INNOVATIVE UTILIZATION OF VIRTUAL CONFERENCING APPLICATIONS: BASIS FOR NEW TECHNOLOGICAL MANAGEMENT APPROACH

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ABSTRACT

In this fourth industrial revolution of technologies, video conferencing applications are now utilized for online business meetings, online classes, and scientific and experimental purposes engaged in a virtual meeting room due to rigorous cases of coronavirus disease 2019. Several difficulties and technical disruptions were encountered in using the said apps, especially during online classes and business conferences. In connection thereto, this Optimization and Innovative Utilization of Virtual Conferencing Applications dissertation were developed to have a new basis for a technological management approach based on the most commonly used video conferencing applications. The encountered problems, considered factors, and optimization processes were also determined. Descriptive quantitative research was used as methodology, and initial closed-ended questionnaires, evaluation forms with a 4-point Likert scale, interviews, consultations, and testing were the instruments and sources of data. Three hundred one (301) respondents were randomly selected around the Province of Laguna, Philippines, composed of 203 respondents from schools, 78 respondents from companies, and 20 professional evaluators. The developed strategic model was evaluated using 6 out of 8 general characteristics of the ISO/IEC 25010: 2011 system quality model, which includes usability, reliability, performance efficiency, maintainability, compatibility, and security. All data gathered were validated as well as the statistical treatments such as percentage, weighted and composite means, and t-test, which was used to determine the significant difference between the normal and optimized utilization of video conferencing applications. Obtained results revealed that utilizing the developed strategic model was significantly more acceptable and effective rather than the normal utilization of the common apps. The teachers and students and as well as the workers of business enterprises are the beneficiaries of this study to optimize and utilize the said applications for better learning and optimal workflow.

Keywords: The new normal environment, video streaming, online distance learning, business meetings, work-from-home, the fourth industrial revolution, remote collaboration.

INTRODUCTION

Nowadays, the fourth industrial revolution of technologies (i4.0) developed different multimedia application (app) platforms using laptops, smartphones, and tablet devices, which build communication between two or more people from different parts of the world through the Internet. These devices contain applications that can be used for communications by social media platforms, and online messaging and video conferencing platforms as well. One of the most widely used applications is the video conferencing platform also known as videotelephony and video teleconference. In video conferencing, data is transmitted via a live video stream between two or more video-enabled devices from different locations. It provides people with the ability to meet face to face long distance and collaborate transmission of audio text, video, and presentations in real-time. (Video Conferencing, 2021).

These video conferencing apps are now utilized for online business meetings, online classes, and scientific and experimental purposes engaged in a virtual meeting room especially in the last quarter of 2019 due to initial cases of coronavirus disease (COVID-19) from Wuhan, China. As we are now experiencing globally a pandemic, schools and universities implemented a blended learning approach to holding classes, particularly favoring online and modular approaches to instructional delivery. Even big and small companies advised their employees to stay at home to prevent the widespread of the virus.

As mentioned above regarding the use of video conferencing platforms before and during the pandemic crisis in which the said business conferences and online classes continue to operate, fast Internet connectivity is the most important requirement in virtual meetings. Schembri (2019) stressed the space equipment. and the fast and stable quality of the network, which can handle highquality audio and video without any lagging and disturbances. Unexpected uneven loading disruption of presentations can result in frustrations of the attendees, waste of time, and hinder productivity. Relationally, Ahmed (2020) emphasized the role and functions of technology management, which can be categorized by effective management resources, maintaining open communications, developing customer relationships, and data-driven decision-making using technologies, which can be applied in schools and most especially by companies. With the mentioned roles of technology management, developing a strategic model of innovative technology management advancements have the potential to solve the problems for online learning, especially in using video conferencing application platforms.



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Figure-1 shows the conceptual model of this study, which is composed of four (4) phases. Identifying the commonly used video conferencing application platforms for online classes and business conferences to sort and limit the broadness of the strategic model to be developed. It only evolved to the identified platforms to be easily understood by the users.



Figure-1. The conceptual model of the study.

