THE INFLUENCE FACTORS TO USE VIDEO CONFERENCING APPLICATIONS DURING WORK FROM HOME (WFH)

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Abstract. *This research aims to evaluate factors that could influence the intention of using video conferencing applications during the COVID-19 pandemic as a means for workers to work from home. The research model used in this study is the UTAUT model, with perceived risk and trust as extended variables. Data collection was carried out by distributing questionnaires. A total of 212 samples were then collected and analyzed using SEM-PLS. The results show that risk perception negatively affects intention to use but is not significant enough to inhibit actual use. It was also revealed that the influence of behavioral intention on the user behavior variable is the most positive and significant.*
Keywords: Video conference, SEM-PLS, COVID-19, UTAUT, Work from home

1. **Introduction.** At the beginning of 2020, the coronavirus disease 2019 or COVID-19 began to spread in the world. This disease then spread to several countries affecting many people, and the World Health Organization classifies this disease as a pandemic. As of 23 September, according to the latest situation report published by the World Health Organization, the Indonesian government announced a total of 257,388 confirmed cases of COVID-19 [1]. The rapid spread of this virus is a serious concern for all parties, including the public, government, and businesses. As a form of restraining the spread of COVID-19, the Indonesian government has established a policy mainly called the large-scale social restrictions. The stipulation of this policy urges workers to work from home without the need to have physical contact with other workers, in a term popularly known as Work from Home (WFH). Therefore, to support this we need good facilities, infrastructure, and coordination [2] from every party, such as institutions, government, and individuals themselves.

One form of technology that can be utilized in implementing WFH is a video-conferencing application. The use of video conferencing applications has increased during the COVID-19 pandemic, according to data obtained by Statqo Analytics, the use of video conferencing applications is increasing every week, such as the Zoom application which has increased by 183% in 20 days [3]. Therefore, this study aims to examine the variables that affect the intention to use video conferencing applications and their significance level and find out how the views or levels of user confidence in terms of privacy and security after issues using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The UTAUT model is used to predict the acceptance of user technology in using an information system and the behavior of its use based on four variables, namely performance expectancy, effort expectancy, social influence, and facilitating conditions [4].

This study follows the advice of Venkatesh et al. [4] that stated the UTAUT model should be enriched by adding additional determinants, such as individual variables or constructs. Among the many variables and constructs, perceived risk and trust are taken into account in this study because they are considered important variables in the acceptance and intention of using technology by its users [5-9], and also because in the context of video conferencing applications, these are two metrics that the leading video conferencing service providers consider to be key namely convenience and security [10]. The initial risk that arises when the use of video conferencing applications starts to increase is *zoombombing*, which is the action of infiltrating a conference or meeting that is in progress. As such, both of these variables deserve to be included in this study. The practical implication of this study is that to make sure all the video conferencing processes could be more efficient and effective to support work from home activities.

2. **Literature Review.** This chapter describes the theories from previous research related to this research which the author uses in analyzing and making conclusions.

2.1. **Video conference.** Video telephony is a telecommunication technology that allows communication between two or more people at different locations by interacting via audio and video signals simultaneously. The definition of video conferencing is used when video telephony technology is used for the communication of a group or organization rather than communication between individuals. The use of new video conferencing was widely used around 2013 due to the development of electronic devices used by consumers that already have high bandwidth and audio and video transmissions with low delays. Apart from that, faster Internet networks are also driving the adoption of the use of video conferencing [11]. The use of video conferencing is now widely offered in various forms of prices, from those that are free of charge to the need to pay a fairly high price. Not only as a means for meetings, but video conferencing technology is also used in the health sector as a means of interaction between doctors and patients, as well as a means in the world of education that makes it easy for educators to teach online through video communication [12,13].

