility to embrace and use of new technologies in order to complete their goals both in working and home life.

In [15] also mentioned the main features that encourage the adoption of technology, i.e. attitude, subjective norms and perceived behaviour control.

### *Satisfaction of Employees using the Virtual Meeting Technology*

The virtual meeting technology is very useful for business users in different cities or even different countries because it saves time, expenses, and hassles associated with business travel. Uses of virtual meeting technology include holding routine meetings, negotiating business deals, and interviewing job candidates.

Due to COVID-19 pandemic, its use has become even much greater with people working from home use the virtual meeting technology to enable collaboration and coordination with their co-workers, customers, and other parties. As the result, this technology has experienced exponential growth in the number of users in the world as well as in Indonesia in 2020.

Although virtual meeting has many positive impacts, it also has its downsides which must come into consideration. For example, there may be network delay and video distortions caused by technological glitches, but they were perceived as flaws in the person rather than in the technology [16-18]. Other example is that there are misinterpretations happening due to delays in split second timing needed to smoothly take turns during a meeting and repair mishearing. More delays will result in less interruptions and fewer speaker changes, creating fewer interactions and ultimately lower-quality collaboration [19]. These things could lower the satisfaction of using virtual meeting technology.

### *Work Performance of Employees*

In [20] suggested that employee performance can be measured in some indicators, such as number of workload being handled in a day, employee satisfaction, employee motivation, reduced absenteeism, and employees' skills.

Performance can be improved and productivity can be increased by using technology when combined with other resources effectively along with productive and ethical use of technology [21]. Technological advancement makes employees more effective in performing their jobs and firms are more efficient [22], i.e. more productive. As the result, technological advancement can improve firm performance as well [23].

Employee performance is enormously influenced by technological advancement [24]. Technological advancement plays an important role for influencing the improvement of performance [25]. Many studies have repeatedly shown a significantly positive relationship between a firm's technological advancement and its performance, and concluded that technological advancement is an important factor for employee performance.

### *Conceptual Framework*

This study claims that technology, in particular virtual meeting technology, has significant impact on the productivity of employees. The increased work performance of employees can be seen from increase in work quality and planning and organizing the work [26]. It also can be seen from other indicators such as increase in workload being handled in a day and employees satisfaction [27].

The study also claims that the impact of virtual meeting technology on employee's productivity is partially mediated by employees' satisfaction when using the virtual meeting technology.

Assuming that all other things are constant during the study, it will be possible to confirm that indeed the above claims are true. A deeper study and analysis will show whether the relationships are significant or not.

### *Hypotheses Development*

Thus, from the conceptual framework above, we can develop our hypotheses of this study, which consist of:

1. The adoption of virtual meeting technology has significant impact to productivity of employees in Jakarta.
2. The impact of virtual meeting technology adoption on employees' productivity is partially mediated by their satisfaction when using the virtual meeting technology. The research model is shown fig 1.

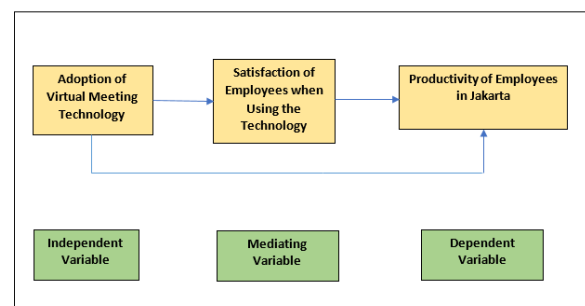


Figure 1: research model

### 3. Research Methods

The objective of this section is to define in detail the research approaches and the methodology development that will be applied in this study. This chapter will describe the research approach, research design continued with the research methods. Researchers will also explain about the data collection methods and data analysis.

Research approach will employ the descriptive research while its design is focused on studying the impact of virtual meeting technology adoption towards employees' productivity. The independent variable in this research is the adoption of virtual meeting technology, while the mediating variable is the satisfaction of employees when using the virtual meeting technology, and the dependent variable is employees' productivity. This research is an assessment at the time of study and the results of this study may change over time. The research also has limitation in location of the study since the researchers are based in Jakarta.

In this study, researchers will apply the simple random sampling method. Researchers set three preliminary filters as the criteria for valid respondents.

#### 1. Occupation

Valid respondents are limited only to the employees of private companies or government employees.

#### 2. Office Location

Valid respondents are limited only to the employees who work in Jakarta.