These sorting phases served as the common data to initialize the input phase. Input data were the problems encountered and factors to be considered in using the said platforms, which were identified and sorted in the common phase. After determining the input data, these underwent different optimization processes to determine and develop a new strategic innovative model also known as the process data through a technological management approach as the basis for utilizing the common data. Upon the development of the process data, it underwent a series of evaluations to determine its usability (simplicity), performance reliability, efficiency, maintainability, compatibility, and security. Output data served as the developed strategic model approach in using the common video conferencing application platforms by the users following the series of evaluations using the six (6) out of eight (8) general characteristics of the ISO/IEC 25010: 2011system quality model in terms of usability, reliability, performance efficiency, maintainability, compatibility, and security to meet the required specific requirements.

The purpose, goal, and objective of this study were to establish a new technological management approach based on the innovative ways of optimization and utilization of different video conferencing application platforms used most especially during online classes. This benefited mostly the students, teachers, and big and small businesses in which the main communication now is through video conferencing.

METHODOLOGY

Descriptive quantitative research was used to illustrate existing conditions so that these could be manipulated later as an outcome of the study since it inspects the connection among variables about developing the best strategic model in using video conferencing application platforms. The total population of the selected schools, colleges, universities, and, small to mid-sized companies came from 1,121 samples. Specifically, cluster sampling was used in selecting the respondents by designations. The total number of samples was computed using Stovin's formula with a 5% marginal error. Three hundred one (301) samples of the total population were randomly selected, composed of 203 respondents from schools, 78 respondents from companies, 20 computer engineers and technicians, and information technologists (IT) who served as professional evaluators.

Closed-ended questionnaires, evaluation forms (final survey) with a 4-point Likert scale, interviews, consultations, and a series of testing were the main research instruments. The Likert scale used has 4-point numerical values from 3.25 - 4.0 with a categorical response of strongly disagree and interpretation of very high and very effective; 2.50 - 3.24 for agreeable response with high and effective interpretations; 1.75 - 2.49 for disagree with low and ineffective interpretations; and 1.00 - 1.74 for strongly disagree with very low and very ineffective interpretations.

For statistical treatments, weighted mean, composite mean or average was used for the rating of the developed model. Relatedly, a t-test was used to verify the significant difference between two variables, which were the normal utilization and the developed model in using the most common video conferencing application platforms. Validation was executed by the research experts of the university, which included authenticating, maintaining, and studying every data collected.

RESULTS AND DISCUSSIONS

This section includes the gathered data for developing the new technology management approach utilizing different video conferencing application platforms, especially during online classes and business conferences.



Figure-2. The bar graph with a percentage presentation of the most common video conferencing application platforms used for online classes and business conferences.

Figure-4 shows the result of the initial survey administered to respondents via multiple responses; there are five (5) most popular video conferencing application platforms for online classes and business conferences, including Google Meet, which received 260 responses (86.4%) of the total population, and Zoom, which received 73.4% (233) of the total responses. Microsoft Teams placed third with 75 responses (24.9%), Skype received 16.6% (50 responses), and Cisco WebEx received 6.9% (21 responses). Other application platforms such as Slack, GoToMeeting, Discord, Facebook Messenger Room, ClassIn, Gather, and Schoology, accounted for the remaining 6.1%.

With the obsolete and inefficient communication systems across a variety of sectors, Skype adopted a simplified communication platform embracing cloudbased technologies (5 Real Benefits of Skype for Business, 2021), which video conferencing platform services have evolved into the beating heart of both online collaboration and personal interactions via the web (Brame, 2021c). In connection thereto, the finest business for enterprise conferencing is WebEx by Cisco because of its highly fullfeatured platform with integration and security capabilities geared directly at mid-sized to big corporations and enterprises (Brame, 2021a). Similarly, Google Meet is fully capable of standing on its own, and there are no burdensome programs to download, apart from the Google Chrome browser, which is optional. It is compatible with all operating systems and has a robust set of collaborative tools (Brame, 2021b). Moreover, Duffy (2021b) labelled the Microsoft Teams app as a user-friendly remote-work collaboration tool because of its ease of navigation and self-service system arrangements. Furthermore, Zoom Meetings has taken root and has become a top choice among video conferencing programs for business, education, government, healthcare, and personal usage, with increasingly strict security and privacy standards (Duffy, 2021a). According to the different research gathered, Google Meet and Microsoft Teams are the most suited for education, while Skype and Cisco WebEx are the most utilized platforms for business. Zoom, on the other hand, is regarded as the most versatile software since

it can be used for both online education and corporate meetings. This reveals that each of the most popular video conferencing application platforms identified in this study has a distinct and appropriate use.