2.2. **Unified theory of acceptance and use of technology.** Unified Theory of Acceptance and Use of Technology (UTAUT) is a technology acceptance model invented by Venkatesh et al. [4], to integrate existing technology acceptance theory models into an integrated theoretical model [13]. UTAUT is built by integrating the elements contained in the following eight theories, namely theory of reasoned action, technology acceptance model, motivational model, theory of planned behavior, combination of planned behavior/technology acceptance model, model of PC utilization, innovation diffusion theory, and social cognitive theory [14]. UTAUT identifies four important factors, namely performance expectancy, effort expectancy, social influence, and facilitating conditions, and has four moderators, namely age, gender, experience, and voluntariness which are used to predict behavioral intention to use technology and technology use in an organizational context. According to UTAUT, performance expectancy, effort expectancy, and social influence affect behavioral intention to use technology, while behavioral intention and social facilitating conditions determine technology use [4].

3. **Method.** The Coronavirus Disease (COVID-19) pandemic has led to increased use of video conferencing applications, and services such as Zoom, Google Meet, and Microsoft Teams are seeing an increase in users during the pandemic. The increase in video conferencing happened because of the need for many workers around the world to do their work from home or it can be called Work from Home (WFH).

3.1. **Research model.** This study uses the theoretical basis of the Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT model was chosen because it reflects the relationship between behavioral intention and actual use [6]. The UTAUT model also has high completeness and explanatory power compared to other technology acceptance models because it is built from the previous eight theoretical models [15], which can explain behavior in the use of video conferencing technology based on the foundations that include human behavior and computer science.
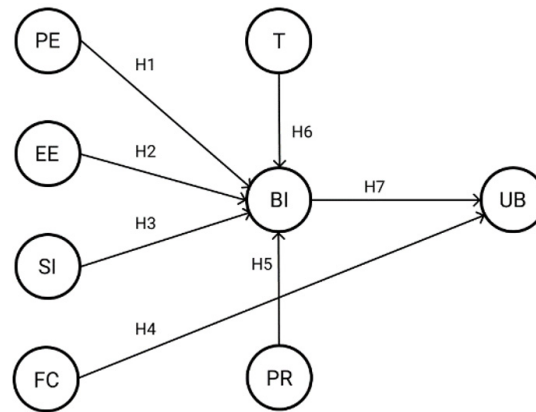

FIGURE 1. Research model

Hypotheses:
1) H1: Performance expectancy affects behavioral intention
2) H2: Effort expectancy affects behavioral intention
3) H3: Social influence affects behavioral intention
4) H4: Facilitating conditions affect use behavior
5) H5: Perceived risk affects behavioral intention
6) H6: Trust affects behavioral intention
7) H7: Behavioral intention affects use behavior

The first variable contained in this research model, namely Performance Expectancy (PE) is defined as the degree to which an individual feels that using video conferencing applications will help them achieve gains in job performance. The second variable contained in the research model, namely Effort Expectancy (EE) is defined as the level of convenience for individuals in using video conferencing applications. The third variable contained in this research model, namely Social Influence (SI) is defined as the level of perceptions of the surrounding environment towards decisions in using video conferencing applications. The fourth variable contained in this research model, namely Facilitating Condition (FC) is defined as the level of infrastructure available to support the use of video conferencing applications. The fifth variable contained in this research model, namely Perceived Risk (PR), is defined as the level of individual perceptions of risk in a system. The sixth variable contained in this research model, namely Trust (T), is defined as the level of user confidence in the ability of the video conferencing application to provide reliable and efficient services. The seventh variable contained in this research model, namely Behavioral Intention (BI), is defined as the level of individual intention in using video conferencing applications. The eighth variable contained in this research model, namely Use Behavior (UB) is defined as the level of a user on actual technology use, whether measured as a binary variable or as a combination with the frequency of use.

3.2. **Research population.** In this study, the authors focused the research population on the DKI Jakarta area. The population in this study were workers who have to work from home in the city of Jakarta, an age range of 18-54 years old, male or female. Based on the data collected from Lokadata, as of 26 May 2020, it was found that 4,057 company

in DKI Jakarta city had implemented WFH policy, and by that around 1,068,589 workers have to undergo the WFH policy. Hence, the authors chose DKI Jakarta for the research population as DKI Jakarta is one of the cities that have been highly impacted by the COVID-19 pandemic. The data was collected through the data collection period where authors were able to collect 256 respondents, consisting of 212 or 82.9% of respondents. While 44 or 17.1% of respondents is not following the criteria.