#### 3. Experience in using the virtual meeting technology for work-related activities

The experience in using the virtual meeting technology for work-related activities is applied as a criteria in order to capture data of respondents who have experienced at least once using any kinds of virtual meeting technology tools, such as Zoom, Cisco Webex, Microsoft Teams, Skype, Google Meet, etc, for work-related activities as an employee.

The researchers used a simple random sample since this method gives the same opportunity for every member of a population to be the research sample. The sampling was done in August 2020 and accepted 332 random respondents. A sample of 301 respondents are valid according to the three criteria specified before. Please see Table 1 for respondents' profile.

Data collected via online questionnaires were then processed and analysed using simple linear regression method by the IBM SPSS Statistics software (SPSS). Researchers applied t-test to check the significance of the impact of virtual meeting technology adoption to employees' productivity. Researchers also applied Process Procedure for SPSS version 3.5 by [28] in SPSS to check the mediating effect of the variable "employees' satisfaction when using the virtual meeting technology" between the technology adoption and employees' productivity.

<u>Sex</u>	<u>No. of Respondents</u>	<u>Age Group</u>	<u>No. of Respondents</u>
Male	151	24-30 years	75
Female	150	31-35 years	75
<b>Total</b>	<b>301</b>	>45 years	57
		36-40 years	54
		41-45 years	36
		<=23 years	4
		<b>Total</b>	<b>301</b>
<u>Length of Work at the Company</u>	<u>No. of Respondents</u>	<u>Business Sector</u>	<u>No. of Respondents</u>
More than 10 years	94	Banking and Financial Services	134
2 - 5 years	83	Trading, Service and Investment	39
6-10 years	81	Others	31
Less than 2 years	43	Mining	31
<b>Total</b>	<b>301</b>	Basic Industry and Chemical	17
		Infrastructure, Utilities, dan Transportation	17
		Other Industries	16
		Property, Real Estate, and Construction	6
		Consumption Goods	5
		E-Commerce	4
		Agriculture and Plantation	1
		<b>Total</b>	<b>301</b>
<u>Length of Company's Operating Time</u>	<u>No. of Respondents</u>	<u>Division / Department</u>	<u>No. of Respondents</u>
More than 25 years	163	Finance and Treasury	81
6-10 years	50	Marketing and Sales	57
10-15 years	32	Others	47
20-25 years	22	Operation	38
15-20 years	19	Operation / Business Support	34
1-5 years	15	Human Resources	20
<b>Total</b>	<b>301</b>	Information Technology (IT)	19
		Customer Service	5
		<b>Total</b>	<b>301</b>
<u>Division / Department</u>	<u>No. of Respondents</u>	<u>Total Employees in the Company</u>	<u>No. of Respondents</u>
Finance and Treasury	81	More than 1000 people	132
Marketing and Sales	57	1-50 people	61
Others	47	51-100 people	45
Operation	38	101-500 people	36
Operation / Business Support	34	500-1000 people	27
Human Resources	20	<b>Total</b>	<b>301</b>
Information Technology (IT)	19		
Customer Service	5		
<b>Total</b>	<b>301</b>		

Figure 2: Respondents' Profile

## 4. Results

Table 1 summarizes the results of simple linear regression analysis expressing the relationship between the

virtual meeting technology adoption as the independent variable and the employees' productivity as the dependent variable.

Table 1: Summary of Regression Analysis Results

Variable	Regression Coefficient	t	Sig.
Constant	0.774		
Technology Adoption (independent variable)	0.744	12.587	0.000

From Table 2, the Sig. value is less than 0.05 significance level, which means that there is significant impact of virtual meeting technology adoption towards the employees' productivity.

R Square of 0.346 means that the virtual meeting technology adoption's influence to the employees' productivity is about 34.6%, while the remaining 65.4% is influenced by other variables which are not studied.