Figure-3. The bar graph with a percentage presentation of the problems encountered in using the different video conferencing application platforms.

Figure-3 shows the findings of the initial survey administered to respondents via multiple responses, revealing six significant issues experienced while utilizing video conferencing application platforms for online classrooms and business conferences. Two hundred eight (208 or 69.1%) said that Internet and network connectivity was the most difficult problem they had encountered, followed by audio background noise (147 responses) and audio and video feed lagging (145 responses), which received 48.8% and 48.2% of the total responses, respectively. Furthermore, camera resolution and camera connection failure received 43.5% (131 responses), followed by minor issues such as file transfer and sharing, which received 13.6% (41 responses), application version compatibility, which received 29 responses (9.6%), and hardware and cable connection (peripherals) issues, which received 8% (24 responses). According to the respondents, time management and remote activities are included in the remaining 1.2% (4 responses).

Video conferencing platforms are available in different formats and required to have a stable local area network through telecommunication lines with network traffic protocols and codecs for handling traffic streaming. The said codecs encode audio and video feed into digital bits and bytes on the broadcasting side and then back to video and audio on the receiving side. Better broadcasts need compatible cameras, microphones, dedicated servers, and client-side apps (Brame, 2021c). In connection with the quoted findings and gathered results of this study, this signifies that the Internet and network connectivity is the main problem to be solved from the encountered

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difficulties in using the different video conferencing application platforms. Having a stable Internet and network connection will decrease the audio background noise and video feed lagging as well as the camera resolution, and file transfer and sharing features of the platforms used will be improved and consistent. On the other hand, using compatible hardware peripherals and updated software versions are also the major solutions to the problems encountered since hardware peripherals, software versions, network connections and their users (peopleware) are the vital components of virtual conferencing.

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Figure-4. The bar graph with a percentage presentation of the factors to be considered in using the different video conferencing application platforms.

Figure-4 shows the result of the initial survey administered to respondents via multiple responses regarding the factors to be considered in using the common video conferencing app platforms. According to the respondents, visual and audio quality obtained 244 responses (81.1%), followed by Internet and network speed connectivity with 77.7% (234) of the responses, memory space usage received 44.5% (134) responses, and group size received 38.2% (115 responses). Additionally, file transfer and sharing features (98 responses) and application version compatibility (95 responses) earned 31.6% and 31.6%, respectively. In terms of hardware and software compatibilities, these include hardware and cable connection peripherals with 24.9% (95 responses) and application user interface (UI) features, which received 70 responses (23.3%). For the remaining respondents, the application cost and assistance received 66 responses (21.9%), participant movements received 14.6% (44) of the responses, and other variables received 0.3%, respectively.

Gittlen (2021) emphasized key factor adjustments of home school and home office environments using video conferencing platforms, such as improved application performance, appropriate video and audio peripherals for video quality and on-camera appearance, high-speed connectivity and optimal workflow, and comfort of the users. Optimizing procedures such as avoiding uploading and downloading big files, modifying default settings, and other optimizations listed in Table 1 might reduce CPU and memory use by 30 to 40%. The gathered result for considered factors indicates that maintaining a stable Internet and network connection, applying optimization processes, and changing and adjusting default settings are key factors to be considered when using video conferencing apps, which could improve audio and video quality as well as file transfer and sharing, update application version, and reduce CPU and memory usage. Furthermore, diverse demands exist for video conferencing, and appropriate practice procedures must be improved; and successful participation is dependent on people, group dynamics, and organizational outcomes.

Based on the above results, Figure-5 and Table-1 below show optimized solutions illustration to the major problems encountered as shown in Figure-3, which were based on the main factors to be considered as shown in Figure-4. Likewise, these optimization and innovative utilization processes and solutions, which serve as a new technological management approach are applicable only for the said most used video conferencing app platforms as shown in Figure-2.