3.3. **Research sample.** To support the determination of the sample size, this study refers to the recommendation table published in the book A Primer on PLS-SEM [16]. The recommendation table describes that the sample size depends on three factors. First, the number of variables or constructs used to explain the dependent variable. The more variables, the more samples needed. Second, the level of significance. If the relationship is considered significant at the error tolerance limit of 10%, then fewer respondents are needed than the error tolerance limit of 1%. Third, the estimated effect size. If previously predicted or there is research that concludes that there are variables that have a substantial impact or have a large effect size, then fewer respondents are needed. The other way around, if previously predicted or there is research that concludes that there are variables that have less impact, then more respondents are needed.

This study has six independent variables. Referring to the table above, with the use of an error tolerance limit of 5% and a minimum value of R^2 as 0.10, the recommended sample size needed is 130 respondents. The authors used an asymmetric Likert scale with an answer choice of 6 points. According to Chomeya [17], the use of a 6 point Likert scale is more reliable and has a lower deviation compared to a 5 point Likert scale.

4. **Discussion.** In this particular study, data collection uses primary data from questionnaires. The outer model determines the relationship between latent variables and the observed indicators. Tests performed on the outer model are indicator loadings, internal consistency reliability, convergent validity, and discriminant validity [18]. Meanwhile, the inner model determines the relationships between exogen variables and endogen variables. Tests performed on the inner model are VIF, coefficient of determination, effect size, predictive relevance, path coefficient, and T statistics can be seen in Table 1.

TABLE 1. Hypotheses

Hypotheses	Relation	Original sample (O)	T statistics (|O/STDEV|)	Conclusion
H1	PE → BI	0.279	4.059	Significant
H2	EE → BI	0.19	2.982	Significant
H3	SI → BI	0.235	3.292	Significant
H4	FC → UB	0.238	3.955	Significant
H5	PR → BI	−0.027	0.513	Not Significant
H6	T → BI	0.283	4.849	Significant
H7	BI → UB	0.602	10.694	Significant

4.1. **Performance expectancy to behavioural intention.** Based on Table 1, it shows that the PE variable has a positive effect on the intention to use the application because it has a path coefficient of 0.279. This influence can be said to be significant on the intention to use video conferencing because it has a statistical T value of 4.059, which is above the threshold of 1.96. In this study, respondents gave answers which showed that the performance of the video conferencing application can help work, speed up work processes, increase productivity, and help improve communication effectiveness. These things affect the user's intention to use video conferencing applications when they have

to do work from home. This significant relationship is also consistent with the results of previous studies on the use of technology [6,19-21].

4.2. **Effort expectancy to behavioural intention.** Based on Table 1, it shows that the EE variable has a positive influence on the intention to use the application because it has a path coefficient of 0.19. This influence can be said to be significant on the intention to use video conferencing because it has a statistical T value of 2.982 which is above the threshold of 1.96. Based on the answers obtained from respondents, the video conferencing application is considered easy to understand, easy to use, easy to learn, and easy to master. These conveniences affect the user's intention to use video conferencing applications when working from home. This is also in line with previous research on the use of technology [5,6,21].

4.3. **Social influence on behavioural intention.** Based on Table 1, it shows that the SI variable has a positive influence on the intention to use the application because it has a path coefficient of 0.235. This effect can be said to be significant on the intention to use video conferencing because it has a statistical T value of 3.292 which is above the threshold of 1.96. Based on the answers obtained from respondents, the use of video conferencing applications is influenced by suggestions from people around them, support from senior management, and support from the company. This shows that the intention to use a video conferencing application can be influenced by the opinion of the surrounding environment regarding the use of video conferencing applications. The results of this relationship are also consistent with previous studies [8,20-22].