Indirect effect(s) of X on Y:				
	Effect	BootSE	BootLLCI	BootULCI
AvgSat	,3412	,0608	,2366	,4734
Partially standardized indirect effect(s) of X on Y:				
	Effect	BootSE	BootLLCI	BootULCI
AvgSat	,5500	,0928	,3863	,7497
Completely standardized indirect effect(s) of X on Y:				
	Effect	BootSE	BootLLCI	BootULCI
AvgSat	,2697	,0363	,2018	,3443

Figure 3: Results of Mediating Effect Test

Table 2: Respondents Result of Adoption Measurement

Adoption Measurement	Disagree	Netral	Agree
	%	%	%
Company support the virtual meeting technology due to work during pandemic Covid-19	0.60	2.30	97.00
Virtual meeting as the main source to communicate and coordinate better	0.60	3.70	95.70
Company provide the facilities directly or indirectly of virtual meeting to support work	1.70	6.30	92.00
Understanding of using virtual meeting application	0.00	5.60	94.30

From the Table 2, our survey results showed that 95.7% respondents agree that virtual meeting as the main source to communicate or coordinate better with their colleagues, customers and others during the outbreak and 97% are responding that video conference has been used to support the meeting. These responses show that the use of virtual meeting technology has significant impact to their work performance.

Figure 3 shows test results of mediating effect of the variable "employees' satisfaction when using the virtual meeting technology". The confidence interval being used is 95% and the number of bootstrap samples is 5,000. Since the value range of BootLLCI and BootULCI of indirect effect of X on Y (circled above) is from 0.2366 to 0.4734, which does not contain zero (0), it means that there is mediating effect. In other words, the impact of virtual meeting technology adoption towards employees' productivity is partially mediated or influenced by employees' satisfaction when using the technology.

A virtual meeting may be a strategy for developing model of effective communication when engaged in dialogue technique, reported greater cohesion, communication satisfaction and team decision-process satisfaction (Heller, 2010). Our 86% respondents expressed their satisfaction using video conference during the outbreak to support their productivity (see Table 3).

Table 3: Respondents' Result of Satisfaction Measurement

Satisfaction Measurement	Disagree	Netral	Agree
	%	%	%
Satisfy using virtual meeting application to support productivity during pandemic	1.00	13.00	86.00
Overall satisfaction for virtual meeting platforms (sound, video, network quality)	2.00	19.90	78.10
Recommend the usage of virtual meeting apps to colleagues	0.70	15.30	84.00
Thinking to still using the virtual meeting apps after pandemic is over	6.00	16.90	77.10

In Table 3, it also shows that 84% respondents will recommend the usage of virtual meeting application to their colleagues. Another surprising result is shown that 77.1% respondents said that they will still use the virtual meeting even though the outbreak of Covid-19 is over. The satisfaction of using virtual meeting application is caused by its easiness to operate and capability to connect with a lot of people promptly. In 2019, Zoom virtual meeting application was said to reach 98% of customer satisfaction in the University of Sydney due to its ease of use and quality, which proven by the average number of Zoom active users at 10,000-12,000 per month.

However, the use of virtual meeting technology has some common challenges, for instances internet connection and other interruptions such as technical issues, unmuted sounds or noises. Similar research [29] has also showed that virtual participants felt frustrated when experiencing the technical issues which could lasted for several minutes when using the virtual meeting platforms. In addition, users of virtual meetings have also considered the threat of breached security system when they use the platforms. Our 79.7% respondents revealed their complaints about poor internet connection while 33.2% expressed their disappointment about unmuted noises (see Table 6 below, which also shows the most used virtual meeting apps).

Table 4: Difficulties when Using Virtual Meeting Apps and Most Used Apps

Top Difficulties when using virtual meeting app	%	The most used Virtual Meeting Apps	%
Internet connection	79,70%	Zoom	82,40%
Other participant's voices	33,20%	Microsoft Teams	40,90%
Security threat	21,30%	Cisco Webex	30,90%
Cost of internet quota	20,60%	Google Meet	22,60%
Turn for speaking	17,60%	Skype	3,70%
Sharing issues	5,60%	Others	2,70%
Login issues	4,00%	Blue Jeans	1,30%
Others	2,70%		

Despite that, most respondents agreed that virtual meeting technology has become the most useful tool to support their works, especially during the Covid-19 outbreak. This should be considered as the main advantage of the virtual meeting platforms. As seen from the similar

research (Archibald et.al, 2019), the use of Zoom as virtual meeting platform was a useful way for conducting qualitative communication.