Exploring the latest developing technologies and numerous ways that might reduce the observed concerns, particularly the quality challenges associated with Voice over IP, as well as video. Similarly, video conferencing necessitates careful consideration of delay, jitter, packet loss, and other technical interruptions. With the said technical interruptions, these optimization processes and solutions came from different cited research, journals, web articles, and web blogs, which were applied, tested, and evaluated also by professionals to the most common video conferencing apps used by the selected schools and companies. These were compiled according to the laptop and mobile device optimizations, optimization of multitasking utilization of other applications, optimization of Internet and mobile data connectivity and its security, minimizing the consumption of computer hardware memory storage, and other technological properties. The users can identify which conferencing app is better for their online classes and business meetings, especially teachers and employers (Continuation on Table-1).



Figure-5. KIEROPINTECH: The virtual conferencing innovative optimization and technological management approach model.

Table-1. The optimization processes and innovative technological management approach in using the most common video conferencing application platforms are based on the most preferred computers and mobile devices used for online classes and business conferences.

Google MeetLenovoSamsungSamsungZoomAcerApple's iPhoneApple's iPadMicrosoft TeamsAsusXiaomiXiaomiSkypeHPOppoHuaweiCisco WebExAcel & Mc PackWincome	Common Video Conferencing	Common Desktop and	Common Mobile	Common Tablet
	Application Platforms	Laptop Brands	Phone Brands	Brands
	Google Meet Zoom Microsoft Teams Skype Cisco WebEx	Lenovo Acer Asus HP Dell	Samsung Apple's iPhone Xiaomi Oppo Huawei Virre	Samsung Apple's iPad Xiaomi Huawei Lenovo



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Table-1. Continued.

Optimization and Innovative Utilization	Applications of Optimization and Innovative Utilization Processes to Common Video Conferencing Application Platforms Used					
Processes	Desktops and Laptops	iPhones, iPads and MacBooks	Mobile Phones	Tablets		
Decrease display brightness	\checkmark	\checkmark	\checkmark	\checkmark		
Use a plain (not bright) desktop and home screen background	\checkmark	\checkmark	\checkmark	\checkmark		
Decrease keyboard backlight	\checkmark	?	?	?		
Disable Bluetooth and Wi-Fi connection when not in use	\checkmark	\checkmark	\checkmark	\checkmark		
Disable the use of virtual backgrounds	\checkmark	\checkmark	\checkmark	\checkmark		
Disable e-mail and Internet sync settings	\checkmark	\checkmark	\checkmark	\checkmark		
Avoid uploading and downloading large files	✓	\checkmark	\checkmark	✓		
Keep Bandwidth-hogging Processes to a Minimum	\checkmark	✓ MacBook, iPhone, iPad	2	?		
Monitoring the temperature of laptops and mobile devices	\checkmark	\checkmark	\checkmark	\checkmark		
Battery optimization	\checkmark	\checkmark	\checkmark	\checkmark		
Turning off, hibernate mode, and sleep mode laptops while charging	\checkmark	2	?	2		
Monitoring charging patterns	\checkmark	\checkmark	\checkmark	\checkmark		
Not in use mobile phones and tablets while charging	?	\checkmark	\checkmark	\checkmark		
Use equipment with appropriate USB HID connections	\checkmark	\checkmark	\checkmark	\checkmark		
Use the appropriate camera, microphones, headsets, and other hardware peripherals	\checkmark	\checkmark	\checkmark	\checkmark		
Use the appropriate Bluetooth connection devices	\checkmark	\checkmark	\checkmark	\checkmark		
Audio and camera testing	\checkmark	\checkmark	\checkmark	\checkmark		
Audio, video, share screen, and local and cloud recording pairings	2	✓	?	?		
Always upgrading the applications to the latest version	✓	✓	\checkmark	~		