4.4. **Facilitating condition to use behaviour.** Based on Table 1, it shows that the FC variable has a positive influence on the use of the application because it has a path coefficient of 0.238. This influence can be said to be significant on the behavior of using video conferencing because it has a statistical T value of 3.955 which is above the threshold of 1.96. Based on the answers obtained from respondents, the video conferencing application requires hardware, a connection to the Internet network, and basic knowledge of using a device before the video conferencing application can be used. Therefore, the existing infrastructure affects the use of video conferencing applications when working from home. These results are also consistent with previous studies [4,23].

4.5. **Perceived risk to behavioural intention.** Based on Table 1, it shows that the PR variable reduces the intention to use because it has a path coefficient value of -0.027 but does not have a significant effect because it has a T statistical value of 0.513 which is below the threshold of 1.96. Based on the answers obtained from respondents, video conferencing applications have the possibility to endanger the privacy of respondents. These results are in accordance with the author's expectations after the popularity of the term zoombombing, that there will be a skeptical view of the public regarding the use of video conferencing applications, but the low level of significance indicates that the risks do not affect the user's intention to use the video conferencing application. Respondents tend to keep using video conferencing applications when working from home. If you look at previous research, this result is by Lee and Song's research [7] which states that the results of their research can support their hypothesis which states that perceived risk reduces the intention to use a technology because it has a path coefficient value of -0.159. This result is also following the research of Abrahão et al., which has a perceived risk coefficient value of -0.125 [22]. Likewise, several previous studies stated that perceived risk negatively affects the intention to use a technology [8,9].

4.6. **Trust to behavioural intention.** Based on Table 1, it shows that the variable T has a positive effect on the intention to use because it has a path coefficient of 0.283. This influence can be said to be significant on the intention to use because it has a T statistical

value of 4.849 which is above the threshold of 1.96. Based on the answers obtained from respondents, video conferencing applications tend to be trusted by users in general. Users tend to trust the integrity, service, quality, and capabilities of applications. This affects the user's intention to use video conferencing applications when working from home. This is also by previous research which states that the trust variable has a positive effect on the intention to use technology [6,7,24].

4.7. **Behavioural intention to use behaviour.** Based on Table 1, it shows that the BI variable has a positive effect on application use because it has a path coefficient of 0.602. This influence can be said to be significant on usage behavior because it has a T statistical value of 10.694 which is above the threshold of 1.96. Based on the answers obtained, respondents tend to use video conferencing applications if they intend to use them for working from home. This is also consistent with many previous studies [4,6,8,23].

5. **Conclusions.** Based on the results of the research analysis that has been obtained regarding the use intentions and behavior of users of the video conferencing application while working from home during the COVID-19 pandemic, it can be concluded that several things, namely the effort expectancy, performance expectancy, social influence, and trust variables each have a positive and significant effect on behavioral intention variable, the facilitating condition and behavioral intention variables each have a positive and significant effect on the use behavior variable. Meanwhile, the perceived risk variable has a negative and insignificant influence on behavioral intention. The relationship between the behavioral intention and use behavior variables has the highest level of significance with a T statistical value of 10.694. This is consistent with the preliminary research of Venkatesh et al. [4] where use intention influences user behavior. Furthermore, the model under study has moderate predictive accuracy based on the results of the coefficient of determination and predictive relevance that have been analyzed. Apart from that, theoretically, this research also plays a role in the development of the UTAUT extension model by adding the variables of perceived risk and trust in the context of using video conferencing. When viewed from a practical point of view, this study provides empirical evidence regarding what variables affect the intention to use video conferencing when working from home, which can be a reference for application developers in understanding user behavior. Looking at the results of research analysis, the risks involved in using the video conferencing application reduce the intention to use the application itself because it has a negative coefficient path value, but the effect is not too significant in reducing the intention to use because it has a T statistics value of 0.513 which is less than the 1.96 limits. When viewed from the respondents' answers, video conferencing applications tend to be easy to use which has become an essential tool in this pandemic era in helping work activities. So, its use will not decrease as long as the work from home policy is still in effect. For future research we could use another research method, such as TAM, IS success model to get a more comprehensive result.

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