Table 5: Respondents' Result of Productivity Measurement

Productivity Measurement	Disagree	Netral	Agree
	%	%	%
Virtual meeting helpful to communicate / coordinate with internal team during pandemic	0.60	7.60	91.70
Virtual meeting helpful to communicate / support business with customer during pandemic	2.00	17.90	80.10
Virtual meeting has increased work's efficiency (using less time / source) during pandemic	5.00	13.30	81.70
Virtual meeting has allowed to have meeting from anywhere and anytime to support the work	1.00	8.00	91.10
Virtual meeting in general has effectively to facilitate the work during pandemic	1.00	12.30	86.70
There is no significant difference between virtual meeting and face-to-face meeting in terms of effective and efficient	23.30	22.30	54.50

Table 5 shows us that in terms of productivity measurement, respondents mostly expressed that the virtual meeting technology had helped them during pandemic especially to support their works or business and easiness to use the technology from anywhere and anytime. However, when we gave a statement that there was no significant difference between virtual and face-to-face meeting in terms of effectiveness and efficiency, only 54.5% agreed on the statement, which meant that respondents still felt that there were differences between both ways.

## 5. Discussion

The use of virtual meeting technology has raised questions whether it helped or hurt many workers during this pandemic. Its broad use is hypothesized to have an impact on the productivity of the workers. Our findings, that the use of virtual meeting technology has significant impact to increase the productivity of employees in Jakarta, confirms the research by [30, 31] which generated same results. This was because the virtual meeting has given some advantages of same-time and different locations of its platform that allow virtual teams to interact without the time, effort and financial costs of a face-to-face meeting.

Our results show that employees who used the technology reported increased productivity. The technology has significantly helped them coordinate and communicate both with their co-workers as well as with their customers or potential customers. It also increased the employees' work efficiency while allowing them to work anywhere and anytime as long as there is good internet connection. While the satisfaction when using the technology is also proven as the mediating variable between the adoption of virtual meeting technology and employees' productivity. The more satisfied the employees when using the technology, the more increased their productivity caused by the adoption of the virtual meeting technology.

Although the virtual meeting technology has positive impact on the productivity, it still may cause fatigue or stress to the employees, which can be studied in further research. In addition, the virtual meeting technology might lack some things which exist in the face-to-face meeting. For example, the personal interaction with the whole body language, face expression, original tone of voice, etc. This perception of differences by respondents may also be caused by the need of human as social creature who likes to socialize. The virtual meeting has reduced the quality of the interaction and it becomes less human touch.

Meanwhile, the findings of this study could act as a basis for companies to consider allowing more of their employees to work from home even after the COVID-19 pandemic is over. The adoption of virtual meeting technology can maintain employees' productivity while at the same time reduce companies' cost of office rent. It also makes employees not having to spend so much time for commuting to and from the office. Thus, it might increase employees' satisfaction and happiness, which employees to produce better work result. The working from home policy, made possible by the virtual meeting technology, can be a perk to attract more talents to work in the companies as well as to retain the employees who perform well.

Furthermore, if companies want to maximize the full benefits of using virtual meeting technology, it needs to help their employees to overcome the difficulties of using the technology, such as providing them with the adequate tools (laptop and good internet connection) and teaching them how to use the technology well and according to the virtual meeting etiquette.

## 6. Conclusion

This research examined the impact of the adoption of virtual meeting technology towards the productivity of employees in Jakarta during COVID-19 pandemic. Moreover, we also examined the impact of satisfaction when using the virtual meeting technology as the mediating variable between the technology adoption and employees' productivity.

It is useful for both companies and employees to have a clear understanding of the impact of virtual meeting technology at work whether it really increases employees' productivity, not much impactful, or even causes more harm than good to the employees.

While the virtual meeting technology is growing in recent years, its growth has not been this fast as during the time of this study, which was accelerated by COVID-19 pandemic. Therefore, it is even more interesting to see what kind of impact to the employees that the broad and sudden use of virtual meeting technology during pandemic has caused. Our aim in this research was to examine the impact, along with some related things such as the obstacles when using the technology as well as the most used virtual meeting apps. We did so by means of a descriptive research using online questionnaires, addressing a sample of valid respondents.

There are two main results. First, the adoption of virtual meeting technology has significant and positive impact on the productivity of employees in Jakarta during COVID-19 pandemic. Second, the satisfaction when using the virtual meeting technology influences the impact of the technology adoption to the employees' productivity.

Our study is one of the few attempts at capturing the relations between the adoption of virtual meeting technology and employees' productivity during COVID-19 pandemic. It hence contributes to companies in their Information Technology (IT) strategy and their working policy. It also helps companies to maximize the productivity of its employees. Meanwhile, further research can be conducted to examine the impact of the virtual meeting technology adoption to the employees working in areas outside Jakarta. The research can also be designed to focus on certain industries to analyse more deeply on the desired industries.

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