Note: Retrieved from "Network Optimization for Video Conferencing" by C. Craven, 2021. SDxCentral.com; "Cisco WebEx Business Review" by D. Brame, 2021. PCMAG.com; "Google Meet Review" by D. Brame, 2021. PCMAG.com; "The Best Video Conferencing Software for 2021" by D. Brame, 2021c. PCMAG.com; "Microsoft Teams Review" by J. Duffy, 2021b. PCMAG.com; "Is Zoom Hogging Your PC's Resources? Try These Tips and Tricks" by Rahi System, 2021. Rahi; "Supported USB HID devices for the Zoom desktop client", 2021. Zoom; "System requirements for iOS, iPadOS, and Android", 2021. Zoom; "System requirements for Windows, macOS, and Linux", 2021. Zoom; "What are the System Requirements for Cisco WebEx Video Platform?", (2021). WebEx & "5 ways to optimize your PC for video conferencing" by E. Weiss, 2021. UniversityBusinessMagazine.com.

(Continuation) The said users are usually the main hosts or organizers of the video conferencing and mainly benefit because they can choose the right platform based on the number of participants who will be going to attend, the Internet and network specifications, and the time limitation of the video conferencing to be held. As for the students and employees, they can also determine the developed model, the required or needed bandwidth and network as well as mobile data specifications so they can apply the optimization process on their Internet or mobile data connection, which also depends on the chosen video conferencing platform by their host. These optimization processes could serve as the basis for innovative technological management and utilization approaches for the most used and specific video conferencing, which can be applied for online education and business conferences. Table-2 below shows the results from the respondents and professional evaluators on their normal utilization of the common video conferencing applications based on ISO/IEC 25010: 2011 system quality model, the first



general characteristic is maintainability garnered an average weighted mean of 2.76 with an acceptable interpretation, together with its five sub-characteristics such as modularity, which earned 2.51, reusability had 2.75, analyzability garnered 2.84, a weighted mean of 2.79 for its modifiability, and for testability, which earned 2.92. Similarly, the second one is security, which received an average weighted mean of 2.50 with an acceptable interpretation, together with its five sub-characteristics namely confidentiality earned 2.34, integrity had 2.62, non-repudiation received 2.34, accountability garnered 2.71, and authenticity with 2.48 weighted mean. As for reliability general characteristics, the average weighted mean was 2.61 with an acceptable interpretation along with its sub-characteristics such as maturity earned 2.68, availability had 2.75, fault tolerance received 2.59 and recoverability garnered 2.42 of the weighted mean. Likewise, the fourth general characteristic is compatibility, which received an average weighted mean of 2.68 along with an acceptable response, with co-existence and interoperability, which had 2.72 and 2.63, respectively as its sub-characteristics.

Table-2. The summary table of the conducted evaluation using the most common video conferencing application platforms
based on ISO/IEC 25010: 2011 system quality model.

General Characteristics	Sub- Characteristics	Normal Utilization		Optimized Utilization			n-	
		Weighted Mean	Average	Weighted Mean	Average	t-Value	Value	Interpretation
	Modularity	2.51		3.72		-8.460		
	Reusability	2.75		3.64			0.0000	
Maintainability	Analyzability	2.84	2.76	3.36	3.66			Significant
	Modifiability	2.79		3.78				
	Testability	2.92		3.81				
	Confidentiality	2.34		3.65			0.0000	Significant
	Integrity	2.62		3.73				
Security	Non-Repudiation	2.34	2.50	3.76	3.74	-14.903		
	Accountability	2.71		3.88				
	Authenticity	2.48		3.70				
	Maturity	2.68		3.80			0.0000	Significant
Daliahilita	Availability	2.75		3.88	2 77	12 694		
Reliability	Fault Tolerance	2.59	2.01	3.61	3.77	-12.684		
	Recoverability	2.42		3.77				
Compatibility	Co-existence	2.72	2.68	3.83	2 72	-8.422	0.0138	Significant
	Interoperability	2.63		3.60	3.72			
Performance Efficiency	Time Behavior	2.86	2.67	3.81		-10.907	0.0000	Significant
	Resource Utilization	2.52		3.84	3.80			
	Capacity	2.63		3.75				
Usability	Appropriateness	2.95	2.87	3.77	-	-10.214	0.0000	Significant
	Recognizability	2.94		3.92				
	Learnability	3.03		3.79				
	Operability	2.78		3.85	3.85			
	User Error Protection	2.35		3.82				
	User Interface Aesthetics	3.09		3.88				
	Accessibility	2.93		3.89				
Composite Mean		2.68		3.76				



In addition, performance efficiency received an acceptable response with a 2.67 average weighted mean with its sub-characteristics of time behavior, which received 2.86, resource utilization had 2.52, and capacity earned 2.63 of the gathered weighted mean. For the final general characteristic, usability with a 2.87 average weighted mean and an acceptable interpretation, accompanied by appropriateness, which earned 2.95, recognizability had 2.94, learnability garnered 3.03, operability received 2.78, user error protection received 2.35, and the last two sub-characteristics were user interface aesthetics and accessibility, which received 3.09 and 2.93, respectively. The normal utilization of the common video conferencing application platforms received an overall composite mean of 2.68 with an agreeable level of acceptability.

Table-2 also shows the results from the evaluation form utilizing the developed optimized innovative technological management approach and its strategic model as shown in Table-1 and Figure-5.

The said evaluations garnered an average weighted mean of 3.66 with a strongly acceptable interpretation, together with its five sub-characteristics such as modularity, which earned 3.72, reusability had 3.64, analyzability garnered 3.36, a weighted mean of 3.78 for its modifiability, and for testability, which earned 3.81. Similarly, the second one is security, which received an average weighted mean of 3.74 with a strongly acceptable interpretation, together with its five sub-characteristics namely confidentiality earned 3.65, integrity had 3.73, non-repudiation received 3.76, accountability garnered 3.88, and authenticity with 3.70 weighted means. As for reliability general characteristics, the average weighted mean was 3.77 with a strongly acceptable interpretation along with its sub-characteristics such as maturity earned 3.80, availability had 3.88, fault tolerance received 3.61 and recoverability garnered 3.77 of the weighted mean. Likewise, the fourth general characteristic is compatibility, which received an average weighted mean of 3.72 along with a strongly acceptable response, with co-existence and interoperability, which had 3.83 and 3.60, respectively as its sub-characteristics. In addition, performance efficiency received a strongly acceptable response with a 3.80 average weighted mean with its sub-characteristics of time behavior, which received 3.81, resource utilization had 3.84, and capacity earned 3.75 of the gathered weighted mean. For the final general characteristic, usability with a 3.85 average weighted mean and a strongly acceptable interpretation, accompanied by appropriateness, which earned 3.77, recognizability had 3.92, learnability garnered 3.79, operability received 3.85, user error protection received 3.82, and the last two subcharacteristics were user interface aesthetics and accessibility, which received 3.88 and 3.89, respectively. The utilization of the common video conferencing application platforms utilizing the developed approach received an overall composite mean of 3.76 with a strongly agreeable level of acceptability. Based on the gathered data and results from the evaluations conducted,

which have a difference of 1.08 from the average weighted mean of 2.68 for normal utilization and 3.76 for optimized utilization with acceptable and strongly acceptable interpretations, respectively. These weighty results from the two evaluations signify that applying the developed optimized innovative technological management approach of the common video conferencing applications for online classes and business conferences is credible and effective.

Table-2 also shows the difference between the normal utilization and optimized utilization of the common video conferencing application platforms used for online classes and business conferences. Optimized utilization involves the utilization of the developed optimized innovative technological management approach and its strategic model. Based on the average weighted mean in terms of maintainability, the normal utilization received 2.76 while 3.66 for the optimized utilization, which had an increase of 0.9. On the other hand, an increase of 1.24 from the normal utilization of 2.50, the optimized utilization earned a 3.74 average weighted mean for the security. Similarly, an increase of 1.16 for the reliability of the normal utilization of 2.61, which the optimized utilization received a 3.77 average weighted mean. Likewise, the normal and optimized utilizations for compatibility garnered an average weighted mean of 2.68 and 3.72, respectively, with a 1.04 increase. For the performance efficiency, the normal utilization received 2.67 while 3.80 for the optimized utilization, which had an increase of 1.13. Lastly, an increase of 0.98 from the average weighted mean of the normal utilization of 2.87 for usability resulted in 3.85 for the optimized utilization. With this, all data gathered underwent a t-test were obtained p-values at a 5% significance level are less than 0.05 (p-value < 0.05), giving a rejected hypothesis (H₀), thus the interpretation being significant. Proving that the produced means from the gathered data of the normal utilization and optimized utilization have a significant difference considering that probabilities were not just coincidence and it was solved with a t-test since the data is summarized already. As such, an evaluation was conducted of the difference between the normal utilization (default setting) and the applied optimized utilization for video conferencing applications made a significant change as the p-value met the required condition to reject the hypothesis. These results proved that the main problem of this study provided a credible solution using the developed optimized innovative technological management approach and its strategic model for the common video conferencing application platforms used for online classes and business

CONCLUSIONS

conferences.

Zoom Video Conferencing is the most flexible application due to its wide range of services, especially for education and business, and its accommodation capacity. Similarly, Google Meet is considered as best for education because of its workplace, which the users can connect by using one Google account only to their other different platforms such as Gmail, Google Drive for cloud storage, Google Docs for real-time editing of documents, YouTube



for video streaming, and others that could help the users in their school activities and unfinished business agendas. Likewise, MS Teams is the same as Google Meet, which the users can also access by also using one Microsoft account with their MS Office files, One Drive cloud storage, Outlook mail, and other useful applications. On the other hand, Cisco WebEx and Skype are essential for business since it has easy, modern, and intuitive set-up feature that could make workflow more optimal.

Since the fourth industrial revolution of technologies including cloud computing and wireless communications to have remote communication and sharing platforms, the major problem encountered in using video conferencing applications is the Internet and network connectivity and its bandwidth requirements and specifications of the wireless communications standards. The key factors to be considered when using video conferencing applications platforms are hardware, software, peopleware, and most especially Internet and network connections. Meanwhile having an unstable bandwidth and network connectivity will have a domino effect, which will start with the software that causes lagging followed by the connection failures of hardware peripherals, and then to its peopleware (users), which can cause additional stress and fatigue due to the delay and unwanted disruptions of the video conferencing.

The immediate transition of face-to-face into the new normal environment had a big impact especially to network communications, which is become growing in demand, but several network traffic and other unexpected disruptions occur due to the increasing number of users. Then, by applying the common optimization processes and solutions in using the different conferencing applications to be easily adopted and create an efficient pace of work, deliver faster problem solving, and increase innovation through technological management. The developed strategic model for using the common video conferencing applications could serve as the basis on which application is more suitable for a specific video conferencing depending on its requirements and limitations. With this, the users will be prepared for necessities and to eliminate unexpected disruptions due to misinformed requirements and specifications of the application to be used.

RECOMMENDATIONS

For the hosts of the video conferencing, always check first the number of attendees, the time consumption, and the network specifications of the users before selecting the video conferencing application to be used since each video conferencing application has a specific and appropriate use. Similarly, the attendees should also check the specific requirements of the video conferencing application provided by the hosts to prepare necessary peripherals and apply the common optimization processes for an optimal video conferencing experience. Securing a stable Internet connection is the best way to eliminate all the problems encountered in using video conferencing applications by using a router booster or wireless range extenders to maintain network connectivity. Additional key factors to consider in using video conferencing applications were the specific compatibility of hardware peripherals, wireless devices through Bluetooth and Wi-Fi connectivity, and device pairings, which is one of the problems encountered especially for Apple devices. Additional specific optimization processes and solutions can be used only for a specific device, operating system used, and its specific optimizations based on the brands of the computer used as well as smartphone and tablet devices. Additional modifications for the developed strategic model, include minimum and recommended requirements and specifications for Linux, ROM and video card specifications, and internal memory specifications for smartphones and devices.

To significantly increase the level of acceptability of the developed strategic model, modify or redevelop a new one, which focuses on the familiarization of the user interface and its features of the common video conferencing applications for online classes and business conferences. Additional key factors to consider are the ages and generation gaps of the peopleware also as the users of the video applications. Millennials and Generation Z are very familiar and can adapt easily to the new trend of technologies, unlike the other generations. In addition, most of the newly hired workers are millennials and gen-z, which prefer a technological way of optimal workflow.

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